# Graduate Study at Bilkent University

## ACADEMIC OFFICERS OF THE UNIVERSITY

Ali Doğramacı, Chairman of the Board of Trustees and President of the University

### CENTRAL ADMINISTRATION

Abdullah Atalar, Rector (Chancellor)
Adnan Akay, Vice Rector - Provost
Kürşat Aydoğan, Vice Rector
Orhan Aytür, Vice Rector
Cevdet Aykanat, Associate Provost
Hitay Özbay, Associate Provost
Özgür Ulusoy Associate Provost

### DEANS OF FACULTIES

Ayhan Altıntaş, Faculty of Art, Design, and Architecture (Acting)
Mehmet Baray, Faculty of Education (Acting)
Ülkü Gürler, Faculty of Business Administration (Acting)
Ezhan Karaşan, Faculty of Engineering
Hitay Özbay, Faculty of Humanities and Letters (Acting)
Tayfun Özçelik, Faculty of Science
Turgut Tan, Faculty of Law
Erinç Yeldan, Faculty of Economics, Administrative, and Social Sciences (Acting)

### GRADUATE SCHOOL DIRECTORS

| | |
|---|---|
| Alipaşa Ayas, Graduate School of Education | apayas@bilkent.edu.tr |
| Halime Demirkan, Graduate School of Economics and Social Sciences | demirkan@bilkent.edu.tr |
| Ezhan Karaşan, Graduate School of Engineering and Science | mfbe@bilkent.edu.tr |

### DEPARTMENT CHAIRS and PROGRAM DIRECTORS

| | |
|---|---|
| Michelle Adams, Neuroscience | michelle@bilkent.edu.tr |
| Adnan Akay, Mechanical Engineering | akay@bilkent.edu.tr |
| M. Selim Aktürk, Industrial Engineering | akturk@bilkent.edu.tr |
| Orhan Arıkan, Electrical and Electronics Engineering | oarikan@ee.bilkent.edu.tr |
| Fatihcan Atay, Mathematics | f.atay@bilkent.edu.tr |
| Pınar Bilgin, Political Science and Public Administration | pbilgin@bilkent.edu.tr |
| Hilmi Volkan Demir, Materials Science and Nanotechnology | volkan@bilkent.edu.tr |
| Oğuz Gülseren, Physics | gulseren@fen.bilkent.edu.tr |
| Ahmet Gürata, Communication and Design | gurata@bilkent.edu.tr |
| Meltem Gürel, Architecture | mogurel@bilkent.edu.tr |
| Refet Gürkaynak, Economics | refet@bilkent.edu.tr |
| Ülkü Gürler, Business Administration (Acting) | ulku@bilkent.edu.tr |
| H. Altay Güvenir, Computer Engineering | guvenir@cs.bilkent.edu.tr |
| Tanju İnal, Translation and Interpreting | inal@bilkent.edu.tr |
| Mehmet Kalpaklı, History and Turkish Literature (Acting) | kalpakli@bilkent.edu.tr |
| Kağan Korad, Music | korad@bilkent.edu.tr |
| Şefik Süzer, Chemistry | suzer@fen.bilkent.edu.tr |
| Nilgün Olguntürk, Interior Architecture and Environmental Design (Acting) | onilgun@bilkent.edu.tr |
| Turgut Tan, Law | ttan@bilkent.edu.tr |
| Timothea Toulopoulou, Psychology | ttoulopoulou@bilkent.edu.tr |
| Simon Wigley, Philosophy | wigley@bilkent.edu.tr |
| Erinç Yeldan, International Relations (Acting) | yeldane@bilkent.edu.tr |
| Işık Yuluğ, Molecular Biology and Genetics | yulug@fen.bilkent.edu.tr |
| Thomas Zimmermann, Archaeology (Acting) | zimmer@bilkent.edu.tr |

# Contents

# Graduate Study at Bilkent University

Bilkent, a nonprofit research university, is widely recognized as the premier institution of higher education in Turkey. Located in the country's capital city Ankara, a vibrant metropolis of five million people, the university serves as a hub of academic, social, and cultural activity.

The language of instruction at Bilkent is English. The university has 13,000 students, and its teaching staff numbers around one thousand. International faculty members, who represent 40 countries, constitute more than a quarter of all academic staff. A growing body of full-time international and exchange students hailing from, at last count, 62 countries also contribute to the multicultural makeup of the university community.

Chief among the factors that ensure a high standard of education at Bilkent is a faculty actively engaged in research. In terms of publications per faculty member, Bilkent ranks high both in Turkey and internationally.

Bilkent University hires academic and administrative staff and admits students regardless of gender, race, ethnicity, religion, age, national origin, or physical disability to all the rights, privileges, programs, and activities generally accorded or made available to staff and students at the university.

A high proportion of Bilkent graduate students receive some form of financial support from the university. Graduate students who have completed their studies at Bilkent go on to find excellent jobs in Turkey and around the world at prominent universities, research institutes, and international organizations.

Bilkent actively invests in new educational and research technologies, and also maintains strong links with universities in the U.S. and Europe through joint academic programs, research projects, and seminars as well as student and faculty exchanges.

Bilkent University ranks 37th in the Times Higher Education (THE) BRICS & Emerging Economies University Rankings (2017), 46th in the THE Asia University Rankings (2017), and 76th in the THE 150 under 50 University Rankings (2017).

This catalog outlines the graduate programs offered at Bilkent University with a brief description of each program and a list of faculty members, their research areas, and selected publications. Applicants can also find herein information about application procedures, facilities at the university, amenities located in its environs, and the city of Ankara.

## GRADUATE SCHOOLS

Graduate programs are organized and administered through the following graduate schools:

Graduate School of Economics and Social Sciences
Director: Dr. Halime Demirkan, Professor
Phone: +90 312 290 2226
E-mail: demirkan@bilkent.edu.tr

Graduate School of Engineering and Science
Director: Dr. Ezhan Karaşan, Professor
Phone: +90 312 290 1208
E-mail: mfbe@bilkent.edu.tr

Graduate School of Education
Director: Dr. Alipaşa Ayas, Visiting Professor
Phone: +90 312 290 2951
E-mail: apayas@bilkent.edu.tr

## APPLICATION FOR ADMISSION

Bilkent University graduate programs offer admission to applicants who have the necessary qualifications and show promise of scholarly achievement. Each department establishes its own criteria for admission, and departmental listings include more detailed information about these requirements. The following are some of the admission requirements common to all departments:

- Submission of ALES (*Akademik Personel ve Lisansüstü Eğitimi Giriş Sınavı*/Academic Personnel and Postgraduate Education Entrance Exam) or GRE scores. GMAT scores are required for graduate programs in Business Administration.)
- Fluency in written and oral English. Please see the websites of each graduate school for the list of accepted tests.
- Official transcripts.
- Recommendations from instructors or others qualified to evaluate academic ability.

Online applications are accepted at https://stars.bilkent.edu.tr/gradapp.

### TUITION

The annual tuition for the 2017-2018 academic year is 14,500 USD for international students and 33,200 TL for Turkish students (including value-added tax).

## FINANCIAL ASSISTANCE

Currently, about 90 percent of graduate students receive financial support. Financial assistance is provided in the form of a tuition waiver or a tuition waiver plus a monthly stipend. The amount of the stipend is adjusted annually to cover changes in the cost of living.

Both admission and financial assistance are based on academic accomplishment and scholarly promise, without regard to gender, race, ethnicity, religion, age, national origin, or physical disability.

## VISA REQUIREMENTS FOR INTERNATIONAL APPLICANTS

Students may need a visa, depending on Turkey's visa regime with their home country. Students must contact the Turkish Embassy/Consulate in their country and submit their acceptance letters in order to find out if they need to obtain a visa.

# RESEARCH

## RESEARCH FACILITIES

### Bilkent Library

The Bilkent University Library is a lending and research library, with open stacks permitting free access to the entire collection (with the exception of the rare book collections). The main library, housed in its own four-story building and annex at the center of the Main Campus, is open throughout the year from 8:30 to 23:30 on weekdays and from 9:00 to 23:30 on weekends. Interlibrary Loan, the Official Publications Room, the Halil İnalcık Collection, the Hasan Âli Yücel Collection, and Special Collections have their own working hours. The East Campus branch library, located on the basement floor of the School of English Language, is open 8:30 to17:00 on weekdays and is closed on weekends. Summer hours may be subject to change.

Bilkent Library was the first Turkish university library to offer its readers automated services through an integrated computer system. It provides use of an online public catalog to all readers via computer terminals both in the libraries and elsewhere on campus as well as to researchers anywhere in the world via the Internet. Internet access is also available in both libraries. The library catalog can be accessed from the library's website.

The collection contains over 1,500,000 items. The book collection includes more than 490,000 printed volumes and over 470,000 electronic books. The library subscribes to over 750 print journals from the U.S. and Europe, and provides electronic access to more than 135,000 journals. $3 million is spent each year on books, journals, and other resources, including video and audio cassettes, DVDs and VCDs, maps, microforms, CD-ROMs, and music scores. The library also makes over 140 research databases available online. Many of these databases are acquired through the library's membership in the Anatolian University Libraries Consortium. Working papers and technical reports are received from leading research centers in Europe, the USA, and Japan.

The Turkish Plastic Arts Archive makes available a file of over 50,400 newspaper clippings, magazine articles, and exhibition materials (invitations, posters, and catalogs). The collection has been catalogued and is accessible via the Internet.

The Bilkent University Library has been designated by the Library of Congress to receive U.S. Government Office of Publications documents and makes them available in the Official Publications Room. The library is also a depository for World Bank regional publications and houses the Bilkent European Union Information Center.

Reciprocal borrowing agreements with a number of Ankara-area universities make it possible for Bilkent graduate students and faculty members to borrow books from those libraries as well.

Computers capable of Internet access are located in the Reference and Current Periodicals Rooms of the Main Campus library for the purpose of searching e-resources and browsing the Internet.

The Main Campus library also houses an art gallery that regularly hosts academic and cultural events, as well as two cafés.

### Computer Center

The Bilkent Computer Center (BCC) provides a variety of computing resources and services to meet the administrative, educational, and research computing requirements of the university community. These services include providing computational, networking, and internetworking equipment, as well as hardware and software maintenance for this equipment. Additionally, BCC develops in-house application software for the university, including the academic information system and the student information system.

More than 10,000 personal computers are distributed in offices, laboratories, and dormitories throughout the campus, and all are connected to BILNET, the Bilkent intranet.

Approximately 900 computers in 23 laboratories are administered by BCC and are available to faculty and students 24 hours a day throughout the academic year. All users have access to laser printer pools available in BCC labs and the Computer Center. In addition to the BCC labs, many departments, schools, and institutes maintain separate educational and research labs. All computers in these laboratories have BILNET and Internet access.

Bilkent University's networking facilities extend to the dormitories as well. All campus dormitory rooms are Ethernet-wired, and students living in the dormitories can connect their own computers to BILNET and the Internet.

BCC provides and maintains a wide variety of scientific tools for research use. These include statistical, mathematical, and simulation libraries and packages complete with various VLSI and graphics design and imaging tools. All current and classical programming languages and development tools are available on various hardware platforms. State-of-the-art word processor, spreadsheet, database application, and presentation graphics software are available in the labs.

Some software developed in-house is also available to faculty, students, and staff. AIRS (the Academic Information Review System) and SRS (the Student Review System) help faculty and students plan their course loads and indicate academic preferences. ORS (the Online Registration System) enables students to view and register for courses. DAIS (the Department Academic Information System) assists departments in managing their course offerings and course enrollment numbers.

## RESEARCH CENTERS

**Acoustics and Underwater Technologies Research Center**
Director: Dr. Abdullah Atalar, Professor
Phone: +90 312 290 2457
E-mail: basta@bilkent.edu.tr

**Ahmed Adnan Saygun Center for Music Research and Education**
Acting Director: Dr. Kağan Korad, Associate Professor
Phone: +90 312 290 1387
E-mail: korad@bilkent.edu.tr

**Center for Research in Transitional Societies**
Director: Dr. Güliz Ger, Professor
Phone: +90 312 290 2949
E-mail: ger@bilkent.edu.tr

**Center for Turkish Literature**
Acting Director: Dr. Mehmet Kalpaklı, Associate Professor
Phone: +90 312 290 2317
E-mail: temerkez@bilkent.edu.tr

**Center for Turkish Politics and History**
Director: Dr. Metin Heper, Professor
Phone: +90 312 290 1857
E-mail: heper@bilkent.edu.tr

**Communications and Spectrum Management Research Center**
Director: Dr. Ayhan Altıntaş, Professor
Phone: +90 312 290 2458
E-mail: altintas@ee.bilkent.edu.tr

**Halil İnalcık Center for Ottoman Studies**
Director: Dr. Mehmet Kalpaklı, Associate Professor
Phone: +90 312 290 2206
E-mail: kalpakli@bilkent.edu.tr

**Institute of Materials Science and Nanotechnology**
Director: Dr. Hilmi Volkan Demir, Professor
Phone: +90 312 290 2513
E-mail: unam@unam.bilkent.edu.tr

**Institute of World Systems, Economies and Strategic Research**
Director: Dr. Orhan Güvenen, Professor
Phone: +90 312 290 1660
E-mail: gorhan@bilkent.edu.tr

**Nanotechnology Research Center**
Director: Dr. Ekmel Özbay, Professor
Phone: +90 312 290 1966
E-mail: nanotechnology@bilkent.edu.tr

**National Magnetic Resonance Research Center**
Director: Dr. Adnan Akay, Professor
Phone: +90 312 290 1154
E-mail: aydan@ee.bilkent.edu.tr

## ONGOING EXTERNALLY SPONSORED RESEARCH PROJECTS

*Quantifying and protecting the privacy of genomic data.* Funding Agency: **European Commission**, Principal Investigator: **Erman Ayday**.

*PRACE 4:The partnership for advanced computing-first implementation phase*. Funding Agency: **European Commission**, Principal Investigator: **Cevdet Aykanat**.

*Investigating the effect of interface structure on friction at the nanoscale*. Funding Agency: **European Commission**, Principal Investigator: **Mehmet Baykara**.

*Control of triboelectricity from micro to macro as a principle of sticking, particulate contamination and esd prevention of micromachines*. Funding Agency: **European Commission**, Principal Investigator: **Tarık Baytekin**.

*The role of urbanization in female empowerment: the Turkish case in comparative perspective*. Funding Agency: **European Commission**, Principal Investigator: **Kürşat Çınar**.

*Neural mechanisms of visual perception and attention*. Funding Agency: **European Commission**, Principal Investigator: **Tolga Çukur**.

*Perceptual representation of illumination, shape and material*. Funding Agency: **European Commission**, Principal Investigator: **Katja Doerschner**.

*Coding for multi-user channels for next generation wireless networks*. Funding Agency: **European Commission**, Principal Investigator: **Tolga Duman**.

*Programmable droplet-based lab-on-a-chip systems*. Funding Agency: **European Commission**, Principal Investigator: **Çağlar Elbüken**.

*The RNA bridge between IRE1 and PKR leading to metaflammation: discovery and intervention in atherosclerosis*. Funding Agency: **European Commission**, Principal Investigator: **Ebru Erbay**.

*Elastic and transparent scaling for stream processing applications*. Funding Agency: **European Commission**, Principal Investigator: **Buğra Gedik**.

*Profiling with nanoelectromechanical systems*. Funding Agency: **European Commission**, Principal Investigator: **Selim Hanay**.

*Graphene based smart surfaces: From visible to microwave-smartGraphene*. Funding Agency: **European Commission**, Principal Investigator: **Coşkun Kocabaş**.

*Nonlinear laser lithography*. Funding Agency: **European Commission**, Principal Investigator: Fatih **Ömer İlday**.

*Energy efficient FPGA accelerators for graph analytics applications*. Funding Agency: **European Commission**, Principal Investigator: **Mustafa Özdal**.

*Econometric modelling of short panels with applications in financial econometrics*. Funding Agency: **European Commission**, Principal Investigator: **Cavit Pakel**.

*Enhancing chemotherapy response in triple negative breast cancer (TNBC) by modulating miRNA-target network and identifiying biomarkers of response*. Funding Agency: **European Commission**, Principal Investigator: **Özgür Şahin**.

*Jean Monnet Migrant Crisis Network*. Funding Agency: **European Commission**, Principal Investigator: **Dimitris Tsarouhas**.

*Magnetic particle imaging for safe angiography*. Funding Agency: **European Commission**, Principal Investigator: **Emine Ülkü Sarıtaş**.

*Use of continuous feedback markov fluid queues for performance modeling of computer and communication systems*. Funding Agency: **TÜBİTAK**, Principal Investigator: **Nail Akar**.

*Homogeneous hydrogen photo-generation by BODIPY based photo-induced electron Mirzatransfer systems*. Funding Agency: **TÜBİTAK**, Principal Investigator: **Engin Umut Akkaya**.

*Computer vision and machine learning techniques for automated classification of whole-slide breast histopathology images*. Funding Agency: **TÜBİTA**K, Principal Investigator: **Selim Aksoy**.

*An investigation of the causes and effects of violence against women within an economic modeling framework*. Funding Agency: **TÜBİTAK**, Principal Investigator: **Pelin Akyol**.

*Algorithms for structural variation discovery using hybrid sequencing technologies and library preparation protocols*. Funding Agency: **TÜBİTAK**, Principal Investigator: **Can Alkan**.

*BacGenTrack - An integrated system for Bacterial Genome Tracking using high throughput sequencing technology: from identification to visualization*. Funding Agency: **TÜBİTAK**, Principal Investigator: **Can Alkan**.

*Functional nanodecoration of the cyclodextrin based electrospun hybrid fibers*. Funding Agency: **TÜBİTAK**, Principal Investigator: **Osman Arslan**.

*Customized class-e digital power amplifier array for magnetic resonance imaging*. Funding Agency: **TÜBİTAK**, Principal Investigator: **Ergin Atalar**.

*Zero echo time magnetic resonance imaging using active decoupling technique*. Funding Agency: **TÜBİTAK**, Principal Investigator: **Ergin Atalar**.

*Robust and privacy preserving decision support systems*. Funding Agency: **TÜBİTAK**, Principal Investigator: **Erman Ayday**.

*High performance tensor decomposition methods for distributed and shared memory systems*. Funding Agency: **TÜBİTAK**, Principal Investigator: **Cevdet Aykanat**.

*High-performance parallel graph analytics kernels for big data applications*. Funding Agency: **TÜBİTAK**, Principal Investigator: **Cevdet Aykanat**.

*Optimization of latency-centric communication metrics towards petascaling sparse iterative solvers*. Funding Agency: **TÜBİTAK**, Principal Investigator: **Cevdet Aykanat**.

*Investigating graphene covered with self-assembled monolayer structures via STM and testing its use as a chemical sensor*. Funding Agency: **TÜBİTAK**, Principal Investigator: **Mehmet Baykara**.

*Developing an atomic force microscope for biological research*. Funding Agency: **TÜBİTAK**, Principal Investigator: **Mehmet Baykara**.

*Lignin as an antistatic additive for polymers*. Funding Agency: **TÜBİTAK**, Principal Investigator: **Bilge Baytekin**.

*Chemically and mechanically controlled pattern formation in gels*. Funding Agency: **TÜBİTAK**, Principal Investigator: **Bilge Baytekin**.

*Cellulose-metal nanoparticle and cellulose-synthetic polymer-metal nanoparticle composites via mechanochemical reactions*. Funding Agency: **TÜBİTAK**, Principal Investigator: **Bilge Baytekin**.

*Reversible mechanochromic reactions and their applications as mechanical deformation sensors*. Funding Agency: **TÜBİTAK**, Principal Investigator: **Bilge Baytekin**.

*Development of methods for tribochemical degradation of machine oils due to triboplasma reactions*. Funding Agency: **TÜBİTAK**, Principal Investigator: **Tarık Baytekin**.

*Contribution of triboelectricity on friction at nano and meso scale*. Funding Agency: **TÜBİTAK**, Principal Investigator: **Tarık Baytekin**.

*Mapping the turkish welfare state through original data generation*. Funding Agency: **TÜBİTAK**, Principal Investigator: **Hasan Tolga Bölükbaşı**.

*Theoretical study of electron spin resonance and spin noise in embedded InGaAs quantum dots*. Funding Agency: **TÜBİTAK**, Principal Investigator: **Ceyhun Bulutay**.

*Atomic resolution structural analysis and quantum control in quantum dots using computational nuclear magnetic resonance*. Funding Agency: **TÜBİTAK**, Principal Investigator: **Ceyhun Bulutay**.

*Predicting social reaction and its labels for a given news article by using microblogs*. Funding Agency: **TÜBİTAK**, Principal Investigator: **Fazlı Can**.

*Automatic scene segmentation*. Funding Agency: **TÜBİTAK**, Principal Investigator: **Aaron Clarke**.

*The role of environmental statistical regularities in stable and efficient visual perception*. Funding Agency: **TÜBİTAK**, Principal Investigator: **Jennifer Corbett**.

*Targeting purinergic and toll-like receptors for the development of novel vaccine adjuvant formulations*. Funding Agency: **TÜBİTAK**, Principal Investigator: **Çağlar Çekiç**.

*Identification of functional links between adenosine A2A receptor and interleukin 7 receptor*. Funding Agency: **TÜBİTAK**, Principal Investigator: **Çağlar Çekiç**.

*Adenosine receptor targeting on CD8 T cells for anti-cancer therapy*. Funding Agency: **TÜBİTAK**, Principal Investigator: **Çağlar Çekiç**.

*The production, dynamics and key concepts of current Islamic political thought in Turkey: civilization, justice and order*. Funding Agency: **TÜBİTAK**, Principal Investigator: **Alev Çınar**.

*Design and development of an online database for genome-scale reconstructed metabolic networks*. Funding Agency: **TÜBİTAK**, Principal Investigator: **Ercüment Çiçek**.

*Using the 3D structure of DNA to associate single nucleotide polymorphisms with autism spectrum disorder*. Funding Agency: **TÜBİTAK**, Principal Investigator: **Ercüment Çiçek**.

*Effects of category-based visual search on visual representations and functional connectivity in the human brain*. Funding Agency: **TÜBİTAK**, Principal Investigator: **Tolga Çukur**.

*Coding and modulation for interference channels*. Funding Agency: **TÜBİTAK**, Principal Investigator: **Tolga Duman**.

*Three dimensional and spectral characterization of plasmonic nanostructures using nitrogen vacancy centers*. Funding Agency: **TÜBİTAK**, Principal Investigator: **Aykutlu Dana**.

*Nanomechanical characterization of osteogenic differentiation of mesenchymal stem cells*. Funding Agency: **TÜBİTAK**, Principal Investigator: **Aykutlu Dana**.

*Lines in surfaces*. Funding Agency: **TÜBİTAK**, Principal Investigator: **Alexander Degtyarev**.

*Singular varieties related to K3-surfaces*. Funding Agency: **TÜBİTAK**, Principal Investigator: **Alexander Degtyarev**.

*High-performance optical gain and lasing from colloidal quantum wells*. Funding Agency: **TÜBİTAK**, Principal Investigator: **Hilmi Volkan Demir**.

*Field dependent properties of low-dimensional semiconductor nanoparticles: colloidal synthesis, design, fabrication and characterization*. Funding Agency: **TÜBİTAK**, Principal Investigator: **Hilmi Volkan Demir**.

*Plasmonic and excitonic study of coupled nanocrystals and nanoplatelets*. Funding Agency: **TÜBİTAK**, Principal Investigator: **Hilmi Volkan Demir**.

*Understanding and controlling the reactivity of the calcium silicate phases at the nanoscale*. Funding Agency: **TÜBİTAK**, Principal Investigator: **Engin Durgun**.

*Investigation of the new emerging 2D material properties aimed for optoelectronic applications*. Funding Agency: **TÜBİTAK**, Principal Investigator: **Engin Durgun**.

*300-W, picosecond fiber laser for ultra-high-speed, non-thermal processing of metals*. Funding Agency: **TÜBİTAK**, Principal Investigator: **Parviz Elahi**.

*Theoretical and experimental study on a novel synchronously-pumped Raman fiber laser*. Funding Agency: **TÜBİTAK**, Principal Investigator: **Parviz Elahi**.

*Development of a point-of-care device for coagulation time and erythrocyte sedimentation rate measurement*. Funding Agency: **TÜBİTAK**, Principal Investigator: **Çağlar Elbüken**.

*Generation of monodisperse droplets in microfluidic systems*. Funding Agency: **TÜBİTAK**, Principal Investigator: **Çağlar Elbüken**.

*Using electrostatic forces to manipulate and organize various types of nanoparticles and composite nanostructures to form multi-functional smart surfaces*. Funding Agency: **TÜBİTAK**, Principal Investigator: **Yegan Erdem**.

*Development of a portable lab-on-a-chip system for genetic diagnostics and compatible HBV diagnostic kits*. Funding Agency: **TÜBİTAK**, Principal Investigator: **Yegan Erdem**.

*Low-cost multiline refreshable braille displays for the visually imparired*. Funding Agency: **TÜBİTAK**, Principal Investigator: **Ahmet Can Erten**.

*Heterogeneous parallel and distributed computing with Java*. Funding Agency: **TÜBİTAK**, Principal Investigator: **Buğra Gedik**.

*Orthogonal polynomials associated with continuous singular measures and related problems*. Funding Agency: **TÜBİTAK**, Principal Investigator: **Alexander Goncharov**.

*Hidden Markov model and perturbation analysis applications in inventory control*. Funding Agency: **TÜBİTAK**, Principal Investigator: **Kağan Gökbayrak**.

*Identifying oncogenic and metastatic potentials of IKK-related kinases in hepatocellular carcinoma*. Funding Agency: **TÜBİTAK**, Principal Investigator: **Serkan İsmail Göktuna**.

*Identifying roles of IKK-related kinases IKBKE and TBK1 in colorectal cancer metastasis*. Funding Agency: **TÜBİTAK**, Principal Investigator: **Serkan İsmail Göktuna**.

*Waring meets Piatetski-Shapiro*. Funding Agency: **TÜBİTAK**, Principal Investigator: **Ahmet Muhtar Güloğlu**.

*Understanding and controlling the friction at nanoscale using graphene and graphene like two dimensional systems*. Funding Agency: **TÜBİTAK**, Principal Investigator: **Oğuz Gülseren**.

*Prototype LED chip development*. Funding Agency: **TÜBİTAK**, Principal Investigator: **Oğuz Gülseren**.

*Design of novel graphene like two dimensional materials based on heterostructures of transition metal dichalcogenides*. Funding Agency: **TÜBİTAK**, Principal Investigator: **Oğuz Gülseren**.

*Understanding the realistic plasmonic properties of metal nanoparticles beyond the model systems for photovoltaic and solar cell applications*. Funding Agency: **TÜBİTAK**, Principal Investigator: **Oğuz Gülseren**.

*The design, fabrication and measurements of high efficiency leds for backplane lighting in smart screens*. Funding Agency: **TÜBİTAK**, Principal Investigator: **Oğuz Gülseren**.

*Formation and development of attachment mental representations in adulthood: using the reverse correlation technique to uncover visual representations*. Funding Agency: **TÜBİTAK**, Principal Investigator: **Gül Günaydın**.

*The role of idiosyncratic experiences in representations of trustworthy faces*. Funding Agency: **TÜBİTAK**, Principal Investigator: **Gül Günaydın**.

*Adult attachment formation: development of vocal and physiological synchrony.* Funding Agency: **TÜBİTAK**, Principal Investigator: **Gül Günaydın**.

*Mass and shape analysis with nanoelectromechanical systems*. Funding Agency: **TÜBİTAK**, Principal Investigator: **Selim Hanay**.

*A nanomechanical sensor system operating at large oscillation amplitudes*. Funding Agency: **TÜBİTAK**, Principal Investigator: **Selim Hanay**.

*Reversible logic gates with nanoelectromechanical systems*. Funding Agency: **TÜBİTAK**, Principal Investigator: **Selim Hanay**.

*High accuracy and fast magnetic resonance electrical properties tomography*. Funding Agency: **TÜBİTAK**, Principal Investigator: **Yusuf Ziya İder**.

*Development of new methods to obtain high performance in electroencephalography based brain-computer interfaces*. Funding Agency: **TÜBİTAK**, Principal Investigator: **Yusuf Ziya İder**.

*Multidimensional control of complex dissipative nonlinear dynamics in mode-locked lasers*. Funding Agency: **TÜBİTAK**, Principal Investigator: **Fatih Ömer Ilday**.

*Development of viable methodologies to form complex materials/ structures by investigation on dynamical (dissipative) self-assembly processes*. Funding Agency: **TÜBİTAK**, Principal Investigator: **Serim Kayacan İlday**.

*Russo-Turkish war of 1877-1878 and its diplomatic implications for European history*. Funding Agency: **TÜBİTAK**, Principal Investigator: **Onur İşçi**.

*Development of burst-mode fiber laser system for material processing*. Funding Agency: **TÜBİTAK**, Principal Investigator: **Hamit Kalaycıoğlu**.

*The preparation, characterization, and electrochemical investigation of water oxidation catalysts incorporating phosphorus-based ligands*. Funding Agency: **TÜBİTAK**, Principal Investigator: **Ferdi Karadaş**.

*The synthesis, characterization,and investigation of water-oxidation capacities of coordination compounds incorporating pentacyanometalate building block*. Funding Agency: **TÜBİTAK**, Principal Investigator: **Ferdi Karadaş**.

*Aldosterone and mineralocorticoid receptor: Pathophysiology, clinical implication and therapeutic innovations*. Funding Agency: **TÜBİTAK**, Principal Investigator: **Özlen Konu Karakayalı**.

*Ion channels and immune response toward a global understanding of immune cell physiology and for new therapeutic approaches*. Funding Agency: **TÜBİTAK**, Principal Investigator: **Özlen Konu Karakayal**ı.

*Plug-in hybrid electric vehicle routing and recharging station location*. Funding Agency: **TÜBİTAK**, Principal Investigator: **Oya Karaşan**.

*Design and fabrication of polycrystalline diamond micro cutting tools*. Funding Agency: **TÜBİTAK**, Principal Investigator: **Yiğit Karpat**.

*Machining of nano scale structures on large surfaces using diamond tools with engineered cutting edges*. Funding Agency: **TÜBİTAK**, Principal Investigator: **Yiğit Karpat**.

*Developing a decision support system that uses expert judgments and incorporates equity concerns in various resource allocation settings where equity concerns on multiple dimensions exist*. Funding Agency: **TÜBİTAK**, Principal Investigator: **Özlem Karsu**.

*Investigation of the effect of crystal thickness on the Metal-Insulator transition in VO2 nanocrystals and fabrication of a novel VO2 Mott field-effect transistor*. Funding Agency: **TÜBİTAK**, Principal Investigator: **Talip Serkan Kasırga**.

*Growth of layered transition metal-dichalcogenides and investigation of fundamental properties under mechanical stress*. Funding Agency: **TÜBİTAK**, Principal Investigator: **Talip Serkan Kasırga**.

*Investigation of the effects of hydrogen doping on vanadium dioxide nanocrystals*. Funding Agency: **TÜBİTAK**, Principal Investigator: **Talip Serkan Kasırga**.

*Controlling the optical properties of graphene using novel capacitor structures*. Funding Agency: **TÜBİTAK**, Principal Investigator: **Coşkun Kocabaş**.

*Graphene based electrically tunable radar surfaces*. Funding Agency: **TÜBİTAK**, Principal Investigator: **Coşkun Kocabaş**.

*Graphene based THz optoelectronics*. Funding Agency: **TÜBİTAK**, Principal Investigator: **Coşkun Kocabaş**.

*Big data adaptive signal processing algorithms*. Funding Agency: **TÜBİTAK**, Principal Investigator: **Serdar Kozat**.
Distributed adaptive signal processing for real life applications. Funding Agency: **TÜBİTAK**, Principal Investigator: **Serdar Kozat**.

*High resolution ultrasound imaging for detection of microcalcifications in breast cancer screening*. Funding Agency: **TÜBİTAK**, Principal Investigator: **Hayrettin Köymen**.

*Design of capacitive micromachined ultrasonic transducer (cmut) arrays in uncollapsed and collapsed modes*. Funding Agency: **TÜBİTAK**, Principal Investigator: **Hayrettin Köymen**.

*A comprehensive national macroeconomic model for Turkish economy:A system dynamic based simulation analysis*. Funding Agency: **TÜBİTAK**, Principal Investigator: **Syed Mahmud**.

*Mathematical modeling approaches for metabolic cholesterol synthesis and its applications on a colon cancer cell*. Funding Agency: **TÜBİTAK**, Principal Investigator: **Meltem Gölgeli Matur**.

*Developing high performance running behaviors in legged robots via adaptive controllers*. Funding Agency: **TÜBİTAK**, Principal Investigator: **Ömer Morgül**.

*Cooling atoming and molecular gases via dipolar interactions*. Funding Agency: **TÜBİTAK**, Principal Investigator: **Mehmet Özgür Öktel**.

*Strongly time dependent many particle systems*. Funding Agency: **TÜBİTAK**, Principal Investigator: **Mehmet Özgür Öktel**.

*Bilkent BEST (Basic Entrepreneurship Skills Training)*. Funding Agency: **TÜBİTAK**, Principal Investigator: **Örsan Örge**.

*Gan based S-band low noise amplifier development*. Funding Agency: **TÜBİTAK**, Principal Investigator: **Ekmel Özbay**.

*Non-linear metamaterial development*. Funding Agency: **TÜBİTAK**, Principal Investigator: **Ekmel Özbay**.

*Development of active fotonic metamaterials*. Funding Agency: **TÜBİTAK**, Principal Investigator: **Ekmel Özbay**.

*Development of quantum cascade laser and production of prototype*. Funding Agency: **TÜBİTAK**, Principal Investigator: **Ekmel Özbay**.

*Robust control of time delayed linear parameter varying systems via switched controllers*. Funding Agency: **TÜBİTAK**, Principal Investigator: **Hitay Özbay**.

*Cheap, printable and bio-inspired ambulatory miniature robots*. Funding Agency: **TÜBİTAK**, Principal Investigator: **Onur Özcan**.

*Joint design and analysis of miniature robots manufactured with non-conventional manufacturing methods*. Funding Agency: **TÜBİTAK**, Principal Investigator: **Onur Özcan**.

*Miniature robots with modular spine compliance and number of legs: design, modeling and locomotion study*. Funding Agency: **TÜBİTAK**, Principal Investigator: **Onur Özcan**.

*Energy efficient processor architecture for big data graph applications*. Funding Agency: **TÜBİTAK**, Principal Investigator: **Mustafa Özdal**.

*Public opinion on turkish foreign policy: global, regional and local preferences*. Funding Agency: **TÜBİTAK**, Principal Investigator: **İbrahim Özgür Özdamar**.

*Pd-promoted perovskite based catalysts for automotive nox emission abatement*. Funding Agency: **TÜBİTAK**, Principal Investigator: **Emrah Özensoy**.

*A novel alternative for the existing homogeneous catalysts for ultra-high H2 production from formic acid*. Funding Agency: **TÜBİTAK**, Principal Investigator: **Emrah Özensoy**.

*NOx storage and reduction catalysts functionalized with CeO2-Zr=2: influence of promoters on surface species and catalytic behavior*. Funding Agency: **TÜBİTAK**, Principal Investigator: **Emrah Özensoy**.

*Modeling foraging swarm behavior as a nash equilibrium of a dynamic game*. Funding Agency: **TÜBİTAK**, Principal Investigator: **Bülent Özgüler**.

*Software and hardware solutions for safety critical applications*. Funding Agency: **TÜBİTAK**, Principal Investigator: **Özcan Öztürk**.

*Ultrafast 3D micromachining for solar cells*. Funding Agency: **TÜBİTAK**, Principal Investigator: **Ihor Pavlov**.

*Femtosecond laser micro-modification of optical materials towards production of novel optoelectronic devices in telecommunication range*. Funding Agency: **TÜBİTAK**, Principal Investigator: **Ihor Pavlov**.

*Interventions guided by magnetic imaging and nanoparticle coated equipment*. Funding Agency: **TÜBİTAK**, Principal Investigator: **Emine Ülkü Sarıtaş**.

*Magnetic active nanochains for nanobiomedicine*. Funding Agency: **TÜBİTAK**, Principal Investigator: **Emine Ülkü Sarıtaş**.

*Magnetic particle imaging for cancer imaging: sensing local diffusion effects*. Funding Agency: **TÜBİTAK**, Principal Investigator: **Emine Ülkü Sarıtaş**.

*Modern practices of self in everyday life: ethnographic analysis of facebook as lifestyle media*. Funding Agency: **TÜBİTAK**, Principal Investigator: **Özlem Savaş**.

*Algebraic and combinatorial properties of modular coinvariant rings*. Funding Agency: **TÜBİTAK**, Principal Investigator: **Müfit Sezer**.

*Depth and Cohen-Macaulay filtrations of invariant rings*. Funding Agency: **TÜBİTAK**, Principal Investigator: **Müfit Sezer**.

*Operando X-ray photoelectron and FTIR spectroscopic investigation of graphene and other 2D materials and devices*. Funding Agency: **TÜBİTAK**, Principal Investigator: **Şefik Süzer**.

*Combinatorial targeting of PI3K and MAPK signaling pathways by micrornas to inhibit tumor growth and metastasis in breast cancer*. Funding Agency: **TÜBİTAK**, Principal Investigator: **Özgür Şahin**.

*Identifying and targeting sponge long non-coding rnas to inhibit metastasis in triple negative breast cancer using a systems biology approach*. Funding Agency: **TÜBİTAK**, Principal Investigator: **Özgür Şahin**.

*Elucidating the mechanisms of sequential trastuzumab/T-DM1 resistance in in vitro and in vivo models of HER-2 overexpressing breast cancer*. Funding Agency: **TÜBİTAK**, Principal Investigator: **Özgür Şahin**.

*Identifying and targeting long non-coding rnas in playing role in tamoxifen resistance in ER-positive breast cancer using in vitro and in vivo assays*. Funding Agency: **TÜBİTAK**, Principal Investigator: **Özgür Şahin**.

*Biogenesis of the bacterial biofilms by synthetic biology approaches and their utilization for bionanotechnology and biotechnology*. Funding Agency: **TÜBİTAK**, Principal Investigator: **Urartu Özgür Şafak Şeker**.

*Developing synthetic gene circuits and whole-cell sensors to determine and monitor nanotoxicity caused by nanomaterials*. Funding Agency: **TÜBİTAK**, Principal Investigator: **Urartu Özgür Şafak Şeker**.

*Programmable genetic circuit design for cascased enzymatic reactions for biomineralization process*. Funding Agency: **TÜBİTAK**, Principal Investigator: **Urartu Özgür Şafak Şeker**.

*Whole cell sensors for biomedical applications using synthetic biology tools*. Funding Agency: **TÜBİTAK**, Principal Investigator: **Urartu Özgür Şafak Şeker**.

*Controlling protein aggregate forming kinetics and thermodynamics in amyloids using peptides ligands to be selected using yeast surface display and phage display approaches*. Funding Agency: **TÜBİTAK**, Principal Investigator: **Urartu Özgür Şafak Şeker**.

*Engineering of biofilm protein biopolymers for utilization as bioadhesives for bioactive surfaces using protein engineering and synthetic biology approaches*. Funding Agency: **TÜBİTAK**, Principal Investigator: **Urartu Özgür Şafak Şeker**.

*Modelling of hybrid energy systems with pumped hydro storage; a case study for Turkey*. Funding Agency: **TÜBİTAK**, Principal Investigator: **Urartu Özgür Şafak Şeker**.

*Learning optimal personalized diagnosis and treatment through big data*. Funding Agency: **TÜBİTAK**, Principal Investigator: **Cem Tekin**.

*Investigation of nerve growth factor binding peptide nanofibers on neural differentiation of neural stem cells*. Funding Agency: **TÜBİTAK**, Principal Investigator: **Ayşe Begüm Tekinay**.

*Utilization of peptide nanostructures for generating antigen specific immune response*. Funding Agency: **TÜBİTAK**, Principal Investigator: **Ayşe Begüm Tekinay**.

*Wound healing in diabetic rats using gag mimetic peptide nanofiber gel*. Funding Agency: **TÜBİTAK**, Principal Investigator: **Ayşe Begüm Tekinay**.

*The use of bioactive peptide nanofibers in articular cartilage regeneration*. Funding Agency: **TÜBİTAK**, Principal Investigator: **Ayşe Begüm Tekinay**.

*Nanomechanical characterization of chondrogenic differentiation of mesenchymal stem cells by force mapping in the presence of hyaluronic acid mimetic supramolecular glycopeptide nanofibers*. Funding Agency: **TÜBİTAK**, Principal Investigator: **Ayşe Begüm Tekinay**.

*Hierarchical isogeometric analysis technology and computational contact mechanics*. Funding Agency: **TÜBİTAK**, Principal Investigator: **İlker Temizer**.

*Multiscale analysis and micro-texture design for lubrication interfaces*. Funding Agency: **TÜBİTAK**, Principal Investigator: **İlker Temizer**.

*Laser microprocessing using spatial light modulators for solar cells*. Funding Agency: **TÜBİTAK**, Principal Investigator: **Onur Tokel**.

*Statistical inference of regulated integrated time series*. Funding Agency: **TÜBİTAK**, Principal Investigator: **Mirza Trokiç**.

*The design and synthesis of surface-functionalized cucurbituril-based functional and smart materials*. Funding Agency: **TÜBİTAK**, Principal Investigator: **Dönüş Tuncel**.

*The design, synthesis and characterization of supramolecular drug delivery systems and the investigation of their drug loading capacity and release profile*. Funding Agency: **TÜBİTAK**, Principal Investigator: **Dönüş Tuncel**.

I*nvestigation of substrate-catalyst interactions in the field of organocatalysis based on non-covalent interactions*. Funding Agency: **TÜBİTAK**, Principal Investigator: **Yunus Emre Türkmen**.

*Utilization of orthogonal hydrogen and halogen bonding pairs in photochemical reactions*. Funding Agency: **TÜBİTAK**, Principal Investigator: **Yunus Emre Türkmen**.

*Development of enantioselective aza-nazarov reactions using anion-binding catalysis*. Funding Agency: **TÜBİTAK**, Principal Investigator: **Yunus Emre Türkmen**.

*Surface decoration of metal nanoparticles onto electrospun nanofibers/nanowebs and their properties as catalysis*. Funding Agency: **TÜBİTAK**, Principal Investigator: **Tamer Uyar**.

*Application of electrochemical noise measurements to batteries*. Funding Agency: **TÜBİTAK**, Principal Investigator: **Burak Ülgüt**.

*Sustainable growth and mitigation of climate change in a dual economy: A Regional General Equilibrium Analysis for Turkey*. Funding Agency: **TÜBİTAK**, Principal Investigator: **Alp Erinç Yeldan**.

*Developing a game theoretical modeling and simulation framework for the integration of unmanned air vehicles in to the national airspace*. Funding Agency: **TÜBİTAK**, Principal Investigator: **Yıldıray Yıldız**.

*Development of metal oxide nanoparticle catalysts for sodium-oxygen battery.* Funding Agency: **TÜBİTAK**, Principal Investigator: **Eda Yılmaz**.

*Preparation of silicon-carbon nanober composite anode materials for lithium-ion batteries with high energy capacity.* Funding Agency: **TÜBİTAK**, Principal Investigator: **Eda Yılmaz**.

*Investigating the mechanical properties of GaN sub-micron/nano wires nanofabricated from GaN thin-films grown by PA-ALD.* Funding Agency: **TÜBİTAK**, Principal Investigator: **Mehmet Yılmaz**.

*Investigating TAGLN gene function in breast cancer and its evaluation as a diagnostic and prognostic marker*. Funding Agency: **TÜBİTAK**, Principal Investigator: **Işık Yulug**.

*Impact of caloric restriction on age-related alterations in synaptic integrity underlying cognitive decline in zebrafish*. **European Molecular Biology Organization**, Principal Investigator: **Michelle Adams**.

*Turquality*. Funding Agency: **Finansbank**, Principal Investigator: **Levent Akdeniz**.

*Development of a carrier tracking system for satellite communication*. Funding Agency: **Turksat,** Principal Investigator: **Orhan Arıkan**.

*Data publication*. Funding Agency: **Turk Telekom**, Principal Investigator: **Erman Ayday**.

*Immune cell regulation by purinergic signaling*. Funding Agency: **European Molecular Biology Organization**, Principal Investigator: **Çağlar Çekiç**.

*Neural representation of information in the human brain during natural vision*. Funding Agency: **European Molecular Biology Organization**, Principal Investigator: **Tolga Çukur**.

*Development of compressive sensing magnetic resonance imaging technologies*. Funding Agency: **Aselsan**, Principal Investigator: **Tolga Çukur**.

*SAYP-OSUNLUK*. Funding Agency: **BLF Optik**, Principal Investigator: **Ekmel Özbay**.

*Using processing trade to facilitate innovation in response to a competitive shock*. Funding Agency: **Newton**, Principal Investigator: **Fitnat Banu Pakel**.

*Systems level analysis of drug resistance and metastasis in breast cancer*. Funding Agency: **European Molecular Biology Organization**, Principal Investigator: **Özgür Şahin**.

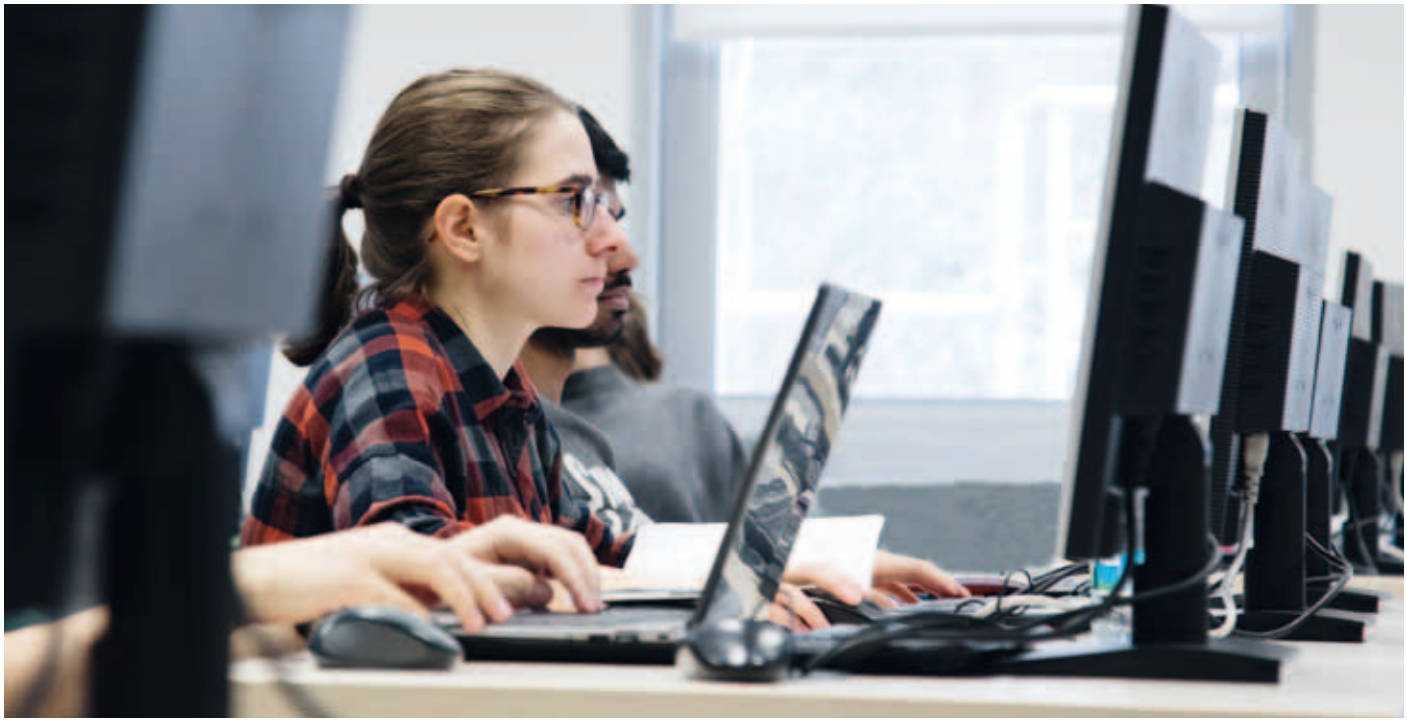
*Genetic study of essential tremor*. Funding Agency: **NIH**, Principal Investigator: **Ayşe Begüm Tekinay**.

**Technology Transfer Office**

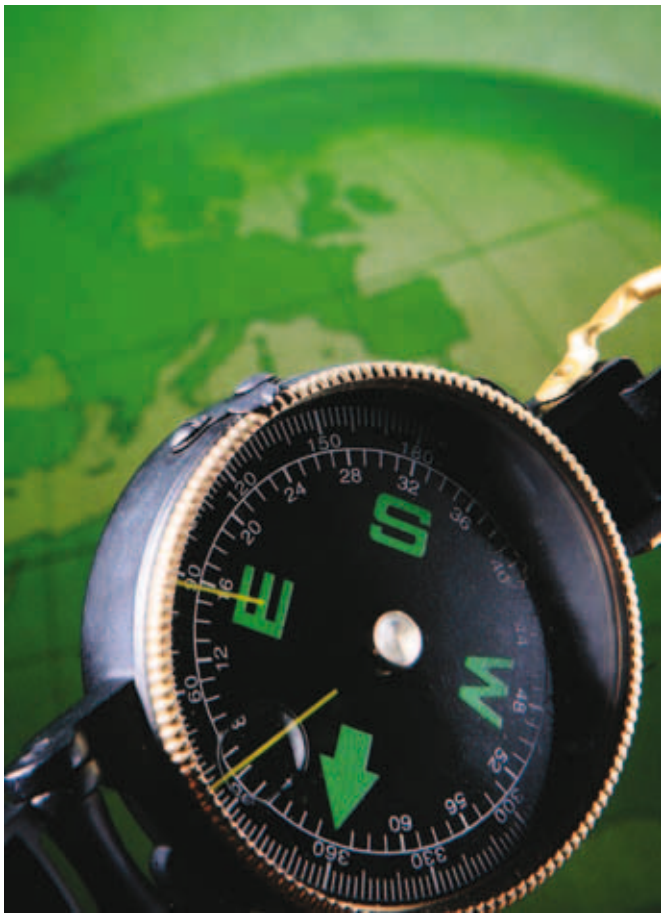
The Bilkent University Technology Transfer Office (Bilkent TTO) aims to support technology transfer and catalyze economic development at Bilkent University through the commercialization of technology.

Bilkent TTO assists researchers in:
- preparing and submitting grant proposals to national and international agencies,
- collaborating with industry on R&D projects,
- protecting and commercializing intellectual property rights (most notably in the area of obtaining patents, as well as providing general know-how),
- establishing startups and engaging in entrepreneurial activities.

Director: Dr. Atilla Hakan Özdemir
Phone: +90 312 290 80 84
E-mail: tto@bilkent.edu.tr
tto.bilkent.edu.tr



# BUSINESS ADMINISTRATION



Several characteristics distinguish Bilkent University's Faculty of Business Administration. First, the faculty is part of a young but ambitious university that has identified business education as an area of priority. Second, the faculty employs an excellent group of instructors with strong research and teaching records, and continues to recruit top-flight faculty members. Third, it attracts some of the best students in Turkey into its programs. Fourth, the location of the university in the capital of Turkey and the heartland of Anatolia in close proximity to a number of industrial centers as well as the national government provides the business faculty with a competitive advantage for collaboration with government and industry. Fifth, Turkey is one of the largest economies in the world, with an exceptionally high growth rate. These features provide an excellent environment for building a world-class business school, and Bilkent's Faculty of Business Administration is determined to take full advantage of them. In addition, the Faculty of Business Administration offers a dual master's program with Tilburg University in the Netherlands, providing a collaborative academic experience.

## FACULTY

**LEVENT AKDENİZ**, Associate Professor. Ph.D., Economics, University of Houston, 1996. *Corporate finance, computational economics, numerical methods.*

**NÜFER YASİN ATEŞ**, Assistant Professor. Ph.D., Strategic management, Erasmus University, 2014. *Strategy process, corporate entrepreneurship.*

**KÜRŞAT AYDOĞAN**, Professor and Vice Rector. Ph.D., Finance, Syracuse University, 1986. *Investments, corporate finance, international finance.*

**CEREN AYDOĞMUŞ**, Instructor. Ph.D., Business Administration, Hacettepe University, 2011. *Organizational psychology, marketing research, financial business applications.*

**ZAHİDE KARAKİTAPOĞLU AYGÜN**, Associate Professor. Ph.D., Social Psychology, Middle East Technical University, 2002. *Organizational behavior, socio-cultural value orientations, individualism-collectivism.*

**ÖZGÜR TOLGA BAYCAN**, Instructor. B.S., Computer Technology and Information System, Bilkent University, 2002. *Programming languages, business applications, networking applications and principles.*

**EMRE BERK**, Associate Professor. Ph.D., Operations Management, University of Washington, 1996. *Manufacturing/ operations strategy, health-care management, inventory theory, quality control, revenue management.*

**LIWEI CAO**, Instructor. MBA, Rady School of Management, University of California, San Diego, 2014. *Accounting, Financial Reporting.*

**JACQUES COUVAS**, Adjunct Senior Lecturer M.B.A., Open University, 2000. L.L.M., University of Leicester, 2003. *Strategy, leadership.*

**BARIŞ ERMAN DEPECİK**, Assistant Professor. Ph.D., Marketing, Erasmus University, 2016. *Empirical Quantitative Modeling.*

**AHMET EKİCİ**, Associate Professor. Ph.D., Marketing, University of Nebraska, 2002. *Public policy and marketing, relationship marketing, advertising.*

**ERDAL EREL**, Professor. Ph.D., Industrial Engineering and Operations Research, Virginia Polytechnic Institute and State University, 1987. *Production control and planning, scheduling, design of manufacturing systems.*

**GÜLİZ GER**, Professor. Ph.D., Marketing, Northwestern University, 1985. *Consumer behavior, culture and consumption.*

**C.ITIR GÖĞÜŞ**, Assistant Professor. Ph.D., Management, Texas A&M University, 2005. *Human resources management.*

**LALE TOMRUK GÜMÜŞLÜOĞLU**, Assistant Professor. Ph.D., Hacettepe University, 2005. *International business, business policy.*

**ÜLKÜ GÜRLER**, Professor and Acting Dean. Ph.D., Statistics, University of Pennsylvania, 1990.

**DESTAN KANDEMİR**, Assistant Professor. Ph.D., Marketing & International Business, Michigan State University, 2005. *Market oriented knowledge management, global alliance management.*

**TIMOTHY S. KIESSLING**, Associate Professor, Ph.D., Management, University of Oklahoma, 2005. *Strategic management, cross cultural management.*

**ZEYNEP ÖNDER**, Associate Professor. Ph.D., Housing Finance, Cornell University, 1995. *Corporate finance, real estate finance, banking.*

**DİLEK ÖNKAL**, Professor. Ph.D., Decision Science, University of Minnesota, 1988. *Judgmental forecasting, decision analysis.*

**ÖRSAN ÖRGE**, Visiting Assistant Professor. Ph.D., Organizational Behavior, University of Kansas, 2005. *Process-oriented and relational approaches to organization, spacing and organization, organizational and strategic change.*

**SÜHEYLA ÖZYILDIRIM**, Associate Professor. Ph.D., Economics, Bilkent University, 1997. *Banking, regulations*.

**TANSELİ SAVAŞER**, Assistant Professor. Ph.D., International Economics and Finance, Brandeis University, *2006. Financial economics, international finance, market microstructure*.

**BANU SULTANOĞLU**, Instructor. M.S., Accounting and Finance, Başkent University, 2008. *International financial reporting standards, assurance and business advisory services in Turkey (auditing)*.

**AHMET ŞENSOY**, Assistant Professor. Ph.D., Mathematics, Bilkent University, 2013. *Asset pricing, market microstructure, financial stability, complex systems*.

**FEHMİ TANRISEVER**, Assistant Professor. Ph.D., Information, Risk and Operations management, University of Texas at Austin, 2009. *Operations and finance interface, commodity markets, energy economics, start-up operations and finance*.

**AYŞE BAŞAK TANYERİ**, Assistant Professor. Ph.D., Finance, Boston College, 2006. *Corporate Finance, banking regulation, mergers*.

**MEHMET SELÇUK USLU**, Adjunct Senior Lecturer. Ph.D., Accounting, Ankara Academy of Economic and Commercial Sciences, 1973. *Accounting, cost analysis and management.*

## MASTER OF SCIENCE IN BUSINESS ADMINISTRATION

**Admission:** Applicants should have a B.S. or M.S. degree, and must be proficient in written and oral English. Applicants are evaluated on the basis of their GMAT (Graduate Management Admission Test) or GRE (Graduate Record Examination) scores, academic records, ALES (*Akademik Personel ve Lisansüstü Eğitimi Giriş Sınavı*/Academic Personnel and Postgraduate Education Entrance Examination) scores, letters of recommendation, statement of purpose, and an interview. The M.S. program is designed to provide a solid foundation for Ph.D. work.

**Degree Requirements:** M.S. candidates must complete a minimum of 24 credit hours of course work, prepare and defend a thesis, and maintain a cumulative GPA of at least 3.0/4.0. The standard duration of study for the M.S. in Business Administration is four semesters.

The M.S. degree is offered in three tracks: Finance, Marketing, and Decision Science/Operations Management.

## DOCTOR OF PHILOSOPHY IN BUSINESS ADMINISTRATION

**Admission:** Applicants should preferably hold an M.S. or M.A degree with thesis, and must be proficient in written and oral English. Applicants are evaluated on the basis of their GMAT (Graduate Management Admission Test) or GRE (Graduate Record Examination) scores, academic records, ALES (*Akademik Personel ve Lisansüstü Eğitimi Giriş Sınavı*/Academic Personnel and Postgraduate Education Entrance Examination) scores, letters of recommendation, statement of purpose, and an interview.

**Degree Requirements:** Ph.D. candidates must complete a minimum of 27 credit hours of course work, conduct a major field examination, prepare and defend a dissertation based on original research, and have a paper accepted for publication. The student should maintain a cumulative GPA of 3.0/4.0 throughout the period of study. Course work is tailored according to the field chosen and the specific research needs of the student.

The Ph.D. degree is offered in three tracks: Finance, Marketing, and Decision Science/Operations Management.

### FIELDS OF STUDY

**Finance**
The field of finance is concerned with the study of allocation of capital as a resource. Research in finance may take many forms. Methodological research develops procedures involved in constructing and analyzing mathematical models that can prescribe or describe financial decision-making. Applied research fits models to specific, real settings in national or global contexts. The current research interests of our finance faculty include asset pricing, derivatives, risk management, global asset allocation, market efficiency, market microstructure, corporate governance, and banking and real estate finance. Both the theoretical and empirical sides of these research areas are investigated.

**Marketing**
The program in marketing emphasizes cultural, cross-cultural, and interdisciplinary research and methodological creativity and diversity. It focuses on understanding the complex dynamics that characterize markets, marketing, and consumption in the contemporary world through the scholarly study of the relationships among the global, regional, and local dimensions and manifestations of social, economic, political, and cultural processes and conditions. Students interested in developing an interdisciplinary perspective on various marketing issues, such as consumption, macromarketing, culture, representation of products and space "servicescapes," retailing, and advertising, especially in the context of sociocultural change induced by modernization and globalization, are encouraged to apply. Doctoral students also have the opportunity to be affiliated with the Bilkent University Center for Research in Transitional Societies.

**Decision Science/Operations Management**
The field of operations management is concerned with the overall transformation process within an organization that converts resource inputs such as raw materials, labor, capital, and technology into finished goods and services. Decision science is a broad, interdisciplinary field of study concerned with decision-making and decision modeling. As such, this program draws on fields including computer science, economics, industrial engineering, management science, operations research, psychology, and political science. The current research interests of the faculty include supply chain management, numerical analysis of queuing systems, U-type and S-type assembly line design, quality management, judgmental forecasting, risk perception, and risk communication.

## MASTER OF BUSINESS ADMINISTRATION (M.B.A.) PROGRAM (Non-Thesis)

The M.B.A. program educates proficient managers and executives who can effectively recognize and "manage" the challenges presented by a continuously changing business environment. The goal is to provide a strong foundation of administrative and conceptual skills to prospective managers, preparing them to assume responsibility for planning, organizing, directing, and controlling the operation of public, private and nonprofit organizations. The M.B.A. degree can be viewed as a path to extend and enhance a wide variety of undergraduate experiences, including but not limited to majors in engineering, economics, and social sciences as well as business. The program's emphasis is on analytical methods and problem solving rather than the mere description of existing practices. Participative learning is emphasized through case analyses, term projects, simulations, classroom discussions, and summer internships. Computer applications, quantitative analysis, and behavioral science principles are integrated into the program to provide a thorough

background in the quantitative and qualitative aspects of management, with emphasis on the former. Graduates are equipped with the knowledge, skills, and analytical thinking abilities required to enhance the efficiency and effectiveness of the enterprises they will join.

**Admission:** Applicants to the program should have a B.S. or B.A. degree and demonstrate a high level of proficiency in English. Applicants are evaluated on the basis of their GMAT (Graduate Management Admission Test) / GRE (Graduate Record Examination) scores, academic records / ALES (*Akademik Personel ve Lisansüstü Eğitimi Giriş Sınavı* / Academic Personnel and Postgraduate Education Entrance Examination) scores, academic records, and an interview.

**Degree Requirements:** Those admitted to the program will be required to complete a minimum of 48 credit hours of course with a minimum cumulative grade point average of 3.00/4.00.

## MASTER OF EXECUTIVE BUSINESS ADMINISTRATION (E.M.B.A) PROGRAM (Non-Thesis)

The Bilkent Executive M.B.A. program aims to cultivate in program participants a strategic perspective on managing in today`s global business environment. The program is designed to build a strong foundational executive skill set and an ability to integrate business functional area knowledge to cope with the challenges of the contemporary business world.

The program begins with a three day orientation geared toward building soft skills, such as teamwork, negotiation, communication, and conflict resolution, through various activities. Participants are exposed to foundational courses, including management, quantitative methods and financial reporting, marketing, and finance. Integrative courses are designed to combine strategic material from a number of functional areas and are taught by multiple instructors. The program concludes with a one-week global business application camp and a strategy simulation that requires participants to lead a global company.

The schedule is designed to accommodate the specific needs of executives. During the academic year, classes take place on Friday afternoons and Saturdays every other week.

**Admission:** Applicants to the program are required to have a bachelor's degree (BS or BA), minimum three years of managerial experience, and proficiency in English sufficient to follow the course material. Applicants should have strong communication and social skills, entrepreneurial and leadership qualities and aim to be top-level executives.

**Degree Requirements:** Participants admitted to the program will be required to complete a minimum of 41 credit hours of course with a minimum cumulative grade point average of 3.00/4.00.

## COURSE DESCRIPTIONS

**MAN 525 Financial Economics**
This course covers the theoretical foundations of modern financial economics. The focus is on financial markets and the valuation of financial claims traded in those markets, under discrete time models. Topics analyzed include models of consumption and investment decisions under uncertainty; risk aversion; stochastic dominance; mean variance theory; equilibrium models of asset pricing (CAPM, ICAPM, APT); linear multifactor models; and incomplete markets.

**MAN 627 Seminars in Corporate Finance**
It is a doctoral seminar course covering major theories and empirical studies that have been developed in the area of corporate finance. The aim is to teach a class that will generate research ideas.

**MAN 628 Advanced Empirical Finance**
It is a doctoral seminar course covering major theories and empirical studies that have been developed in the area of investment theory. The aim is to teach a class that will generate research ideas.

**MAN 629 Seminar in Financial Intermediation**
It is a doctoral seminar course covering major theories, recent developments and empirical studies that have been developed in the area of financial intermediation. The aim is to teach a class that will generate research ideas.

**MAN 631 Marketing Theory**
This course aims to develop fundamental knowledge of and about marketing as a field of study and provoke critical thinking about the field. Readings and discussions examine the historical development of marketing thought and theory, as well as contemporary issues, alternative perspectives, and critical insights. The course considers the philosophical foundations of marketing practice and marketing thought and issues of scholarship and science in marketing. The course is interactive and involves critical discussion of the readings during both lectures and student presentations. Students search for possible dissertation topics and develop a preliminary dissertation proposal.

**MAN 633 Seminar in Marketing Strategy**
This course is designed to provide doctoral students with a foundation in marketing strategy research. This course will identify, review, and critique a variety of theoretical perspectives that can be applied to areas including firm capabilities, marketing channels, strategic alliances, and firm boundaries.

**MAN 634 Consumer Behavior Theory I**
**MAN 636 Consumer Behavior Theory II**
This course deals with the understanding of the behavior, attitudes, preferences and decision making processes of people as consumers and psychological theories underlying consumer behavior. Some strategic implications of consumer preference formation, judgment and decision making are also addressed. Understanding consumers is a critical component of marketing to implement efficient marketing strategies. Principles from psychology as well as other social sciences are integrated to analyze consumer behavior.

**MAN 639 Special Topics in Marketing I**
**MAN 640 Special Topics in Marketing II**
This doctoral seminar covers major theories and studies in selected areas in the marketing field. The course reviews historical and contemporary approaches in the area and aims equip students with knowledge useful in generating research ideas.

**MAN 656 Advanced Multivariate Statistics**
The objective of this course is to introduce tools for multivariate analysis including multivariate ANOVA, principle components analysis, discriminant analysis, cluster analysis, factor analysis, structural equations modeling, canonical correlations and multidimensional scaling.

**MBA 500 Bilcamp**
This is an extended MBA orientation. It will be used to review some background that is important for the program, as well as team building. It will be run as a one-credit orientation course during the week before classes start in September. Possible skills components to be included are calculus review, basic statistics, intermediate excel (modeling), presentation skills, group skills (team work), research skills, leadership skills and emotional intelligence.

**MBA 502 Macroeconomics**
The objective of this course is to enable you to have an understanding of the macroeconomic environment in which businesses operates. We will cover topics like economic growth; unemployment; inflation; money supply; money demand; interest rates; trade; balance of payments; and

exchange rates in order to enable you to analyze and to examine the functioning of aggregate economy. In addition, government policies, public's expectations about government policies and their possible effects on macroeconomics performance of an economy will be covered to enable you to evaluate the consequences of those policies for businesses and to make more informed decisions.

**MBA 503 Business Economics**
This course is designed to introduce the theory and practice of Microeconomics for MBA students. The topics covered include fundamental issues in Microeconomics. Theory of the consumer and the firm are the primary areas of the course. In addition, market structure, choice under uncertainty and some topics in financial economics will be covered.

**MBA 504 Financial Risk Management**
This course is a graduate level course focusing on the instrument of financial risk management. After taking this course participants will be able to understand the economic functions of derivatives markets and where they fit within the financial intermediation process. More specifically they will develop an understanding of the basic instruments like futures, forwards, options and some commonly used exotic derivatives. The course also aims to develop a working knowledge of the hedging strategies that could be implemented by the instruments introduced in the course.

**MBA 511 Accounting**
The need for accounting records and reports and the basic principles underlying the accounting cycle and preparation of financial statements. Emphasis is given to accounting as an aid to managerial decision making. In addition, topics such as budgeting, funds flow and the basics of cost accounting are discussed.

**MBA 512 Managerial Accounting**
The primary objective of this course is to teach the skills, tools and managerial insights for intelligent and ethical decision making. The course focuses on the information development and analysis, presenting and communicating information to make it useful, and bring in accounting, financial and business information into the decision process. As students learn the fundamental concepts of management accounting, an attempt is made to identify problems with current accounting and managerial conventions.

**MBA 513 Financial Statement Analysis**
This course aims at providing the student with the tools of financial and credit analysis. Analysis of the relation between financial accounting data and firm performance is emphasized. Characteristics of accounting ratios and their relations to market and industry factors, time series behavior of earnings and forecasting models are also investigated.

**MBA 519 Financial Institutions and Markets**
This course aims to investigate the history, structure and functions of financial institutions (banks, insurance companies, mutual funds, etc.) as well as central banking. It analyzes money, financial intermediaries, markets and recent banking legislation. Topics include why banks and other financial institutions exist, how asset prices are determined, what is the risk and term structure of interest rates and what is efficient market hypothesis. All major markets and their respective financial instruments are studied to develop the necessary quantitative toolset for sensible decision making in an increasingly global economy.

**MBA 522 Corporate Finance**
A course in the theory of corporate finance with emphasis on investment and financing decisions of the firm. Topics include valuation, capital budgeting, capital structure, cost of capital, dividend policy, financial statement analysis, profit planning, financial forecasting, and working capital management.

**MBA 524 Investment Analysis**
Risk and return characteristics of various investment instruments such as common stocks, bonds, convertibles and options are considered. Modern portfolio theory is discussed and related concepts are used in constructing portfolios for individual and institutional investors. Alternative portfolio management strategies and financial analysis and valuation of corporate securities are also covered.

**MBA 526 International Finance**
This course introduces the environment, theory and practice of international finance. The major topics covered are: the foreign exchange market and price elasticities of trade, the Keynesian Model of Income and the trade balance, the Monetary approach to the balance of payments, introduction to capital mobility: The Mundell-Fleming model. In the second part of the course international monetary system, the European monetary system, financial liberalization and stabilization in LDC's are covered.

**MBA 531 Marketing Research**
After a brief review of the examination of marketing information needs and resources including the collection and dissemination of primary and secondary data, this course focuses on quantitative research in marketing. More specifically, this course discusses problem definition, research design, sampling techniques, data collection and analysis. An overview of methods of measuring consumer reactions to project characteristics, effectiveness of advertising, and other promotional devices are also discussed.

**MBA 532 Marketing Management**
Survey of the marketing concept, consumer behavior, segmentation, marketing research, competitive analysis, and marketing decisions involving products, price, distribution and promotion. Analytical, strategic and decision making aspects are emphasized. Cases are used for application of the principles discussed.

**MBA 542 Production and Operations Management**
Principles and decision analysis related to the effective utilization of the factors of production in manufacturing and non-manufacturing activities. The design, operation and control of production systems using mathematical, computational and other modern analytical techniques.

**MBA 551 Probability and Statistics**
Basic concepts in probability and statistical analysis. Topics include data analysis, Bayes theorem, discrete and continuous distributions, estimation, testing of hypotheses, analysis of variance, and regression analysis.

**MBA 553 Data Models and Decisions**
This course introduces students the fundamental techniques of using data and management science tools and models to think structurally about decision problems, make more informed management decisions, and enhance decision-making skills. Topics include linear, discrete, and non-linear optimization and simulation modeling, as well as multi-criteria optimization. Spreadsheet models and spreadsheet-based software packages will be used extensively.

**MBA 561 Managing People and Organizations**
Managing successfully in the chaotic and dynamic world of 21st Century business demands a wide range of management skills and understanding. This course will emphasize these new skills and understandings in its three major components: (1) The Fundamentals of Modern Management: concepts, theories, and models of effective management. (2) Competing by Design: organizational structure as the critical tool for implementing corporate strategies. (3) The Management of Organizational Behavior in order to achieve a competitive advantage. Emphasis will be placed on the practicalities of managing successfully in the 21st Century, as well as on the supporting research.

**MBA 562 Managing People and Organizations**
Human resource management (HRM) is one of the major functional areas in management. It is now widely accepted that all managers need to be aware of HRM to successfully deal with various managerial issues. In this course, it is aimed to give MBA students with little or no prior knowledge of HRM an academic understanding the subject. The development of HRM as an academic field is critically explored in its historical context, with a special emphasis on the differences between personnel management and HRM. Various functions and dimensions of HRM (i.e. recruitment and selection, training and development, performance management, etc.) are defined and discussed, by using case studies and real examples both from Turkey as well as from abroad. Contemporary issues around HRM (e.g. discrimination and diversity, downsizing, industrial relations, etc.) are also explored. The course eventually aims to stimulate answers to the following questions: firstly, why and how is HRM one of the most significant management functions? And secondly, who does HRM in organizations? This course helps MBA students who want to extend their background in HRM, whether or not they plan to work as specialists in this area.

**MBA 568 Entrepreneurship and Innovation Management**
This course covers approaches to the study of entrepreneurship and discusses theories and practices to entrepreneurship as well as the wealth creation character and role of innovative entrepreneurship in the growth of economies. All aspects of entrepreneurship; from the influences on entrepreneurship development and the characteristics and behavior of the entrepreneur to developing intrapreneurship in organizations are discussed.

**MBA 582 New Product Design and Marketing**
New products and services are vital to the success of all companies and their brands. However, innovation is risky and most new products fail in the marketplace. Ineffective marketing is the primary cause of new products failures whose financial impact to the economy is significant. Thus, expertise in the marketing and design of new products is a critical skill for all managers, inside and outside of the marketing department. In this course, we focus on the tools and techniques associated with analyzing market opportunities and then designing, testing and introducing new products and services. Both quantitative and qualitative approaches are covered. In particular during the course, we'll use real case studies and competitive team projects to understand and apply the new product development process, market entry strategies, how to generate new products ideas, mapping customer perceptions, segmentation, product positioning, forecasting market demand, and product design.

**MBA 591 Business Strategy**
A capstone course utilizing comprehensive cases as the means of integrating all aspects of strategic management. Synthesizes the previous training in functional areas to address the evaluation, formulation and implementation of corporate and business level strategies in relation to the firm's environment.

**MBA 592 Business Practice Project**
The business practice course will require students to either complete a management consulting project or a business plan for an organization (company, government branch, NGO, or non-profit enterprise). Projects will be completed in groups of three or four. In this course, students will be able to propose a structured analysis, a decision support tool, a report, and/or other deliverables dictated by the organization in their terms of reference with the students.

**MBA 672 Leadership for International Managers**
This course aims at providing students with the knowledge and skills for recognizing leadership patterns and developing competencies and attitudes that will enhance their own competitiveness in the corporate arena and contribute to developing their personal managerial styles. It combines management theory and practical tools used by managers to carve a leading role for their organizations? Whether commercial enterprises or not-for-profit organizations? In the global environment, taking into consideration the impact of cultural diversity and the increasing importance of the emerging markets on drawing and implementing international strategies successfully.

**MBA 673 International Business Strategy**
Business conducted internationally entails the consideration of a far greater range of variables and associations than business conducted in the home country. Accordingly, in this course we study the environment, markets, institutions, challenges, strategy, and operations of international and cross-cultural business. We also examine the globalization of business and associated challenges posed for the competitiveness of the modern enterprise, as well as orientations, strategies, and tactics appropriate for international business success. Upon conclusion of this course, students should: (a) become sensitized to the urgency and challenges of international business for the contemporary enterprise; (b) have substantial understanding of fundamentals of international business with respect to major world markets, their environments and consumers; (c) understand basic managerial requirements for the successful performance of firms in international business; (d) be able to fit in quickly and perform in the international business operations of any firm.

**MBA 677 Negotiating Skills for International Executives**
This course aims at providing the students with knowledge and skills to understand the dynamics of cross-cultural negotiations in the global business environment and apply in practice proven techniques in a variety of circumstances. After an initial skill assessment of the participants, theory and cases inspired from real-life situations alternate in order to immerse the participants and equip them with first-hand experience. Role playing, feed-back, self-evaluation, and multi-media aids are some of the pedagogical tools used. One-on-one, multiparty, cross-border, government, mediation, alternate conflict resolution approaches are addressed, to degrees tailored to the profile and needs of the students. The topic of negotiations in the work-place for personal achievement is also covered. Assignments are used for ongoing evaluation, and final examination is in the form of a short essay.

**EMBA 502 EMBA Project**
This applied course enables participants to put into practice the various functional area knowledge that they gained in their courses. With a macro-level strategic focus, this application is designed to enable participants to think about how their learning experiences in the program could be leveraged to identify and initiate business change and strategic improvement avenues in their own business and managerial contexts.

**EMBA 515 Foundations of Organizational Management**
This course serves as a general overview of managerial issues in modern business organizations. Structured around distinct organizational management domains, the course emphasizes the importance of effectively managing 1) employees (individuals and teams/groups), 2) organizational processes (motivation, leadership, communication, and learning), and 3) macro organizational design issues (structure and culture). The course also aims to serve as a platform for participants to start reflecting on their ongoing managerial practice, and comparing and connecting their practical managerial experience with the theoretical knowledge on organizational management that they are going to be exposed to in the course.

**EMBA 516 Competitive Strategy**
The main purpose of the course is to develop knowledge skills and abilities concerning the fundamentals in strategic

management. The general objectives of the course are to introduce to the key principles of strategic of management, develop an understanding of the concepts, skills, and abilities that make strategies successful, develop an awareness of the critical importance of industry and competition analysis, develop knowledge and skills for evaluating strategic options in corporate growth decisions, involve in a variety of activities that will develop the ability to apply the concepts.

**EMBA 521 Business Law**
The participants of this course will learn the legal system and how to use legal advice for managerial decisions. Topics covered include principals of obligation law, concepts of "obligational relationship" and "obligation", sources of obligations, formation and validity of legal transactions; particularly contracts, representation, torts and unjust enrichment. Basic concept of commercial enterprises law and negotiable instruments law, Partnerships and corporations, different aspects of public companies, legal issues related to competition, Principals of bankruptcy law, forcing of payments of debts, order of payment, forced sale and bankruptcy, Legality, sources and application of the criminal laws. General theory of crime; elements of crime, criminal responsibility; punishment, new perspectives in criminal law, especially in commercial criminal law area.

**EMBA 525 Managing Systems Effectively**
One of the key responsibilities of today's global managers is to orchestrate the multitude of actors, resources and processes of business value creation systems. Based primarily on an operational perspective, this course aims to shed light on and integrate various interdependent facets of value creation to instill in participant a holistic and practice-oriented appreciation of issues in modern business systems management. With this goal the course examines key topics including supply chain, operations and logistics management; strategic human resource management; and, IT and managerial reporting processes.

**EMBA 535 Foundations of Quantitative Methods and Financial Reporting**
This course is built around fundamental quantitative and reporting tools to help executives become informed and strategic users of the managerial data supplied to them. To that end, participants are first introduced a framework for thinking about problems involving uncertainty and, building on this framework, and developing quantitative tools for analyzing and interpreting data. This analytical framework is also supported by various spreadsheet applications for managerial use. Building on this analytical foundation, participants then learn how to examine accounting records and reports and the basic principles underlying the accounting cycle and preparation of financial statements, with a general focus on how accounting can be used as an aid to strategical managerial decision making.

**EMBA 545 Foundations of Financial Management**
Participants of this course will develop a basic understanding of the financial management issues and problems in business organizations. To this end, the participants are first introduced the general functioning of the aggregate macroeconomic environment and how and through which channels international financial environment affects the local economy. The course then covers the role and functioning of the capital and money markets as a device for the allocation of resources, the channeling of investable funds, and reallocation of risk, finally, the course involves a basic introduction to financial mathematics and how financial securities are priced. Topics covered include interest rates, basic financial instruments, stock and bond pricing, concepts of return and risk and how they affect the managerial decision making process.

**EMBA 546 Strategic Financial Management**
This course is designed around the question of how to create value for your company and increase financial performance through strategic decisions such us investing in real assets with a thorough understanding of the risks involved, optimal mix of financing and how it relates to the markets and people, how to allocate financial resources among various stakeholders.

**EMBA 547 Decision Analysis**
This course integrates the managerial decision making process under uncertainty and many stakeholders through strategic financial decisions. Founded on descriptive and prescriptive approaches, it covers models in decision making, heuristics and biases, individual versus group decision making and tools for decision support.

**EMBA 555 Foundations of Marketing Management**
This course is crafted around the core elements and tools of marketing, such as market-focused culture, customer and competitor analysis, value delivery, pricing, relationship management, brand management, marketing communication and marketing analytics. For these purposes, the participants are introduced various frameworks to better understand and manage the nature and determinants of consumer behavior, branding, and sales management techniques. The course also provides opportunities for participants to reflect on and apply the course contents in their own business and managerial contexts.

**EMBA 556 Managing Markets, Growth and Change**
In today's increasingly complex and dynamic global business environment, one haunting management challenge is to continually nurture market responsiveness and adaptation as key business competences. To help participants address these challenges, the course aims to examine various processes through which successful business organizations monitor, internalize, and respond to market dynamics. With this focus, the course examines topics such as market research; marketing strategy; new product development; innovation; business growth management; and, organizational change management.

## SAMPLE OF RECENT PUBLICATIONS


• I. Sendeniz-Yuncu, L. Akdeniz, K. Aydogan, "Do Stock Index Futures Affect Economic Growth? Evidence from 32 Countries", *Emerging Markets Finance & Trade* (Forthcoming)

• B. Yayvak, L. Akdeniz, A. Altay-Salih, "Do Time-Varying Betas Help in Asset Pricing? Evidence From Borsa Istanbul", *Emerging Markets Finance & Trade*, 51, 747-756 (2015)

• M.K. Kozan, L. Akdeniz, "Role of Strong versus Weak Networks in Small Business Growth in an Emerging Economy", *Administrative Sciences*, 4, 35-50 (2014)

• E. Avcı-Surucu, K. Aydogan, D. Akgul, "Bidding Structure, Market Efficiency and Persistence in a Multi-time Tariff Setting", *Energy Economics*, 54, 77-87 (2016)

• C. Aydogmus, S.M. Camgoz, A. Ergeneli, O.T. Ekmekci, "Perceptions of Transformational Leadership and Job Satisfaction: The Roles of Personality Traits and Psychological Empowerment", *J of Management and Organization*., 1-27(2017)

• C. Aydogmus, "Generation Y Employees: The role of Psychological Empowerment on the Relationship between Emotional Intelligence and Interpersonal Citizenship Behaviors". *International Journal of Business and Social Science*. 7 (11). 114-128 (2016)

• C. Aydogmus, "How to Satisfy Generation Y? The Roles of Personality and Emotional Intelligence", *Int Review of Management and Business Research*, 5, 1342-1358 (2016)

• C. Aydogmus, A. Ergeneli, S.M. Camgoz, "The Role of Psychological Empowerment on the Relationship between Personality and Job Satisfaction", *Research J of Business and Management*, 2, 251-276 (2015)

• S. Cross, A. Uskul, B. Gercek-Swing, Z. Sunbay, C. Alozkan, C. Gunsoy, B. Ataca, Z. Karakitapoglu-Aygun, "Cultural

prototypes and dimensions of honor", *Personality and Socia Psychology Bulletin*, 40, 232-249 (2014)

• V. Taras, R. Sarala, ...., Z. Karakitapoglu-Aygun, E. Kashima, A. Kolstad, T. Milfont, J. Oetzel, S. Okazaki, T. Probst, T. Sato, M. Shafiro, T. Singelis, S. Schwartz, C. Sinclair, "Opposite ends of the same stick? Multi-method test of the dimensionality of individualism and collectivism", *J of Cross-Cultural Psychology*, 45, 213-245 (2014)

• U. Gurler, D. Yenigun, M. Caglar, E. Berk, "On the Modeling of CO2 EUA and CER Prices of EU-ETS for the 2008-2012 Period", *Applied Stochastic Models in Business and Industry* (Forthcoming)

• R. Kian, U. Gurler, E. Berk, "The dynamic lot-sizing problem with convex economic production costs and setups", *Int J of Production Economics*, 155, 361-379 (2014)

• E. Berk, U. Gurler, "Inventory Theory", *Decision Sciences Theory and Practice*, Raghu Nandan Sengupta, Aparna Gupta, Joydeep Dutta (Eds.), pp. 351-414, CRC Press (2016)

• U. Gurler, E. Berk, "Queueing Theory'", *Decision Sciences Theory and Practice*, Raghu Nandan Sengupta, Aparna Gupta, Joydeep Dutta (Eds.), pp. 289-351, CRC Press (2016)

• R. Kian, E. Berk, U. Gurler, "An Integrated Replenishment and Transportation Model: Computational Performance Assessment", *Global Logistics Management*, B.Y. Kara, I. Sabuncuoglu, B. Biranda (Eds.), pp. 271-294, CRC Press (2015)

• J. Couvas, E*uropean Union: Institutions, Law, Trade, Future,* Berlin (D): Pnyx Press-GD Publishing, (2016)

• B. Depecik, Y.M. van Everdingen, G.H. van Bruggen, "Firm Value Effects of Global, Regional, and Local Brand Divestments in Core and Non-Core Busienesses", *Global Strategy Journal*, 4, 143-160 (2014)

• L. Kurpis, J.G. Helgeson, A. Ekici, M. Supphellen, "Consumers' Use of Country of Manufacture Information: Turkey, and Emerging Market versus the U.S.A., a Developed Market", *J of the Academy of Marketing Studies* (Forthcoming)

• A. Ekici, S. Onsel-Ekici, "A Bayesian Network Analysis of Ethical Behavior", *J of Macromarketing*, 36, 96-115 (2016)

• F. Watson, A. Ekici, "Well-being in Alternative Economies: The role of shared commitments in the context of a spatially extended alternative food network", *J of Macromarketing* (Forthcoming)

• M.J. Sirgy, D-J. Lee, B. Grace, A. Ekici, "Self-expressiveness in shopping", *J of Retailing and Consumer Services,* 30, 292-299 (2016)

• O. Sandikci, M. Peterson, A. Ekici, T. Simkins, "Development and Quality of Life in Turkey: How Globalization, Religion, and Economic Growth Influence Individual Well-being", *J of Macromarketing,* 36, 304-320 (2016)

• K. Hamilton, M.G. Piacentini, E. Banister, A. Barrios, C.P. Blocker, C.A. Coleman, A. Ekici, H. Gorge, M. Hutton, F. Passerard, B. Saatcioglu, "Poverty in Consumer Culture: Towards A Tranformative Social Representation", *J of Marketing Management*, 30, 1833-1857 (2014)

• D-J. Lee, G.B. Yu, J. Sirgy, A. Ekici, E. Gurel-Atay, K.D. Bahn, "Shopping Well-Being and Ill-Being: Toward an Integrated Model", *Handbook of Research on Retailer+Consumer Relationship Development*, F. Musso, E. Druica (Eds.), pp. 27-44, Business Science Reference IGI Global (2014)

• E. Erel, O. Hazir, M. Haouari, "Robust optimization for the discrete time-cost tradeoff problem with cost uncertainty", *Handbook on Project Management and Scheduling*, C. Schwindt, J. Zimmermann (Eds.), pp. 865-874, Springer (2015)

• M. Ture, G. Ger, "Continuity through Change: Navigating Temporalities through Heirloom Rejuvenation", *J of Consumer Research,* 43, 1-25 (2016)

• A. Kuruoglu, G. Ger, "An Emotional Economy of Mundane Objects", *Consumption Markets and Culture,* 18, 209-238 (2015)

• B. Figueiredo, J. Chelekis, B. DeBerry-Spence, A.F. Firat, G. Ger, D. Godefroit-Winkel, O. Kravets, J. Moisander, K. Nuttavuthisit, L. Penaloza, M. Tadajewski, "Developing Markets? Understanding the Role of Markets and Development at the Intersection of Macromarketing and Transformative Consumer Research (TCR)", *J of Macromarketing*, 35, 257-271 (2015)

• A. Kocabiyikoglu, C.I. Gogus, M.S. Gonul, "Decision Making and the Price-Setting Newsvendor: Experimental Evidence", Decision Sciences, 47, 157-186 (2016)

• A. Kocabiyikoglu, I. Gogus, M.S. Gonul, "Revenue Management vs. Newsvendor Decisions: Does Behavioral Response Mirror Normative Equivalence?", *Production and Operations Management*, 24, 750-761 (2015)

• C.I. Gogus, O. Orge, O. Duygulu, "Gendering entrepreneurship: A discursive analysis of a woman enterepreneur competition", *Context, Process and Gender in Enterpreneurship*, R. Blackburn, U. Hytti, F. Welter (Eds.), pp. 111-126, Cheltehem, UK: Edward Elgar (2015)

• L. Gumusluoglu, N. Acur, "Fit Among Business Strategy, Strategy Formality and Dynamic Capability Development in New Product Development", *European Management Review,* 13, 107-123 (2016)

• T. Kiessling, T. Martin, B. Yasar, "The Power of Signaling: Presidential leadership and rhetoric over 20 years", *Leadership and Organization Development Journal* (Forthcoming)

• T. Kiessling, L. Isaksson, B. Yasar, "Market Orientation and CSR: Performance Implications", *J of Business Ethics*, 137, 269-284 (2016)

• F.D. Galetic, T. Kiessling, "Media control: An assessment of privatization in transitional economies", *J of Media Economics*, 29, 111-124 (2016)

• M. Moeller, J. Maley, M. Harvey, T. Kiessling, "Global Talent Management and Inpatriate Social Capital Building: A Status Inconsistency Perspective", *Int J of Human Resource Management,* 27, 991-1012 (2016)

• M. Loureiro, T. Kiessling, M. Dabic, "Supply chain management as the key to a firm's strategy in the global marketplace: trends and research agenda", *Int J of Physical Distribution & Logistics Managmenet*, 45, 159-181 (2015)

• M. Loureiro, T. Kiessling, M. Dabic, "Acculturation and overseas assignments: a review and research agenda", *Int J of Intercultural Relations,* 49, 239-250 (2015)

• T. Kiessling, M. Harvey, "The Human Resource Management Issues Associated with the Globalization of Distribution/ Logistics", *Int J of Physical Distribution & Logistics Managmenet*, 44, 8-9 (2014)

• T. Kiessling, M. Harvey, L. Akdeniz, "The Evolving Role of Supply Chain Managers in global Channels of Distribution and Logistics Systems", *Int J of Physical Distribution & Logistics Managmenet,* 44, 671-688 (2014)

• I. Isaksson, T. Kiessling, M. Harvey, "CSR: why Bother?", *Organizational Dynamics,* 43, 64-72 (2014)

• A. Kocabiyikoglu, I. Popescu, C. Stefanescu, "Pricing and Revenue Management: The Value of Coordination", *Management Science*, 60, 730-752 (2014)

• Z. Onder, S. Ozyildirim, "Foreign banks, financial crises and macroeconomic fluctuations", *Economics of Transition,* 24, 447-479 (2016)

• Z. Onder, A. Yurekli, "Who pays the most cigarette tax in Turkey", *Tobacco Control,* 25, 39-45 (2016)

• Z. Onder, S. Ozyildirim, "Bank Quality, Loan Demand and Market Discipline", *Emerging Markets Finance & Trade,* 50, 61-72 (2014)

• N. Bilir, B. Cakir, E. Dagli, T. Erguder, Z. Onder, *Tobacco Control in Turkey,* WHO, (2009)

• Z. Onder, *The Economics of Tobacco in Turkey: New Evidence and Demand Estimates*, The World Bank and World Health Org., (2002)

• Z. Onder, "Smoking in Turkey", *Life-Course Smoking Behavior: Patterns and National Context in Ten Countries,* D.R. Lillard, R. Christopoulou (Eds.), pp. 141-153, New York: Oxford University Press (2015)

• R. Christopoulou, Z. Onder, "Smoking by women in cross-country perspective", *Life-Course Smoking Behavior: Patterns and National Context in Ten Countries,* D.R. Lillard, R. Christopoulou (Eds.), pp. 167-178, New York: Oxford University Press (2015)

• D. Onkal, M.S. Gonul, P. Goodwin, M. Thomson, E. Oz, "Evaluating expert advice in forecasting: Users' reactions to presumed vs experienced credibility", *Int J of Forecasting*, 33, 280-297 (2017)

• J.A. Alvarado, L.H. Barrero, D. Onkal, J. Dennerlein, "Expertise, credibility of system forecasts and integration methods in judgmental demand forecasting", *Int J of Forecasting*, 33, 298-313 (2017)

• M.S. Gonul, E. Soyer, D. Onkal, "Decision Analysis in Turkey", *Decision Analysis Today*, 33, 16-18 (2014)

• T. Savaser, E. Sisli-Ciamarra, "Managerial Performance Incentives and Firm Risk during Economic Expansions and Recessions", *Review of Finance* (Forthcoming)

• W.B. Omrane, T. Savaser, "The sign switch effect of macroeconomic news in foreign exchange markets", *J of International Financial Markets, Institutions and Money* (Forthcoming)

• D.J. Morrice, P. Cronin, F. Tanrisever, J. C. Butler, "Supporting hurricane inventory management decisions with consumer demand estimates", *J of Operations Management,* 45, 86-100 (2016)

• F. Tanrisever, K. Derinkuyu, G. Jongen, "Organization and functioning of liberalized electricity markets: An overview of the Dutch market", *Renewable and Sustainable Energy Reviews*, 51, 1363-1374 (2015)

• K. Derinkuyu, F. Tanrisever, F. Baytugan, M. Sezgin, "Combinatorial Auctions in Turkish Day Ahead Electricity Markets", *Industrial Engineering Applications in Emerging Countries,* I. Sabuncuoglu, B.Y. Kara, B. Bidanda (Eds.), pp. 49-64, CRC Press (2015)

• I. Yilmaz, B. Tanyeri, "Global Merger and Acquisition (M&A) Activity: 1992-2011", *Finance Research Letters*, 17, 110-117 (2016)

• N. Comez, B. Tanyeri, "Inventory performance with pooling: Evidence from mergers and acquisitions", *Int J of Production Economics*, 168, 331-339 (2015)

• P. Strahan, B. Tanyeri, "Once Burned, Twice Shy: Money Market Fund Responses to a Systemic Liquidity Shock", *J of Financial and Quantitative Analysis,* 50, 119-144 (2015)

## Faculty Profile: Dr. Erdal Erel, Professor, Faculty of Business Administration

Erdal Erel graduated from İstanbul Technical University in 1981, with a B.S. degree in industrial engineering. He received an M.S. degree in industrial engineering from Stanford University in 1983 and a Ph.D. in industrial engineering and operations research from Virginia Polytechnic Institute and State University in 1987. He joined the faculty of Bilkent University in 1989.

Prof. Erel served as director of the university's Graduate School of Economics and Social Sciences from 2004 to 2015, and as dean of the Faculty of Business Administration from 2008 to 2016. His current research interests are in the fields of manufacturing systems design, sequencing and scheduling, and project management. He has published over 40 articles and received over 800 citations. His work has appeared in *IIE Transactions, the European Journal of Operational Research,* the *International Journal of Production Research, Omega, Applied Mathematics and Computation, Computers and Industrial Engineering, Computers and Operations Research*, the *Journal of the Operational Research Society,* the *Journal of Intelligent Manufacturing*, the *International Journal of Production Economics, Production Planning and Control*, the *Annals of Operations Research, and Discrete Applied Mathematics*.

Contact:
Dr. Ülkü Gürler
(Acting Dean)
Phone : +90 312 290 1276
Fax : +90 312 266 4958
fba@bilkent.edu.tr
man.bilkent.edu.tr

## Faculty Profile: Dr. Celile Itır Göğüş, Assistant Professor, Faculty of Business Administration

Celile Itır Göğüş received a B.S. degree in management from Bilkent University in 1999 and an M.S. degree in human resource management from Texas A&M University in 2001. She completed a Ph.D. in management at the Mays Business School of Texas A&M University in 2005, where she subsequently worked as a postdoctoral researcher prior to joining the faculty of Bilkent University in 2006.

Dr. Göğüş's research focuses on employee and organizational effectiveness, entrepreneurship, and, broadly, organization studies. Her articles have appeared in journals such as the *Journal of Applied Psychology*, the *Journal of Business Ethics, Production and Operations Management, Decision Sciences, Applied Psychology: An International Review, Small Group Research and the Organizational Psychology Review*. She has also published book chapters on work teams and female entrepreneurship.

Dr. Göğüş teaches courses on management, organizational behavior, organization theory, family business and human resource management at the undergraduate and graduate levels. She is a two-time recipient of the Dr. Orhan Karacadağ Scientific Achievement Award at Bilkent University and a recipient of the Mays Business School Dean's Award for Outstanding Research by a Doctoral Student at Texas A&M University. She is a member of the Academy of Management.

# LAW

The Faculty of Law concentrates on graduate studies, where students have a distinctive opportunity to widen their understanding of law through advanced master's and Ph.D. programs.

## FACULTY

**TEKİN AKILLIOĞLU**, Adjunct Professor. Ph.D., Law, University of Rennes, 1972. *Administrative law, human rights law.*

**HÜSEYİN CAN AKSOY**, Assistant Professor. Ph.D. Law Martin–Luther-Universität Halle-Wittenberg, 2013. *Basic concepts of law, business law, introduction to contract law, civil law, law of obligations.*

**PINAR ÇAĞLAYAN AKSOY**, Assistant Professor. Ph.D., Civil Law, Ankara University, 2015. *Basic concepts of law.*

**ZÜHTÜ AYTAÇ**, Visiting Professor. Ph.D., Law, Albert Ludwig Freiburg University, 1975. *Commercial law, bound enterprises law (company groups law).*

**ASLI BAYATA CANYAŞ**, Assistant Professor. Ph.D. Private International Law Ankara University, 2011. *Business law, basic concepts of law, recognition and enforcement of foreign arbitral awards, private international law, refugee law and international protection, citizenship and foreigners law.*

**ECE GÖZTEPE ÇELEBİ**, Associate Professor. Ph.D., Law, Münster Westfaelische Wilhelms University, 2001. *Public law, constitutional law, constitutional judiciary; law, film and literature, methodology of law and research methods.*

**ELVİN EVRİM DALKILIÇ**, Assistant Professor. Ph.D., Law, Gazi University, 2009. *Administrative law.*

**M. ALİ ERTEN**, Visiting Professor. Ph.D., Law, Ankara University, 1976. *Civil law, law of obligations.*

**OSMAN B. GÜRZUMAR**, Professor, Ph.D., Law, Bern University, 1991. *Civil law, competition law.*

**A. RÜÇHAN IŞIK**, Visiting Professor. Ph.D., Law, Ankara University, 1962. *Labor law.*

**HALİL BAHA KARABUDAK**, Instructor. Economics, METU, 1985. *Principles of economics, economics of competition, introduction to law and economics of competition and regulatory policies, introduction to economic analysis of law.*

**TUĞRUL KATOĞLU**, Visiting Associate Professor. Ph.D., Law, Ankara University, 2001. *Criminal procedure, criminal law (special part).*

**CENGİZ KOÇHİSARLIOĞLU**, Visiting Professor, Ph.D., Law, Lausanne University, 1982. *Civil law, introduction to law, law of obligations, inheritance law.*

**ERDEN KUNTALP**, Adjunct Professor. Ph.D., Law, Ankara University, 1964. *Civil law.*

**ÇAĞLAR MANAVGAT**, Professor. Ph.D., Commercial Law, Ankara University, 1996. *Law of capital markets, commercial law, capital markets and market abuse, financial institutions law.*

**KAMİL MUTLUER**, Adjunct Professor. Ph.D., Tax Law, Eskişehir Economic and Commercial Sciences Academy, 1971. *Tax law, budget law, public finance, fiscal law.*

**ERDAL ONAR**, Visiting Professor. Ph.D., Public Law, Ankara University, 1976. *Constitutional law, Turkish constitutional history, parliamentary law.*

**PINAR ALTINOK ORMANCI**, Assistant Professor. Ph.D. Civil Law, Ankara University, 2011. *Basic concepts of law, law of obligations (special part), business law, civil law II.*

**ARİF BARIŞ ÖZBİLEN**, Assistant Professor Ph.D., Law, Galatasaray University, 2011. *Property law, law of obligations (special part), business law.*

**BARIŞ ÖZÇELİK**, Assistant Professor. Ph.D., Civil Law, Ankara University, 2009. *Property law, law of obligations (special part).*

**GÜLÜM BAYRAKTAROĞLU ÖZÇELİK**, Assistant Professor. Ph.D., Private International Law, Ankara University, 2007. *European Union law, selected topics in English law, international family law, legal aspects of EU-Turkey relations, private international law.*

**HAMDİ PINAR**, Assistant Professor. Ph.D., Law, Ludwig Maximilian University Munich, 2002. *Commercial law, advertising law, intellectual property, unfair competition.*

**SAMİ SELÇUK**, Adjunct Professor. Ph.D., Law, Ankara University, 1982. *Criminal law, criminal procedure, criminal law (special part).*

**LALE SİRMEN**, Visiting Professor. Ph.D., Law, Ankara University, 1975. *Civil law, consumer law, legal acts, law of obligations, concepts of ownership and limitations of ownership related with land.*

**TURGUT TAN**, Professor and Dean. Ph.D., Administrative Sciences, Ankara University, 1970. *Administrative law, public economic law, legal and administrative aspects of privatization.*

**BİLGİN TİRYAKİOĞLU**, Visiting Professor. Ph.D., Law, Ankara University, 1991. *Private international law, settlement of energy investment disputes, citizenship and foreigners law, ICSID arbitration, moot court.*

**BİLGİN TİRYAKİOĞLU**, Visiting Professor. Ph.D., Law, Ankara University, 1991. *Private international law, settlement of energy investment disputes, citizenship and foreigners law, ICSID arbitration, moot court.*

**HALUK TOROSLU**, Assistant Professor. Ph.D. Criminal Law, Ankara University, 2013. *Criminal law, criminology, basic concepts of law, criminal procedure.*

**NEVZAT TOROSLU**, Visiting Professor. Ph.D., Law, Ankara University, 1964. *Criminal law.*

**ASLI E. GÜRBÜZ USLUEL**, Assistant Professor. Ph.D., Law, Ankara University, 2008. *Commercial law, moot court.*

**EJDER YILMAZ**, Visiting Professor. Ph.D., Ankara University, 1975. *Civil procedure, enforcement and bankruptcy law.*

## PART TIME FACULTY

**ŞAHİN ARDIYOK**, LL.M., Law, Chicago University, 2004. M.B.A. Ankara University, 2000.

**ALPARSLAN BAYRAKTAR**, LL.M., Law and Economics, Bilkent University, 2013.

**OSMAN R. GÜNVER**, Ph.D. Law, Ankara University, 1999.

**GÖNENÇ GÜRKAYNAK**, LL.M. Law, Harvard University, 2001.

**FUAT OĞUZ**, Associate Professor. Ph.D. Economics, George Mason University, 2000.

**SİNAN UTKU**, J.D., Columbia University, 1997, Ph.D., Physics, Yale University, 1994.

## MASTER OF PRIVATE LAW

The master's program in private law is designed for applicants with a bachelor's degree in law who wish to specialize in private law. The program includes courses in classical and substantial areas of private law as well as in other areas involving national and international perspectives with regard to specialization. The language of instruction in some courses is English and in others, Turkish.

**Admission:** Applicants to the program must have a bachelor's degree in law. Proficiency in written and oral English must be documented, and an ALES score must be submitted.

**Degree Requirements:** Students admitted to the program will be required to complete a minimum of 21 credit hours of course work as well as three non-credit courses including a seminar and to write and defend a thesis. Students must complete the courses and the seminar in a maximum of four semesters and must complete the program with a minimum cumulative grade point average of 3.00/4.00, with no grades below C. The standard duration of study for the program is four semesters; the maximum duration is six semesters.

## MASTER OF PUBLIC LAW

The master's program in public law is designed for applicants with a bachelor's degree in law who wish to specialize in public law. The program includes courses in classical and substantial areas of public law as well as in other areas that involve national and international perspectives with regard to specialization. The language of instruction in some courses is English and in others, Turkish.

**Admission:** Applicants to the program must have a bachelor's degree in law. Proficiency in written and oral English must be documented, and an ALES score must be submitted.

**Degree Requirements:** Students admitted to the program will be required to complete a minimum of 21 credit hours of course work as well as three non-credit courses including a seminar and to write and defend a thesis. Students must complete the courses and the seminar in a maximum of four semesters and must complete the program with a minimum cumulative grade point average of 3.00/4.00, with no grades below C. The standard duration of study for the program is four semesters; the maximum duration is six semesters.

## DOCTOR OF PHILOSOPHY IN PRIVATE LAW

The Ph. D. program in public law is designed for applicants with a master's degree in law who wish to further specialize in public law. The program includes courses in classical and substantial areas of public law as well as in other areas involving national and international perspectives with regard to specialization. The language of instruction in some courses is English and in others, Turkish.

**Admission:** Applicants to the program must have a master's degree in law. Proficiency in written and oral English must be documented, and an ALES score must be submitted.

**Degree Requirements:** Students admitted to the program will be required to complete a minimum of 21 credit hours of course work as well as four non-credit courses including a seminar and to write and defend a thesis. Students must complete the courses and the seminar in a maximum of four semesters and must complete the program with a minimum cumulative grade point average of 3.00/4.00, with no grades below B. The standard duration of study for the program is eight semesters; the maximum duration is twelve semesters.

## DOCTOR OF PHILOSOPHY IN PUBLIC LAW

The Ph. D. program in public law is designed for applicants with a master's degree in law who wish to further specialize in public law. The program includes courses in classical and substantial areas of public law as well as in other areas involving national and international perspectives with regard to specialization. The language of instruction in some courses is English and in others, Turkish.

**Admission:** Applicants to the program must have a master's degree in law. Proficiency in written and oral English must be documented, and an ALES score must be submitted.

**Degree Requirements:** Students admitted to the program will be required to complete a minimum of 21 credit hours of course work as well as four non-credit courses including a seminar and to write and defend a thesis. Students must complete the courses and the seminar in a maximum of four semesters and must complete the program with a minimum cumulative grade point average of 3.00/4.00, with no grades below B. The standard duration of study for the program is eight semesters; the maximum duration is twelve semesters.

## MASTER OF LAW AND ECONOMICS (Non-Thesis)

The rapid development of the relationship between law and economics has brought multidisciplinary studies to the center of 21st-century legal education and practice. In today's world, where the way in which law and economics interact has become ever clearer due to developments in the legal framework of market economies, legal scholars must also address the economic effects of laws and regulations and analyze the impact of globalization. The need for experts who are well versed in the economic issues arising in different legal regimes is growing; thus, it is

important to graduate students who are knowledgeable in economics as well as law. The recent and rapid convergence of the objectives of law and economics, which had traditionally been considered completely separate academic fields, has brought to the fore various nexuses between the two. Investors, for example, require the assistance of lawyers who can take economic points of view into consideration when interpreting laws and regulations, and who are able to comment on economic behavior in the context of different legal systems, rather than simply providing standard legal consultancy. In this context, competition law and economic regulation law are especially important legal fields.

The main purpose of this program is to provide students with expertise in the legal framework of market economies as well as in competition law and economic regulation, who have the ability to apply their knowledge and awareness of the interaction between law and economics in modern practice.

**Admission:** Applicants to the program must have a bachelor's degree, and proficiency in written and oral English must be documented. Submission of an ALES score is not required.

**Degree Requirements:** Students admitted to the program will be required to complete a minimum of 30 credit hours of course work as well as one non-credit course, and to submit a term project. Students must complete the program with a minimum cumulative grade point average of 3.00/4.00, with no grades below C. The standard duration of study for the program is two semesters; the maximum duration is three semesters.

## COURSE DESCRIPTIONS

**LAW 501 Economic Analysis of Law**
Economic analysis of law (or the doctrine of law and economics) is in today's world considered the most influential thought in foreign legal systems. This course aims to introduce this legal thought to students and to explain them how it is to be applied in some basic fields of Turkish Law. Economic analysis of law can be defined as the application of economic theory (theories of behavior) to the legal rules and institutions. In this context, some basic terminology like rational choice theory, economic efficiency, social welfare and Coase theorem will be explained in the first part of the course. In the second part, the method of economic analysis will be applied in criminal law, laws of corporal property, contracts, consumer protection and mainly torts. The course language is English.

**LAW 503 Economics of Competition**
Competition law regulates the economic activities; but the operation of competition law has important differences from what is traditionally called legal regulation or regulation. The regulation has a nature peculiar to industry. Direct and regular determination of prices is related with product standards or barriers to entry to - exit from the market. Competition law, on the other hand, has application that covers the whole economy. It focuses on certain fundamental rules that aim good and efficient solutions for the society by enabling competitive interaction among firms. Interventions of authorities and proceedings, which may come into question in case of violation of these fundamental competition rules, are exceptional in nature. The main goal of this course is to introduce the theoretical approaches and basic techniques of economic analysis to graduate students in Turkey, where subjects of competition law and policy have developed parallel to the progressions in EU. The course language is English.

**LAW 504 Competition Law**
Basic concepts of competition law, anti-competitive agreements and concerted practices, abuse of the dominant position, mergers & acquisitions; decisions of the Turkish Competition Board, Turkish Conseil d'Etat, European Commission, European Court of Justice, US Supreme Court.

**LAW 505 Economic Regulation and Law**
This course has four main parts: In the first part, information about basic pricing theory will be given and the essential terminology that is going to be used in the other parts will be explained. In the second part, traditional approaches in regulation law, which focus on the relationship between market defects and regulation, will come into question. In the third part, it will be examined together with the results of positive regulation theory how the relationship between regulation and politic processes forms the law of regulation. In the fourth part, the methods of application of regulation in related markets will be analyzed. The course language is English.

**LAW 506 Energy Law and Policy**
In this course, legal aspects of Electricity, Natural Gas, Petroleum and LPG services and activities as the main research topics of the energy sector and the powers of Turkish Energy Market Regulatory Authority (EMRA) are going to be studied. In this context, for each sector license, tariff and monitoring mechanisms will be examined. The differences between current legal statuses arose within new regulations and the previous regulations and legal problems of the transition period going are to be assessed. Thereto relevant decisions of EMRA and current situation of competition complications within the energy sector will be analyzed from a legal perspective.

**LAW 507 Public Economic Law**
Characteristics and sources of `public economic law': the law of the state intervention in the economy; fundamental principles of public economic law; public organization in the economy area; public law framework of the market economy and the transition period from interventionist state to regulatory state; and privatization of public economic enterprises, the legal mechanisms of public-private partnership in public services and the regulation of sectors.

**LAW 508 Telecommunications Law**
This course is composed of two parts. Topics that are going to be studied in the first part are: (i) Basic terms and concepts of telecommunications, history of telecommunications law and economic substances of telecommunications regulations, (ii) Comparative study of European Union Communications Law and Turkish telecommunications regulations especially about access and interconnection, universal service obligations and privacy, (iii) Intercourse of telecommunications law and regulations with other codes and especially the competition law, (iv) Attitudes in Turkish and European Union regulations and basics of Turkish telecommunications regulation in the context of telecommunications law's future. In the second part, legal framework of access and interconnection arrangements is going to be examined.

**LAW 509 Term Project**
Term project is a non-credit program activity stipulated by the Regulation for Graduate Education of the Council of Higher Education for the post-graduate programs with no thesis. The students are required to be successful at the term project in order to obtain the Diploma. Within this activity, the students should accomplish a research project, internship and a similar assignment under the supervision of an academic instructor and submit their projects in the form of a written report or a research document to the related academic instructor. Subject of the project: It should be related to one of the first-term courses. The project supervisor can be any of the academic instructors lecturing at the program.

**LAW 510 Banking Regulation Law**
Banks have a major importance in the economics of a country. Fulfilling the functions of the banks, especially accepting small amounts of money for deposit and directing this source towards credits for the development of the country, is very crucial for economic welfare. Profitable functioning of banking services depends on the regulation of this sector by an independent regulatory agency. This

task lies within the responsibility of Banking Regulation and Supervision Agency (BRSA) in Turkey. BRSA is an independent regulatory agency, of recent date, given extensive supervision powers of banking services performs its duties within the terms of Banking Law. Legal grounds of the powers of BRSA, how these powers should be exerted and their legal consequences are going to be examined in this course.

**LAW 520 Capital Markets and Market Abuse**
The concept of market, price formation mechanisms, market abuses: insider trading and manipulation, sanctions for abuses: criminal and legal liabilities, market oriented approach, regulation approach in the European Union.

**LAW 530 Unfair Competition**
Regulation of unfair competition law in the European Union, Switzerland, Germany and Turkey; relation to the other right zone, especially to the competition law and law of the intellectual property; faithfully and belief; confusion, protection of know-how and against the abuse of fabrication secrets or business secrets; non-observance of work conditions; specials cases of the unfair competition through advertising, sponsorship; sanction in the right of the unfair competition and consumer right.

**LAW 540 Real Estate Market Law**
Rights the subject of which are real estate, the use of real estate as a finance instrument, real estate financing, lien and housing finance institutions and funds as providers of such, real estate investment companies and asset lease companies together with mortgage backed and guaranteed securities, lease and real estate certificates will be discussed in this course.

**LAW 544 The Legal Framework of Social Dialogue**
Social dialogue, the "making" of EU Labor Law .The need for EU initiatives on social issues: European social dialogue: core concepts and mechanisms; structural and functional legal analysis. Rights to share information, to be consulted, to decide jointly, to produce joint opinions. Tripartite and bipartite platforms for dialogue.

**LAW 550 Fundamentals of Legal Thought**
Natural law: basic readings on some of the great thinkers defending the natural law view; concepts of natural rights, de officiis, the importance of natural law. Positive law, basic readings on some of the great thinkers who defend positive law view; concepts of legality, social contract, utilitarianism, relation between economy and law, justice. Legal method (language): legal relations, normativism, legal system, argumentum, antinomies, Tû Tû, force of law.

**LAW 551 Current Issues on Immovable Property Law**
Concept, types and components of real rights; land registry and the effect of registrations; acquisition of immovable property; expropriation, condominium; The Act on Subsidizing The Development of Forest Villagers and The Interpretation of Areas Taken Out of Forest Territories In the Name of Treasury as well as Sale of Agricultural Estate Owned by the Treasury; The Act on Development (Zoning) and the Law on the Conversion of Disaster Relief Areas.

**LAW 552 Current Issues on Consumer Law**
Economic and social basis of consumer protection, constitutional bases and sources of consumer law, Consumer Protection Law, consumer protection in European Union, basic consumer rights, characteristics of consumer transactions in general, different types of consumer transactions, unfair terms, unfair commercial practices, arbitration committees for consumer problems and consumer courts.

**LAW 553 Current Issues on Law of Contracts**
Freedom of contract; establishment and validity of a contract; performance of obligations; restraints of performance; designation of compensation, innominate contracts; disputes related to law of contract.

**LAW 554 Current Issues on Law of Torts**
Concept and terminology; non-contractual liability in general; types of non-contractual liability; fault liability and liability without fault in tort law, elements of fault liability: damage, causation, unlawfulness, fault; types of liability without fault.

**LAW 555 Corporate Governance in Joint Stock Companies**
History, meaning, function and importance of corporate governance; policy; nature of rules; basic principles of corporate governance regarding protection of shareholders, equal treatment to shareholders, rights of stakeholders, responsibility of board members, independent directors, public disclosure and transparency; special corporate governance rules on capital markets law, banking law; the approach of Turkish Commercial Code and G20/OECD Corporate Governance Principles.

**LAW 556 Company Law and Competition Law Aspects of Mergers and Divisions**
Mergers and divisions, Turkish Commercial Code provisions for mergers and divisions ; shareholder rights in mergers and divisions, minority rights (especially in take over squeeze out transactions) and possible claims ; concentration and deconcentration in terms of competition law including horizontal and vertical mergers ; permission, commitments and divestiture in competition law ; decisions of European Court of Justice, Competition Board and Council of State.

**LAW 557 Law Applicable to Contractual Obligations**
Law applicable to international contracts has become one of the most significant subjects of international trade. Choice of law by the parties is encountered frequently both in state courts and in international arbitration. Objective determination which indicates determination of applicable law where there is no choice of law by the parties is also an important issue before state courts and in international arbitration. In this framework, party autonomy in contract law and objective determination of applicable law are to be analyzed from the perspectives of private international law codes of certain states and international conventions.

**LAW 558 Procedural Irregularities in International Commercial Arbitration**
In this course, the notion of procedural violation and classification of procedural irregularities in international commercial arbitration are to be analyzed. In this regard, mainly, «notification, objectivity and independency of arbitrators, procedural violations related to claim and defense, violation of the principle of party equality, drafting the arbitral award and the binding nature of the award » will be scrutinized. The gravity of a procedural violation and its effect on the enforcement of the arbitral award will be analyzed; control of the award by the state courts in terms of procedural irregularities will also be discussed.

**LAW 559 Liability of Organs and Members in Companies**
Company organs, organs of joint stock companies, organs of limited liability companies, general assembly, board of directors, directors, liability of board of directors, liability of directors, liability grounds, characteristics of liability, liability suits.

**LAW 560 Lis Pendens in International Civil Procedure**
Lis pendens or lis alibi pendens is today regarded as one of the important problems of international civil procedure. Where the same dispute is litigated simultaneously by the courts of more than one country, there is a risk of irreconcilable judgments and waste of judicial resources, time and effort. However there are no uniform rules or practices regarding international parallel proceedings adopted in international conventions or national legal systems. Therefore the course shall include discussions regarding the reasons of parallel proceedings, the main remedies provided for lis pendens in international

conventions and national laws as well as how Turkish law approaches to this problem.

**LAW 562 Legal and Administrative Aspects of Privatization**
The emergence of the concept of privatization and its theoretical basis. The formation of legal and administrative basis of privatization. The methods of privatization of property, management and finance. Privatization of public services, the model of Built-Operate-Transfer and other Public-Private Partnership models. Analysis of important decisions given by Constitutional Court and Council of State on privatization. Analysis of privatization methods in certain areas such as privatization of harbors and postal services.

**LAW 563 General Theory of Crime**
The course deals with the definition and study of the concept of crime, followed by an in depth analysis of the elements of crime. A comparative analysis of different views in Turkish law on the elements of crime and forms of crime will be made under the light of court decisions.

**LAW 564 Status of International Treaties in Domestic Legal Orders**
The aim of the course is to analyses the judicial regime of international treaties in terms of their formation under the Constitutions of 1924, 1961 and 1982, their hierarchical position in the Turkish legal system as ordinary laws and their exclusion from constitutional review. The scope of the course will also be put on the jurisprudential praxis and the scholarly discussions regarding the constitutional amendments of 2001 and 2004 and the specialties of the ECHR pursuant to Article 90/5 of the 1982 Constitution.

**LAW 565 Protection Mechanism of the ECHR (Historical process and Implementation)**
This course aims at a historical and functional analysis of the fundamental rights protection system within the Council of Europe through the ECHR. Regarding this aim the main principles of the ECHR protection system, the content of the Convention and the Protocols will be focused. The Protocols to which Turkey is party will be of special importance. The normative regulations will be discussed in the light of the jurisprudence of the ECHR, since it has been developed to a crucial source for the jurisprudence of the Turkish Constitutional Court after the introduction of constitutional complaint mechanism in 2012. The leading case law analysis of the ECHR will be the heart of the course.

**LAW 566 Legal Security and Protection of Legitimate Expectations in EU Administrative Law**
Sources and general principles of EU administrative law; EU case-law and judgments of the European Court of Justice interpreting EU administrative law and legislation; EU treaties, regulations, directives and decisions including general principles of EU administrative law; recognition of the principle legal certainty and protection of legitimate expectations as one of the general principles of EU administrative law; legal certainty and protection of legitimate expectations in Turkish administrative law.

**LAW 567 Parliamentary Law**
Concept of "parliament", its historical background, formation of the legislative body, unicameral and bicameral systems, electoral systems, size of parliaments, time period between elections, Turkish Parliament, its functions, legal status of the members (that is, representing the nation, parliamentary immunity, termination of membership).

**LAW 568 Contemporary Governmental Systems**
This course aims at an analysis of typologies of many governmental systems. The typological systems are amongst others the presidential, parliamentary system, semi-presidentialism, super-presidentialism, prime-minister presidentialism, presidential-parliamentary system which will be analyzed from the normative and factual perspectives.

**LAW 570 Principles of Social Security Law**
The objective of this course is to review from a global perspective the concept of social security, modern tendencies on the issue and the types of social insurances.

**LAW 590 Pre-Thesis Seminar**
A seminar for sophistication of the LL.M. student's required skills prior to writing the master's thesis through a series of meetings between the LL.M. student and the advisor.

**LAW 601 Civil Law (Real Securities)**
General concept of real securities; particularly legal characteristics and types of real securities; namely pledge of movable property and mortgage on immovable property, creation and termination of pledge and mortgage, realization of pledge and mortgage, effective use of them in banking law.

**LAW 605 Constitutional Judiciary**
Functions of constitutional review and its relation to democracy, status of constitutional courts in political systems, the problem of constitutional court as "political actor", the problem of judicial activism and judicial self-restraint, rigid constitutions, protection of legal and political system by the means of constitutional review.

**LAW 610 ICSID Arbitration**
Foreign direct investments, ICSID arbitration, additional facility rules, ICSID cases against Turkey, settlement of state-investor disputes, jurisdiction of ICSID, enforcement of ICSID arbitral awards, World Bank.

**LAW 612 Bound Enterprises Law (Company Groups Law)**
Provisions of Turkish Commercial Code for group of companies, dominant and affiliated companies, legal independence- economic dependence, main concepts such as dominance, types and tools of dominance, contracts between group companies, special protection for shareholders within the provisions of Turkish Commercial Code for group of companies, supervision and disclosure requirements, liabilities specially designed for group of companies.

**LAW 615 Doctrine of Innominate Contracts**
Freedom of contract and its limits, innominate contracts and mixed contracts; particularly the rules governing innominate contracts, filling the blanks in mixed and innominate contracts, multi-meaning provisions in contracts and especially in innominate contracts, type and the typological practice.

**LAW 618 Social Law**
This Ph.D. seminar gives an overview of the background and sources of collective labor law and social policy, a brief history of collective labor law, emergence of traditional labor institutions trade unions, collective agreements, labor disputes, strikes, together with increase and decrease in density of union membership, economics and human rights perspectives on labor laws and emergence of new labor instruments, among which are social dialogue, participation, flexibility, new forms of employment contracts, job security.

**LAW 624 International Procedure**
International Jurisdiction of state courts, ADR, Arbitration, Recognition and Enforcement of arbitral awards, Subject matter jurisdiction of domestic courts in international disputes, exorbitant jurisdiction of the courts, annulment of arbitral awards.

**LAW 632 Legal Acts (Transactions) Theory**
Formation, form and validity of legal acts, types of legal acts; particularly the contracts, rules governing contracts, formation and validity of contracts, legality and interpretation of the contracts

**LAW 634 Methodology of Law**
The course for young academics pursues three aims: To learn the research sources in general and specifically for

law; the categorization of the acquired material and its main principles; and lastly, to practice the methodology of law in terms of writing short research papers which will be discussed in class

**LAW 680 Current Issues on Private Law**
Materials and tools for legal studies, methods and principles on shaping ideas and writing papers, function of comparative law and methodological considerations, legal hermeneutic.

**LAW 682 Current Issues on Public Law**
Current issues and new developments in public law.
The specific content of the course is determined by the instructors.

**LAW 690 Pre-Thesis Seminar**
A seminar for sophistication of the Ph.D. student's required skills prior to writing the Ph.D. dissertation through a series of meetings between the Ph.D. student and the advisor.

## SAMPLE OF RECENT PUBLICATIONS

- T. Akillioglu, *Gozden Gecirilmis Avrupa Sosyal Sarti ve Turkiye*, Imaj Yayinevi, (2015)

- T. Akillioglu, *Hangi Hukuka Giris: Hukuk Ustdili Incelemesine Giris[2. basim in 2015]*, Imaj Yayinevi, (2014)

- T. Akillioglu, *Insan Haklari: Kavram, Kaynaklar ve Koruma Sistemleri[2. Basim]*, Imaj Yayınevi, (2010)

- T. Akillioglu, "Telekonumikasyon ve Insan Haklari", *Prof Dr. Yildirim Uluer'e Armagan*, pp. 137-143, Yakın Dogu Universitesi Yayinlari (2014)

- H.B. Schafer, H.C. Aksoy, "Alive and well: the good faith principle in Turkish contract law", *European Journal of Law and Economics* (Forthcoming)

- H.C. Aksoy, "Cevap ve Duzeltme Hakki Cercevesinde Haberin Gercege Aykiriligi", *Turkiye Barolar Birligi Dergisi,* 112, 55-72 (2014)

- H.C. Aksoy, *Impossibility in Modern Private Law*, Springer Verlag, (2014)

- H.B. Schafer, H.C. Aksoy, "Encyclopedia of Law and Economics", *Good Faith*, J.G. Backhaus (Eds.), pp. 1-8, New York: Springer (2015)

- H.C. Aksoy, "Impracticability", *Encyclopedia of Law and Economics*, J.G. Backhaus (Eds.), New York: Springer (2014)

- Z. Aytac, "Yonetim Kurulu Uyelerinin Hakimiyetinin Hukuka Aykiri Kullanilmasindan Dogan Sorumlulugu", *Banka ve Ticaret Hukuku Dergisi,* 29, 5-55 (2014)

- A. Bayata-Canyas, "Yabanci Unsurlu Bosanma Davalarinda Hukuk Secimi", *Gazi Universitesi Hukuk Dergisi*, 3, 3-24 (2015)

- A. Bayata-Canyas, "Yabancilar ve Uluslararasi Koruma Kapsamindaki Geri Gonderme Yasaginin Uygulanma Kosullarının AIHM Kararlari Cercevesinde Irdelenmesi", *Hacettepe Universitesi Hukuk Fakultesi Dergisi*, 5, 73-90 (2015)

- A. Bayata-Canyas, "Yabancilar ve Uluslararasi Koruma Kanunu Kapsamindaki Kabul Edilemez Basvuru ve Hizlandirilmis Degerlendirme Kararlarinin Kesinligi", *Turkiye Adalet Akademisi Dergisi*, 6, 133-167 (2015)

- A. Bayata-Canyas, "Hukuki Sartlar Olusmadan Verilmis olan Turk Vatandasligi Kazanma Kararinin Geri Alinmasinda Sure Sorunu", *Turkiye Barolar Birligi Dergisi,* 114, 347-360 (2014)

- A. Bayata-Canyas, *UNCITRAL Model Kanunu Temelinde Uluslararası Ticari Hakem Kararlarına Karşı Başvuru Yolu,* Ankara, Adalet Yayınevi, (2016)

- E.E. Dalkilic, "Kamu Avukatlarının Türk İdare Hukuku Açısından Dikkate Alınması Gereken Sorunları", *Turkiye Barolar Birligi Dergisi,* 124, 305-322 (2016)

- E.E. Dalkilic, "Turkiye'de Zihinsel veya Ruhsal Engellilerin "Zorla" Tedavisinin Elestirisi", *Turkiye Barolar Birligi Dergisi,* 117, 11-34 (2015)

- E.E. Dalkilic, "Elektronik Tebligatin Idari Islemler Bakimindan Degerlendirmesi", *Hacettepe Universitesi Hukuk Fakultesi Dergisi,* 4, 107-124 (2014)

- E.E. Dalkilic, *Avrupa ve Turk Idare Hukukunda Hukuki Guvenlik ve Mesru Beklentilerin Koruınmasi,* Turhan Kitabevi, (2016)

- E.E. Ozcan, *İdare Hukuku Acisindan Turkiye'de Elektrik Sektorunun Regulasyonu ve Avrupa Birligi, Rusya, Cin, ve Guney Amerika Uygulamalari,* Turhan Kitabevi, (2010).

- E. Goztepe, "Bir Klasik Eser Olarak Carl Schmitt'in Anayasa Ogretisi", *Istanbul Universitesi Hukuk Fakultesi Mecmuasi,* 1, 129-180 (2015)

- E. Goztepe, "Turkiye Avrupa Insan Haklari Sozlesmesi'ne Ek 4.Protokolle Bagli Midir? Anayasa Mahkemesi'ne Bireysel Basvuru Hakki Acisindan Bir Degerlendirme: Rona Aybay'a Armagan", *Legal Hukuk Dergisi* (Forthcoming)

- E. Goztepe, *Avrupa Birligi'nin Siyasal Butunlesmesi ve Egemenlik Yetkisinin Paylasilmasi, Seckin Yayinlari,* Ankara, (2008)

- E. Goztepe, "Die Einfuhrung der Verfassungbeschwerde in der Turkei. Eine Zwischenbilanz (2012-2014)", *Jahrbuch des offentlichen Rechts der Gegenwart,* pp. 485-542, Mohr Siebeck (2015)

- O. Gurzumar, "Alacagin Devri ve Tahkim Anlasmasi", *Marmara Universitesi Hukuk Fakultesi Hukuk Arastir. Dergisi* (Forthcoming)

- O. Gurzumar, *Zorunlu Unsur Doktrinine Dayali Sozlesme Yapma Yukumlulugu, Seckin Yayinevi, Ankara,* (2006)

- T. Katoglu, "Olasi Kasit ve Suca Tesebbus", *Ankara Universitesi Hukuk Fakultesi Dergisi.,* 611-626 (2015)

- T. Katoglu, "Turk Ceza Kanunu'nda Iskence Tanimi: Rona Aybay'a Armagan", *Legal Hukuk Dergisi,* 4, 1457-1482 (2014)

- T. Katoglu, *Ceza Kanunlarinin Zaman Yonunden Uygulanmasi,* Seckin Yayincilik, (2008)

- T. Katoglu, "Polis Vazife ve Salahiyet Kanunu ile Bazı Kanun ve Kanun Hukmunde Kararnamelerde Degisiklik Yapilmasina Dair Kanun Tasarisi", *Hukuki Gorus*, pp. 1-21, Turkiye Barolar Birligi (2015)

- C. Kochisarlioglu, O. Sogutlu, Erisgin, *Roma Ozel Hukuku Uygulamali Calismalari [2. baskı in 2016]*, Seckin Yayinevi, (2013)

- E. Kuntalp, "Faktoring Sözleşmesinin Tipolojisi Üzerine Bir Deneme", *Ist. Kultur. Univ. Hukuk Fakultesi Dergisi Prof.Dr.İlhan Ulusan'a Armağan,* Seckin Yayincilik (2016)

- C. Manavgat, "Ortulu Kazanc Aktariminin Ortakliklar Toplulugu Duzenlemelerindeki Sinirlari", *Banka ve Ticaret Hukuku Dergisi,* 1, 86-105 (2015)

- C. Manavgat, "Kayitli Sermaye Sistemindeki Halka Acik Anonim Ortakliklarda Payin Dogumu ve Satis Surecine Etkileri", *Banka ve Ticaret Hukuku Dergisi*, 3, 4-20 (2015)

- C. Manavgat, "Bagimsiz Yonetim Kurulu Uyelerinin Islevleri ve Sahip Olmalari Gereken Nitelikler", *Banka ve Ticaret Hukuku Dergisi*, 30, 33-75 (2014)

• C. Manavgat, "Anonim Ortakliklarda Bagimsiz Dentimin Kapsami", *Banka ve Ticaret Hukuku Dergisi*, 30, 39-61 (2014)

• C. Manavgat, *Hukuki Bakımdan Halka Açık Anonim Ortaklıklar ve Halka Arz,* Is Bankasi Yayinlari, (2016)

• I. Kırca, F. Sehirali Celik, C. Manavgat, *Anonim Sirketler Hukuku Cilt I,* Banka ve Ticaret Hukuku Arastirma Enst., (2013)

• C. Manavgat, *Sermaye Piyasasinda Isleme Dayali Manipulasyon ve Ozel Hukuk Bakimindan Sonuclari,* Banka ve Ticaret Hukuku Arastirma Enst., (2008)

• M.K. Mutluer, N.N. Dayanc, " 1982 T.C. Anayasası'nın Vergi Ödevi ile İlgili 73. Maddesinin Değerlendirilmesi", *Vergi Dunyasi*, 35, 10-29 (2016)

• K. Mutluer, "Anayasa'nın Mali ve Ekonomik Hükümleri", *Sayistay Dergisi,* 96, 137-145 (2015)

• K. Mutluer, E. Oner, A. Coskun, *Sayistay Hukuku*, Istanbul Bilgi Universitesi Yayinlari, (2015)

• K. Mutluer, N. Dayanc, *Vergi Hukuku Genel ve Ozel Hukumler*, Turhan Kitabevi, (2014)

• K. Mutluer, E. Oner, A. Kesik, *Teoride ve Uygulamada Kamu Maliyesi [3. Basim 2013, 4. Basim in 2016]*, Istanbul Universitesi Yayinlari, (2013)

• M.K. Mutluer, *Sermaye Sirketlerinin Denetimi*, Istanbul Bilgi Universitesi Yayinlari, (2013)

• E. Onar, "Tarihten bir yaprak: CHP Milletvekili Nihat Erim'in Avrupa İnsan Haklari Komisyonuna Bireysel Basvuru Hakkini ve Avrupa Insan Haklari Divaninin Yargi Yetkisini Tanimamiza Iliskin 4 Aralik 1961 Tarihli Kanun Teklifi", *Legal Hukuk Dergisi*., 1654-1703 (2015)

• P. Altinok Ormanci, "İsviçre Federal Mahkemesi'nin ATF 140 III 200 Kararı Işığında Şekle Aykırı Sözleşmede Yer Alan Ceza Koşulunun Geçerliliği", *Bahcesehir Universitesi Hukuk Fakultesi Dergisi*, 11, 121-142 (2016)

• P. Altinok Ormanci, H.C. Aksoy, "Effet de la bonne foi du conjoint survivant sur ses droits successoraus en cas d'annultaion du mariage", *Successio*, 2, 176-182 (2016)

• E. Kuntalp, P. Altinok Ormanci, "Kefalet Sozlesmesinin Sona Ermesi: Prof. Dr. Nevzat Toroslu'ya Armagan", *Ankara Universitesi Hukuk Fakultesi Dergisi,* 2, 729-752 (2015)

• P. Altinok-Ormanci, "Borclar Hukuku", *Isletme Hukuku*, K. Mutluer, T. Sans (Eds.), pp. 73-132, Turhan kitabevi (2014)

• A.B. Ozbilen, "Tüketim Ödüncü Sözleşmesinde Ödünç Alanın Ödeme Güçsüzlüğü ve Bu Güçsüzlüğün Yarattığı Hukuki Sonuçlar", *Turkiye Adalet Akademisi Dergisi*, 27, 125-154 (2016)

• A.B. Ozbilen, "Üst Hakkı İradı ve Bu İradın Ödenmesine İlişkin Alacağın Güvencesi Olarak Kanunî İpotek Hakkı", *Turkiye Barolar Birligi Dergisi,* 29, 263-310 (2016)

• A.B. Ozbilen, "İsteğe Bağlı Açık Artırma Yoluyla Yapılan Satışlarda Müzayede Evlerinin Türk Borçlar Kanunu Hükümleri Çerçevesinde Ayıptan ve Zapttan Doğan Sorumluluğu ve Bu Sorumluluğu Ortadan Kaldıran Anlaşmalar", *Marmara Universitesi Hukuk Fakultesi Hukuk Arastir. Dergisi*, 22, 271-330 (2016)

• B. Ozcelik, "Türk Borçlar Kanunu'na Göre Konaklama Yeri İşletenin Konaklayanın Eşyasının Yok Olması, Zarar Görmesi veya Çalınmasından Sorumluluğu", *Marmara Universitesi Hukuk Fakultesi Hukuk Arastir. Dergisi* (Forthcoming)

• B. Ozcelik, "Kamu İhale Sözleşmeleri Kanunu'na Göre Mücbir Sebepler ve Sonuçları", *Turkiye Barolar Birligi Dergisi,* 123, 303-324 (2016)

• B. Ozcelik, "6502 Sayılı Tüketicinin Korunması Hakkında Kanun'a Göre Taşınmazlarda Ayıptan Sorumluluk", *Ankara Universitesi Hukuk Fakultesi Dergisi,* 64, 1161-1188 (2015)

• B. Ozcelik, "5403 Sayili Toprak Koruma ve Arazi Kullanimi Kanunu'nda 6537 Sayili Kanun'la Yapilan Degisiklikler ve Degerlendirilmesi", *Gazi Universitesi Hukuk Dergisi,* 19, 53-76 (2015)

• B. Ozcelik, "Sozlesmeden Dogan Borclarin Ifasinda Hukuki Imkansizlik ve Sonuclari", *Ankara Universitesi Hukuk Fakultesi Dergisi*, 63, 569-621 (2014)

• S.B. Ozcelik, *Tapu Siciline Güvenin Korunması,* Yetkin Kitabevi Ankara, (2016)

• G. Ozcelik, "Kanunlar Ihtilafı Hukukunda Olumlu Vatandaslik Ihtilaflarinin Cozumu ve MOHUK m 4(1)(b) ve (c) Hukumlerinin Degerlendirilmesi", *Gazi Universitesi Hukuk Dergisi,* 19, 111-150 (2015)

• G. Bayraktaroglu Ozcelik, "Bruksel I Tuzugu Hukumleri Uyarinca Tuketicinin Korunmasi - Prof. Dr. Rona Ayabay'a Armagan", *Legal Hukuk Dergisi*, 1, 527-558 (2014)

• G. Bayraktaroglu-Ozcelik, "Yabanci Unsurlu Tuketici Sozlesmelerinden Dogan Uyusmazliklarda Turk Mahkemelerinin Milletlerarasi Yetkisinin Tayini", *Ankara Universitesi Hukuk Fakultesi Dergisi*, 63, 833-878 (2014)

• G. Ozcelik, *Milletlerarası Usul Hukukunda Paralel Davalar*, Yetkin Kitabevi Ankara, (2016)

• G. Bayrakyaroglu-Ozcelik, "Turk İscilerinin AB Uyesi Ulkelerde Serbest Dolasimlarina Iliskin C 187/10 sayili Baris Unal Karari", *Prof. Dr. Ramazan Aslan'a Armagan*, pp. 341-348, Yetkin Yayincilik (2015)

• H. Pinar, "Tasarım ve Haksız Rekabet Hukuku Acisindan Yedek Parcalarin Korunmasi ve Turkiye'nin Ekonomi Politik Tercih Sorunu", *Malatya Inonu Universitesi Hukuk Fakultesi Dergisi,* 2, 739-774 (2015)

• H. Pinar, "Rekabet hukuku ile haksiz rekabet hukuku iliskisi", *Rekabet Dergisi,* 15, 59-87 (2014)

• H. Pinar, "Kooperatif Yoneticilerinin Gorevden Alinmasi ve Denetim", *Gazi Universitesi Hukuk Dergisi*, 18, 139-174 (2014)

• S. Selcuk, "Eski Caglarda Suc Hukuku", *Ankara Universitesi Hukuk Fakultesi Dergisi,* 2, 1013-1058 (2015)

• S. Selcuk, *Kendini Tuketen Hukukun Dramı - Bir Dogululasma Seruveni,* Imge Kitabevi, (2015)

• S. Selcuk, *Dreyfus Davasi, Dunyaca Unutulmayan Yargilama Yanilgisi*, Imge Yayinevi, (2014)

• S. Selcuk, *Turkiye Cumhuriyeti Basbakanina Bes Mektup,* Imge Yayinevi, (2014)

• S. Selcuk, *Hukuki Tanida Yanilgi: "Onanan Balyoz Kararlari",* Imge Yayinevi, (2013)

• S. Selcuk, "Suc, Sucun Oznitelikleri ve Tanim", *Prof. Dr. Feridun Yenisey Armagani,* pp. 85-106, Beta Kitabevi (2014)

• A.L. Sirmen, *Esya Hukuku [2. Basim in 2014 and 3. Basim in 2015 and 4. Basim in 2016]*, Yetkin Yayincilik, (2013)

• T. Tan, "Yasama Faaliyetinden Devletin Sorumlulugu", *Ankara Universitesi Hukuk Fakultesi Dergisi,* 459, 1059-1069 (2015)

• T. Tan, *Idare Hukuku cilt III 4. basim[5. basim in 2016]*, Turhan Kitabevi, (2015)

• T. Tan, *Ekonomik Kamu Hukuku Dersleri[guncellestirilmis 2. baski in 2015],* Turhan Kitabevi, (2010).

• A.S. Gozubuyuk, T. Tan, *Idare Hukuku, cilt I, Genel Esaslar (6. Basim)*, Turhan Kitabevi, (2008)

• A.S. Gozubuyuk, T. Tan, *Idare Hukuku, cilt II, Idari Yargilama Hukuku 3. Basim, Turhan* Kitabevi, (2008)

• S. Gozubuyuk, T. Tan, *Idare Hukuku, cilt I, Genel Esaslar 4. Basim, 9. Basim 2013, 10. Basim 2014, 11. Basim in 2016,* Turhan Kitabevi, (2006)

• S. Gozubuyuk, T. Tan, *Idare Hukuku, cilt II, Idari Yargilama Hukuku 2. Basim, 6. Basim 2013, 7. Basim 2014, 8.Basim in 2016*, Turhan Kitabevi, (2006)

• T. Tan, "Anayasa Mahkemesi'nin Yerel Idarelere Bakisi", *Prof. Dr. Tayfur Ozsen Anisina 70. yas Armagani,* pp. 378-382, Memleket Yayinlari (2014)

• T. Tan, "Sozlesme Ozgurlugune Kamunun Mudahalesi", *Prof. Dr. Yildirim Uler'e Armagan*, pp. 513-524, Yakın Dogu Universitesi Yayinlari (2014)

• B. Tiryakioglu, M. Aygun, E. Kucuk, *Turk Uluslararasi Ozel Hukuk Mevzuatı [9. Basim in 2016],* Yetkin Yayincilik, (2015)

• B. Tiryakioglu, A. Bayata Canyas, "Challenges to Arbitral Awards", *Arbitration in Turkey,* A. Yesilirmak, I.G. Esin (Eds.), pp. 183-211, The Netherlands: Kluwer Law International (2015)

• H. Toroslu, "Bilinçli Taksir Üzerine Bir Değerlendirme", *Turkiye Barolar Birligi Dergisi,* 126, 95-122 (2016)

• H. Toroslu, "Kamu Barisina Karsi Suclar Bakimindan Tahrik Kavrami: Prof. Dr. Nevzat Toroslu'ya Armagan", *Ankara Universitesi Hukuk Fakultesi Dergisi,* 2, 1201-1233 (2015)

• H. Toroslu, *Ceza Hukukunda Isnat Yetenegi*, Savas Yayinevi, (2015)

• N. Toroslu, *Ceza Hukuku Genel Kisim 11. Basim[12. basim in 2008, 13-14. basim in 2009, 16. basim in 2011, 17. 18. basim in 2012, 19. basim in 2013, 20. basim in 2014, 21. basim in 2015, 22. ve 23. basim in 2016]*, Savas Yayinevi, (2008)

• N. Toroslu, *Ceza Hukuku Ozel Kisim 3. Basim[4. basim in 2009, 6. basim in 2012, 7. basim in 2013, 8. basim in 2015]*, Savas Yayinevi, (2008)

• N. Toroslu, M. Feyzioglu, *Ceza Muhakemesi Hukuku[7. basim in 2009, 8. baski in 2011, 10. basim in 2012, 11-12. basim 2013, 13.basim in 2014, 14. basim in 2015, 15. ve 16. Basim in 2016]*, Savas Yayinevi, (2008)

• A.E. Gurbuz-Usluel, *Anonim Sirketlerde Pay Sahibinin Kar Payı Alma Hakkı*, Is Bankasi Yayinlari, (2016)

• A.E. Gurbuz-Usluel, "Societas Unius Personae (SUP): Yeni Tek Kisilik Sirket Taslak Yonergesi ve Turk Sirketler Hukukuna Etkileri", *Banka ve Ticaret Hukuku Dergisi*, 31, 75-108 (2015)

• A.E. Gurbuz-Usluel, "Considerations on the Economic Effect of the New Commercial Code Provisions Regarding Single Member Companies", *European Journal of Law and Economics,* 40 (2015)

• A.E. Gurbuz-Usluel, *Turk Ozel Hukukunda ve Ozellikle Anonim Sirketlerde Ticari Sirrin Korunmasi,* Vedat Kitapcilik, (2009)

• A.E. Gurbuz-Usluel, "Ticari Isletme Hukuku - Sirketler Hukuku", *Isletme Hukuku*, K. Mutluer, T. Sans-Ucaryilmaz (Eds.), pp. 135-218, Ankara: Turhan Kitabevi (2014)



Contact:
Dr. Barış Özçelik
(Program Coordinator)
Phone : +90 312 290 3304
Fax : +90 312 266 4001
bozcelik@bilkent.edu.tr
law.bilkent.edu.tr

## Faculty Profile: Dr. Turgut Tan, Professor, Faculty of Law

Turgut Tan, dean of the Faculty of Law, received a Ph.D. from the University of Ankara. He also obtained a Diplome d'Etudes Superieur Européennes from Centre Européen Universitaire de Nancy (France). He was a professor of administrative law in Ankara University's Faculty of Political Sciences prior to joining Bilkent University in 2002 as the founding dean of the Faculty of Law.

Prof. Tan has held visiting positions in Paris, Dijon, Pau (France), Sapienza (Rome, Italy) and Cambridge (U.K.) universities. His areas of research include various aspects of administrative law and public economic law. He has served as a director or participant in research projects such as the Reorganization of Financial and Economic Institutions (a project supported by State Planning Organization) and the Legal Aspects of B.O.T. Contracts (a project supported by the Turkish Industrialists' and Businessmen's Association).

Among his publications are the books *Legal Aspects of Economic Planning* (1976), *Legal Framework of Turkish Economic Policy* (with Ö. Uluatam, 1982), *Public Economic Law* (2nd ed. 2015), *Administrative Law* (2 volumes, with Ş.Gözübüyük, 11th ed. 2016), and *Administrative Law* (5th ed. 2016). His articles have appeared in various Turkish and international journals and reviews of constitutional and administrative law.

Prof. Tan has also served as a member of the Constituent Assembly (1981-1983), dean of Hacettepe University's Faculty of Administrative and Economic Sciences (1986-1991), president of the Permanent Experts Committee for Legislative Harmonization between the European Union and Turkey (1993-1995), counselor to the Minister of State in charge of public servants and human rights (1997-1999), and counselor to the Presidency of the Competition Authority (1999-2002).

## Faculty Profile: Dr. Aslı Gürbüz Usluel, Assistant Professor, Faculty of Law

Aslı Gürbüz Usluel graduated from the Ankara University Faculty of Law in 2000 and obtained her LL.M. degree in international business and trade law at Erasmus University (Rotterdam) in 2002. Before being appointed a research assistant at Bilkent University, she practiced law and also taught business law courses at other universities (2002-2003). She subsequently received a Ph.D. in commercial law from the Ankara University Faculty of Law; her doctoral thesis, *Türk Özel Hukukunda ve Özellikle Anonim Şirketlerde Ticari Sırrın Korunması*, was published in 2009.

Dr. Gürbüz Usluel has pursued her research at Albert-Ludwigs-Universitaet in Freiburg, Germany (2006), and the Swiss Institute of Comparative Law in Lausanne (2008, 2015). In September 2009 she was appointed assistant professor of commercial law in the Bilkent University Faculty of Law, where she subsequently served as assistant dean (May 2012-January 2015).

Her research and teaching interests focus on commercial enterprises, mergers and acquisitions, groups of companies, corporations, and international business law. Dr. Usluel's latest book, *Anonim Şirketlerde Pay Sahibinin Kâr Payı Alma Hakkı*, was published in 2016. She has also published articles in journals such as the *European Journal of Law and Economics*, *Batider and İstanbul Üniversitesi Hukuk Fakültesi Mecmuası* and presented papers on corporate law at national and international conferences.

# ECONOMICS

Bilkent University's graduate programs in economics not only prepare students to conduct independent research, but also furnish them with specialized knowledge to meet the needs of today's business world. For this purpose, the programs are designed to ensure that students acquire a solid background in economic theory and a thorough knowledge of the techniques used in empirical research. The Department of Economics offers M.A. and Ph.D. degrees geared toward academic careers, as well as a dual master's program with Tilburg University in the Netherlands, which provides application-oriented specialization in fields of high demand. The core requirements common to all programs leave little room for choosing the courses to be taken during the first year, but students are offered considerable flexibility in their choice of fields of specialization later on.

The underlying educational philosophy of the programs is that independent research activities improve students' problem solving skills and are useful learning tools that are at least as important as the course work students are expected to complete. In keeping with this philosophy, the department places considerable emphasis on high-quality student research and offers master's degrees only through the thesis option. Both the master's thesis and the doctoral dissertation must be the result of original research on an empirical or theoretical issue of the candidate's choice and must satisfy the high academic standards of the department.

## FACULTY

**PELİN AKYOL**, Assistant Professor, Ph. D., Economics, Pennsylvania State University, 2014. *Applied microeconomics, industrial organization, educational economics.*

**HAKAN BERUMENT**, Professor, Ph.D., Economics, University of North Carolina, 1994. *Macroeconomics, monetary economics.*

**NUH AYGÜN DALKIRAN**, Assistant Professor, Ph.D., Managerial Economics and Strategy, Kellogg School of Management, Northwestern University, 2012. *Game theory, economics of information, repeated games and reputations, political economy, decision theory.*

**REFET GÜRKAYNAK**, Professor and Department Chair. Ph.D., Economics, Princeton University, 2004. *Monetary economics, financial economics, international economics.*

**KEVIN HASKER**, Assistant Professor, Ph.D., Economics, Northwestern University, 1998. *Microeconomics, game theory, auction markets.*

**MİNE KARA**, Instructor, Ph.D., Economics, Hacettepe University, 2002. *Methodology in economics, history of economic thought, economic development.*

**TARIK KARA**, Assistant Professor, Ph.D., Economics, Rochester University, 1996. *Game theory.*

**EMİN KARAGÖZOĞLU**, Associate Professor. Ph.D., Economics, Maastricht University, 2010. *Game theory, experimental and behavioral economics, microeconomic theory, organizational economics, public economics and (positive) political economy.*

**BURÇİN KISACIKOĞLU**, Assistant Professor Ph.D., Johns Hopkins University, 2016. *Macroeconomics, financial economics, monetary economics.*

**SEMİH KORAY**, Visiting Professor, Ph.D., Mathematics, Boğaziçi University, 1980. *Mathematical economics.*

**SANG SEOK LEE**, Assistant Professor, Ph. D., Economics, University of Oxford, 2014. *Dynamic stochastic general equilibrium macroeconomics, learning in macroeconomics, applied time series econometrics.*

**SYED F. MAHMUD**, Visiting Associate Professor, Ph.D., Economics, McMaster University, 1986. *Econometrics, macroeconomics.*

**BİLİN NEYAPTI**, Associate Professor. Ph.D., Economics, Northwestern University, 1999. *Public economics, industrial organization.*

**ÇAĞLA ÖKTEN**, Associate Professor. Ph.D., Economics, Northwestern University, 1999. *Public economics, industrial organization.*

**BANU DEMİR PAKEL**, Assistant Professor, Ph.D., Economics, University of Oxford, 2012. *International trade, multinational firms, industrial organization.*

**CAVİT PAKEL**, Assistant Professor, Ph.D., Economics, University of Oxford, 2012. *Panel data econometrics, financial econometrics, econometric theory.*

**AYŞE ÖZGÜR PEHLİVAN**, Assistant Professor, Ph.D., Economics, Pennsylvania State University, 2011. *International trade, empirical industrial organization and applied microeconometrics.*

**ÇAĞRI SAĞLAM**, Associate Professor, Ph.D. Economics, Université Catholique de Louvain, 2003. *Macroeconomics.*

**FATMA TAŞKIN**, Associate Professor, Ph.D., Economics, Boston College, 1988. *International economics, macroeconomics.*

**SÜBİDEY TOGAN**, Professor, Ph.D., Economics, Johns Hopkins University, 1972. *International economics.*

**MİRZA TROKİC**, Assistant Professor, Ph.D., Economics, McGill University, 2013. *Econometric theory, time series analysis, bootstrap techniques, statistics.*

**ERİNÇ YELDAN**, Professor and Acting Dean. Ph.D., Economics, University of Minnesota, 1988. *International economics, general equilibrium theory.*

**KEMAL YILDIZ**, Assistant Professor, Ph.D., Economics, New York University, 2013. *Microeconomic theory, mechanism design, choice theory, matching theory.*

**TANER YİĞİT**, Associate Professor, Ph.D., Economics, University of North Carolina, 1999. *Macroeconomics, monetary economics, time series econometrics.*

## MASTER OF ARTS IN ECONOMICS

**Admission:** Applicants to the program must have a B.A. degree in economics or a B.A. or B.S. in a related field. They are expected to have a strong background in calculus and multivariate analysis, and must have taken courses in linear algebra, probability, and statistics. Applicants should take the ALES (*Akademik Personel ve Lisansüstü Eğitimi Giriş Sınavı*/ Academic Personnel and Postgraduate Education Entrance Examination) and must satisfy the announced minimum requirements. Applicants who are not Turkish citizens and Turkish citizen applicants who are residents of a foreign country may take the GRE (Graduate Record Examination) instead of the ALES. All nonnative speakers of English are required to submit proof of proficiency in English.

**Degree Requirements:** The standard duration of study for an M.A. in economics is two academic years (including summers). The core curriculum for the M.A. degree requires completion of 10 courses and 36 credits, and the preparation and successful defense of a master's thesis based on original research.

## DOCTOR OF PHILOSOPHY IN ECONOMICS

The Ph.D. program requires the attainment of theoretical and technical competence conforming to international standards in the field of economics.

**Admission:** Prospective students may apply either immediately after obtaining an undergraduate degree, or following the completion of an M.A. degree in economics or an M.A. or M.S. in a related field. Applicants should take the ALES (*Akademik Personel ve Lisansütü Eğitimi Giriş Sınavı*/ Academic Personnel and Postgraduate Education Entrance Examination) and must satisfy the announced minimum requirements. Applicants who are not Turkish citizens and Turkish citizen applicants who are residents of a foreign country may take the GRE (Graduate Record Examination) instead of the ALES. All nonnative speakers of English are required to submit proof of proficiency in English.

**Degree Requirements:** At least 24 credit hours of course work must be completed beyond that for the M.A. degree, and 60 hours beyond the bachelor's degree. The Ph.D. student is expected to pass qualifying examinations, and to prepare and successfully defend a dissertation. The dissertation must be an original piece of work written by the candidate to address an empirical or theoretical issue and must satisfy the high academic standards of the department.

## MASTER OF ARTS IN ENERGY ECONOMICS, POLICY AND SECURITY (Non-Thesis)

The main objective of the program is to introduce and build the necessary academic infrastructure regarding issues of energy policy and security that strategically affect Turkey's economy and foreign policy. The program emphasizes both basic conceptual and applied policy-related aspects of global energy markets and identifies the key agents, institutions, and powers involved in processes of sustainable and affordable energy and resource management, as well as examining Turkey's strategic policy choices for satisfaction of its growing energy needs in a potentially conflict-ridden global economy.

The program addresses the following issues:

- Documentation of Turkey's energy needs and priorities in the short and the long run;
- Assessment and investigation of regional/global developments in energy markets with a special focus on the strategic powers and key players;
- Analytical assessment of Turkey's strategic policy choices and the key constraints on and opportunities for energy security.

**Admission:** An undergraduate degree is a prerequisite for admission.

**Degree Requirements:** Students accepted into the program must complete at least 90 credit hours of course work. There is one scientific preparation course, Energy Geopolitics and Policy, and a total of six required EEPS courses: Economic Analysis of Energy Issues, Energy Policy Analysis, Empirical Methods in Energy Economics, Policy Skills and Strategic Analysis, Energy Security and Foreign Policy, and Guided Academic Writing. In additional, four elective courses may be selected from among the graduate courses offered each semester (at least two must be from the list of restricted elective courses).

## COURSE DESCRIPTIONS

**ECON 500 Mathematical Review Course**
Mathematics Review Course, Econ 500 (Math camp) is designed to maintain and develop familiarity with the mathematical tools used in the Master's and Ph.D. Program in the department of Economics. This course is designed to help students master an important set of mathematical skills necessary to study economics. It will cover basic concepts from calculus, linear algebra, optimization, and mathematical analysis, which will be used in the first year courses.

**ECON 501 Economics I**
**ECON 502 Economics II**
A sequence designed for M.B.A. students of the Faculty of Business Administration. The fundamentals of micro- and macroeconomics are covered in these courses. The theory of firm, demand theory, and market structures are among the micro topics. Macro subjects include national income concepts, theory of income determination, money and banking, monetary policy, and international trade.

**ECON 503 Microeconomic Theory I**
Theory of production. Theory of consumption. General equilibrium. Fundamental welfare theorems, externalities, public goods, and second best analyses.

**ECON 504 Microeconomic Theory II**
Theory of general competitive equilibrium. Topics include existence of equilibrium, computational techniques, core of the economy, stability, uniqueness of equilibrium, and empirical general equilibrium models.

**ECON 505 Macroeconomic Theory**
A wide-ranging survey of modern macroeconomic theory with an emphasis on the necessary mathematical tools and the dynamic methods. Focuses on competitive equilibrium, optimality, dynamics of equilibria, economic fluctuations, long-run growth, technological progress, life-cycle aspects and economic policies.

**ECON 506 Macroeconomic Theory II**
Stochastic models of economic fluctuations. Rational expectations. The effectiveness of monetary and fiscal instruments. Uses of general equilibrium econometric models for forecasting and policy simulations. Multi-country models and the international transmission mechanism.

**ECON 509 Probability and Statistics I**
Introduction to probability. Random variables and its distribution. Expectation, moments and moment generating functions. Conditional probability and expectations. Transformations of random variables, and order statistics. Stochastic convergence and central limit theorem. Sampling distribution. Point estimation, method of moments and maximum likelihood. Large and small sample properties. Sufficiency. Interval estimation. Testing of hypotheses - MP, UMP, UMPU, GLR, LM and Wald tests.

**ECON 510 Probability and Statistics II**
Ordinary Least Squares: basic assumption, estimation and tests of hypotheses, the coefficient of determination, prediction, functional forms, the problem of choosing between them and specification tests, multicollinearity. Dummy Variables, testing structural change, estimating the prediction error variance and pooling cross-sectional and time-series data. Lagged dependent variables, binary dependent variables. Autocorrelation and heteroscedasticity. Simultaneous equations; identification and single-equation estimation techniques.

**ECON 511 Econometrics I**
Theory and applications of time series models. Topics include ARMA and VARMA models, Trend-Cycle decomposition, Unit roots, Cointegration, Structural change, GARCH, Regime switching and threshold models, State space form and Kalman filters, and specialized topics such as Fractional Integration and I(2) models,

**ECON 512 Econometrics II**
Theory and application of existing micro-econometric techniques, econometrics of panel data, and Monte Carlo simulation. Topics include Discrete regression models, Censored and Truncated regression, Models with self-selectivity, Disequilibrium models, Count Data, Duration models, Static panel data analysis, Dynamic panel data analysis, Non-stationary panel methods: Panel unit roots and cointegration, Panel VAR, Monte Carlo and bootstrap.

**ECON 513 Game Theory I**
Noncooperative game theory. Various equilibrium concepts, games with incomplete information, equilibrium refinements, applications of game theory.

**ECON 514 Game Theory II**
Cooperative game theory. Axiomatic bargaining, cooperative games, public decision mechanisms, social choice theory.

**ECON 515 Mathematics for Economists I**
Use of various mathematical structures in economic theory. Order structures, metric structures, linear algebraic structures, etc. Calculus for economists. Unconstrained optimization. Constrained optimization, Lagrangean and Kuhn-Tucker multipliers, linear programming. Difference and differential equations. Correspondences. Fixed point theorems.

**ECON 516 Mathematics for Economists II**
The contraction mapping theorem. Theorem of the maximum. Dynamic programming under certainty. Measure theory and integration. Stochastic dynamic programming. Modes of convergence and laws of large numbers.

**ECON 517 Mathematical Economics I**
Mathematical theory of general economic equilibrium.

**ECON 518 Mathematical Economics II**
Dynamic aspects of equilibrium models. Game theory and the theory of industrial organization.

**ECON 521 International Economics I**
Theory of international trade and applications in commercial policy.

**ECON 522 International Economics II**
Adjustment in international economic relations with attention to foreign exchange markets, balance of payments, and the international monetary system.

**ECON 523 Firms in International Trade**
The aim of this course is to provide a comprehensive overview of the theory of international trade at an advanced level. In doing so, it will focus on firms and examine the role they play in international trade. The course will cover various topics that include firm heterogeneity, quality differentiation, multi-product firms, oligopoly and trade, foreign direct investment, trade in intermediates, and globalization-induced organization of firms. It will present various models, empirical findings that motivate them, and it will discuss the predictions of the models for trade policy.

**ECON 531 Economic History I**
**ECON 532 Economic History II**
A survey of world economic history designed to introduce students to the subject matter and methodology of research in the area.

**ECON 535 Methodology and History of Economics I**
**ECON 536 Methodology and History of Economics II**
A brief discussion of the history of science to be followed by methodological issues in economics. A chronological survey of various past contributions to economic theory, starting with a broad overview of the pre-Classical period. Special emphasis is placed on the Classical school with a detailed survey of individual contributions from Adam Smith to John S. Mill. The coverage extends to a critical review of Marxian economics, the rise of Neo-Classical economics and the Keynesian challenge to Neo-Classical economics.

**ECON 551 Contemporary Topics in Economics I**
**ECON 552 Contemporary Topics in Economics II**
General discussion of various non-technical topics of interest to faculty members that is likely to help broaden the horizons of graduate students beyond their chosen fields of study.

**ECON 561 Topics in Microeconomic Theory I**
**ECON 562 Topics in Microeconomic Theory II**
The subject matter of this course will vary from year to year according to the interests of the instructor. Prerequisite: ECON 504 and the consent of the instructor.

**ECON 563 Topics in Macroeconomic Theory I**
**ECON 564 Topics in Macroeconomic Theory II**
The subject matter of this course will vary from year to year according to the interests of the instructor.

**ECON 565 Contemporary Issues in Fiscal Economics I**
**ECON 566 Contemporary Issues in Fiscal Economics II**
Macroeconomics of populism, time consistency, commitment and reputation, fiscal policy as a strategic tool in political competition, the impact of budgetary institutions and procedures, the role of political institutions, incomplete or delayed stabilization.

**ECON 571 Fiscal Economics I**
First and second best fiscal theory (income distribution, public goods, externalities, deadweight burden, Ramsey Problem). Incidence models. Economic response to taxation.

**ECON 572 Fiscal Economics II**
Quantitative analysis of economic effects of fiscal instruments and fiscal changes such as negative income tax, corporate income tax, integration, general fiscal incidence, expenditure taxation.

**ECON 591 Pro-Thesis Seminar I**
**ECON 592 Pro-Thesis Seminar II**
This is a course where students will attend a series of lectures presented by faculty members and/or invited academics and submit written reports on the papers presented.

**ECON 595 Research Paper I**

**ECON 596 Research Paper II**

**ECON 599 Master's Thesis.**

**ECON 691 Ph.D. Pro-Thesis Seminar I**
**ECON 692 Ph.D. Pro-Thesis Seminar II**
This is a course where students will attend a series of lectures presented by faculty members and/or invited academics and submit written reports on the papers presented. The students working on their dissertation are expected to present the outcome of their research and submit a research paper of publishable quality.

**ECON 695 Research Methods in Economics I**
**ECON 696 Research Methods in Economics II**
This is a course where students will complete a research project with the full-time guidance and tutoring of a group of faculty members. The students will learn alternative research methods used in economics and apply them to a research question, with the goal of completing an academic paper at the end of the course sequence.

**ECON 699 Ph.D. Dissertation**
Independent work leading to the selection and elaboration of a dissertation topic. Participation in departmental seminars and presentation of results from the student's own research.

**EEPS 501 Economic Analysis of Energy Issues**
This course will equip you with the necessary tools to do economic analysis relevant for energy related issues. The aim is to make you comfortable with the basic analytical tools of economics and also to illustrate their use in better understanding the economy we are living in.

**EEPS 502 Empirical Methods in Energy Economics**
The course provides an introduction to quantitative methods used to analyze problems in energy and environmental economics. This course will focus on econometric modeling and methods and their application to analyze energy and environmental issues. By doing so, the course will reinforce concepts, rationales, and instruments for policy intervention in energy markets. Students will develop expertise in working with data and in applying numerical simulation models as well as econometric techniques using computer software.

**EEPS 503 Energy Policy Analysis**
This course aims to introduce key themes related to energy policy analysis. Students will be provided with the essential conceptual and analytical tools required to the study of identification and satisfaction of energy needs and priorities by reference to a multiplicity of perspectives, including national, regional and global dynamics, challenges and processes and the interplay among them. In particular: how are energy policies formulated, designed and implemented at a regional and global scale, issues of energy governance and societal risks. By the end of the course, students are expected: i. to acquire a basic understanding of political and social factors that contribute to energy policy-making; ii. to advance ability for using theories and concepts in energy policy analysis; iii. to develop critical thinking and comparative skills in energy politics and energy policy analysis.

**EEPS 504 Policy Skills and Strategic Analysis**
This course will equip students with the necessary tools to understand the multifaceted nature of the energy sectors and its applications in contemporary society. The purpose of the course is twofold: First, it will enable students to develop the analytical tools necessary for following recent trends in the global energy markets. Second, it will help them develop the necessary knowledge and skills to conduct strategic analysis in energy related issues. Each week we will have an expert who will give a guest lecture on different aspects of the course material and discuss how policymakers could best react to contemporary challenges in the field of energy.

**EEPS 505 Energy Geopolitics and Policy (Scientific Preparation Course)**
This course is focused on contemporary trends, issues and actors involved in the making of policies towards affordable and sustainable management of energy needs and resources.

**EEPS 506 Energy Security and Foreign Policy**
This course examines the challenge for energy security in relation to foreign policy analysis. The course has three parts. The first part outlines the continuities and changes in the global energy market to underline the emerging challenges in securing energy supplies, access to resources and the environment. The second part presents different theoretical approaches to facilitate a conceptual framework in analyzing how energy security relates to foreign policy. The third part focuses on selected issues and cases to analyze and discuss energy security and foreign policy in the light of the different conceptual frameworks presented in the second part of the course.

**EEPS 508 Guided Academic Writing**
This course aims to help students in EEPS to develop effective ways to communicate within their professional and academic fields. Through hands-on writing exercises and workshops, and through close reading of texts reflecting conventions and discourse patterns of different fields, students will improve their ability to attend to such important writing skills as clarity, concision, style, structure, and genre awareness.

## SAMPLE OF RECENT PUBLICATIONS


• P. Akyol, K. Krishna, "Preferences, selection, and value added: A structural approach", *European Economic Review*, 91, 89-117 (2017)

• V. Ulke, H. Berument, "Asymmetric effects of monetary policy shocks on economic performance: empirical evidence from Turkey", *Applied Economics Letters*, 23, 353-360 (2016)

• S. Varlik, H. Berument, "Credit channel and capital flows: a macroprudential policy tool? Evidence from Turkey", *BE Journal of Macroeconomics*, 16, 145-170 (2016)

• H. Berument, N.N. Dincer, P. Yasar, "Persistency of Turkish export shocks: a quantile autoregression (QAR) approach", *Empirica: J of European Economics*, 43, 445-460 (2016)

• B. Dogan, A. Sahin, H. Berument, "Rethinking interest rate volatility as a macroprudential policy tool", *Middle East Development Journal*, 8, 109-126 (2016)

• V. Ulke, H. Berument, "Effectiveness of monetary policy under different levels of capital flows for an emerging economy: Turkey", *Applied Economics Letters*, 22, 441-445 (2015)

• N. Ceylan, B. Dogan, H. Berument, "Three-factor asset pricing model and portfolio holdings of foreign investors: evidence from an emerging market - Borsa Istanbul", *Economic Research*, 28, 467-486 (2015)

• H. Berument, Z.S. Denaux, Y. Yalcin, "Assessing the Effects of a Policy Rate Shock on Market Interest Rates: Interest Rate Pass-Through with a FAVAR Model - The Case of Turkey for the Inflation-Targeting Period", *J of Money, Investment and Banking*, 9, 21 (2015)

• H. Berument, Z. Denaux, F. Emirmahmutoglu, "The effects of capital inflows on Turkish macroeconomic performance", *Empirica: J of European Economics*, 42, 813-824 (2015)

• H. Berument, R. Froyen, "Monetary Policy and Interest Rates under Inflation Targeting in Australia and New Zealand", *New Zealand Economic Papers*, 49, 171-188 (2015)

• H. Berument, H.Z. Denaux, Y. Yalcin, "The inconsistent Response of Turkish Export Demand to Real Exchange Rate Shocks", *Global Journal of Business Research*, 30, 49-56 (2015)

• A. Sahin, A. Tansel, H. Berument, "Output-Employment Relationship Across Sectors: A Long-Versus Short-Run Perspective", *Bulletin of Economic Research*, 67, 265-288 (2015)

• A. Dogan, B. Dogan, H. Berument, "Effectiveness of the reserve option mechanism as a macroeconomic prudential tool: evidence from Turkey", *Applied Economics*, 47, 6075-6087 (2015)

• H. Berument, N.B. Ceylan, B. Dogan, "An interest-rate-spread-based measure of turkish monetary policy", *Applied Economics*, 46, 1804-1813 (2014)

• H. Berument, N. Dincer, Z. Mustafaoglu, "External Income Shocks and turkish Exports: A Sectoral Analysis", *Economic Modelling*, 37, 476-484 (2014)

• H. Berument, A. Sahin, S. Sahin, "The relative effects of crude oil price and exchange rate on petroleum product prices: Evidence from a set of Northern Meditteranean countries", *Economic Modelling*, 42, 243-249 (2014)

• A. Sahin, A. Tansel, H. Berument, "Output-Employment Relationship across the Employment Status: Evidence from Turkey", *Macroeconomics and Finance in Emerging Market Economies*, 7, 99-121 (2014)

• N.A. Dalkiran, "Order of limits in reputations", *Theory and Decision*, 81, 393-411 (2016)

• K. Cosar, B. Demir, "Domestic road infrastructure and international trade: Evidence from Turkey", *J of Development Economics*, 118, 232-244 (2016)

• T. Davig, R. Gurkaynak, "Is Optimal Monetary Policy Always Optimal?", *Int J of Central Banking*, 11, 353-384 (2015)

• R. Gurkaynak, Z. Kantur, A. Tas, S. Yildirim-Karaman, "Monetary Policy in Turkey after Central Bank Independence", *Iktisat Isletme ve Finans*, 30, 9-38 (2015)

• R. Gurkaynak, "Appropiate Policy Tools to Manage Capital Flow Externalities", *Taming Capital Flows*, J. Stiglitz, R. Gurkaynak (Eds.), pp. 82-92, Palrave Macmillan (2015)

• F. Ersoy, K. Hasker, E. Inci, "Parking as a loss leader at shopping malls", *Transportation Research B*, 91, 98-112 (2015)

• K. Hasker, E. Inci, "Free Parking for All in Shopping Malls", *Int Economic Review*, 55, 1281-1304 (2014)

• M. Kara, "Causes and Consequences of Recent European Crisis: Can Polanyi Help Us Understand Problems of Eurozone?", *All Azimuth, J of Foreign Policy and Peace*, 3, 37-49 (2014)

• Z. Akin, E. Karagozoglu, "The Role of Goals and Feedback in Incentivizing Performance", *Managerial and Decision Economics* (Forthcoming)

• E. Karagozoglu, U.B. Urhan, "The Effect of Stake-Size in Experimental Bargaining and Distribution Games: A Survey", *Group Decision & Negotiation*, 26, 285-325 (2017)

• E. Karagozoglu, S. Rachmilevitch, "Duality, Area-considerations, and the Kalai-Smorodinsky Solution", *Operations Research Letters*, 45, 30-33 (2017)

• G. Bolton, E. Karagozoglu, "On the influence of hard leverage in a soft leverage bargaining game: The importance of credible claims", *Games and Economic Behavior*, 99, 164-179 (2016)

• E. Karagozoglu, K. Keskin, "A Tale of Two Bargaining Solutions", *Games*, 6, 161-174 (2015)

• E. Karagozoglu, A. Riedl, "Performance information, production uncertainty and subjective entitlements in bargaining", *Management Science*, 61, 2611-2626 (2015)

• E.D. Cetemen, E. Karagozoglu, "Implementing Equal Division with an Ultimatum Threat", *Theory and Decision*, 77, 223-236 (2014)

• E. Karagozoglu, "A noncooperative approach to bankruptcy problems with an endogenous estate", *Annals of Operations Research*, 217, 299-318 (2014)

• E. Karagozoglu, "A Dynamic Model of Dissonance Reduction in a Modular Mind", *J of Neuroscience, Psychology and Economics*, 7, 15-32 (2014)

• B. Dogan, S. Koray, "Maskin-Monotonic Scoring Rules", *Social Choice and Welfare*, 44, 423-432 (2015)

• N. Demir, S. Mahmud, M.N. Solakoglu, "Sentiment and Beta Herding in the Borsa ıstanbul (BIST)", *Risk Management Post Financial Crisis: A Period of Monetary Easing*, J.A. Batten, N.F. Wagner (Eds.), pp. 389-400, Emerald Group Publishing Limited (2014)

• Z. Akin, Z.B. Bulut-Cevik, S.B. Neyapti, "Does Fiscal Decentralization Promote Fiscal Discipline?", *Emerging Markets Finance & Trade* (Forthcoming)

• E.G. Aslim, B. Neyapti, "Optimal fiscal decentralization: Redistribution and welfare implications", *Economic Modelling*, 61, 224-234 (2017)

• B. Neyapti, Y. Arasil, "The Nexus of Economic and Institutional Evolution", *Economic Modelling*, 52, 574-582 (2016)

• B. Neyapti, "Educate or Adjudicate? Socioeconomic Heterogeneity and Welfare", *Defence and Peace Economics* (Forthcoming)

• Z.B. Bulut-Cevik, B. Neyapti, "Fiscal Efficiency, Redistribution and Welfare", *Economic Modelling*, 41, 375-382 (2014)

• N. Dincer, B. Neyapti, "Macroeconomic Impact of Bank Regulation and Supervision: A cross-country investigation", *Emerging Markets Finance & Trade*, 50, 52-70 (2014)

• B. Neyapti, *Macroeconomic Institutions and Development*, Cheltenham, UK, Northampton, USA, (2010)

• J. Klugman, B. Neyapti, F. Steward, *Conflict and Growth in Africa, Vol. 2: Kenya, Tanzania, and Uganda*, OECD Development Centre, (1999)

• A. Goudie, B. Neyapti, *Conflict and Growth in Africa, Vol. 3: Southern Africa*, OECD Development Centre, (1999)

• N. Anbarci, K.P. Arin, C. Okten, C. Zenker, "Is Roger Federer More Loss Averse Than Serena Williams?", *Applied Economics* (Forthcoming)

• A. Caner, C. Guven, C. Okten, S.O. Sakalli, "Gender Roles and the Education Gender Gap in Turkey", *Social Indicators Research*, 129, 1231-1254 (2016)

• D. Karaoglan, C. Okten, "Labor-force Participation of Married Women in Turkey: A Study of the Added-Worker Effect and the Discouraged-Worker Effect", *Emerging Markets Finance & Trade*, 51, 274-290 (2015)

• M. Ozer, Ç. Sağlam, "Strategic interaction and catching up", *Bulletin of Economic Research* (Forthcoming)

• C. Le van, Ç. Sağlam, A. Turan, "Optimal growth strategy under dynamic threshold", *J of Public Economic Theory* (Forthcoming)

• B. Fazlioglu, H.C. Saglam, M.K. Yuksel, "Hopf bifurcation in an overlapping generations resource economy with endogenous population growth rate", *Studies in Nonlinear Dynamics and Econometrics* (Forthcoming)

• K. Keskin, C. Saglam, "On the existence of Berge equilibrium: An order-theoretic approach", *Int Game Theory Review*, 17, 155007-1--10 (2015)

• K. Keskin, C. Saglam, A. Turan, "General Complementarities on Complete Partial Orders", *Fixed Point Theory and Applications*, 101(2014)

• K. Keskin, C. Saglam, "Complementarities and the Existence of Strong Berge Equilibrium", *RAIRO Operations Research*, 48, 373-379 (2014)

• S. Sayek, F. Taskin, "Financial Crises: Lessons from History for Today", *Economic Policy*, 29, 447-493 (2014)

• S. Meyveci Doganay, S. Sayek, F. Taskin, "Is environmental efficiency trade inducing or trade hindering?", *Energy Economics*, 44, 340-349 (2014)

• H. Aytug, M.M. Kutuk, A. Oduncu, S. Togan, "Twenty Years of the EU-Turkey Customs Union: A Synthetic Control Method Analysis", *J of Common Market Studies* (Forthcoming)

• S. Togan, "Technical Barriers to Trade: The Case of Turkey and the European Union", *J of Economic Integration*, 30, 121-147 (2015)

• S. Togan, "Silk Road: Past and Present", *The Problems of Oriental Studies*, 69, 32-37 (2015)

• S. Togan, *The Liberalization of Transportation Services in the EU and Turkey*, Oxford: Oxford University Press, (2016)

• S. Togan, *Economic Liberalization and Turkey*, Routledge, London and New York, (2010)

• S. Togan, *Foreign Trade Regime and Trade Liberalization in Turkey During the 1980s*, Avebury, (1994)

• M. Trokic, "Wavelet energy ratio unit root tests", *Econometric Reviews* (Forthcoming)

• M. Ozer, E. Yeldan, "Dynamic Linkages of Current Account Deficits and Unemployment: Evidence from Turkey", *Wulfenia* (Forthcoming)

• E. Yeldan, "Turkey's Employment Subsidy Programme Under Great Recession: A General Equilibrium Assessmen", *Int Review of Applied Economics* (Forthcoming)

• S. Acar, E. Yeldan, "Environmental Impacts Of Coal Subsidies In Turkey: A General Equilibrium Analysis", *Energy Policy*, 90, 1-15 (2016)

• A.E. Yeldan, B. Unuvar, "An Assessment of the Turkish Economy in the AKP Era", *Research and Policy on Turkey*, 1, 11-28 (2016)

• E. Voyvoda, E. Yeldan, "Public Policy and Growth in Canada: An Applied Endogenous Growth Model with Human and Knowledge Capital Accumulation", *Economic Modelling*, 50, 298-304 (2015)

• E. Voyvoda, E. Yeldan, "An Applied Endogenous Growth Model with Human and Knowledge Capital Accumulation for the Turkish Economy", *Middle East Development Journal*, 7, 195-225 (2015)

• A. Bouzaher, S. Sahin, A.E. Yeldan, "How to Go Green? A General Equilibrium Investigation of Environmental policies for Sustained Growth with an Application to Turkey", *Letters in Spatial and Resource Sciences*, 8, 49-76 (2015)

• A.E. Yeldan, G. Kolsuz, B. Unuvar, "What to Smooth: Rate of Interest or the Foreign Exchange? Turkish Monetary Policy under Turbulent Times", *Review of Middle East Economics and Finance*, 10, 247-262 (2014)

• K. Yildiz, "List-Rationalizable Choice", *Theoretical Economics*, 11, 587-599 (2016)

• B. Dogan, K. Yildiz, "Efficiency and Stability of Probabilistic Assignmets in Marriage Problems", *Games and Economic Behavior*, 95, 47-58 (2016)

• B. Eroglu, T. Yigit, "A nonparametric unit root test under nonstationary volatility", *Economics Letters,* 140, 6-10 (2016)

Contact:
Dr. Çağla Ökten
(Director of Graduate Studies)
Phone : +90 312 290 2498
Fax : +90 312 266 5140
bilecon@bilkent.edu.tr
econ.bilkent.edu.tr

## Faculty Profile: Dr. Refet Gürkaynak, Professor, Department of Economics

Refet Gürkaynak received a Ph.D. from Princeton University in 2004. After working at the Federal Reserve Board, he joined Bilkent University, where he currently teaches macroeconomics, in 2005. He was also a consultant to the Central Bank of the Republic of Turkey and research fellows of the Centre for Economic Policy Research, Center for Financial studies and CESIfo. He is chair of the Department of Economics. His articles have appeared in publications including the *Journal of the European Economic Association*, the *Journal of Monetary Economics*, the *American Economic Review,* and the *Review of Economics and Statistics*. He was awarded the Central Bank of Turkey's Young Researcher Award, the European Central Bank's Lamfalussy Fellowship, and the Turkish Academy of Sciences' Young Scientist Award, Young Scientist Award, as well as an ERC Consolidator Grant. Dr. Gürkaynak's current research is on monetary economics, finance, and, broadly, macroeconomics. He is an associate editor of the *Central Bank Review*, and the *Journal of Monetary Economics*, and managing editor of *Economic Policy*.

# HISTORY

The Department of History focuses on graduate studies, offering M.A. and Ph.D. programs in the areas of Ottoman, American, and European history. Emphasis is placed on preparing students to undertake independent research in these fields. The graduate program includes a preparatory year, allowing students to acquire the skills and language proficiency that will enable them to carry out original research using primary source materials.

## FACULTY

**AHMET BEYATLI,** Instructor. Ph.D., Management, University of Baghdad, 1994. *Arabic.*

**ÖZER ERGENÇ**, Visiting Professor. Ph.D., History, Ankara University, 1974. *Ottoman social and economic history, Ottoman urban history.*

**MEHMET KALPAKLI**, Associate Professor and Acting Department Chair. Ph.D., Turkish Literature, University of Washington/İstanbul University, 1992. *Ottoman literature and cultural history, near eastern languages and literature, modern Turkish literature, theory of literature, digital humanities.*

**AKİF KİREÇÇİ**, Assistant Professor. Ph.D., University of Pennsylvania, 2007. *Middle Eastern modernization; orientalism.*

**EDWARD KOHN**, Associate Professor and Department Chair of American Culture and Literature. Ph.D., History, McGill University, 2000. *US history, 20th century US foreign relations.*

**PAUL LATIMER**, Assistant Professor. Ph.D., History, Sheffield University, 1982. *Medieval European history.*

**OKTAY ÖZEL**, Assistant Professor. Ph.D., History, University of Manchester, 1993. *Ottoman socio-economic history, demographic changes, methods and problems in historical writings.*

**EVGENI RADUSHEV**, Visiting Assistant Professor. Ph.D., History, Bulgarian Academy of Sciences, 1982. *Ottoman diplomatics and paleography, ottoman socio-economic, political and ethnocultural history.*

**NORMAN STONE**, Professor. M.A., History, Cambridge University, 1965. *Central European and Russian history, military history, economic systems.*

**ANN-MARIE THORNTON**, Instructor. M.Phil. French Literature, University of Exeter, 1994. *History of civilization.*

**DAVID THORNTON**, Assistant Professor. Ph.D., History, University of Cambridge, 1991. *Medieval history of the British Isles.*

**KENNETH WEISBRODE**, Assistant Professor. Ph.D., History, Harvard University, *20th century American diplomatic history.*

**LUCA ZAVAGNO**, Assistant Professor. Ph.D., History, University of Birmingham, 2007. *Byzantine history, medieval history.*

## MASTER OF ARTS IN HISTORY

The program is designed with concentrations in the areas of Ottoman History, European History, and the History of the United States.

**Admission:** An undergraduate degree in history is not a prerequisite for entering the M.A. program. Graduates of departments in the social sciences, humanities, sciences, management, and engineering may apply. All students entering the graduate program in history must take one year of preparatory courses before beginning the master's level courses. Students should have a good command of written and oral English, as indicated by a minimum TOEFL score or an equivalent announced by the department.

Applicants should take the ALES (*Akademik Personel ve Lisansüstü Eğitimi Giriş Sınavı*/Academic Personnel and Postgraduate Education Entrance Examination) and must satisfy the announced minimum requirements. Applicants who are not Turkish citizens and Turkish citizen applicants who are residents of a foreign country may take the GRE (Graduate Record Examination) instead of the ALES. All nonnative speakers of English are required to submit proof of proficiency in English.

**Degree Requirements:** In addition to at least 18 credits taken during the preparatory year, the completion of 21 graduate-level units of credit is required. Students in the Ottoman History program must also demonstrate competence in Ottoman Turkish, and students in the European History program, competence in Latin. All students must demonstrate competence in one modern language other than English and Turkish. A master's thesis must be submitted and accepted.

## DOCTOR OF PHILOSOPHY IN HISTORY

**Admission:** To enter the Ph.D. program, candidates are required to have completed an M.A. degree in history or a related field. They must also pass the entrance exam for the area in which they wish to specialize. All applicants must submit ALES *(Akademik Personel ve Lisansüstü Eğitimi Giriş Sınavı*/Academic Personnel and Postgraduate Education Entrance Exam) or GRE (Graduate Record Examination) scores and proof of satisfactory knowledge of English.

**Degree Requirements:** Students must take a minimum of 21 credit units of graduate-level course work beyond the

master's level. These courses are to be determined by the advisor and the departmental chair on an individual basis for each doctoral candidate. If appropriate, graduate level courses from other departments may be taken. Partial or full credit may be granted by the Graduate School of Economics and Social Sciences to those who have taken graduate courses elsewhere. The candidate may also take language courses as recommended by his/her advisor and is expected to have participated in seminars offered on source materials.

After completing the minimum 21 credits of course work, candidates take written and oral comprehensive exams. The first part of these examinations evaluates a candidate's expertise in the field/period. The second part is tailored to the individual student's dissertation research proposal. The candidate must prepare a doctoral dissertation based upon original research and must successfully defend it during a final examination before a faculty committee by the end of the second year of the doctoral program. The dissertation must represent a substantial contribution to historical knowledge in the particular field of study in question.

## COURSE DESCRIPTIONS

**HIST 501 Ottoman Paleography I**
**HIST 502 Ottoman Paleography II**
Advanced reading exercises with Ottoman documents.

**HIST 505 Ottoman Rule in Southeast Europe I: 1354-1600**
Local Balkan monarchies (Bosnians, Bulgarians, Serbs) and the growing feudalization of the region. Ottoman expansion and the foundation of the First Ottoman Empire. Interregnum and the Second Ottoman Empire. Social and economic developments. Administration and land regime. Urban and rural structure. Vassal and tributary states. The unique case of Dubrovnik.

**HIST 506 Ottoman Rule in Southeast Europe II: 1600-1878**
Islamic culture and heterodox Islamic movements in Southeast Europe. Decline of the Ottoman Empire. Military and fiscal transformation and its impact on Ottoman Balkans. The Siege of Vienna in 1683 and the political and social effects of the Ottoman defeats. The rise of non-Muslim middle class and education. The struggle for independence of Balkan people and the "Eastern Question"'.

**HIST 507 Methodology in History I**
**HIST 508 Methodology in History II**
Basic methods in historical research. The history of historiography. Main traditions and currents of historical thought.

**HIST 509 Latin Palaeography for Medieval and Early Modern European History**
The aim of this course is to introduce the main developments in European handwriting for the period 500 to 1600, and to enable history students to use Latin and vernacular manuscript sources as part of their research. In addition to different scripts, the course will also cover other paleographical topics, such as abbreviations, as well as codicology and manuscript illumination.

**HIST 511 Ottoman Social and Economic History I**
Ottoman Beylik as a frontier state. Hegemony in Anatolia and the Balkans. The Battle of Ankara and struggle for Revival. The conquest of Constantinople. The definitive foundation of the classical Ottoman Empire. The Ottoman Empire as a world power. Internal disorders. Social, economic and religious institutions.

**HIST 512 Ottoman Social and Economic History II**
The periods of transition and modernization of the Ottoman state and society. The detonation of the Ottoman classical socio-economic structure. The weakening of central authority. The ayans. Early attempts of modernization. Influence of the "Enlightenment" ideas on emergence of nationalist currents among non-Muslim communities". Tanzimat.

**HIST 515 Aspects of Ottoman Social History**
Main foundations of the Ottoman Empire. Demographic movements, fiscal structure, administrative institutions, land and peasants, settlement patterns, internal and external trade.

**HIST 517 Ottoman Millet System**
Legal and social status of non-Muslim communities in the Empire, their cultural life and ecclesiastic organizations. The evaluation of the Christian and Jewish communities after the decree of "Tanzimat" in 1839 and after the Congress and Convention of Paris in 1856 will be discussed in this course.

**HIST 518 Introduction to Ottoman Diplomatics**
History and development of the field of archival research. Archives and archival sources in Turkey. Development of the field of Ottoman diplomatics. Types and classifications of Ottoman documents. Internal structure of Ottoman official correspondence, decrees and diploma prior to the Tanzimat period. Ottoman official documentation in the period of reforms until the dissolution of the Ottoman Empire.

**HIST 519 Sources of Ottoman Social of Economic History I**
**HIST 520 Sources of Ottoman Social of Economic History II**
The Ottoman land regime. Social and legal changes throughout periods. Reading and analysis of sources berats, mühimmes, sicils, tahrirs, temettüats and vakfiyyes.

**HIST 524 US in the Vietnam Era**
This course is designed to give students in the Master's program in American history an in-depth look at the history of Vietnam War. The course will focus on the period roughly 1945-1975. In addition to the war itself, other topics for discussion will include the Cold War, the Civil Rights movement, the counter culture and the legacy of the war in the 1990s.

**HIST 526 Advanced Ottoman Diplomatics**
Historical development and characteristics of ottoman diplomatics, focusing particularly on the bureaucratic-institutional mechanisms that produced diverse genres in the Ottoman central bureaucracy. Particular emphasis will be made on changing priorities of the central government over periods of time from the `classical' period to the Tanzimat.

**HIST 530 Comparative History of Crusading and Holy War**
Discussion on the definition of Crusades and its comparison with the Jihad. Analysis of European and Islamic historiography on Crusades. Ideological, political and economic components of the Crusades and Jihads. Examination of contemporary texts from both civilization

**HIST 538 US in the Gilded Age and Progressive Era**
An intensive examination of the U.S. history in the period 1877-1920. Institutional, economic and intellectual developments. Analysis of historiographical discussions concerning the Gilded Age and Progressive Era.

**HIST 560 Major Issues in Medieval and Early Modern Economies**
Study of the main transformations in the economies of Europe and the Near East from late Roman times to the mid-17th century. Examination of the disappearance of monetary economy, emergence of manorialism, and trade life in the Mediterranean basin. Development of markets and the domination of the Atlantic economy. Price inflation. Reasons for and consequences of these developments.

**HIST 563 Islamic Culture in the Ottoman Balkans 1400-1600 - I**
**HIST 564 Islamic Culture in the Ottoman Balkans 1600-1900 - II**
Introduction of Islamic culture to the Balkan peninsula by the Ottomans. Local Balkan Islamic culture. Relations between high Islam in Istanbul and the local Balkanic Islam. Emergence of heterodoxy and orthodoxy.

**HIST 573 New Era/New Deal (1920-1945)**
This course is designed to give students in the Master's program in US history an in-depth look at the history of and historical literature about the period 1920-1945. Major topics will include the Jazz Age, the Roaring 20's, the Great Depression, Franklin Roosevelt's New Deal and World War II.

**HIST 577 US Military and Diplomatic History**
An intensive examination of American military and diplomatic history from the colonial period to the present with a focus on historiography. Topics may include colonial wars in North America, the wars of the United States, war and American society, treaties with European nations and with Native Americans, imperialism and anti-imperialism, relationism, and the cold war.

**HIST 581 Latin for Medieval and Early Modern History III**
Reading and interpretation of Medieval historical documents in Latin. Selection of documents relevant to the socio-economic history of Europe like registers, bills, treaties, monastic writings.

**HIST 589 History of Arab Nationalism in the Middle East**
This course explores the birth, triumph and fall of Arab nationalism in the Middle East. The course focuses on historical events, political leaders and movements all of which defined and shaped the nature of the movement. Concepts such as Arabism, Arab unity and Arab nationalism are among the terms that we will investigate along with their contextualization in different regions of the Middle East by various actors. Factors which contributed to the development and/or decline of the Arab nationalist movement will be examined are: colonialism, the dissolution of the Ottoman Empire, World War I and World War II, the emergence of the State of Israel, the Egyptian Revolution and the rise of Al-Nasser, Islamic resurgence and the recent incidents in the region. The ideological links between Arab nationalism and modern radical movements will also be examined.

**HIST 708 European Migration to the Ottoman Empire and Early Republican Turkey**
The course aims at giving an overview of European Migration to the Ottoman Empire up to Early Republican Times (1930). The Jewish immigrants from 15th-century Spain, the Levantines, renegades, and converts to Islam, reformers in different areas in the 18th and 19th centuries up to the German intelligentsia migrating to the Republic of Turkey during World War II will be dealt with. Biographies of selected persons from different backgrounds will be introduced. Within the framework of the course, migration theories will be the subject of discussion; selected primary sources will be studied and analyzed.

**HIST 710 Topics in Modern European History 1870-1970**
This course will take the most significant episodes of modern European (and in part world) history with a view to encouraging students' interpretive abilities. The topics will be Imperialism around 1890, the "Great Depression" of the later nineteenth century and what it meant, the spread of parliamentary constitutionalism, the rise of Socialism and of a new Political Catholicism. Minority nationalism will be examined, and the rise of Fascism and Communism. The course ends with the attempt to create a new Europe after 1947, and the involvement of the USA.

**HIST 713 History of European Integration**
This Seminar explores the history of the European movement from a political, social, economic and cultural perspective from the interwar period through the end of the Cold War. Topics include alternate visions of Europe, the histories of European institutions and legal regimes, the trajectory of 'widening' and deepening, the relations between European integration and the Cold War, biographies of the principal figures in the European movement (Briand, Monnet, Schuman, Spinelli, Delors, etal), and legacies of European federalism in present -day relations of the EU with wider world.

**HIST 714 Central Eastern Europe (1815-1945)**
This course will cover assorted topics in the modern history of Central Europe, extending from the later nineteenth century to 1970, with the possibility, for IR students, of studying the late-Communist period. The area involved stretches from Poland to the Balkans, but the students will be able to concentrate on countries that are of particular interest to them, e.g. Yugoslavia or Hungary. Some themes of great importance will be treated: the failure of parliamentary Liberalism (the 1890's and 1930's), the treatment of questions of nationalism and minority rights throughout the period; the rise of left-wing and political-Catholic parties; the relationship of agriculture and economic development; and the extraordinary cultural flourishing associated with 'Vienna 1900' but also extending to Prague and particularly Budapest; the process of Communist take-over. With the exception of some memoirs, the existing English-language literature should be adequate for the course.

**HIST 5513 Venice between the Byzantines and the Ottomans (ca. 300 - ca. 1700 CE)**
The historical interaction between the Republic of Venice and the two most important Mediterranean polities in the Medieval and Modern Era: the Byzantine and the Ottoman Empire.

## SAMPLE OF RECENT PUBLICATIONS


• M. Kalpakli, "Sadullah Pasha's Poem, The Nineteenth Century: A Literary Echo of Ottoman Modernization", *Studia et Documenta*, 2, 223-230 (2015)

• D. Arifoglu, E. Sahin, H. Adiguzel, P. Duygulu, M. Kalpakli, "Matching Islamic patterns in Kufic images", *Pattern Analysis and Applications*, 18, 601-617 (2015)

• M. Kalpakli, N. Demirkol, "Eternal Narratives of the Silk Road: The Thousand and One Nights from Samarkand to Istanbul", *Bulletin of IICAS*, 19, 81-97 (2014)

• P. Duygulu, D. Arifoglu, M. Kalpakli, "Cross-document word matching for segmentation and retrieval of Ottoman divans", *Pattern Analysis and Applications*..

• W.G. Andrews, N. Black, M. Kalpakli, Ottoman Lyric Poetry: *An Anthology*, University of Washington Press, (2006)

• M. Kalpakli, W.G. Andrews, *The Age of Beloveds: Love and the Beloved in Early-Modern Ottoman and European Culture and Society*, Duke University Press, (2005)

• W.G. Andrews, N. Black, M. Kalpakli, *Ottoman Lyric Poetry: An Anthology*[Revised edition forthcoming from Univ of Washington Press], Univ of Texas Press, (1997)

• M. Kalpakli, "Osmanlı'da Edebiyata Yansıyan Yeme-İçme Kültürü", *Kuşhane Saray Mutfagı*, Seyhan Livaneli (Eds.), pp. 41-49, Bir Yudum İnsan Yay. İstanbul (2016)

• M. Kalpakli, N. Demirkol, "İpek Yolu'nun Ölümsüz Anlatısı: Binbir Gece Masalları", *Elfü Leyletin ve Leyle Hikayeleri: Binbir Gece Masalları*, Sadettin Eğri (Eds.), pp. 24-32, Bursa Büyükşehir Belediyesi Yayınları (2016)

• W.G. Andrews, M. Kalpakli, "Poet, panegyric, and patron: A Bahariye Kaside by Tacizade Ca'fer Çelebi for Sultan Bayezit II", *Turkish Language, Literature, and History: Travelers' tales, sultans, and scholars since the eighth century*, Bill Hickman and G. Leiser (Eds.), pp. 1632, London and New York: Routledge Press (2016)

• A. Kirecci, S. Tezcan, "The Predicemant of the Crimean Tatars Past and Present", *Bilig*, 77, 1-26 (2016)

• E. Kohn, *A Most Glorious Ride: The Diaries of Theodore Roosevelt, 1877-1886*, Albany, New York: SUNY Press, (2015)

• E. Kohn, *Hot Time in the Old Town: The Great Heat Wave of 1896 and the Making of Theodore Roosevelt*, New York: Basic Books, (2010)

• E. Kohn, *Heir to the Empire City: New York and the Making of Theodore Roosevelt*, New York: Basic Books, (2013)

• E. Kohn, *This Kindred People: Canadian-American Relations and the Anglo-Saxon Idea, 1895-1903*, Montreal: McGill-Queen's Univ. Press, (2004)

• P. Latimer, "How to supress a rebelion: England 1173-4", *Rulership and Rebellion in the Anglo-Norman World, c. 1066-c.1216: Essays in Honour of Professor Edmund King*, P. Dalton, D. Luscombe (Eds.), pp. 163-177, Farnham: Ashgate Publishing (2015)

• O. Ozel, *The Collapse of Rural Order in Ottoman Anatolia. Amasya 1576-1643*, Leiden: Brill, (2016)

• H.Inalcik, E. Radushev, U. Altug, *1455 Tarihli Pasa Livasi Icmal Defteri,* Turk Tarih Kurumu, (2013)

• E. Radushev, *The Pomaks (Christianity and Islam in the Western Rhodope Mountains and the Valley of the Mesta River from the 15th c. to the 1730s)*, St. Cyril Meth.Nat.Lib.Pub. House Sofia, (2005)

• N. Stone, "The Russian Army in the First World War", Mitt. *Oesterreichischen Sudosteuropa-Inst: Wirtschaft Politik* (Forthcoming)

• N. Stone, *World War One, A Short History [reprinted in 2015]*, Penguin: London, (2007)

• N. Stone, *Europe Transformed 1878-1919*, Blackwells, (1999)

• N. Stone, *The Eastern Front 1914-1917*, Penguin Books, (1998)

• T.M. Russell, A. Thornton, *Gardens and Landscapes in the Encyclopedie of Diderot and D'Alembert: the Letterpress Articles and Selected Engravings*, Ashgate, (1999)

• K.S.B. Keats-Rohan, D.E. Thornton, *Domesday Names: An Index of Latin Personal and Place Names in Domesday Book*, Boydell & Brewer, (1997)

• D.E. Thornton, *Kings, Chronologies and Genealogies: Studies in the Political History of Early Medieval Ireland and Wales*, Prosopographical Research, Oxford, (2003)

• K. Weisbrode, "Roosevelt's Man in Europe", *J of Gilded Age and Progressive Era*, 15, 45-59 (2016)

• K. Weisbrode, "The Political and Cultural Underpinnings of Atlanticism's Crisis in the 1960s", *GHI Bulletin Supplement.*, 41-61 (2014)

• K. Weisbrode, *Old Diplomacy Revisited,* New York: Palgrave Macmillan, (2013)

• K. Weisbrode, *Churchill and the King*, New York: Viking, (2013)

• K. Weisbrode, "Diplomacy and Politics", *Global Diplomacy: Theories, Types, and Models*, Alison R. Holmes and J. Simon Rofe (Eds.), pp. 125-138, Boulder, CO: Westview Press (2016)

• L. Zavagno, "Island not the last frontier: Insular Model in Early Medieval Mediterranean (ca. 600-ca. 850)", *Borders and Conflict in the Mediterranean Basin*, G. D'Angelo- J.M Ribeiro (Eds.), pp. 37-51, Salerno: IMK (2016)

## Faculty Profile: Dr. Özer Ergenç, Visiting Professor, Department of History

Özer Ergenç received a Ph.D. in history from the Ankara University Faculty of Languages, History and Geography in 1974, following which he pursued postdoctoral studies at Freiburg University in Germany. Prior to joining Bilkent University as a full-time professor in 2006, he was a faculty member at Ankara University and in addition taught at universities including Bilkent and Middle East Technical as a visiting professor.

His research interests range from Ottoman urban history, with a focus on Ankara, Konya and Bursa, to the social and economic history of the Ottoman Empire, in areas including the history of mohair in the Ottoman Empire and the history of ordinary people, to Ottoman Turkish paleography and diplomatics, methodological approaches to Ottoman judicial court records, and spatial analysis of the Empire.

He has been a member of Türk Tarih Kurumu (the Turkish Historical Society), Tarih Vakfı (the History Foundation), TÜBİTAK (the Scientific and Technological Research Council of Turkey) and its Social Sciences and Humanities Research Group (SOBAK), and the Middle Eastern Studies Association.

Contact:
Dr. Mehmet Kalpaklı
(Acting Department Chair)
Phone : +90 312 290 2206
Fax : +90 312 266 4061
kalpakli@bilkent.edu.tr
hist.bilkent.edu.tr

# INTERNATIONAL RELATIONS

The Department of International Relations offers graduate degree programs as advanced preparation for careers in teaching, research, government, journalism, international business, and international organizations.

The graduate program is designed to enhance students' skills by means of carefully chosen graduate seminars and courses, which demand rigorous preparation and build confidence through active participation and discussion.

The basic goal of the program is to develop practical as well as theoretical competence in the field of international relations through refinement of the skills of critical thinking, analysis, and expression. As a reflection of the importance the department places on the ability of its students to communicate effectively, admission depends upon demonstration of English proficiency sufficient to begin graduate-level work.

## FACULTY

**ERSEL AYDINLI**, Professor. Ph.D., Political Science, McGill University, 2002. *International relations theory, international security and globalization.*

**TUĞBA BAYAR**, Instructor. Ph.D., International Relations, Otto-Friedrich Universität, 2014. *International regimes, security regimes, nuclear non-proliferation, Middle East.*

**ALİ BİLGİÇ**, Associate Professor. Ph.D., International Politics, University of Wales, Aberystwyth, 2010. *Critical security studies, international relations theories, European security migration, Turkish foreign policy.*

**H. PINAR BİLGİN**, Professor. Ph.D., International Politics, University of Wales, Aberystwyth, 2000. *Security studies, critical international relations theory, critical security studies.*

**BERK ESEN**, Assistant Professor. Ph.D., Government, Cornell University, 2015. *International political economy, democratization and authoritarian regimes, state-building, comparative historical analysis, political economy of development, Turkish foreign policy, middle east and Latin American politics.*

**TORE FOUGNER**, Associate Professor. Ph.D., International Relations, Keele University, 2002. *Global political economy, global governance, international relations theory, critical theory, gender, labor.*

**SERDAR Ş. GÜNER**, Associate Professor. Ph.D., International Relations, University of Geneva, 1990. *Game theory, foreign policy analysis and conflict resolution.*

**SAMUEL J. HIRST**, Assistant Professor. Ph.D., History, University of Pennsylvania, 2012. *Soviet History, Russia Turkish Relations, Diplomatic History.*

**CLEMENS MAXIMILIAN HOFFMANN**, Assistant Professor. Ph.D., International Relations, University of Sussex, 2010. *Historical sociology, international relations theory, state formation, environment, African politics, Ottoman Empire, Turkish foreign policy.*

**PINAR İPEK**, Assistant Professor. Ph.D., International Relations, University of Pittsburgh, 2003. *International political economy, energy security, Turkish political economy, European Union energy policy.*

**ONUR İŞÇİ**, Assistant Professor. Ph.D., History, Georgetown University, 2014. *Diplomatic history, cold war studies, Imperial/Soviet Russian history, Ottoman/Turkish foreign affairs.*

**SIRRI HAKAN KIRIMLI**, Associate Professor. Ph.D., History, University of Wisconsin-Madison, 1991. *Russian and Soviet studies, history of the Crimea, Volga-Ural Region, and the Caucasus.*

**SEÇKİN KÖSTEM**, Assistant Professor. Ph.D., Political Science, McGill University, 2016. *International political economy, regional and rising powers, Russia, Eurasia.*

**TUDOR A. ONEA**, Assistant Professor. Ph.D., Political Studies, Queen's University, 2010. *Grand strategy, Diplomacy, Security.*

**İBRAHİM ÖZGÜR ÖZDAMAR**, Assistant Professor. Ph.D., Political Science, University of Missouri-Columbia, 2006. *International relations theory, foreign policy analysis, research methods, American foreign policy, Black Sea politics.*

**NORMAN STONE**, Professor. M.A., History, Cambridge University, 1965. *Central European and Russian history, military history, economic systems.*

**SELVER B. ŞAHİN**, Assistant Professor. Ph.D., Political Science, University of Canterbury, 2008. *Contemporary international interventions, security sector reform, democratization, peace building after conflict, politics and society of the Balkans and Southeast Asia.*

**DIMITRI TSAROUHAS**, Associate Professor. Ph.D., Politics, The University of Sheffield, 2005. *European integration, political economy, EU-Turkey Relations, comparative European politics.*

**PAUL ANDREW WILLIAMS**, Assistant Professor. Ph.D., Political Science, University of California, Los Angeles, 1997. *International relations theory, international political economy, global environmental politics.*

**ERİNÇ YELDAN**, Professor and Acting Department Chair. Ph.D., Economics, University of Minnesota, 1988.

## MASTER OF ARTS IN INTERNATIONAL RELATIONS

**Admission:** Prospective students must have completed the Bilkent University requirements for a Bachelor of Arts degree in International Relations or the equivalent training. Applicants should take the ALES (*Akademik Personel ve Lisansüstü Eğitimi Giriş Sınavı*/Akademik Personnel and Postgraduate Education Entrance Examination) and must satisfy the announced minimum requirements. Applicants who are not Turkish citizens and Turkish citizen applicants who are residents of a foreign country may take the GRE (Graduate Record Examination) instead of the ALES. All nonnative speakers of English are required to submit proof of proficiency in English.

**Degree Requirements:**

1. Completion of at least 24 credit units of course work. There are seven required courses: Fundamentals of Social Research Design, Research Methods and Academic Publication Ethics, International Relations Theory, Issues in Turkish Foreign Policy, Pre-Thesis Seminar, Academic Practices and Master's Thesis. Five elective courses can be selected from the offered graduate courses each semester.
2. Completion of an M.A. thesis proposal before the start of the second year.
3. An M.A. thesis must be submitted to and approved by the thesis defense committee.
4. A cumulative grade point average of at least 3.00 must be maintained for the totality of Master's level work.

## DOCTOR OF PHILOSOPHY IN INTERNATIONAL RELATIONS

The doctoral program is highly specialized. Its purpose is to develop the skills of doctoral candidates in international political analysis and to increase their capacity to conduct research on theoretical issues, international security studies, strategic studies, comparative foreign policy, international political economy, regional integration, global environmental problems, international law, and peacekeeping and conflict resolution, as well as area studies such as the European Union, the Balkans, Russia, the Middle East, Central Asia, and the Caucasus. The program is reserved for a limited number of students who are qualified and committed to spend several years conducting intensive research. The program is particularly suitable for students who wish to pursue an academic career.

**Admission:** Prospective students must have completed the Bilkent University requirements for a Master of Arts degree in International Relations or the equivalent. Applicants should take the ALES (*Akademik Personel ve Lisansüstü Eğitimi Giriş Sınavı*/Akademik Personnel and Postgraduate Education Entrance Examination) and must satisfy the announced minimum requirements. Applicants who are not Turkish citizens and Turkish citizen applicants who are residents of a foreign country may take the GRE (Graduate Record Examination) instead of the ALES. All nonnative speakers of English are required to submit proof of proficiency in English.

**Degree Requirements:** Students accepted into the program must complete at least 26 credit hours of course work. Students may take elective courses from other departments in accordance with IR Ph.D. curriculum requirements. A cumulative GPA of at least 3.00 must be maintained for Ph.D. course work. The doctoral program must be completed in at most 12 semesters.

## MASTER OF INTERNATIONAL AFFAIRS AND PUBLIC POLICY (MIAPP) (Non-Thesis)

The curriculum of the Master of International and Public Policy (MIAPP) program is designed to provide students with a broad analytical background in the major fields of international affairs and European integration, combined with a specific focus on the newly emerging issues of governance and globalization. The program of study comprises 36 credits and is without the requirement of submitting a master's thesis.

By underlining updated knowledge and skills essential to careers in the international, private, and public sectors, the program responds to new professional opportunities at home as well as abroad. The program addresses public governance, corporate governance, globalization, European integration, and other fundamental issues of 21st century global politics using an approach that incorporates a scholarly perspective as well as practical experience.

**Admission:** An undergraduate degree in international relations is not a prerequisite for admission. Graduates of other disciplines are also eligible and are encouraged to apply.

## COURSE DESCRIPTIONS

**IR 501 International Relations Theory**
The main traditions and currents of thought in international political theory. Early thinking about international relations. Major twentieth century approaches: idealist-realist debate; the power politics approach and its fundamental concepts such as balance of power, national interest, nationalism and imperialism. Behaviorism; systems thinking; interdependence and structure list theories. Decision-making and integration theories.

**IR 507 Foreign Policy of the United States**
This course examines the making and execution of US foreign policy in terms of the following factors: constitutional checks and balances; religious and ideological traditions; Presidential doctrines and "the lessons of history"; economic tools and cultural diplomacy; the role of special-interest lobbies; and area-specific concerns.

**IR 509 Pre-thesis Seminar**
This course corresponds to MA students' thesis proposal, finalized under their supervisors' guidance.

**IR 513 Game Theory and International Policy**
This course is designed to introduce students to the main concepts and the applications of game theory to international politics. Accordingly, arms races, deterrence, crisis stability, arms verification, national security and war are among the subjects of this course.

**IR 522 Foreign Policy Analysis**
An advanced seminar on foreign policy analysis literature. Actor-specific focus, which assumes source of international politics is humans, acting individually or in groups. Modern foreign policy theory, data and analysis. Process of decision making, political, rational and psychological factors.

**IR 531 Central Eastern Europe (1815-1945)**
Political and military history of Eastern Central Europe with an emphasis on wars and revolutions between 1815 and 1945.

**IR 543 International and Public Policy Decision Making**
This course aims at a gentle introduction of students into formal political theory. It is basically divided into two parts: individual decision-making theory and game theory. The first part concentrates on individual preferences and choice including decision making under certainly and risk, cardinal

utility, subjective probability, the calculus and paradoxes of voting, and mispresentation of preferences. The second part includes two-person mixed-motive games, coalitional-form games, concepts of equilibrium such as iterated elimination of dominated strategies and backward induction, Nash and subgame-perfect Nash equilibrium. These analytical tools would serve as nuts and bolts for the student to go beyond mere description of political events, either domestic or international, and to construct their own explanations of puzzling choices at those levels.

**IR 547 International Politics**
This course offers an introduction to the study of international politics. It aims to first provide the historical, conceptual, and theoretical tools and lenses for analyzing behavioral and institutional patterns in the international system, and then to use these analytical means in exploring major international issues and events. Particular emphasis will be given to topics of international security, such as major power rivalries, the impact of globalization on security, and the management of low intensity conflicts. Government experts and practitioners will be invited as quest lectures for certain specific issues, such as international terrorism and regional geostrategy.

**IR 571 Russia and Turkey**
This course is a unique seminar on the history of Turco-Russian relations in the course of history. Although it covers the period from 1552 to present, its main focus would be 20th century Turco-Russian relations, given the similarities of the "modernization" projects of both countries.

**IR 572 European Union Integration, EU and OECD Economies**
This course includes analyses of EU integration, globalization, regionalism and their relationship with nation states. Students will learn about the impact of EU integration on economic, political, cultural and social structures, the structure of the Turkish economy and the dynamics of its technological and socio-economic development. There will be a comparative analysis of EU and OECD economies and a transdisciplinary analysis of Turkey and the EU integration process.

**IR 574 Turkey's International Relations**
This course will first examine the structural and historical determinants of Turkish foreign policy, with an emphasis on the foreign policy decision-making mechanism, as well as the sources of change and continuity. This will be followed by first, a general exploration of the dynamics of the sub-system/region in which Turkey is located, and then more in-depth analyses of Turkey's particular relations with different geographical regions, such as Europe, Eurasia, the United States, and the Middle East. Some experts from the Turkish foreign ministry, as well as public figures with experience and expertise on relevant issues, will provide guest lectures.

**IR 594 International Law and Organizations**
International relations have legal and political sides. This comprehensive study will firstly analyze the normative side of international relations by describing and explaining the basic legal concepts of international law. At the later stage, it will focus on to the role of international organizations e.g. UN, Council of Europe, EU etc. to the contemporary world order under the effect of international law and politics.

**IR 599 Master's Thesis**

**IR 614 New Directions in Security Studies**
This course is designed as a post-graduate level introduction to new directions in the study of security. Since the late 1980s, there has been remarkable change in the way security is conceived, studied and practiced. The academic field of Security Studies has been the subject of intense academic, intellectual and political debate during this period. The main aim of this course is to introduce students to main debates in Security Studies by tracing the development of Security Studies from its Cold War past to its post-Cold War present and opening up alternative ways of thinking about the future.

**IR 621 Current Debates in International Relations Theory**
This course is designed as a post-graduate level introduction to current debates in International Relations theory. The content and nature of International Relations theory is by no means fixed. Indeed, International Relations theory has been the subject of intense academic, intellectual and political debate. The main aim of this course is to introduce students to some of the major debates in International Relations theory. The course also covers epistemological, ontological and methodological debates in IR. Specifically, the course aims to generate familiarity with the language of social research, the uses of theory and meanings of methodology in IR, ethical and political issues involved in the research process.

**IR 625 Advanced Diplomatic History**
The course is designed to help prepare students for the diplomatic history qualifying examination by introducing them to current literature and comparative history.

**IR 629 Global Political Economy**
This course is designed to explore questions relating to theory and process of increasingly globalizing international political economy. The purposes of the course are to expose students to major changes in the international political economy; to explore some of the theoretical debates over these changes; and, to examine the multitude of adjustment strategies states adopt to cope with changing structure of comparative advantage. Particular emphasis is placed upon the position of the middle-income developing countries (especially Turkey) within the global market structure.

**IR 649 The Soviet Union and The Second World War**
As a consequence of the Second World War, the Soviet Union became one of the preeminent powers in the world, imposed its ideology and ethos upon an array of other countries, and parlayed its victory over fascism into a new claim of legitimacy. This seminar will explore the origins, course and character, and impact of the Second World War, with especial attention paid to the role of the USSR during the world's greatest conflict. The course will be organized topically, within a more or less chronological framework.

**IR 662 EU Politics**
This course is designed to provide graduate students with an advanced analysis of EU politics. After a general historical introduction, Part 1 discusses EU's institutional architecture. Part 2 dwells on an in-depth analysis of European integration theories. Part 3 explores various meanings of Europeanization before examining some of the most important EU policy areas, such as the single market. Part 4 concludes with a discussion of EU's recent enlargements and possible future scenarios.

**IR 670 Topics in the History of Communism 1847-1953**
This course takes the outstanding moments and writers in the history of Communism. It starts of course with Marx and the Communist Manifesto, and proceeds through the construction of Capital and the International to a discussion of the emergence of socialism especially in France and Germany. It moves on to a consideration of Lenin's adaptation of Marx to fit the world of Imperialism, and the position of large semi-capitalist states such as Russia (and later China). The success of the Bolsheviks in Russia alone is discussed, and then the emergence of the USSR as a super-power, especially with the Second World War. The course ends with the death of Stalin in 1953.

**IR 699 Ph.D. Dissertation**

**IR 5100 Introduction to Security Studies**
This course offers an introduction to the study of security. It traces the evolution of security studies from the study of

war and strategy to concerns with individual, societal and global security.

**IR 5104 Issues in Turkish Foreign Policy**
This course is not a historical account of Turkish Foreign Policy. Nor does it consist of a chronological description of the events and issues. It is designed to acquaint the candidates with conceptual and institutional frameworks useful to explain and understand Turkish foreign and security policy and the essence of Turkey's diplomatic-strategic conduct. Nevertheless, as a prerequisite of this course, candidates are required to have a basic preliminary knowledge about the history of Turkey's foreign relations. The approach of the course is critical as well as analytical. This means that the cause should underline not only the achievements, but also failures, contradictions, and deficiencies of Turkey's foreign policy.

**IR 5105 Issues in International Political Economy**
This graduate seminar course explores a series of issues central to the field of International Political Economy (IPE). While the exact focus is contingent on the contemporaneous disciplinary and policy agendas, as well as on the research interests of the participants, the course is centrally concerned with integrating theory and practice in a thorough and critical engagement with both IPE as an academic field of study, and various substantive aspects of the current world political economy.

**IR 5107 EU Public Policy**
This course is designed to introduce students to the major policies of the EU. It starts with an overview of the functioning of the EU as a political system and policy process. The course then provides an understanding of the major EU policy areas, such as single market, monetary union, agriculture, regional policy, and common foreign and security policy.

**IR 5109 The Politics of EU Enlargement**
This course focuses on the politics of enlargement by the European Union. It examines successive rounds of enlargement and analyzes their evolution with reference to EU priorities as well as member states' policies and intentions. The course combines theoretical insights with empirical analysis and offers a variety of perspectives from which students can assess for themselves the politics of enlargement. By the end of the course students should have become familiar with the EU, its politics and institutions as well as the theory and practice of EU enlargement.

**IR 5110 Topics in Modern European History 1870-1970**
This course will take the most significant episodes of modern European (and in part world) history with a view to encouraging students' interpretive abilities. The topics will be Imperialism around 1890, the "Great Depression" of the later nineteenth century and what it meant, the spread of parliamentary constitutionalism, the rise of Socialism and of a new Political Catholicism. Minority nationalism will be examined, and the rise of Fascism and Communism. The course ends with the attempt to create a new Europe after 1947, and the involvement of the USA.

**IR 5112 Conflicts in the Middle East**
This course offers an advanced conceptual and empirical analysis of contemporary Middle East politics through an exploration of its main conflicts and developments since the end of World War II. From the Palestinian question, to peace and war in the region, and the ``Arab Spring''; students will engage in critical evaluation of the roots of key Middle East conflicts, the role that social movements and media play in the regions' trends and developments, and the involvement of superpower rivalry and impact on international politics. The course aims to provide students with an advanced understanding of key Middle East events and theories, and enhances their skill in interpreting political developments in the region. The course enables students to critically evaluate leading scholarship in the field of Middle East politics and international relations, and encourages students to develop their own positions on contemporary issues of the Middle East based on critical assessment of existing literature and empirical evidence.

**IR 5114 Religion and IR Theories**
The proposed course aims at increasing our understanding of how religion shapes international relations. The main topic of the course is the integration of religious subject matter into conceptual frameworks ranging from realism to liberalism and constructivism. The main question is how religion translates into international politics. Hence, theoretical and empirical views are blended together. The subject matter covers whether religious actors can act as strategic actors, whether religions can have variable impact upon war and the likelihood of war in addition to analyses of international politics through the prism of religion and the interaction between secular and religious forces at global level.

**IR 5115 Transnational Security**
Various conceptualizations of security to develop a comprehensive understanding of the transnational challenges facing states and other actors as well as prospects for transnational cooperation. Reconsideration of theoretical positions, approaches, and tools used in security studies from a transnational perspective. New perspectives and policy suggestions to address the most hard-pressing problems of a transnational nature.

**IR 5116 International State-Building**
Dynamics of contemporary policy and practice of state-building interventions through relevant academic and policy literature on sovereignty, stateness and state 'failure' or 'fragility' and specific cases of international state-building interventions. Major theoretical approaches and recent experiences of intervention for constructing knowledge and evaluating the effectiveness and outcomes of the prevailing policy approaches devised as a solution to the problem of weak governance as a source of global insecurity.

**IR 5119 Issues for Turkey in Global Political Economy**
International/global political economy with a focus on issues important for Turkey through a historical overview of the political economy of Turkey in relation to structural economic transformations and political developments in the globalization process. Relationship between the institutional legacy of the early modernization, industrialization during the Ottoman Empire and state-led development in Turkey between 1908 and 1960s, including the role of state in economic growth and development within competing theories of political economy of development. Economic crises and market liberalization period between 1980 and 1991, specifically focusing on the changing role of state and continuities in state-society relationship within the theoretical debate about internationalization of state in globalization process and politics of income distribution in neoliberalism. Major changes and continuities for Turkey in trade, production/foreign direct investment, human development and income distribution in light of the previous debate on the role of state in international political economy.

**MIAPP 501 Term Project**
This course has an accompanying course. Students taking this accompanying course are first expected to agree on a topic with the professor of that course and then write a 5,000 words long term paper on that topic.

**MIAPP 516 International Logistics**
The course provides all of the concepts of international logistics with a special focus on management of international trade operations. The philosophy of international logistics and important international trade elements will be thought within the light of logistics management approaches. It aims to perceive the students the international logistics management and implementations and documentations of international trade. Within this scope, it has been targeted to introduce various sub concepts collectively through the baseline of international logistics and global marketing

along with the processes for the entities of foreign trade management to enable students to understand the effects of the international logistics on international economy and relations. The course begins with the general explanations of international supply chain management in line with international logistics infrastructure and continues with the main implementations of international trade. The course also includes international transportation and security issues along with the competitive support of international logistics within the context of theoretical knowledge.

**MIAPP 555 Public Policy Making in the European Union**

This course is about policy processes in the EU. It is designed to equip students with knowledge, skills and research experience to analyze the challenges in the EU decision-making process. During the lectures, we will try to understand the policy making process in the EU by touching on the most complicated policy areas. Specific focus will be put on the current financial crisis and contemporary debates on the future integration of the EU. At the end of this course, students should be familiar with the complex EU policy making and policy implementing processes with a capacity to examine supranational policy problems and controversies, as well as to develop solutions in the field. The participants of the course will be able to analyze the political environment of European public policy and form effective strategies.

## SAMPLE OF RECENT PUBLICATIONS


• E. Aydinli, G. Biltekin, "Time to Quantify Turkish Foreign Affairs: Setting Quality Standards for a Maturing International Relations Discipline", *International Studies Perspectives* (Forthcoming)

• E. Aydinli, *Violent Non-State Actors: From Anarchists to Jihadists*, London: Routledge, (2016)

• A. Bilgic, "Real People in Real Places: Conceptualizing Power for Emancipatory Security through Tahrir", *Security Dialogue*, 46, 272-290 (2015)

• A. Bilgic, "Hybrid Hegemonic Masculinity of the EU before and after the Arab Spring: A Gender Analysis of Euro-Mediterranean Security Relations", *Mediterranean Politics*, 20, 322-341 (2015)

• A. Bilgic, "We are not barbarians: Gender Politics and Turkey's Quest for the West", *International Relations*, 29, 198-218 (2015)

• A. Bilgic, "Exploring what is good about security? Politics of Security during the Dissolution of Yugoslavia", *J of Balkan and Near Eastern Studies*, 16, 260-278 (2014)

• A. Bilgic, "Trust in World Politics: Converting "Identity" into a Source of Security through Trust-Learning", *Australian J of International Affairs*, 68, 36-51 (2014)

• A. Bilgic, *Turkey, Power and the West: Gendered International Relations and Foreign Policy*, London: I.B. Tauris, (2016)

• A. Bilgic, *Rethinking Security in the Age of Migration: Trust and Emancipation in Europe*, London, Routledge, (2013)

• P. Bilgin, "Contrapuntal Reading" as a Method, an Ethos, and a Metaphor for Global IR", *International Studies Review*, 18, 134-146 (2016)

• P. Bilgin, "What is the point about Sykes–Picot?", *Global Affairs*., 1-5 (2016)

• P. Bilgin, "Beyond the Billiard Ball Model of the International? (symposium review)", *European Political Science*, 15, 117-119 (2016)

• P. Bilgin, "How to remedy Eurocentrism in IR? A complement and a challenge for The Global Transformation", *International Theory*, 8, 492-501 (2016)

• P. Bilgin, "Arguing against security communitarianism", *Critical Studies on Security*, 3, 176-181 (2015)

• P. Bilgin, B. Ince, "Security and Citizenship in Global South: In/securing citizens in early Republican Turkey (1923-1946)", *International Relations*, 29, 500-520 (2015)

• P. Bilgin, "Critical Investigations into the international", *Third World Quarterly*, 35, 1098-1114 (2014)

• P. Bilgin, *The International in Security, Security in the International*, London, Routledge, (2016)

• P. Bilgin, *Regional Security in the Middle East: A Critical Perspective*, London: Routledge, (2005)

• B. Esen, S. Gumuscu, "Turkey - How the Coup Failed", *J of Democracy*, 28, 59-73 (2017)

• B. Esen, S. Gumuscu, "Rising Competitive Authoritarianism in Turkey", *Third World Quarterly*, 37, 1581-1606 (2016)

• T. Fougner, "Fethullah Gulen's Understanding of Women's Rights in Islam: A Critical Reappraisal", *Turkish Studies* (Forthcoming)

• T. Fougner, A. Kurtoglu, "Gender Policy: A Case of Instrumental Europeanization?", *The Europeanization of Turkish Public Policies: A Scorecard*, A. Guney, A. Tekin (Eds.), pp. 143-163, London and New York: Routledge (2016)

• S. Guner, "Secularization, Evolution, and Politics", *Politics, Religion and Ideology* (Forthcoming)

• S. Guner, "Turkey's EU Accession Prospects", *The Great Ctalyst: European Union and Lessons from Greece and Turkey*, B. Temel (Eds.), pp. 201-223, New York: Lexington Books (2014)

• C. Hoffmann, C. Cemgil, "The (un)making of the Pax Turca in the Middle East: Understanding the social-historical rroots of foreign policy", *Cambridge Review of International Affairs* (Forthcoming)

• C. Hoffmann, "Imagining a Middle Eastern 'International Society'?: A reply to Ayla Gol", *Global Discourse*, 5, 395-397 (2015)

• J. Selby, C. Hoffman, "Beyond scarcity: Rethinking water, climate change and conflict in the Sudans", *Global Environmental Change*, 29, 360-370 (2014)

• J. Selby, C. Hoffman, "Rethinking Climate Change, Conflict and Security[ed.vol Routledge in 2016 ]", *Geopolitics*, 19, 747-756 (2014)

• J. Selby, C. Hoffmann, "Beyond Scarcity Failure and Under-Development: Rethinking Water, Climate Change and Conflict in the New Sudans", *Global Environmental Change*, 29, 360-370 (2014)

• P. Ipek, "Oil and Intra-State Conflict in Iraq and Syria: Sub-State Actors and Challenges for Turkey's Energy Security", *Middle Eastern Studies*, 53, 406-419 (2017)

• P. Ipek, "Ideas and Change in Foreign Policy Instruments: Soft Power and the Case of the Turkish International Cooperation and Development Agency (TIKA)", *Foreign Policy Analysis,* 11, 173-193 (2015)

• H. Kirimli, *National Movements and National Identity Among the Crimean Tatars (1905-1916)*, Leiden: E.J.Brill, (1996)

• O. Ozdamar, "Leadership Analysis at a "Great Distance:" Using the Operational Code Construct to Analyze Islamist Leaders", *Global Society* (Forthcoming)

• O. Ozdamar, B.T. Halistoprak, I.E. Sula, "From Good Neighbor to Model: Turkey's Changing Roles in the Middle East şn the Aftermath of the Arab Spring", *International Relations*, 11, 93-113 (2014)

• O. Ozdamar, "Domestic Sources of Changing Turkish Foreign Policy Towards the MENA during 2010s", *Domestic Role Contestation, Foreign Policy and International Relations*, Christian Cantir and Juliet Kaarbo (Eds.), pp. 89-104, New York: Routledge Press. Taylor and Francis Group (2016)

• N. Stone, "The Russian Army in the First World War", *Mitt. Oesterreichischen Sudosteuropa-Inst: Wirtschaft Politik* (Forthcoming)

• N. Stone, *The Atlantic and its Enemies*, Basic Books, USA. (2010)

• N. Stone, *World War One, A Short History [reprinted in 2015]*, Penguin: London, (2007)

• N. Stone, *Europe Transformed 1878-1919*, Blackwells, (1999)

• N. Stone, *The Eastern Front 1914-1917*, Penguin Books, (1998)

• S.B. Sahin, "The rhetoric and practice of the 'ownership' of security sector reform processes in fragile countries: the case of Kosovo", *International Peacekeeping* (Forthcoming)

• S.B. Sahin, "Timor-Leste's Foreign Policy: Securing State Identity in the Post-Independence Period", *J of Current Southeast Asian Affairs*, 33, 3-25 (2014)

• S.B. Sahin, *Intervention and Statemaking: How Exception Became the Norm*, London and New York: Routledge, (2015)

• S. Ladi, D. Tsarouhas, "The Politics of Austerity and Public Policy Reform in the EU", *Political Studies Review*, 12, 171-180 (2014)

• D. Tsarouhas, Social Democracy in Sweeden: *The Threat from a Globalized World*, London and New York: IB Tauris, (2008)

• D. Tsarouhas, "Rethinking the European Social Model", *Delivering Empowered Welfare Societies*, E. Stetter, K. Duffek & A. Skrzypek (Eds.), pp. 145-164, Brussels: FEPS (2016)

• A. Tekin, P. Williams, *Geo-poltiics of the Euro-Asia Energy Nexus: The European Union, Russia and Turkey*, UK: Palgrave MacMillan, (2010)

• P. Williams, "Energy and Trans-European Networks - Energy (TEN-E)", *The Europeanization of Turkish Public Policies: A scorecard*, A. Guney, A. Tekin (Eds.), pp. 46-62, London and New York: Routledge (2016)

Contact:
Dr. Onur İşçi
(Director of Graduate Studies)
Phone : +90 312 290 1249
Fax : +90 312 266 4326
ir@bilkent.edu.tr
ir.bilkent.edu.tr

## Faculty Profile: Dr. Ersel Aydınlı, Professor, Department of International Relations

Ersel Aydınlı specializes in security, transnational relations/terrorism, and Turkish foreign and domestic affairs. He holds an M.A. in international relations from the George Washington University and a Ph.D. in political science from McGill University, and did postdoctoral work at Harvard University's Kennedy School of Government. Prior to joining academia.

Dr. Aydınlı worked in the Turkish state security sector. He has taught at Middle East Technical and George Washington universities. He joined Bilkent in 2001. After chairing the Department of International Relations during 2006-2010, he was appointed as executive director of the Turkish Fulbright Commission, a position in which he continues to serve. Dr. Aydınlı is author of *Violent Non-State Actors: From Anarchists to Jihadists* (Routledge, 2016) and *Yöntem, Kuram, Komplo Türk Uluslararası İlişkiler Disiplininde Vizyon Arayışları* (with E. Kurubaş and H. Özdemir, 2nd edition, 2014). He has also edited such volumes as *Paradigms in Transition: Globalization, Security and the Nation State* (with James N. Rosenau, SUNY Press, 2005) and *Emerging Transnational (In) Security Governance: A Statist Transnationalist Approach* (Routledge, 2010).

He has published numerous articles in journals including *Foreign Affairs*, the *Review of International Studies*, the *Journal of Peace Research, Third World Quarterly, Security Dialogue, Governance*, the *Journal of Democracy*, the *International Studies Review,* and *Terrorism and Political Violence*. He is a frequent commentator for various domestic and international television channels on questions of security/terrorism and Turkish foreign and domestic affairs. He is the co-founder and chief editor of *All Azimuth*, the journal of the İhsan Doğramacı Center for Foreign Policy and Peace Research, of which he is a co-director and board member.

## Faculty Profile: Dr. Selver B. Şahin, Assistant Professor, Department of International Relations

Selver B. Şahin holds a Ph.D. in political science from the University of Canterbury (New Zealand). Prior to joining Bilkent University in September 2013, she worked as a researcher and lecturer in New Zealand and Australia.

Dr. Şahin's research is focused on the forms and consequences of post-conflict reconstruction and state-building interventions in war-affected and fragile states. She has extensive field research experience in conflict-affected settings both independently and as a member of various teams. Her research has been published in her book *International Intervention and State-Making: How Exception Became the Norm* (Routledge, 2015) as well as in various journals including *International Peacekeeping, Democratization, Asian Survey*, the *Australian Journal of International Affairs*, and the *Journal of Balkan and Near Eastern Studies*.

She is a recipient of a grant under a program TÜBİTAK (the Scientific and Technological Research Council of Turkey) administers for researchers returning to the country; the grant supported her research project on the societal and institutional dimensions of the peace-building environment in Kosovo and Macedonia. Dr. Şahin also acts as an honorary research fellow and contact in Turkey for the UN Global Compact Cities Program.


KÜTÜPHANE LIBRARY

# POLITICAL SCIENCE

The Department of Political Science and Public Administration offers advanced degree programs at the M.A. and Ph.D. levels. The M.A. degree in political science is designed to provide students with a solid background in the study of this discipline. M.A. applicants are expected to have an undergraduate degree in political science or a cognate field. The M.A. program is designed to offer students who wish to continue their studies a smooth transition into the department's Ph.D. program. Apart from this, the M.A. program offers an excellent foundation in the study of political science and research training.

The Ph.D. program focuses primarily on preparing candidates for university-level teaching and research. It includes courses intended to broaden and deepen students' knowledge in four core areas of political science: comparative politics, political theory, Turkish politics, and social theory and cultural studies. The program provides students with a sophisticated conceptual framework and analytical skills, enabling them to make original contributions to theory by specializing in a particular aspect of one of the above-mentioned core areas.

## FACULTY

**JAMES ALEXANDER**, Assistant Professor. Ph.D., History, Trinity College, 2000. *Philosophy, political theory, history, empire, drama, religion.*

**İLKER AYTÜRK**, Associate Professor. Ph.D., Near Eastern and Judaic Studies, Brandeis University, 2005. *Nationalism, language politics, Turkey and Israel.*

**H. PINAR BİLGİN**, Professor and Department Chair. Ph.D., International Politics, University of Wales, Aberystwyth, 2000. *Security studies, critical international relations theory, critical security studies.*

**H. TOLGA BÖLÜKBAŞI**, Assistant Professor. Ph.D., Sociology, McGill University, 2007. *Comparative and international political economy, political economy of European integration and Europeanization, comparative welfare states and labor markets, political economy of Turkey.*

**SAİME ÖZÇÜRÜMEZ BÖLÜKBAŞI**, Associate Professor. Ph.D., Political Science, McGill University, 2005. *Comparative politics (advanced industrialized states), politics and governance in the European Union, immigration and asylum law, politics and policy, diversity and citizenship, and politics of healthcare.*

**BERRAK BURÇAK**, Assistant Professor. Ph.D. Near Eastern Studies, Princeton University, 2005. *Late Ottoman modernization.*

**ALEV ÇINAR**, Visiting Professor. Ph.D. Political Science, University of Pennsylvania, 1998. *Society and politics, nation and state building, gender and cultural studies.*

**MERAL UĞUR ÇINAR**, Assistant Professor. Ph.D. Political Science, University of Pennsylvania, 2012. *Nationalism, citizenship, immigration, democracy, constitution making, collective memory, social movements, European and Middle Eastern Politics.*

**ESRA ÇUHADAR**, Associate Professor. Ph. D., Maxwell School of Citizenship and Public Affairs, Syracuse University, 2004. *Conflict, resolution and peacebuilding (negotiation and mediation processes), foreign policy decision-making, political psychology, leadership.*

**TAHİRE E. ERMAN**, Associate Professor. Ph.D., Environmental Psychology, City University of New York, 1992. *Migration, squatter housing, migrant communities, informal sector, urban politics, globalization and urban space, ethnicity and Alevism in the urban context, women's issues, urban poverty.*

**IOANNIS N. GRIGORIADIS**, Associate Professor. Ph.D., Politics, University of London, 2005. *Comparative and international politics, democratization, nationalism, energy, Middle East, Balkan and Turkish politics.*

**JALE GÜRZUMAR**, Instructor. MBA, Department of Business Administration, Middle East Technical University, 1986.

**BANU HELVACIOĞLU**, Adjunct Senior Lecturer. Ph.D., Political Studies, Queen's University, 1988. *Modern political theory, history of political thought, continental political philosophy, aesthetics of politics.*

**METİN HEPER**, Professor. Ph.D., Public Administration, Syracuse University, 1971. *Turkish politics, comparative state, politics and bureaucracy.*

**BAŞAK İNCE**, Assistant Professor. Ph.D., Politics, School of Oriental and African Studies, London 2008. *Turkish politics, citizenship, education, conflict resolution.*

**AIDA JUST**, Associate Professor. Ph.D., Political Science, The State University of New York (at Binghamton), 2005. *Political behavior, public opinion, and political institutions, particularly with respect to the issues of democratic legitimacy, political representation, and international human migration.*

**DANIEL JUST**, Associate Professor. Ph.D., Comparative Literature, NYU, 2005, *Sociology of literature, political theory, as well as issues of cold war culture and the interaction between literature and politics.*

**NEDİM KARAKAYALI**, Associate Professor. Ph.D., Sociology, University of Toronto, 2003. *Social and political theory, history of social and political thought, international migration, science and technology studies, sociology of culture.*

**NİLGÜN FEHİM KENNEDY**, Instructor. Ph.D., Sociology, Middle East Technical University, 2005. *Higher education, social transformation, violence, gender issues, ethics and architecture*.

**ZEKİ SARIGİL**, Associate Professor. Ph.D., Political Science, University of Pittsburgh, 2007. *Institutional theory, ethnonationalism, civil-military relations, Turkish politics*.

**ZERRİN TANDOĞAN**, Instructor. Ph.D., Anthropology, Hacettepe University, 1991. *Culturalism, multiculturalism, transnationalism, research ethics*.

## MASTER OF ARTS IN POLITICAL SCIENCE

**Admission:** Admission is made on the basis of ALES or GRE scores, TOEFL scores, and an interview conducted in English. Applicants should take the ALES (*Akademik Personel ve Lisansüstü Eğitimi Giriş Sınavı*/Academic Personnel and Postgraduate Education Entrance Examination) and must satisfy the announced minimum requirements. Applicants who are not Turkish citizens and Turkish citizen applicants who are residents of a foreign country may take the GRE (Graduate Record Examination) instead of the ALES. All nonnative speakers of English are required to submit proof of proficiency of English.

**Degree requirements:** A candidate for the M.A. degree must successfully complete the program's core curriculum. All candidates must submit and successfully defend an M.A. thesis.

## DOCTOR OF PHILOSOPHY IN POLITICAL SCIENCE

**Admission:** Admission is made on the basis of ALES or GRE scores, TOEFL scores, and an interview conducted in English. Applicants should take the ALES (*Akademik Personel ve Lisansüstü Egitimi Giriş Sınavı*/Academic Personnel and Postgraduate Education Entrance Examination) and must satisfy the announced minimum requirements. Applicants who are not Turkish citizens and Turkish citizen applicants who are residents of a foreign country may take the GRE (Graduate Record Examination) instead of the ALES. All nonnative speakers of English are required to submit proof of proficiency in English.

**Degree requirements:** A candidate for the Ph.D. degree must successfully complete the program's core curriculum and demonstrate competence in written and oral comprehensive examinations. The candidate must take the comprehensive exam by the end of the fifth semester. All candidates must submit a detailed Ph.D. dissertation proposal within six months of passing their comprehensive examinations, and must then complete and successfully defend a dissertation that represents an original contribution to knowledge in the field.

## COURSE DESCRIPTIONS

**POLS 601 Seminar in Turkish Politics**
This is an introductory course on Turkish politics for the Ph.D. Program in Political Science. It covers such topics as political culture, including its antecedents, nationalism and politics, Islam and politics the dynamics of the political system with special reference to political parties and political leaders, the military and politics, and the consequent trial and tribulations of democracy in Turkey

**POLS 602 Seminar in Comparative Politics**
This seminar is designed to introduce students to the major theoretical and conceptual debates in the sub-field of comparative politics. The weekly readings are chosen to reflect the variety of topics and methodological approaches in comparative politics.

**POLS 604 Democratization Process in Turkey**
This course will deal with the processes of democratization and liberalization in Turkey particularly in the light of constitutional and legislative reforms adopted between 1993 and 1995. Attention will also be given to the impact of the EU membership prospective

**POLS 605 The Public Sphere**
This course takes the public sphere as the main field of politics where different political ideologies emerge, contending ideologies clash and power relations take shape. Originally developed by Jurgen Habermas, the notion ``public sphere'' has been extensively and critically debated by writers in relation to democracy, civil society, state-society relations, political participation and the place and function of political identities in relation to these. This course surveys this debate and focuses on the different ways in which the "public sphere" is understood and contextualized, particularly in relation to ethnic, racial and gender identities.

**POLS 606 Seminar in Political Theory**
This course engages in a critical reading of a select number of contemporary thinkers from K. Marx in 19th to L. Irigaray 20th, and to S. Zizek in 21st century. The course starts with the most recent texts and moves backward in history. Although the questions posed each week revolve around the most pressing issues of the present political conjuncture, such controversial concepts as democracy, difference, representation and the subject are analyzed from within a broad range of perspectives.

**POLS 608 Politics, Culture, Nation and Gender**
This course takes the realm of urban daily life as the locus of politics and investigates different dimensions of the making of national identities in relation to issues of gender, race, ethnicity, and class. The readings have been structured so as to explore the complexity of national identities and founding ideologies around several dimensions. First, they will address the ways in which national ideologies are constructed and propagated in relation to race, ethnicity, gender, class, religion or colonial relations, as one or several of these elements converge in the making and contestations of national ideologies in different contexts. Second, the course will simultaneously explore different mediums of representation in the making and contestation of national ideologies, ranging from popular music, novels, architecture, art, films and mass media to clothing, food and other daily practices.

**POLS 609 Issues in Urban Studies**
This course addresses the theoretical and methodological issues in studying the city as a socio-cultural entity, and it aims to reveal urban dynamics that shape the city and city spaces in a variety of contexts. Attention is paid to emerging social and spatial landscapes in our era of globalization. In the class such concepts and topics are explored as the global city, the city in modernity and post-modernity, urban ethnography, suburbanization, gentrification and ghettoization, gated communities, the privatization of urban space, and urban governance, as well as Third World urbanization, squatter formation, migrant enclaves, and local politics. The city is approached critically in terms of gender, ethnicity and class.

**POLS 610 Research Methods**
The purpose of this course is to introduce you to the qualitative research methods in social sciences. Emphasis will be placed both on acquiring skills as a researcher and on learning to evaluate empirical work in political science. We will take up, in turn, basic concepts of qualitative research design and data collection. This is a seminar course and students will design their own research project in the light of the methods discussed in class sessions

**POLS 612 Seminar in Social and Cultural Studies**
This course brings together concepts and perspectives from various fields of the human sciences such as sociology,

psychoanalysis, anthropology and semiology. The focus will be on current analyses of how societies and cultures are formed and break down. Special attention will be paid to the problems and future of contemporary societies and cultures.

**POLS 634 European Union Politics**
An advanced level seminar course on the study of concepts, theories and research on politics and policies in the European Union, member states and accession countries.

**POLS 635 Politics of Turkish Modernization**
This course explores the main themes around which Turkish modernization have revolved throughout the 20th century. It will focus on debates and controversies over modernization, Westernization, nationalism and secularism as they become the main themes of the constitutive norms of the modern Turkish Republic.

**POLS 636 Nationalism and Politics**
The aim of this course is to integrate the study of Turkish nationalism within the broader context of nationalism studies as a general field. While its main emphasis will be on Turkish nationalism, the course will address each theme by reference to the growing literature on nationalism as a global phenomenon.

**POLS 639 The Ecology of Social Relations and Cultural Processes**
This seminar type course aims to explore key concept and models in social theory. One major concern throughout the course will be compare and contrast the perspectives that were developed by social theorists since the nineteenth century with ``ecological'' approaches which propose that the forms that social relations and cultures take can only be intelligible by looking at how human agents interact with their natural and social environments.

**POLS 640 Issues in Political Psychology**
Political Psychology is an interdisciplinary field which explores topics that lie at the intersection between politics and psychology. This is a seminar course that explores various topics in political psychology. The course focuses on various theories in political psychology and their application to domestic and international political processes. Some of these theories are concerned with elite behavior in politics; others try to explain mass political behavior. The topics that will be covered in the seminar include: political communication and media, social identity, authorianism, social dominance orientation, formation of belief systems and political attitudes, decision making and information processing, political leadership, inter-group conflict and cooperation, and collective violence.

**POLS 641 The Ultimate Sources of Politics**
Political theory often considers the question of the most just or right form of politics. This course aims at analyzing the three theoretical foundations of any form of politics originates with God; that politics originates with those who are spirited, strong or powerful; and that it originates with the people. The course will consider them on its own terms: first, theocracy, then timocracy, and finally democracy.

**POLS 643 Issues in Political Theory**
This is a higher level course which aims to extend political theory in terms of depth and breadth. In terms of depth, several major political works (highways) will be considered more reflectively and at more length than is usually possible elsewhere. And in terms of breadth, several rarely studied, little known or highly unconventional works (byways) which have contributed to political theory from odd angles, or what might be seen as cul-de-sac, will be studied. It is hoped that these two different approaches will give a better insight into the canons and canonical subjects of political theory than is possible in a more traditional course.

**POLS 645 Voting Behavior and Political Parties**
Electoral politics in contemporary democracies; party organization and electoral strategies, citizen political participation and vote choice, the consequences of political institutions, the economy, and social identities.

**POLS 646 Politics of the Self**
This course aims to provide an in-depth understanding of divergent perspectives in the social sciences on selfhood, with a particular focus on the challenges that individuals face in forming themselves as autonomous subjects in modern societies. Among the topics that will be discussed in the course are: the relationship between ethics and politics; identity politics in modern societies; the role of reflexivity in the formation and transformation of social structures; alternative types of subjectivity; individualism; and, the role of modern technologies in changing contemporary individuals' self-perception.

**POLS 5431 Politics and Society in Turkey**
This course explores the debates and controversies over modernization, westernization, nationalism and secularism as they become the main themes of the constitutive norms of the modern Turkish Republic. After briefly tracing the historical developments around these themes since the founding of the Republic, the course examines different dimensions of Turkish nationalism and its aspirations for a West-oriented modernity in various contexts of politics and daily life such as the use of public spaces, urban planning issues, differentiation of gender roles, or trends in popular culture.

**POLS 5437 Politics and Literature**
This course discusses literature as a social product, analyzing ways in which it represents reality, reflects on it, and reacts to it. Focusing on the modern period from the nineteenth century to the present, the course examines political aspects of different literary paradigms from realism to postmodernism. We will inquire into the political potential of these paradigms and their political aspirations, and will ask how these paradigms have functioned as modes of social critique and how they have imagined social and political alternatives.

**POLS 5451 Comparative Political Economy of Development**
This seminar course exposes students to some of the main debates in the field of economic and political development and underdevelopment.

**POLS 5462 Globalization: Theories and Experiences**
How thinking about the relationship between political and economic processes has changed in response to the interaction of the domestic and international arenas using examples from Latin America, East Asia, South Asia, the Middle East and North Africa. The experiences of late developers contrasted with those of "early" industrializers to illustrate the importance of "world time" in shaping their developmental trajectories.

**POLS 5467 Conflict, Violence, and Peace**
This is a seminar course that dwells on various theories of social and political conflict, violence, and peace. The course brings together different theoretical approaches developed in sociology, social psychology, cultural anthropology, and political science in addition to some classical texts in philosophy with regard to conflict, violence, and peace. Some of the issues covered are: the origins of social conflict, functions of conflict in a society, different types of social conflict, structure-agency debate with regard to conflict, escalation of conflict, psychological dynamics of social conflict and violence. The course will also examine different theoretical approaches that developed in various social science disciplines with regard to peace and reconciliation.

**POLS 5486 Issues in Comparative Politics**
This module introduces students to advanced research in comparative politics. It centers on the following topics: politics and government, the state, democracy, authoritarian rule, the comparative approach, political culture, political communication, political economy, political participation,

elections and voters, interest groups, political parties, constitutions and the legal framework, multilevel governance, legislatures, the political executive, public management and administration, and public policy.

**POLS 5490 Democracy, Development, and Human Rights**
This course is designed to introduce students to the issues of democracy, development, and human rights from the perspective of comparative politics. We will discuss different conceptualizations, theories, and measurements of these phenomena, analyze the extent to which existing theories contradict or complement each other, and whether their policy prescriptions have been successful in the real world. While the course focuses on how democracy, development, and human rights relate to each other, we will also address the effects of domestic and international institutions, natural resources, political culture, and globalization. The course is designed to provide a general understanding of the patterns and challenges to democracy, development, and human rights; however, we will also pay some attention to regional differences among Latin America, East Central Europe, Asia, and the Middle East.

## SAMPLE OF RECENT PUBLICATIONS

• J. Alexander, "Who was the First Philosopher? Or, How Many Does It Take?", *Think* (Forthcoming)

• J. Alexander, "The Cambridge School, c. 1875 - c. 1975", *History of Political Thought*, 37, 360-386 (2016)

• J. Alexander, "The Fundamental Contradiction of Cosmopolitanism", *European Legacy*, 21, 168-183 (2016)

• J. Alexander, "A Dialectical Definition of Conservatism", *Philosophy,* 91, 215-232 (2016)

• J. Alexander, "The Philosophy of Political History in Oakeshott and Collingwood", *J of the Philosophy of History,* 10, 279-303 (2016)

• J. Alexander, "A Systematic Theory of Tradition", *J of the Philosophy of History,* 10, 1-28 (2016)

• J. Alexander, "Three Major Ideologies of Liberalism, Socialism and Conservatism", *Political Studies*, 63, 980-994 (2015)

• J. Alexander, "A Sketch of a System of Theory and Practice", *Political Studies Review,* 13, 485-493 (2015)

• J. Alexander, "Notes Towards a Definition of Politics", *Philosophy,* 89, 273-300 (2014)

• J. Alexander, *Shaw's Controversal Socialism,* Florida: University of Florida Press, (2009)

• J. Alexander, *Frederick Bulmer: A Life*, London: Cooke and Bulmer, (2009)

• J. Alexander, "Socialism", *George Bernard Shaw in Context,* B. Kent (Eds.), pp. 230-237, Cambridge: Cambridge University Press (2015)

• J. Alexander, "The History of Political Philosophy", *Bloomsbury Companion to Political Philosophy*, A. Fiala (Eds.), pp. 19-31, London: Bloomsbury (2015)

• J. Alexander, "Imitiato Pilati et Christi in Modern Historical Drama", *The Edinburgh Companion to the Bible and the Arts*, S. Prickett (Eds.), pp. 550-563, Edinburgh: Edinburgh University Press (2014)

• P. Dost-Niyego, I. Ayturk, "Holocaust Education in Turkey: Past, Present, and Future", *Contemporary Review of the Middle East,* 3, 250-265 (2016)

• I. Ayturk, "Nationalism and Islam in Cold War Turkey", *Middle Eastern Studies*, 50, 693-719 (2014)

• P. Bilgin, "Contrapuntal Reading" as a Method, an Ethos, and a Metaphor for Global IR", *International Studies Review,* 18, 134-146 (2016)

• P. Bilgin, "What is the point about Sykes–Picot?", *Global Affairs*., 1-5 (2016)

• P. Bilgin, "Beyond the Billiard Ball Model of the International? (symposium review)", *European Political Science,* 15, 117-119 (2016)

• P. Bilgin, "How to remedy Eurocentrism in IR? A complement and a challenge for The Global Transformation", *International Theory,* 8, 492-501 (2016)

• P. Bilgin, B. Ince, "Security and Citizenship in Global South: In/securing citizens in early Republican Turkey (1923-1946)", *International Relations*, 29, 500-520 (2015)

• P. Bilgin, "Arguing against security communitarianism", *Critical Studies on Security*, 3, 176-181 (2015)

• P. Bilgin, "Critical Investigations into the international", *Third World Quarterly,* 35, 1098-1114 (2014)

• P. Bilgin, *The International in Security,* Security in the International, London, Routledge, (2016)

• P. Bilgin, *Regional Security in the Middle East: A Critical Perspective,* London: Routledge, (2005).

• H.T. Bolukbasi, K.G. Oktem, "Conceptualizing and operationalizing social rights: towards higher convergent validity in SCIP and CWED", *J of European Social Policy* (Forthcoming)

• A. Cinar, H. Tas, "Politics of Nationhood and the Displacement of the Founding Moment: Contending Histories of the Turkish Nation", *Comparative Studies in Society & History* (Forthcoming)

• A. Cinar, *Turkey: Producing Globalization Locally*, New York: Routledge. (2009)

• A. Cinar, *Modernity, Secularism and Islam in Turkey: Bodies, Places and Time*, Univ of Minnesota Press, Minneapolis, (2005)

• A. Cinar, "State Building as an Urban Experience: The Making of Ankara", *Power and Architecture*, M. Minkenberg (Eds.), pp. 227-260, Berghahn Books, New York - Oxford (2014)

• M. Ugur Cinar, "Letter from Ankara", *Political Quarterly*, 86, 359-363 (2015)

• K. Cinar, M. Ugur Cinar, "Building Democracy to Last: The Turkish Experience in Comparative Perspective", *Mediterranean Politics*, 20, 342-363 (2015)

• M. Ugur Cinar, "Construction of Gender and National Identity in Turkey: First Lady Images in the Turkish Media (2002-2007)", *Middle Eastern Studies*, 5, 482-492 (2014)

• M. Ugur Cinar, "When Defense Becomes Offense: The Role of Threat Narratives in the Turkish Civil War of the 1970s", *Turkish Studies*, 15, 1-11 (2014)

• M. Ugur Cinar, K. Cinar, "The Second International: The Impact of Domestic Factors on International Organization Dysfunction", *Political Studies,* 62, 669-685 (2014)

• M.U. Cinar, *Collective Memory and National Membership,* Palgrave Macmillan, (2015)

• M.U. Cinar, R.M. Smith, "Nation-Building Narratives: Implications for Immigrants and Minorities", *The Nation State and Immigration The Age of Population Movements,* A. Shapira, Y.Z. Stern, A. Yakobson, L. Orgad (Eds.), pp. 1-30, Sussex Academic (2015)

• E. Cuhadar, J. Kaarbo, B. Kesgin, B. Ozkececi-Taner, "Personality or Role? Comparisons of Turkish Leaders Across Different Institutional Positions", *Political Psychology* (Forthcoming)

• E. Cuhadar, J. Kaarbo, B. Kesgin, B. Ozkececi, "Examining Leaders' Orientations to Structural Constraints: Turkey's 1991 and 2003 Iraqi War Decisions", *J of International Relations and Development.,* 1-26 (2015)

• E. Cuhadar, O.G. Genc, A. Kotelis, "A Greek-Turkish peace project: Assessing the effectiveness of interactive conflict resolution", *J of Southeast European and Black Sea Studies* (Forthcoming)

• E. Cuhadar, R. Kampf, "Does Conflict Content Affect Learning from Simulations? A Cross-National Inquiry into the Israeli-Palestinian and Guatemalan Conflict Scenarios", *Negotation and Conflict Management Research,* 8, 243-260 (2015)

• E. Cuhadar, R. Kampf, "Do computer games enhance learning about conflicts? A cross-national inquiry into proximate and distant scenarios in Global Conflicts", *Computers in Human Behavior,* 52, 541-549 (2015)

• E. Cuhadar, R. Kampf, "Learning about Conflict and Negotiations through Computer Simulations: The Case of PeaceMaker", *International Studies Perspectives,* 15, 142-162 (2014)

• E. Cuhadar, D. Druckman, "Representative Decisionmaking: Challenges to Democratic Peace Theory",*Handbook of International Negotiation: Interpersonal, Intercultural, and Diplomatic Perspectives,* M. Gallucio (Eds.), pp. 3-14, New York: Springer (2015)

• T. Erman, "Formalization by the State, Back to Informalization by the People: A Gecekondu (Squatter) Transformation Housing Estate as the Site of Multiple Discrepancies", *Int J of Urban and Regional Research*, 40, 425-440 (2016)

• T. Erman, "Ethnography in the Urban Periphery: Understanding the Gecekondu", *Ethnologie Francaise,* 44, 267-278 (2014)

• I.N. Grigoriadis, "The Peoples' Democratic Party (HDP) and the 2015 elections", *Turkish Studies*, 17, 39-46 (2016)

• I. Grigoriadis, "The Turkish Presidential Elections of 10 August 2014", *Mediterranean Politics,* 20, 1-6 (2015)

• I. Grigoriadis, "The Cyprus Question: A Window of Opportunity in 2014?", *IEMED Observatory Focus,* 110, 1-3 (2014)

• I. Grigoriadis, "Turkey's Foreign Policy Activism: Between Vision Continuity and Reality Check", *J of Southeast European and Black Sea Studies*, 14 (2014)

• I. Grigoriadis, "Energy Discoveries in the Eastern Meditteranean: Conflict or Cooperation?", *Middle East Policy,* 11, 124-133 (2014)

• I. Grigoriadis, T. Gurcel, "Religious Courses in Turkish Public Education: Explaining Domestic Change with Europeanization Theory", *J of Church and State*, 56, 300-322 (2014)

• I.N. Grigoriadis, Instilling Religion in Greek and Turkish Nationalism: *A "Sacred Synthesis"*, London and New York: Palgrave MacMillan, (2012)

• I. Grigoriadis, "On the Europeanization of Minority Rights Protection", *The Europeanization of Turkish Public Policies: A Scorecard,* A. Guney, A. Tekin (Eds.), pp. 130-142, London and New York: Routledge (2015)

• B. Helvacioglu, "Modern Death in Don DeLillo: A Parody of Life?", *Mosaic*, 48, 179-196 (2015)

• M. Heper, *The State and Kurds in Turkey: The Question of Assimilation*, Macmillan Palgrave, UK, (2007)

• M. Heper, *Historical Dictionary of Turkey (Second Updated & Expanded Version) [reprinted in 2009 with N.B. Criss]*, The Scarecrow Press: Lanham, Maryland, (2002)

• M. Heper, *Ismet Inonu: The Making of a Turkish Statesman,* Brill Academic Publishers, (1998)

• M. Heper, *Historical Dictionary of Turkey,* Scarecrow Press, (1994)

• P. Bilgin, B. Ince, "Ontological (in)security of "included" citizens: The case of early Republican Turkey (1923-1946)", *Conflict Resolution and Ontological Security: Peace Anxieties*, B. Rumelili (Eds.), pp. 117-135, London Routledge (2015)

• B. Ince, *Citizenship and Identity in Turkey: From Ataturk to the Present*, London: I.B. Tauris, (2012)

• A. Just, "The Far-right, Immigrants, and the Prospects of Democracy Satisfaction in Europe", *Party Politics* (Forthcoming)

• A. Just, C.J. Anderson, "Dual Allegiances? Immigrants' Attitudes toward Immigration", *J of Politics,* 77, 188-201 (2015)

• A. Just, C.J. Anderson, "Opinion Climates and Immigrant Political Action", *Comparative Political Studies*, 47, 935-965 (2014)

• A. Just, E.M. Sandovici, O. Listhaug, "Islam, Religiosity, and Immigrant Political Action in Western Europe", *Social Science Research,* 43, 127-144 (2014)

• D. Just, "Literature and Learning How to Live: Milan Kundera's Theory of the Novel as a Quest for Maturity", *Comparative Literature,* 88, 235-250 (2016)

• D. Just, "A Biopolitics of Immaterial Labor", *Political Studies*, 64, 401-416 (2016)

• D. Just, "Milan Kundera and the Poetics of Novelistic Truth", *Poetics Today*, 36 (2015)

• D. Just, *Literature, Ethics, and Decolonization in Postwar France: The Politics of Disengagement,* Cambridge: Cambridge University Press, (2015)

• N. Karakayali, "Adapting, Defending and Transforming Ourselves: Conceptualizations of Self Practices in the Social Science Literature", *History of the Human Sciences*, 28, 98-117 (2015)

• N. Karakayali, "Two Ontological Orientations in Sociology: Building Social Ontologies and Blurring the Boundaries of the 'Social'", *Sociology,* 49, 732-747 (2015)

• N. Karakayali, "Social Distance", *The Wiley Blackwell Encyclopedia of Race, Ethnicity, and Nationalism,* John Stone, Rutledge M. Dennis, Polly S. Rizova, Anthony D. Smith, and Xiaoshuo Hou (Eds.), pp. 1-2, John Wiley&Sons (2016)

• N.F. Kennedy, *The Ethos of Architects*, Lambert Academic Publishing, Germany, (2010)

• S. Ozcurumez, D. Yetkin, "What moves the high skilled and why? Comparing Turkish Nationals in Canada and Germany", *International Migration*, 54, 61-72 (2016)

• S. Ozcurumez, J. Hoxha, "Conditional Deliberation: The Case of Joint Parliamentary Committees in the EU", *J of Common Market Studies*, 53, 642-647 (2015)

• S. Ozcurumez, D. Yetkin, "Limits to Regulating Irregular Migration in Turkey: What constraints public policy and why?", *Turkish Studies*, 15, 442-457 (2014)

• Z. Sarigil, E. Karakoc, "Inter-ethnic (In)tolerance between Turks and Kurds: Implications for Turkish Democratisation", *South European Society and Politics* (Forthcoming)

• Z. Sarigi, E. Karakoc, "Who Supports Secession? The Determinants of Secessionist Attitudes Among Turkey's Kurds", *Nations and Nationalism*, 22, 325-346 (2016)

• Z. Sarigil, "Showing the Path to Path Dependence: The Habitual Path", *European Political Science Review,* 7, 221-242 (2015)

• Z. Sarigil, "The Turkish Military: Principal or Agent?", *Armed Forces and Society,* 40, 168-190 (2014)

• Z. Sarigil, O. Fazlioglu, "Exploring the roots and dynamics of Kurdish ethno-nationalism in Turkey", *Nations and Nationalism,* 20, 436-458 (2014)

Contact:
Dr. Esra Çuhadar
(Graduate Student Advisor)
Phone : +90 312 290 1339
Fax : +90 312 290 2742
polsgrad@bilkent.edu.tr
pols.bilkent.edu.tr

## Faculty Profile: Dr. Aida Just, Associate Professor, Department of Political Science and Public Administration

Aida Just received a Ph.D. in political science from the State University of New York (SUNY) at Binghamton in 2005. Prior to assuming her current position at Bilkent, Dr. Just was a tenured faculty member in the Department of Government at the University of Essex (2007-2010), and a visiting scholar at Columbia University (2013). She is also a member of the planning committee of the international election study project, the Comparative Study of Electoral Systems (2014-2018). Dr. Just's research interests focus on comparative political behavior, public opinion, and political institutions, particularly with respect to the issues of democratic legitimacy, political representation, and international migration.

Her publications include articles in the *Journal of Politics*, the *British Journal of Political Science, Comparative Political Studies,* the *European Political Science Review*, the *Journal of Peace Research, Party Politics, Electoral Studies, Social Science Research*, and the *Journal of Political and Military Sociology*, as well as contributions to the edited volumes *The Social Logic of Politics* (Temple University Press, 2005), and *The Oxford Research Encyclopedia of Politics* (Oxford University Press. 2017) *Political Parties and Partisanship* (Routledge, 2009). Dr. Just's research has been recognized by several international awards, including the Best Paper Award from the *Journal of Politics* in 2008, and the award for the Best Paper on European Politics & Society from the American Political Science Association (APSA) in 2008. She also received the Emerging Scholar Award (GEBİP) from the Turkish Academy of Sciences (TÜBA) in 2012.

## Faculty Profile: Dr. Metin Heper, Professor, Department of Political Science and Public Administration

Metin Heper received a Ph.D. in Public Administration from Syracuse University in 1971. He has been a research fellow at Harvard University, a Fulbright Scholar and visiting professor at the University of Connecticut, a Lester Martin Fellow at the Hebrew University of Jerusalem, a Simon Senior Research Fellow at the University of Manchester (UK), and a research fellow, Madeleine Haas Russell Visiting Professor of Non-Western and Comparative Politics, and a visiting professor at Princeton University. At Bilkent University, he is the founding chair of the Department of Political Science and has served as university provost and dean of the Faculty of Economics, Administrative, and Social Sciences.

A founding member of the Turkish Academy of Sciences, Prof. Heper is the author of several books, including *The State Tradition in Turkey, İsmet İnönü: the Making of a Turkish Statesman, The State and Kurds in Turkey: The Question of Assimilation*, and the *Historical Dictionary of Turkey*. He has published a large number of articles in leading international journals, and served as the editor or coeditor of *Islam and Politics in the Modern Middle East, The State, the Military and Democracy in Turkey, Turkey and the West: Changing Political and Cultural Identities, Politics in the Third Turkish Republic, Local Government in Turkey, The State and Public Bureaucracies: A Comparative Perspective, Strong State, Economic Interest Groups: The Post-1980 Turkish Experience, Institutions, Democratic Statecraft, and The Routledge Handbook of Modern Turkey*. Prof. Heper is the recipient of the Scientific and Technological Research Council of Turkey's 2016 Science Award in the Social Sciences.

# PSYCHOLOGY

The M.A. and Ph.D. programs in the Department of Psychology are designed to build a strong, interdisciplinary background in theory and research in the psychological sciences. The programs focus on cognitive, social and developmental as well as neuroscience. Graduate students are expected to participate in research activities upon entering the program. To support psychological research, the university has developed an infrastructure that includes the National Magnetic Resonance Research Center (UMRAM), along with state-of-the-art research laboratories equipped with observation rooms for testing children and adults, a genetic testing room, and testing rooms for psychophysical and behavioral experiments.

## FACULTY

**MICHELLE M. ADAMS**, Associate Professor. Ph.D., Neurobiology, Mount Sinai School of Medicine - New York University, 2001. *Cellular and synaptic changes in the aging brain.*

**LAITH AL-SHAWAF**, Assistant Professor. Ph.D., Psychology, The University of Texas at Austin, 2014. *Applied statistical modeling, cognitive science, philosophy, cognition, emotion.*

**JEDEDIAH ALLEN**, Assistant Professor. Ph.D., Developmental Psychology, Lehigh University, 2012. *Imitation, infant research methodology, the nativist-empiricist debate, the emergence of new knowledge.*

**GAMZE BARAY**, Instructor. Ph.D., Social and Organizational Psychology, University of Exeter, UK, 2007. *Intergroup relations, religious and cultural identity, moral psychology.*

**MİRİ BESKEN**, Assistant Professor. Ph.D., Cognitive Psychology, University of North Carolina, 2011. *Memory, learning, cognition, meta-cognition.*

**HÜSEYİN BOYACI**, Associate Professor. Ph.D., Physics, Bilkent University, 1999. *Visual perception, cognitive neuroscience.*

**AARON M. CLARKE**, Assistant Professor. Ph.D., Psychology, North Dakota State University, Centre for Visual Neuroscience, 2010. *Neural synchrony and asynchrony as mechanisms for perceptual grouping and segmentation. Vision sciences, time-frequency analysis, microstate analysis, event-locked, steady-state, ROI analysis.*

**JENNIFER E. CORBETT**, Assistant Professor. Ph.D., Cognitive Science, The University of British Columbia, 2007. *Perceptual averaging /ensemble encoding, visual stability, visual attention, working memory and executive functions. spatiotemporal integration, segmentation and grouping, multisensory interactions.*

**KATJA DOERSCHNER**, Associate Professor. Ph.D., Experimental Psychology, New York University, 2006. *Visual perception of object qualities, machine vision, brain structure and function in rare genetic cases.*

**SELİN SALMAN ENGİN**, Instructor. Ph.D., Social Psychology, Middle East Technical University, 2014. *Attachment across the life span, parenting, social development.*

**GÜL GÜNAYDIN**, Assistant Professor. Ph.D., Social and Personality Psychology, Cornell University, 2013. *Interpersonal cognition, impression formation, close relationships and mental representations of close relationship partners.*

**HANDE ILGAZ**, Assistant Professor. Ph.D., Child Development, Lehigh University, 2011. *Children's cognitive, language, and social-cognitive development.*

**ALİ KHATIBI**, Assistant Professor. Ph.D., Psychology, University of Leuven, Belgium, 2014. *Pain communication, cerebrospinal correlates of pain, cognitive bias in pain, cognitive neuroscience, pain management.*

**JACOB ALEX MUNNEKE**, Assistant Professor. Ph.D., Cognitive Psychology. Vrije Universiteit Amsterdam, 2010. *Visual attention, visual working memory, value-driven cognition, binocular vision, psychopathy, visual search & cognitive neuroscience.*

**EZGİ SAKMAN**, Instructor. Ph.D., Social Psychology, Middle East Technical University, 2016. *Attachment system and its activation, functionality of insecure attachment in cultural context.*

**TIMOTHEA TOULOPOULOU**, Visiting Associate Professor and Department Chair. Ph.D., Neuropsychology, University of London, 2001. *Abnormal psychology, biological psychology, brain development, schizophrenia.*

## MASTER OF ARTS IN PSYCHOLOGY

**Admission:** Applicants must have a degree from a related undergraduate program. Applicants who are Turkish citizens should take the ALES (*Akademik Personel ve Lisansüstü Eğitimi Giriş Sınavı*/Academic Personnel and Postgraduate Education Entrance Examination). Applicants who are not Turkish citizens and Turkish citizen applicants who are residents of a foreign country may take the GRE (Graduate Record Examination) instead of the ALES. All nonnative speakers of English are required to submit proof of proficiency in English. Minimum requirements are announced by the Graduate School of Economics and Social Sciences.

**Degree Requirements:** Candidates must successfully complete at least 21 credits and 11 courses, and must prepare and defend a thesis.

## DOCTOR OF PHILOSOPHY IN PSYCHOLOGY

**Admission:** Applicants must have a degree from a related undergraduate program for the Doctor of Philosophy Program without a Master's and a degree from a related graduate program for the Doctor of Philosophy Program with a Master's. Applicants who are Turkish citizens should take the ALES (*Akademik Personel ve Lisansüstü Eğitimi Giriş Sınavı*/Academic Personnel and Postgraduate Education Entrance Examination). Applicants who are not Turkish citizens and Turkish citizen applicants who are residents of a foreign country may take the GRE (Graduate Record Examination) instead of the ALES. All nonnative speakers of English are required to submit proof of proficiency in English. Minimum requirements are announced by the Graduate School of Economics and Social Sciences.

**Degree requirements:** Candidates with a master's degree must successfully complete at least 21 credits and 11 courses. Those without a master's degree must successfully complete at least 45 credits and 20 courses. All candidates must prepare and defend a dissertation.

## COURSE DESCRIPTIONS

**PSYC 501 Advanced Cognitive Psychology**
This course will serve as a general introduction to cognitive psychology at a graduate level. It aims to give breadth and depth of expertise to cognitive area students and relevant background knowledge to non-cognitive area students, and to highlight methods and approaches as well as new trends in cognitive psychology.

**PSYC 502 Advanced Developmental Psychology**
This course is a general introduction to developmental theory and research. It will cover developmental theories such as attachment theory, Vygotsky, and Piaget's theories, etc. as well as areas of research such as language development, infancy, social cognition, emotional development, moral development and cognitive development.

**PSYC 510 Advanced Social Psychology**
This graduate seminar aims to survey cutting-edge theory and research on topics at the heart of social psychology. Students will read selected social psychological articles from top journals in the field and will be encouraged to think critically about social psychological research and to identify strengths and weaknesses of research studies.

**GE 512 Quantitative Data Analysis**
Professional statistical training while working with actual research data sets. Working with real life data to calculate descriptive statistics and perform inferential statistical tests. Practical training in the use of statistical software to analyze data sets. Sets of skills that enable to work with research data in professional settings. Specific tests conducted appropriate for a) relevant research questions, and b) structure of data (e.g., interval/ratio vs. nominal data). Tests possibly including, but not necessarily limited to, t-tests (single-sample, repeated-measures, and between-subjects), ANOVA (one-way, factorial, within-subjects, between-subjects, mixed models, and ANCOVA), correlation (zero-order bivariate, part, and partial), regression (e.g., simple linear regression, multiple regression, and logistic regression), as well as non-parametric tests (e.g., chi-square analyses, Mann-Whitney U test, and Kruskal-Wallis' H).

**PSYC 515 Selected Topics in Psychology I**
The aim of this course is to help students obtain more in-depth knowledge in a sub-area of psychology. To this end, this graduate seminar will survey cutting-edge theory and research on a selected topic in psychology.

**PSYC 535 Meta-analysis**
Meta-analysis. Effect sizes. Fixed and random effects. Heterogeneity. Moderators. Dependencies. Power. Sensitivity analysis.

**PSYC 575 Advanced Training in Psychological Research I**
The aim of this course is to help students obtain skills necessary to carry out independent research by gaining an integrated, hands-on experience with conducting research and preparing research reports in the psychological sciences. To obtain these skills, students will work with a faculty member on a research project other than their thesis project.

**PSYC 591 Pro-Thesis Seminars I**
Students will prepare for their thesis work by presenting material related to their thesis and attending presentations of other students.

**PSYC 599 M.A. Dissertation**
Students add this course to work on their master's thesis every semester after their thesis advisor and topics are determined.

**GE 590 Academic Practices**
This course aims to contribute to the preparation of graduate students for academic studies and research. It includes practical classroom teaching, practical lab assistance and teaching, practice in conducting exams and grading assignments.

**PSYC 691 Pro-Thesis Seminars II**
Students will prepare for their doctoral dissertation by presenting material related to their dissertation and attending presentations of other students.

**PSYC 699 Ph.D. Dissertation**
Students add this course to work on their Ph.D. dissertation every semester after their thesis advisor and topic are determined.

**GE 500 Research Methods and Academic Publication Ethics**
Preparation of graduate students for their careers. Regular discussion of term project, thesis, or dissertation with academic advisor. Attendance in various research seminars or scholarly talks offered regularly at the departments. Participation in a series of independent modules including workshops, short courses, and seminars in the Fall and Spring semesters on "Academic Integrity", "Effective Teaching", and other topics such as doing literature searches and publishing.

**GE 690 Academic preparation for doctoral students**
This course aims to contribute to the preparation of doctoral students for their academic careers. It includes practical classroom teaching, practical lab assistance and teaching, practice in conducting exams and grading assignments. It requires attendance in various research seminars or scholarly talks offered regularly at the departments as well as participation in a series of independent modules including workshops, short courses, and seminars in the Fall and Spring semesters on "Academic Integrity", "Effective Teaching", and other topics such as doing literature searches and publishing.

## SAMPLE OF RECENT PUBLICATIONS


• A. Arslan-Ergul, B. Erbaba, E.T. Karoglu, D.O. Halim, M.M. Adams, "Short-term dietary restriction in old zebrafish changes cell senescence mechanisms", *Neuroscience*, 334, 64-75 (2016)

• F. Doldur-Balli, M.N. Ozel, S. Gulsuner, A.B. Tekinay, T. Ozcelik, O. Konu, M.M. Adams, "Characterization of a novel zebrafish (Danio rerio) gene, wdr81, associated with cerebellar ataxia, mental retardation and dysequilibrium syndrome (CAMRQ)", *BMC Neurosciences*, 16, 96-1--17 (2015)

• A. Arslan-Ergul, M.M. Adams, "Gene Expression changes in aging zebrafish (Danio rerio) brains are sexually dimorphic", *BMC Neurosciences*, 15, 29-1--11 (2014)

• E.D. Celebi-Birand, E.T. Karoglu, F. Doldur-Balli, M.M. Adams, "Mammalian Target Of Rapamycin (mTOR), Aging, Neuroscience, And Their Association With Aging-Related Diseases", *Molecules To Medicine*, K. Maiese (Eds.), pp. 185-205, United Kingdom: Elsevier (2016)

• D. Sznycer, L. Al-Shawaf, Y. Bereby-Meyer, …, L. Cosmides, J. Tooby, "Cross-cultural regularities in the cognitive architecture of pride", *Proceedings of National Academy of Sciences USA* (Forthcoming)

• D.M.G. Lewis, L. Al-Shawaf, D. Conroy-Beam, K. Asao, D.M. Buss, "Evolutionary Psychology: A How-To Guide", *American Psychologist* (Forthcoming)

• D.M.G. Lewis, L. Al-Shawaf, M.C. Janiak, S.P. Akunebu, "Integrating molecular genetics and evolutionary psychology: Sexual jealousy and the androgen receptor (AR) gene", *Personality and Individual Differences* (Forthcoming)

• D.M.G. Lewis, M. Anderson, L. Al-Shawaf, "Contemporary evolutionary psychology and the evolution of intelligence. Commentary on Burkhart et all.", *Behavioral and Brain Sciences* (Forthcoming)

• L. Al-Shawaf, "Could there be a male commitment skepticism bias and a female sexual overperception bias? Novel hypotheses based on Error Management Theory", *Evolutionary Psychological Science*, 2, 237-240 (2016)

• L. Al-Shawaf, "The evolutionary psychology of hunger", *Appetite*, 105, 591-595 (2016)

• L. Al-Shawaf, D.M.G. Lewis, D.M. Buss, "Disgust and Mating Strategy", *Evolution & Human Behavior*, 36, 199-205 (2015)

• L. Al-Shawaf, D.M.G. Lewis, T.R. Alley, D.M. Buss, "Mating Strategy, disgust and food neophobia", *Appetite*, 85, 30-35 (2015)

• D.M.G. Lewis, L. Al-Shawaf, E.M. Russell, D.M. Buss, "Friends and happiness: An evolutionary perspective on friendship", *Friendship and Happiness,* M. Demir (Eds.), pp. 37-57, Springer (2015)

• J.W.P. Allen, "How to help: can more active behavioral measure help transcend the infant false-belief debate?", *New Ideas in Psychology,* 39, 63-72 (2015)

• J.W.P. Allen, M.H. Bickhard, "Stepping Back: Reflections on a Pedagogical Demonstration of Reflective Abstraction", *Human Development,* 58, 245-252 (2015)

• J.W.P. Allen, D.S. Bennett, D.P. Carmody, Y. Wang, M. Lewis, "Adolescent risk-taking as a function of prenatal cocaine exposure, sex and environmental risk", *Neurotoxicology and Teratology*, 41, 65-70 (2014)

• G.V. Oades-Sese, D. Cohen, J.W.P. Allen, M. Lewis, "Little Children, BIG Challenges: Building Resilience in Young Children the Sesame Street Way", *Resilience Interventions for Youth in Diverse Populations*, S. Prince-Embury, D. Saklofske (Eds.), pp. 181-201, New York: Springer (2014)

• M. Besken, "Picture-perfect is not Perfect for Metamemory: Testing the Perceptual Fluency Hypothesis with Degraded Images", *J of Experimental Psychology: Learning, Memory, Cognition*, 42, 1417-1433 (2016)

• Z. Pamir, H. Boyaci, "Context-dependent lightness affects perceived contrast", *Vision Research,* 124, 24-33 (2016)

• H.B. Turkozer, Z. Pamir, H. Boyaci, "Contrast Affects fMRI Activity in Middle Temporal Cortex Related to Center–Surround Interaction in Motion Perception", *Frontiers in Psychology,* 7 (2014)

• H. Boyaci, K. Simsek, E. Subasi, "Effect of contiguity and figure-ground organization on the area rule of lightness", *J of Vision*, 14, 1-11 (2014)

• M. Manassi, S. Lonchampt, A. Clarke, M.H. Herzog, "What crowding can tell us about object representations", *J of Vision*, 16, 35-1--13 (2016)

• M.N. Agaoglu, A.M. Clarke, M.H. Herzog, H. Ogmen, "Motion-based nearest vector metric for reference frame selection in the perception of motion", *J of Vision*, 16, 14-1--16 (2016)

• J.E. Corbett, "The Whole Warps the Sum of Its Parts: Gestalt-Defined-Group Mean Size Biases Memory for Individual Objects", *Psychological Science* (Forthcoming)

• J.E. Corbett, P. Venuti, D. Melcher, "Perceptual Averaging in Individuals with Autism Spectrum Disorder", *Frontiers in Psychology* (Forthcoming)

• B. Akin, C. Ozdem, S. Eroglu, D. Taslak-Keskin, F. Fang, K. Doerschner, D. Kersten, H. Boyaci, "Attention modulates neuronal correlates of interhemispheric integration and global motion perception", *J of Vision,* 14, 1-13 (2014)

• O. Yilmaz, K. Doerschner, "Detection and localization of specular surfaces using image motion cues", *Machine Vision and Applications*, 25, 1333-1349 (2014)

• S. Salman-Engin, T. Little, V. Gaskin-Butler, J. McHale, "A Prenatal Coparenting Intervention with Unmarried Father-Mother Dyads: Fidelity of Intervention Delivery by Male-Female Community Mentor Teams", *J of Nursing Research* (Forthcoming)

• J. McHale, S. Salman-Engin, M. Coovert, "Improvements in unmarried African American parents' rapport, communication and problem-solving following a prenatal coparenting intervention", *Family Process,* 54, 619-629 (2015)

• V. Gaskin-Butler, K. McKay, G. Gallardo, S. Salman-Engin, T. Little, J. McHale, "Thinking three rather than 2+1: How a coparenting framework can transform infant mental health efforts with unmarried African American parents", *Zero to Three,* 35, 49-58 (2015)

• G. Gunaydin, E. Selcuk, V. Zayas, "Impressions Based on a Portrait Predict, 1-Month Later, Impressions Following a Live Interaction", *Social Psychological and Personality Science* (Forthcoming)

• G. Gunaydin, E. Selcuk, A.D. Ong, "Trait Reappraisal Predicts Affective Reactivity to Daily Positive and Negative Events", *Frontiers in Psychology*., 1-9 (2016)

• E. Selcuk, G. Gunaydin, A.D. Ong, D.A. Almeida, "Does partner responsiveness predict hedonic and eudaimonic well-being? A 10-year longitudinal study", *J of Marriage and Family,* 78, 311-325 (2016)

• G. Gunaydin, J.E. DeLong, "Reverse correlating love: Highly passionate women idealize their partner's facial appearance", *Plos One,* 10, 0121094-1--10 (2015)

• V. Zavas, G. Gunaydin, Y. Shoda, "From an unknown other to an attachment figure: How do mental representations change with attachment formation?", *Bases of Adult Attachment: Linking Brain, Mind and Behavior,* V. Zavas, C. Hazan (Eds.), pp. 157-183, Springer (2015)

• A. Nicolopoulou, K.S. Cortina, H. Ilgaz, C.B. Cates, A.B. de Sa, "Using a narrative-and-play-based activity to promote low-income preschoolers' oral language, emergent literacy, and social competence", *Early Childhood Research Quarterly,* 31, 147-162 (2015)

• D.S. Weisberg, H. Ilgaz, K. Hirsh-Pasek, R.M. Golinkoff, A. Nicolopoulou, D. Dickinson, "Shovels and Swords: How realistic and fantastical themes affect children's word learning", *Cognitive Development*, 35, 1-14 (2015)

• K.E. Ridge, D.S. Weisberg, H. Ilgaz, K.A. Hirsh-Pasek, R.M. Golinkoff, "Supermarket Speak: Increasing Talk Among Low-Socioeconomic Status Families", *Mind, Brain and Education,* 9, 127-135 (2015)

• A. Nicolopoulou, H. Ilgaz, "What do we know about pretend play and narrative development? A response to Lillard, Lerner, Hopkins, Dore , Smith, and Palmquist on "The impact of pretend play on children's development: A review of the evidence", *American J of Play,* 6, 55-81 (2014)

• A. Khatibi, "Be precise and suffer less pain! A comment on "A brief intervention utilising visual feedback reduces pain and enhances tactile acuity in CLBP patients", *J of Back and Musculoskeletal Rehabilitation* (Forthcoming)

• F. Akbari, M. Dehghani, A. Khatibi, T. Vervoort, "Incorporating Family Function into Chronic Pain Disability: The Role of Catastrophizing", *Pain Research and Management.,* 6838596-1--9 (2016)

• J. Todd, L. Sharpe, B. Colaguiri, A. Khatibi, "The effect of threat on cognitive biases and pain outcomes: An eye-tracking study", *European J of Pain,* 20, 1357-1368 (2016)

• T. Toulopoulou, M. Picchioni, P.B. Mortensen, L. Petersen, "IQ, the Urban Environment, and Their Impact on Future Schizophrenia Risk in Men", *Schizophrenia Bulletin* (Forthcoming)

• J.P. Andre, M. Picchioni, R. Zhang, T. Toulopoulou, "Working memory circuit as a function of increasing age in healthy adolescence: A systematic review and meta-analyses", *NeuroImage: Clinical* (Forthcoming)

• R.M. Zhang, M. Picchioni, P. Allen, T. Toulopoulou, "Working Memory in Unaffected Relatives of Patients With Schizophrenia: A Meta-Analysis of Functional Magnetic Resonance Imaging Studies", *Schizophrenia Bulletin*, 42, 1068-1077 (2016)

Contact:
Dr. Timothea Toulopoulou
(Department Chair)
Phone : +90 312 290 3415
Fax : +90 312 266 4960
psy.grad@bilkent.edu.tr
psy.bilkent.edu.tr

## Faculty Profile: Dr. Timothea Toulopoulou, Visiting Associate Professor, Department of Psychology

Timothea Toulopoulou received her Ph.D. from the University of London in 2001. She completed most of her postgraduate training and began her career at the Institute of Psychiatry, Psychology and Neuroscience at King's College London, where she retains a visiting position. After heading the Psychosis Lab and serving as the director of Biopsychosocial and Developmental Research at the University of Hong Kong, she was appointed chair of the Department of Psychology at Bilkent University in September 2015.

Dr. Toulopoulou's research fellowships have included a Canon Foundation in Europe Research Fellowship (2003) that allowed her to do work at Hamamatsu Medical School in Japan; a two-year Young Investigator Award (2005) from the National Alliance of Research on Schizophrenia and Affective Disorders (USA) that she completed at Harvard Medical School; and a one-year fellowship (2011) from the Chinese Academy of Sciences that she completed at the Institute of Psychology in Beijing, China.

Dr. Toulopoulou served as lead scientist for the Genes and Cognition work package of the European Community's 6th Framework Programme, and is a partner in the (current) 7th Framework Programme. She has received grants or subcontracts from the Economic and Social Research Council (UK), the Research Grants Council (Hong Kong), and the National Institutes of Health (USA). She reviews for numerous journals on a regular basis, is a member of the editorial boards of several journals, and serves as a fellowship and grant reviewer for organizations including the Wellcome Trust (UK), the Medical Research Council (UK), and the European Research Council.

Research in her lab focuses on understanding the genetic, neurobiological, cognitive, and environmental mechanisms that influence an individual's susceptibility to developing schizophrenia.

## Faculty Profile: Dr. Gül Günaydın, Assistant Professor, Department of Psychology

Gül Günaydın received a bachelor's degree in business from Middle East Technical University. Before starting her graduate education at Cornell University, she spent a year at the University of California, Berkeley, as a Fulbright Fellow, conducting research on interpersonal relationships. She completed a Ph.D. in psychology at Cornell and joined the Bilkent University Department of Psychology as an assistant professor in 2013.

In her research, Dr. Günaydın studies interpersonal relationships using a multidisciplinary approach that draws on research and theory from social and cognitive psychology. Her current research focuses on how others, from unknown individuals to romantic partners, are mentally represented, and the consequences of those representations for impression formation, interpersonal behavior, and emotion regulation.

Dr. Günaydın's research has been funded by grants and awards from TÜBİTAK (the Scientific and Technological Research Council of Turkey) and TÜBA (the Turkish Academy of Sciences). Dr. Günaydın is currently an associate editor for *Frontiers in Psychology* and has recently received the TÜBA Outstanding Young Scientist Award. Her research has been published in journals including the *Journal of Personality and Social Psychology,* the *Journal of Experimental Social Psychology*, and *Social Psychological* and *Personality Science*.

# ARCHAEOLOGY

The Department of Archaeology offers a unique opportunity for graduate students to pursue the study of Anatolian, Near Eastern, and Mediterranean art and archaeology in a multicultural setting. Given its growing international prominence and its location in the heart of Turkey, Bilkent University provides an ideal environment for students interested in this field. Within easy reach of Ankara are central Anatolian sites such as Boğazköy, Alacahöyük, Gordion, and Pessinus; the west and south coasts of the country are particularly rich in classical sites. The department arranges field trips to museums and sites in the vicinity of Ankara and further afield. There are ample resources for research, as the libraries and museums in Ankara are easily accessible, and the archaeology section of Bilkent's library is developing rapidly.

Since its inception in 1988, the Department of Archaeology has attracted an international faculty. Current professors come from Turkey, France, Great Britain, Canada, Germany, and the United States. Turkish and foreign scholars are regularly invited to give guest lectures and seminars on their excavations and fields of expertise and workshops on technical subjects relating to archaeology.

The department offers a Master of Arts program in Anatolian art and archaeology. Students come from a variety of academic backgrounds, archaeology and other. The program aims to impart a broad knowledge of the field, but students also develop knowledge of a particular area through their choice of courses and, especially, thesis topic. After completing this program, most students continue on to Ph.D. studies, in the United States and Canada (at such universities as Boston, Brown, Harvard, Illinois, Pennsylvania, Toronto, and Victoria), Europe (Cambridge, Liverpool, Marburg, Newcastle, Tübingen, and Vienna), and Turkey (Ege, Muğla, and Istanbul).

**Research activities:** Department members are engaged in a variety of research activities. The department sponsors one major research project, excavations at Kinet Höyük near Dörtyol (Hatay) in southeastern Turkey. Kinet Höyük is an ancient harbor town occupied from the Neolithic to the Hellenistic periods, followed by a brief resettlement as a Crusader fort. The site has long been identified as Classical Issos, the town near which Alexander the Great defeated the Persian king, Darius III, in 333 BC. Excavations concentrated on the Bronze-Iron Age and Medieval levels in order to investigate this port's economic and cultural features within an eastern Mediterranean context.

Field work at Kinet Höyük was carried out from 1992 to 2012; preparation of the final reports in now in progress. In addition to this department-sponsored project, department faculty are currently involved in excavation, survey, and publication work at a number of sites in Anatolia and neighboring regions. These sites include Alaca Höyük (Bronze Age, Çorum province), the Letoon (a Greco-Roman sanctuary in Lycia), and Akkerman (a Late Antique – Ottoman fortress in Ukraine). Other projects include the preparation of a corpus of Roman amphoras in the museum of Turkey's Black Sea region, a result of excavations conducted in an amphora workshop at Sinop.

A multidisciplinary project (archaeology, chemistry, and physics) to analyze the composition of stone and metal objects from central Anatolian sites is being coordinated by Dr. Thomas Zimmermann in collaboration with Bilkent's Department of Chemistry, the Turkish Nuclear Research and Training Center, the central laboratories at the Museum of Anatolian Civilizations, and Ankara University. Currently, Neo-Assyrian objects from Ziyaret Tepe are being examined as a new facet of this endeavor.

Participation in a field project is encouraged for all students in the M.A. program. All students have the opportunity to participate in the department's survey, excavation, and publication projects, and arrangements can be made for students to take part in excavations and other research projects sponsored by other institutions, or to acquire work experience in a museum. Over the years, Bilkent students have been involved in field projects at such sites as Arycanda, Bodrum, Bozburun, Çatalhöyük, Ephesos, Gordion, Ilıpınar, Kaman-Kalehöyük, Pessinus, Sagalassos, Sardis, and Troy, and have occasionally ventured further afield to excavations in England, France, Israel, and Italy.

## FACULTY

**JULIAN BENNETT**, Associate Professor. Ph.D., Archaeology, University of Newcastle upon Tyne, 1991. *Roman art and archaeology, Roman provinces and frontier studies, Archaeological drafting and surveying.*

**CHARLES GATES**, Senior Lecturer. Ph.D., Classical Archaeology, University of Pennsylvania, 1979. *Aegean Bronze Age, Greek art and archaeology, Byzantine art and archaeology.*

**MARIE-HENRIETTE GATES**, Associate Professor. Ph.D., Ancient Near Eastern Languages and Literatures, Yale University, 1976. *Archaeology of Mesopotamia, Archaeology of Syria-Palestine, Archaeology of Egypt, Archaeological method and theory.*

**N. İLGİ GERÇEK**, Assistant Professor. Ph.D., Hittite and Mesopotamian Studies, University of Michigan, 2012. *History and languages of the Ancient Near East; Hittite history, language, and archaeology.*

**JACQUES MORIN**, Instructor. Ph.D., Classics, McGill University, 1991. *Aegean prehistory, Greek and Roman art and archaeology, Ancient Greek, Archaeological theory.*

**DOMINIQUE KASSAB TEZGÖR**, Professor Ph.D., University of Human Sciences of Dijon, 1993, *Greek and Roman Art and Archaeology, ceramics and terracottas, Black Sea Archaeology,*

**THOMAS ZIMMERMANN**, Assistant Professor and Acting Department Chair. Ph.D., Archaeology, Regensburg University, 2005. *European and Anatolian prehistory and protohistory.*

## MASTER OF ARTS IN ARCHAEOLOGY

**Admission:** Applicants are normally expected to have an undergraduate major in archaeology, art history, anthropology, or a related subject, and must demonstrate proficiency in English. Students from other disciplines are also eligible for the program, providing they strengthen their academic background by completing a year of preparatory courses prior to beginning the master's program. Students with an undergraduate degree in archaeology but insufficient English may complete one year in the Bilkent English preparatory program prior to beginning the M.A.

Applicants should take the ALES (*Akademik Personel ve Lisansüstü Eğitimi Giriş Sınavı*/Academic Personnel and Postgraduate Education Entrance Examination) and must satisfy the announced minimum requirements. Applicants who are not Turkish citizens and Turkish citizen applicants who are residents of a foreign country may take the GRE (Graduate Record Examination) instead of the ALES. All nonnative speakers of English are required to submit proof of proficiency in English.

**Degree Requirements:** The M.A. program offered by the department focuses on the ancient and medieval archaeology and art of Anatolia. The program is designed to be completed in two years. Requirements consist of a minimum of 9 semester courses (27 credits) and a thesis (75–100 pages). In addition, reading proficiency in French or German must be demonstrated by test or by course. The required courses consist of two groups: (1) two core courses: Research Directions for Anatolian Archaeology and Art, and Issues in Archaeological Theory; (2) four seminars in at least two of the following divisions: pre-classical, classical, and medieval art and archaeology. Seminar topics vary from term to term depending on the research interests of the instructors. Students also take three electives. These can be additional seminars, courses in ancient or medieval languages, selected fourth-year undergraduate courses, or courses from other departments. Languages offered are Ancient Greek, Latin, Hittite, Classical Arabic, and Ottoman Turkish (the last two given in the History Department); in past years, Akkadian has also been taught.

## COURSE DESCRIPTIONS

**HART 501 Issues in Archaeological Method and Theory**
This course will examine contemporary debates in archaeological methodology, analysis and interpretation. Emphasis will be placed on the techniques for applying theoretical models to fieldwork and analytical research.

**HART 507 Seminar: Pre-Classical Art and Archaeology**
**HART 508 Issues in Pre-Classical Art and Archaeology**
Readings and discussion of key issues of Anatolian art and archaeology from the Prehistoric period to the Iron Age.

**HART 509 Seminar: Classical Art and Archaeology**
**HART 510 Issues in Classical Art and Archaeology**
Readings and discussion of key issues of Anatolian art and archaeology from the Greek, Hellenistic and Roman periods.

**HART 519 Research Directions for Anatolian Archaeology and Art**
A team-taught introduction to research perspectives and sources, with one topic per week, on periods (Neolithic, Ancient Near East and Egypt, Iron Age Near East, Bronze Age Europe/Mediterranean, Greece, Rome, Byzantium, Islamic world) and themes (Science in Archaeology, Ancient Languages and Epigraphy, Ethnoarchaeology, Ceramics, and Artifactual Analysis).

**HART 523 Seminar: Medieval Art and Archaeology**
**HART 524 Issues in Medieval Art and Archaeology**
Readings and discussion of the key issues of Anatolian art and archaeology of the Byzantine, Islamic, Seljuk, and Ottoman periods.

**HART 551 Ancient Greek I**
**HART 552 Ancient Greek II**
Introduction to ancient Greek for graduate students. All basic points of grammar will be covered, and students will be able to read simple texts by the end of the year.

**HART 553 Ancient Greek III**
**HART 554 Ancient Greek IV**
Selections from Greek literature and an introduction to epigraphy.

**HART 563 Latin I**
**HART 564 Latin II**
Introduction to Latin for graduate students. Basic points of grammar will be covered and reading skills developed.

**HART 583 Latin III**
**HART 584 Latin IV**
Selections from Latin literature, prose composition, and an introduction to epigraphy.

**HART 599 Master's Thesis**

## SAMPLE OF RECENT PUBLICATIONS


• J. Bennett, "The Auxiliary Garrison of Asia Province", *Anatolica*, 42, 151-169 (2016)

• J. Bennett, "Christianity in Lycia: From its Beginnings to the 'Triumph of Orthodoxy'", *Adalya* 18, 259-288 (2015)

• J. Bennett, *Trajan: Optimus Princeps* (2nd edition), Indiana University Press (2001)

• J. Bennett, *Towns in Roman Britain* (3rd revised edition), Shire Publications (2001)

• C. Gates, "Kinet Höyük (Classical Issos): A Harbor Town in Southeast Cilicia during the Persian and Hellenistic Period", *J of Eastern Mediterranean Archaeology and Heritage Studies*, 3, 81-104 (2015)

• C. Gates, *Ancient Cities: The Archaeology of Urban Life in the Ancient Near East and Egypt, Greece, and Rome* (2nd edition), Routledge (2011)

• M.-H. Gates, "Gods, Temples and Cult at the Service of the Early Hittite State", pp. 189-210 in *At the Dawn of History: Ancient Near Eastern Studies in Honour of J. Nicholas Postgate*, ed. by Y. Heffron, A. B. Stone, M. J. Worthington, Eisenbrauns (2017)

• J. Morin, *Khostia II: The Bronze Age*, Ares Publishers (2004)

• D. Kassab Tezgör, *Tanagréennes d'Alexandrie : figurines de terre cuite hellénistiques des nécropoles orientales*, Institut Français d'archéologie orientale, Cairo (2007)

• T. Zimmermann, L. Özen, "The Early Bronze Age Figurine from Hasanoğlan, Central Turkey: New Archaeometrical Insights", *Anatolian Studies*, 66, 17-22 (2016)

• T. Zimmermann, "Early Bronze Age Elites: A Fresh Look at Some Old and New Evidence from West and Central Anatolia", pp. 277-287 in *Early Bronze Age Troy. Chronology, Cultural Development and Interregional Contacts*, ed. by E. Pernicka, S. Ünlüsoy, S.W.E. Blum, Studia Troica Monograph Series 8 (2016)

• E.Y. Geniş, T. Zimmermann, "Early Bronze Age Metalwork in Central Anatolia – An Archaeometrical View from the Hamlet", *Praehistorische Zeitschrift*, 89, 280-290 (2015) • T. Zimmermann, *Die ältesten kupferzeitlichen Bestattungen mit Dolchbeigabe. Archäologische Untersuchungen in ausgewählten Modellregionen Alteuropas*. Monographien des Römisch-Germanischen Zentralmuseums Bd. 71 (2007)

• T. Zimmermann, *Die bronze- und früheisenzeitlichen Troiafunde der Sammlung Heinrich Schliemann im Besitz des Römisch-Germanischen Zentralmuseums*. Kataloge des Römisch-Germanischen Zentralmuseums Bd. 40 (2006) • T. Zimmermann, *Die ältesten kupferzeitlichen Bestattungen mit Dolchbeigabe. Archäologische Untersuchungen in ausgewählten Modellregionen Alteuropas*. Monographien des Römisch-Germanischen Zentralmuseums Bd. 71 (2007)

• T. Zimmermann, *Die bronze- und früheisenzeitlichen Troiafunde der Sammlung Heinrich Schliemann im Besitz des Römisch-Germanischen Zentralmuseums*. Kataloge des Römisch-Germanischen Zentralmuseums Bd. 40 (2006)

Contact:
Dr. Charles Gates
(M.A. Academic Advisor)
Phone : +90 312 290 2042
Fax : +90 312 266 4934
gates@bilkent.edu.tr
hart.bilkent.edu.tr

## Faculty Profile: Dr. Marie-Henriette Gates, Associate Professor, Department of Archaeology

Marie-Henriette Gates received a B.A. in archaeology and classical languages from Bryn Mawr College in 1970, and a Ph.D. in ancient Near Eastern languages and literatures, with a focus on the archaeology of the ancient Near East, from Yale University in 1976. She taught in the Department of Classics at the University of North Carolina at Chapel Hill before coming to Bilkent University as an associate professor in 1990.

This move followed upon many years of research and academic activity in Turkey: two years at the American Research Institute in Turkey's Ankara branch (1976-78), and two decades of excavation experience in Turkey during summer field seasons, starting in 1969. During the same period, Dr. Gates also participated in excavations in Italy, Iran, and Syria.

Dr. Gates specializes in the Bronze Age cultures of the eastern Mediterranean and their interaction with ancient Anatolia, especially during the second millennium B.C. The excavations she has directed since 1992 at Kinet Höyük, an ancient maritime port north of İskenderun, have determined the focus of her recent publications, from yearly season reports in *Kazı Sonuçları Toplantısı* to articles on specific cultural and chronological aspects of the site. She also wrote "Archaeology in Turkey," an annual summary and assessment of excavations, for the *American Journal of Archaeology* from 1994 to1997, and again in 2007 with coauthor Bahadır Yıldırım.

# PHILOSOPHY

The M.A. degree in philosophy is designed to develop an advanced understanding of philosophical problems, especially those in contemporary analytic philosophy and the history of philosophy. It provides students with an understanding of key philosophical debates and problems, and encourages them to develop and defend their own argumentative position. Coursework will often have an interdisciplinary character. Many courses will explore the impact of empirical and theoretical developments in other disciplines on contemporary philosophical debates.

## FACULTY

**ISTVAN ARANYOSI**, Assistant Professor. Ph.D., *Philosophy, Central European University, 2005. Philosophy of mind and of cognitive science, metaphysics.*

**SANDRINE BERGES**, Associate Professor. Ph.D., Philosophy, University of Leeds, 2000. *History of social and political philosophy, feminist philosophy.*

**YEHEZKEL S. BERKOVSKI**, Assistant Professor. Ph.D., Philosophy, Oxford University, 2005. *Philosophy of science, metaphysics, ethics.*

**NAZIM KEVEN**, Assistant Professor. Ph.D., Washington University in St. Louis, Philosophy-Neuroscience-Psychology Program, 2016. *Philosophy of cognitive science, neurophilosophy, moral psychology.*

**DAVID MARK KOVACS**, Assistant Professor. Ph.D., Philosophy, Cornell University, 2016. *Metaphysics, philosophy of mind, epistemology.*

**MUSTAFA NAKEEB**, Visiting Assistant Professor. Ph.D., Philosophy, State University of New York at Buffalo, 1999. *Philosophy, ancient philosophy, ancient historiography, philosophy of history.*

**RINA TZINMAN**, Instructor. Ph.D., University of Miami, Philosophy, 2016. *Metaphysics and philosophy of mind.*

**LARS ROLAND VINX**, Assistant Professor. Ph.D., Philosophy, University of Toronto, 2006. *Legal philosophy, political philosophy, constitutional theory, history of political thought.*

**SIMON WIGLEY**, Associate Professor and Department Chair. Ph.D., Political Philosophy, London School of Economics and Political Science, 1998. *Social and political philosophy, ethics.*

**WILLIAM GILES WRINGE**, Assistant Professor. Ph.D., Philosophy, University of Leeds, 2000. *Social and political philosophy, philosophy of mind.*

## MASTER OF ARTS IN PHILOSOPHY

**Admission:** Applicants from all disciplines are encouraged to apply. Applications from international students are also welcomed. Those without an undergraduate major or minor in philosophy may be required to take preparatory undergraduate courses in philosophy before they commence the M.A. program. Evaluation of applicants is based on their ALES (*Akademik Personel ve Lisansüstü Eğitimi Giriş Sınavı*/ Academic Personnel and Postgraduate Education Entrance Examination) scores, past academic records, references letters, a written exam, and an interview. Applicants who are not Turkish citizens, or who are Turkish citizens residing abroad, may take the GRE (Graduate Record Examination) instead of the ALES. All nonnative speakers of English are required to submit proof of proficiency in English.

**Degree Requirements:** The program requires students to complete a minimum of 24 units of course work (a total of at least 11 courses). By the end of the second year the student will complete and defend a master's thesis based on original research. The standard duration of study for the M.A. in Philosophy is two years (including summers).

## COURSE DESCRIPTIONS

**PHIL 501 Research Preparation in Philosophy I**
This course is based around the close reading of classic texts in analytic philosophy with an emphasis on epistemology, metaphysics, and logic. The course work will develop the ability to identify and assess informal and formal arguments and to write and present in a lucid and persuasive manner. Particular emphasis will be placed on research methodology of theoretical philosophy, such as assessing validity and logical consequence, inference to the best explanation, theories of reference and meaning, and explanation.

**PHIL 502 Research Preparation in Philosophy II**
Close reading of classic texts in analytic philosophy with an emphasis on ethics, political philosophy, and aesthetics. Ability to identify and assess informal and formal arguments, make key distinctions, and write and present in a lucid and persuasive manner. Research methodology of practical philosophy, such as identifying and distinguishing normative from non-normative explanations, how to apply theoretical work in ethics to actual ethical situations, and the functional role of evaluative judgment.

**PHIL 504 Philosophy of Cognitive Science**
Focusing on a selection of key texts, core topics in contemporary philosophy of cognitive science, such as: memory, theory of mind, modularity, innateness and empiricism, neuroethics, animal cognition, consciousness.

**PHIL 521 History of Political and Educational Philosophy**
The course introduces students to philosophical thinking about the relation between human nature, society and education. It focuses on the study of key texts in the history of philosophy and educational thought including Aristophanes, Plato, Descartes, Voltaire, Mill and Russell. There is strong emphasis on the development of students' critical reasoning skills. Students are encouraged to think about the implications of the views discussed for their own pedagogical practice.

**PHIL 531 Metaphysics**
Focusing on a selection of key texts, this course examines core topics in contemporary metaphysics, such as: truth, existence, universals and particulars, causality, modality, perception, knowledge, the a priori, identity, anomalous monism, supervenience, vagueness, and time.

**PHIL 532 Aesthetics**
Key debates in the philosophy of art, such as the definition of art, the ontology of artworks, the nature and scope of the aesthetic, expression, representation, interpretation, appreciation, aesthetic value and the value of art, creativity, art and ethics.

**PHIL 591 Thesis Seminar**

**PHIL 599 M.A. Dissertation**

## SAMPLE OF RECENT PUBLICATIONS

- I. Aranyosi, *The Peripheral Mind, Philosophy of Mind and the Peripheral Nervous System*, New york: Oxford University Press, (2013)

- I. Aranyosi, *God, Mind and Logical Space, A Revisionary Approach to Divinity*, London: Palgrave Macmillan, (2013)

- S. Berges, "Is Not Doing Washing Up Like Draft Dodging? The Military Model for Resisting a Gender Based Labour Division", *J of Applied Philosophy* (Forthcoming)

- S. Berges, "A Republican housewife: Marie-Jeanne Phlippon Roland on women's political role", *Hypatia,* 31, 107-122 (2016)

- S. Berges, "On the Outskirts of the Canon: The Myth of the Female Philosopher and What to Do About It", *Metaphilosophy*, 46, 380-392 (2015)

- S. Berges, "Is Motherhood Compatible with Political Participation? Sophie de Grouchy's Care-Based Republicanism", *Ethical Theory and Moral Practice*, 18, 47-60 (2015)

- S. Berges, "Sophie de Grouchy on the cost of domination in the Letters on Sympathy and two anonymous articles in Le Republicain", *Monist,* 98, 102-112 (2015)

- S. Berges, *The Routledge Guidebook to Wollstonecraft's A Vindication of the Rights of Woman*, New York: Routledge, (2013)

- S. Berges, *Virtue and the Law[paperback edition 2012]*, Continuum International Publishing Group, (2009)

- S. Berges, "The hardboiled detective as moralist: ethics in crime fiction", *Values and Virtues: Aristotelianism in contemporary ethics,* T. Chappell (Eds.), Oxford University Press (Forthcoming)

- S. Berkovski, "A naturalist view of humiliation", *Phenomenology and Mind* (Forthcoming)

- S. Berkovski, "A Hobbesian theory of shame", *Southern J of Philosophy*, 53, 125-150 (2015)

- S. Berkovski, "Gratitude, self-interest, and love", *Philosophia*, 42, 645-664 (2014)

- S. Berkovski, "Two nations of shame", *Ratio*, 27, 328-349 (2014)

- D.M. Kovacs, "Grounding and the argument from explanatoriness", *Philosophical Studies* (Forthcoming)

- D.M. Kovacs, "Self-made people", *Mind*, 125, 1071-1099 (2016)

- L. Vinx, G. Seven, "The Hegemonic Preservation Thesis Revisited", *Hague J on the Rule of Law* (Forthcoming)

- L Vinx, "Does Freedom of Association Justify Restrictions on Immigration?", *Res Cogitans,* 10, 61-78 (2015)

- L Vinx, *The Guardian of the Constitution. Hans Kelsen and Carl Schmitt on the Limits of Constitutional Law Translation, Cambridge University Press,* (2015)

- L. Vinx, *Hans Kelsen's Pure Theory of Law. Legality and Legitimacy,* Oxford: University Press, (2007)

- L. Vinx, "The Kelsen-Hart Debate: Hart's Critique of Kelsen's Legal Monism Reconsidered", *Hans Kelsen in America - Selective Affinities and the Mysteries of Academic Influence*, J. Telman (Eds.), pp. 59-83, Springer (2016)

- L. Vinx, "Carl Schmitt", *International Encyclopedia of the Social and Behavioral Sciences 2nd ed.*, J.D. Wright (Eds.), pp. 28-33, Oxford: Elsevier (2015)

- L. Vinx, "Carl Schmitt and the Problem of Constitutional Guardianship", *The Contemporary Relevance of Carl Schmitt, Law, Politics, Theology,* M. Arvidsson, L. Brannstrom, P. Minkkinen (Eds.), pp. 34-49, Abingdon: Routledge (2015)

- L. Vinx, "Carl Schmitt's Defense of Sovereignty", *Law, Liberty and State: Oakeshott, Hayek and Schmitt on the Rule of Law*, D. Dyzenhaus, T. Poole (Eds.), pp. 96-122, Cambridge: Cambridge University Press (2015)

- W.B. Wringe, "Rethinking expressive theories of punishment: why denunciation is a better bet than communication or pure expression", *Philosophical Studies* (Forthcoming)

- W.B. Wringe, "Punishment, Forgiveness and Reconciliation", *Philosophia* (Forthcoming)

- S. Wigley, "The Resource Curse and Child Mortality, 1961-2011", *Social Science and Medicine,* 176, 142-148 (2017)

- B. Wringe, "Collective Obligations: Their Existence; their explanatory Power; and their Supervenience on the Obligations of Individuals", *European J of Philosophy, 24,* 472-497 (2016)

- B. Wringe, "Epicurean Wills, Empty Hopes, and the Problem of Post Mortem Concern", *Philosophical Papers*, 45, 289-315 (2016)

- B. Wringe, "Perp Walks as Punishment", *Ethical Theory and Moral Practice*, 18, 615-629 (2015)

- B. Wringe, "The Contents of Perception and the Contents of Emotion", *Nous*, 49, 275-297 (2015)

- B. Wringe, "May I Treat A Collective As A Mere Means?", *American Philosophical Quarterly,* 51, 273-284 (2014)

- W.B. Wringe, *An Expressive Theory of Punishment,* Palgrave MacMillan, (2016)

- W.G. Wringe, "Is Understanding evil morally dangerous: fiction, emotion and moral contagion", *Their Deeds Were Evil: Understanding atrocity, ferocity and extreme crimes,* D. Medlicott (Eds.), Rodopi Press

## Faculty Profile: Dr. Sandrine Bergès, Associate Professor, Department of Philosophy

Sandrine Bergès studied philosophy at King's College London and Birkbeck College before moving to the University of Leeds, where she obtained a Ph.D. in 2000. Before coming to Bilkent she taught part time in London, Leeds, and St. Andrews.

Dr. Bergès works on the history of moral and political philosophy—ancient (Plato, Aristotle, the Stoics), medieval (Heloise, Christine de Pizan), early modern (Cavendish), and eighteenth century (Wollstonecraft, Sophie de Grouchy, Marie-Jeanne Roland, Olympe de Gouges)—as well as on contemporary social and political philosophy, with an emphasis on the capability approach and feminism.

An active member of Project Vox and the New Narratives Project international groups striving to reintroduce important texts by women philosophers into teaching and research, Dr. Bergès is also a cofounder of the Turkish–European Network for the Study of Women Philosophers and of SWIP-TR. Her publications include Wollstonecraft's *A Vindication of the Rights of Women* (Routledge), *A Feminist Perspective on Virtue Ethics* (Palgrave Macmillan), and *Plato on Virtue and the Laws* (Continuum); she is coeditor of *The Social and Political Philosophy of Mary Wollstonecraft* (Oxford University Press). In addition, she has published a number of articles in journals such as *The Monist*, the *Journal of Applied Philosophy*, *Utilitas*, the *British Journal for the History of Philosophy*, *Hypatia*, and *Ethical Theory and Moral Practice*.

## Faculty Profile: Dr. Simon Wigley, Associate Professor, Department of Philosophy

Simon Wigley studied philosophy, politics and economics at Otago University in New Zealand. After completing his masters and doctoral studies at the London School of Economics and Political Science, he started working in the Department of Political Science at Bilkent University. In 2003 he moved to the newly created Department of Philosophy at Bilkent, where he became chair in 2015.

Dr. Wigley's research interests range from theoretical work in normative political philosophy to empirical work in comparative politics. He is currently working on a long-term project on the impact of political institutions on population health, which has an important bearing on the question of whether democracy can be justified because of the outcomes that it produces. Further research areas include the arguments for and against parliamentary immunity, the capabilities approach and education, and the apparent incompatibility between automatic unconscious behavior and moral responsibility. His work has been published in a number of journals, including *World Politics, Public Choice, Social Indicators Research, Human Rights Quarterly, Philosophical Psychology, Law and Philosophy,* the *Journal of Value Inquiry, Politics, Philosophy & Economics*, and the *Journal of Political Philosophy.*

Contact:
Dr. Simon Wigley
(Department Chair)
Phone : +90 312 290 1072
Fax : +90 312 266 4528
phil@bilkent.edu.tr
phil.bilkent.edu.tr

# TURKISH LITERATURE

The Department of Turkish Literature encourages free and creative thinking, emphasizing research, analysis, interpretation, and criticism. Aiming at enhancing the standards of Turkish literary studies and universalizing the field, the department encourages proficiency in several languages and fortifies theoretical, interdisciplinary, and comparative approaches.

The graduate programs are designed to encompass all periods and genres of oral and written Turkish literature. Present fields of concentration are: Ottoman Literature, 19th-Century Literature and 20th and 21st-Century Literature.

## FACULTY

**ETIENNE CHARRIERE**. Assistant Professor. PhD, University of Michigan, 2016. *Late Ottoman and Modern Turkish Literature, Minority Literatures in the Ottoman Empire and Republican Turkey, Novel Studies, Translation Studies, Literary Theory.*

**MEHMET KALPAKLI**, Associate Professor and Acting Department Chair. Ph.D., University of Washington/ İstanbul University, 1992. *Ottoman literature and cultural history, Near Eastern languages and literature, modern Turkish literature, theory of literature, digital humanities.*

**ZEYNEP SEVİNER**, Assistant Professor. Ph. D., University of Washington, 2015. *Modern Ottoman and Turkish Literatures, technology and cultural production, translation theory.*

**KUDRET EMİROĞLU**, Part-Time Instructor. B.A., International Relations, Ankara University, 1979.

## MASTER OF ARTS IN TURKISH LITERATURE

The duration of the M.A. program is three years, including a preparatory year during which students take courses designed to introduce various aspects of literature and strengthen proficiency in Ottoman Turkish and foreign languages.

**Admission:** Applicants must be graduates of four-year undergraduate programs, preferably in literature. Applications will be evaluated on the basis of the applicant's scholarly record, ALES (*Akademik Personel ve Lisansüstü Eğitimi Giriş Sınavı*/Academic Personnel and Postgraduate Education Entrance Exam) or GRE (Graduate Record Examination) scores, level of proficiency in English (TOEFL iBT 87) and in Turkish, a composition designed to assess his/her ability to make a critical analysis of literary texts, and an interview.

**Degree Requirements:** Candidates for the M.A. degree are required to complete at least 21 units of credit beyond the preparatory year and to prove their competence in Turkish, Ottoman, and English. Some students may be exempted from taking courses in Ottoman depending on their proficiency levels. The candidates may be required to learn additional languages according to their fields of concentration: Persian and/or Arabic for Ottoman Literature; French and/or German for 19th-Century Literature and 20th-Century Literature. Candidates must prepare and defend a master's thesis. They must maintain a minimum GPA of 3.00 throughout their studies. Language courses and thesis writing are noncredit requirements. Candidates must demonstrate their proficiency in English.

## DOCTOR OF PHILOSOPHY IN TURKISH LITERATURE

**Admission:** Applicants are required to hold an M.A. degree in Turkish literature or a related field. Applicants should take the ALES (*Akademik Personel ve Lisansüstü Eğitimi Giriş Sınavı* / Academic Personnel and Postgraduate Education Entrance Examination) or GRE (Graduate Record Examination), and must satisfy the announced minimum requirements. To be admitted to the program, applicants from other universities may be required to take written and/or oral exams. The duration of the doctoral program is at maximum six years.

**Degree Requirements:** Doctoral students must complete course work of at least 21 credit hours with a minimum GPA of 3.00 and fulfill all language requirements before they present their written dissertation proposals and take comprehensive written and oral exams. The research proposal for the dissertation must be approved by the department before the candidate takes the comprehensive exams. These exams are designed to evaluate the candidate's expertise in his/her area of concentration and the research proposal for the dissertation. The candidate is eligible to take the orals after passing the written exam. Following the successful completion of these requirements, the candidate conducts research and proceeds with writing the dissertation, which must be based on original research and make a substantial contribution to Turkish literary scholarship. Candidates must successfully defend their dissertations before a committee of the faculty. Bilkent University will award successful doctoral candidates the degree of Doctor of Philosophy in Turkish Literature.

## COURSE DESCRIPTIONS

**EDEB 401 Introduction to Turkish Literature I**
Designed to give the student an overview of Turkish literature, the course will deal with the earliest poems, the Orkhon Inscriptions, major early works (Divan-ı Lugati't-Türk, Kutadgu Bilig, Dede Korkut, etc.), highlights of Seljuk literature (especially Yunus Emre), and the most important works of Divan poetry and prose (from the 14th century to the mid-19th century).

**EDEB 402 Introduction to Turkish Literature II**
This course will provide an overview of Turkish literature from the Tanzimat era to the present. Emphasis will be on the development of such literary genres as the novel, short story, drama, poetry, essay, and criticism in the modern era. The ethical and aesthetic arguments of major literary movements, key literary debates, and the social impact of literature will be discussed and evaluated. Readings will include major works in various genres.

**EDEB 403 Theories of Literature**
This course will provide a wide-ranging theoretical background for the practice of literary criticism. A general survey of western literary history, literary movements, genres, and key terms, will be followed by the examination of modern literary/critical theories, including formalist, structuralist, post-structuralist, Marxist, feminist, and psychoanalytical approaches. Readings (in Turkish) will include selections from Aristotle, Barthes, Benjamin, Brecht, Eagleton, Escarpit, Freud, Genette, Jameson, Lukacs, Ong, and Todorov. Students will write reading reports, make a presentation, and write a term paper on a selected topic.

**EDEB 405 Written Expression**
This course aims at enhancing the appreciation and control of written Turkish at a high level. It will equip the students with the fundamental skills of writing and editing. After a review of the basic elements of composition (thesis, organization, style, tone), the techniques of narration (summary, paraphrase, quotation), the rules of punctuation, citation, etc., numerous examples of printed works will be discussed in class. Regular writing and rewriting assignments will be given. Emphasis will be on non-fictional prose, including scholarly and critical writing.

**EDEB 411 Ottoman Turkish I**
This course will introduce students to the Ottoman script and teach them the fundamentals of Ottoman-Turkish grammar through readings and written exercises.

**EDEB 412 Ottoman Turkish II**
This course will enhance the students' comprehension of the Ottoman script and the fundamentals of Ottoman-Turkish grammar through readings and written exercises.

**EDEB 413 Theoretical History of Western Civilization**
In this course, western civilization, from preliterate societies to modern times, will be examined theoretically. Political, economic, religious, technological and artistic transformations on various levels are to be dealt with from different theoretical points of view. Ancient Greek and Roman contributions with respect to philosophy and law are also on the agenda of this course. Historical backgrounds of Humanism, Renaissance, Scientific Revolution, Reformation, Enlightenment and Romanticism are, inter alia, part of the basic problematic to be discussed. Furthermore, numerous important questions will be raised, among them: 'Are primitive/civilized differences tenable?', 'On what basis can there be periodization of human history?', and 'How the human mind passes from myth to Logos?'

**EDEB 414 Introduction to Folk Literature**
This course will offer historical survey of the major genres of Turkish folk literature including poetry, folktale, the epic, and folk humor. Students will also be introduced to significant scholarly works in the field.

**EDEB 416 Criticism**
This course aims at furnishing the students with a critical understanding of the development of the history and practice of literary criticism in Turkey since the Ottoman period. Readings will include selections from the works of such writers as Ataç, Namık Kemal, Moran, Parla, Şinasi, A. Şuayip, Tanpınar, Uşaklıgil, and Ziya Paşa. Assignments will include regular reading reports, a class presentation, and a term paper.

**EDEB 419 The Turkish Short Story**
The origins of the contemporary short story in Turkish literature may be found in Aziz Efendi's Muhayyelât, a late 18th-century work, which is considered a bridge between the story-telling tradition in the East and the modern short story. In this course, the development of the modern Turkish short story will be examined in historical context, especially with regard to its generic transformation, and in terms of comparisons of style and content among various works by modern authors.

**EDEB 424 Introduction to Divan Literature**
Taking off from the question, "What kind of literature is Divan literature?" this course aims to introduce the aesthetic structure and understanding of divan literature, regarding both form and content, and to see how they are different from those of today. Our primary topic is poetry: we examine Aruz metrics, the rules of rhyme, and verse forms; we also discuss figures of speech and subtleties of expression.

**EDEB 434 Introduction to Divan Literature II**
Ottoman literature endured for 600 years. Its classical epoch ended in the 16th century and its transformation began in the 17th century. This transformation and reorientation period lasted into the 18th century and ended with westernization in the 19th century. In this course we shall examine and discuss the lyric poetry, mesnevis and prose works.

**EDEB 503 Ottoman Divan Literature**
This course will cover the most important genres of Ottoman Divan literature including poetry (gazel, kaside, mesnevi) and prose (tezkires, chronicles, risales). It will prepare the students for a broader critical understanding of Ottoman literature.

**EDEB 504 Turkish Folk Literature**
This course will concentrate on diverse types of Turkish oral literature, folk poems and tales, epics and narratives, anecdotes and satirical pieces, riddles and lyrics from Anatolia.

**EDEB 505 Turkish Literature, 1839-1922**
This course will examine the major developments in Turkish literature from the Tanzimat era to the founding of the Republic. Emphasis will be on the inception and transformation of various literary genres including the novel, the essay, poetry, drama, and criticism. The contest between tradition and modernity, debates concerning literariness and the place of literature within society, and the social impact of the literature of the period will be among the key areas of investigation. Readings will consist of the major works of significant writers and poets, as well as secondary literature, including A. H. Tanpınar's XIX. Asır Türk Edebiyatı Tarihi.

**EDEB 507 Turkish Poetry**
Following a brief overview of the process of change in Turkish poetry from Tanzimat (reforms period) until the Republic, this course will survey and discuss movements, changing ideological and aesthetic approaches, the correlation between modern poetry and Republican enlightenment from 1923 until the present day. It will also make a critical analysis of modern poetry in conjunction with literary theories.

**EDEB 508: Text and the City: Urban Space and Architecture in Turkish Literature**
A survey of the relationship between the literary text and urban space in late Ottoman Empire and Turkish Republic. As two cultural products in process of change in this period, their parallel structural transformation, and details on urban spaces and architectural artifacts in the fictional texts of the time. Keeping these parallelisms in mind, new ways of reading space in these texts, thus establishing an interdisciplinary approach toward the study of Turkish literature and introducing new methods such as geocriticism and digital humanities.

**EDEB 511 Ottoman Turkish III**
This course will enhance students' comprehension of Ottoman texts from all periods and genres.

**EDEB 512 Ottoman Turkish IV**
This course aims at furnishing students with an understanding of difficult Ottoman texts.

**EDEB 514 Seminar on Divan Literature**
History of Ottoman literature from the 17th to the end of the 19th century. This seminar will deal with Ottoman Divan Poetry, especially gazel, kaside, mesnevi and prose (tezkires, chronicles, risales). It aims to give the students a wide perspective and critical understanding of major aspects of Ottoman Literature.

**EDEB 518 Poetry and Translation**
The aim of this course will be to show how our total understanding of a poem is influenced by the language it is written in and how our perception changes not only as we translate but afterwards when we review the translated text. We will also analyze how imagery can shift with language and how the sounds of another language influence our perception of the poem. We shall also be reviewing translation techniques as well as comparing our translations to existing translations and criticizing these and our own translations in terms of accuracy, imagery and sound and if whether the general mood of the translation reflects the original. It must be remembered that no two impressions of a work of art will be the same. Therefore every person's translation is bound to be different. After all "interpretation" is a synonym for translation. However, in translating literature, as well as anything else, there are limits to interpretation which are imposed by the original text. We shall endeavor to learn how to keep within these limits. The general focus will be on two writers; Thomas Hardy and T.S. Eliot. The former as both poet and novelist, the latter as poet and essayist.

**EDEB 524 The Turkish Novel**
This course will examine the transformation of the social, psychological and aesthetic parameters of the Turkish novel from its inception in the latter part of the 19th century to its most recent examples. Areas of interest will include: the relationship of the early novels with traditional narratives; the questions concerning the social representativeness of novels, the formal changes in the tradition of novel, writing, and critical responses to key novels. Readings will include major samples of such subtypes of the Turkish novel, as the historical novel, philosophical novel, village novel, nature novel, and modernist novel as well as several critical books and essays.

**EDEB 526 Divan Literature Through Texts**
In this course several sample texts of Ottoman Divan literature, including those in the forms of münazara, sakiname, şahrengiz, dibace, and tezkire, will be read and discussed. Emphasis will be on comprehending the special vocabulary of these texts and the unique way of thinking they express.

**EDEB 530 Literary Translation**
Organized essentially as a workshop, this course will familiarize students with techniques of translating Turkish literary texts into English. It is designed for students with proven proficiency in English. Texts will include verse and prose from most periods of Turkish literary history - certainly Divan, folk, Tanzimat and modern literature. Selections may vary depending upon individual needs related to field of specialization and/or thesis topic. This course will train students in literal translation as well as in doing creative - and hopefully publishable - versions.

**EDEB 593 Seminar**
This course is designed to guide the Master's students in their thesis work. Research methods, literature review, elaboration of topics, and organization of material will be discussed in periodic meetings. Presentation in departmental seminars may be requested.

**EDEB 606 Sufi Seminar**
In this seminar Islamic mysticism, orthodox as well as heterodox, will be discussed with special reference to Sufi poetry and its history. Especially the question that, in the absence of systematic philosophical tradition, can mysticism work in loco parentis as a systematic world-view will be dealt with. Other topics like the relation of Sufism to Islamic theology, the problematic of a special Turkish mysticism, and the theoretical basis of Sufi symbolism will also be on the agenda.

**EDEB 607 Modernism in Turkish Literature**
This course will deal mainly with the repercussions of political and social aspects of Modernism qua Westernization in Ottoman and Republican Turkish Literature. But, Modernism as a transformation of literature itself, especially in the field of poetry, will also be critically investigated.

**EDEB 608 Critical Approaches to Turkish Literature**
This course is designed to reevaluate modern Turkish (Republican) literature from a theoretical point of view. Theories such as Marxism and Psychoanalysis (Freudian and Lacanian), and philosophical currents (Phenomenology and Existentialism, among others) will be brought to bear upon related texts to produce new critical understanding.

**EDEB 619 World Fiction**
The seminar will critically survey and discuss several major 20th-Century novels and many modern short stories translated into Turkish. It will examine the cultural contexts of the novels and short stories, the way they reflect their times and respective societies, their fictional techniques, aesthetic and ethical concerns, and influences (if any) on Turkish fiction. Relevant theories will also be analyzed.

**EDEB 621 Seminar on the Mesnevi in Divan Literature**
This seminar provides a historical perspective on the Mesnevi genre from the thirteenth century onward, and examines how it ceded place to the novel and short story as Turkish literature opened to the West in the nineteenth century. We take a topical approach, and discuss the origin of the Mesnevi genre and the way in which it assumed a Turkish (or Anatolian) dress. We also read selected mesnevis, examining such features as structure, plot, authors' apologies, character, folk-tale elements, societal value judgments, and local elements; and compare these with the technique and understanding of the Western novel.

## SAMPLE OF RECENT PUBLICATIONS


- M. Kalpakli, "Sadullah Pasha's Poem, The Nineteenth Century: A Literary Echo of Ottoman Modernization", *Studia et Documenta*, 2, 223-230 (2015)

- D. Arifoglu, E. Sahin, H. Adiguzel, P. Duygulu, M. Kalpakli, "Matching Islamic patterns in Kufic images", *Pattern Analysis and Applications*, 18, 601-617 (2015)

- M. Kalpakli, N. Demirkol, "Eternal Narratives of the Silk Road: The Thousand and One Nights from Samarkand to Istanbul", *Bulletin of IICAS*, 19, 81-97 (2014)

• P. Duygulu, D. Arifoglu, M. Kalpakli, "Cross-document word matching for segmentation and retrieval of Ottoman divans", *Pattern Analysis and Applications* (Forthcoming)

• W.G. Andrews, N. Black, M. Kalpakli, *Ottoman Lyric Poetry: An Anthology*, University of Washington Press, (2006)

• M. Kalpakli, W.G. Andrews, *The Age of Beloveds: Love and the Beloved in Early-Modern Ottoman and European Culture and Society*, Duke University Press, (2005)

• W.G. Andrews, N. Black, M. Kalpakli, *Ottoman Lyric Poetry: An Anthology*[Revised edition forthcoming from Univ of Washington Press], Univ of Texas Press, (1997)

• M. Kalpakli, "Osmanlı'da Edebiyata Yansıyan Yeme-İçme Kültürü", *Kuşhane Saray Mutfağı*, Seyhan Livaneli (Eds.), pp. 41-49, Bir Yudum İnsan Yay. İstanbul (2016)

• M. Kalpakli, N. Demirkol, "İpek Yolu'nun Ölümsüz Anlatısı: Binbir Gece Masalları", *Elfü Leyletin ve Leyle Hikayeleri: Binbir Gece Masalları*, Sadettin Eğri (Eds.), pp. 24-32, Bursa Büyükşehir Belediyesi Yayınları (2016)

• W.G. Andrews, M. Kalpakli, "Poet, panegyric, and patron: A Bahariye Kaside by Tacizade Ca'fer Çelebi for Sultan Bayezit II", *Turkish Language, Literature, and History: Travelers' tales, sultans, and scholars since the eighth century*, Bill Hickman and G. Leiser (Eds.), pp. 1632, London and New York: Routledge Press (2016)

Contact:
Dr. Mehmet Kalpaklı
(Acting Department Chair)
Phone : +90 312 290 2711
Fax : +90 312 266 4059
kalpakli@bilkent.edu.tr
edeb.bilkent.edu.tr

## Faculty Profile: Dr. Mehmet Kalpaklı, Associate Professor, Department of Turkish Literature

Mehmet Kalpaklı is acting chair of the Department of Turkish Literature and acting chair of the Department of History. He received his Ph.D. from the University of Washington-İstanbul University joint program in 1992. He specializes in Ottoman literature, cultural history of the Ottoman Empire, cultural heritage, and digital humanities. He is co-founder of and an active participant in the Ottoman Text Editing Project at the University of Washington and Bilkent University. Some of his publications are: *The Age of Beloveds: Love and the Beloved in Early Modern Ottoman Turkish and European Literature, Culture*, and *Society* (with Walter G. Andrews), Duke University Press, 2005; *Ottoman Lyric Poetry: An Anthology* (with Walter Andrews and Najaat Black), University of Texas Press, 1997, and an expanded edition, University of Washington Press, 2006; *Osmanlı Divan Şiiri Üzerine Metinler* (Texts on Ottoman Divan Poetry), Yapı Kredi Press, 1999; and *The Complete Works of Halide Edib Adıvar* (18 volumes), Özgür Press/Can Press, 1996-2011. He wrote the script for a documentary on the life of Fatih Sultan Mehmed as a "Renaissance Emperor" that was shown on TRT (Turkish National Television), and released as a DVD in 2013. Dr. Kalpaklı served as the Executive Board Member of the UNESCO Turkish National Commission between 2006-2014.

# TRANSLATION AND INTERPRETING

## MASTER'S IN CONFERENCE INTERPRETING (Non-Thesis)

The graduate program in Conference Interpreting is multilingual (Turkish-English-French) and does not require the writing of a thesis. As a joint project undertaken by the European Commission, the European Parliament, and Bilkent University, the program has two major objectives. The first is to provide students with the skills they need to work as conference interpreters, in view of the growing need for multilingual interpreters in this area. This is especially relevant in view of Turkey's possible future EU membership and increasing relations with EU countries. The second aim of the program is to augment the level of professionalism in this field. Familiarizing students with the theories, tools, and methodology of the field, as well as with contemporary issues, the EU, and other international institutions is an important part of the program. It has been designed in accordance with the norms of the EU institutions supporting the program and AIIC norms. The candidates are instructed at Bilkent University by professional accredited conference interpreters working for EU institutions, visiting professional conference interpreters from EU institutions, field experts, and language experts in professional conference interpreting premises designed for training purposes.

## FACULTY

**YİĞİT BENER**, Instructor. Faculty of Medicine (ULB-Belgique), 1982. *Freelance professional conference interpreter, Accredited Interpreter for the EU Institutions. Member of AIIC. Vice-President of BKTD. Jury Member for European Commission and European Parliament Joint Interpreters Screening Tests.*

**KUTLAY BENSAN**, Instructor. Boğaziçi University, Bachelor of Arts Department of Translation and Interpretation 1992. *Professional conference interpreter for Boğaziçi CO. Member of AIIC. Member of TKTD.*

**RAGIP DURAN**, Instructor. Faculty of Law, University of Aix-Marseille, 1978. *Freelance professional conference interpreter. Member of TKTD.*

**TANJU İNAL**, Professor and Department Chair. Ph.D., French Literature, University of Poitiers, 1968. *Contemporary French literature, critical approach, translation.*

**EBRU KANIK**, Instructor. M.A., English Translation and Interpreting, Hacettepe University, 1998. *Freelance professional conference interpreter. Accredited Interpreter for the EU Institutions. Member of AIIC. Member of TKTD.*

**ŞİRİN OKYAYUZ**, Assistant Professor. Ph.D., Department of Linguistics, Hacettepe University, 2001. *T&I scholar, freelance translator, staff interpreter.*

**DİLEK ÖNAY**, Instructor, B.A., Public Administration, Middle East Technical University, 1961. *Professional interpreter for ENTERKON ASSC CO. Accredited Interpreter for the EU Institutions. Member of AIIC. Founding Member of TKTD.*

**VALERY PATERNOTTE**, Instructor, Ph.D., Environmental Management, Université Libre de Bruxelles, 2002. *Master's Degree in Conference Interpreting, Institut Libre Marie Haps, 2012. Freelance conference interpreter.*

**Admission:** Applicants are required to have a bachelor's degree. The program recruits candidates who hold university degrees in a wide range of subjects, including not only interpreting and translation but also such fields as law, business administration, international relations, economics, medicine, and engineering. The candidates must be competent in Turkish, English, and French. In addition to the general requirements set forth by the university, admittance to the graduate program is determined by the results of a three-stage entrance examination, including language aptitude tests, general knowledge and written translation exams, and an interpreting aptitude test, followed by an interview. Each stage of the admission examination is eliminatory, and those candidates who make it to the final stage appear before a jury of professional interpreters to demonstrate their interpreting skills.

**Degree Requirements:** After the completion of three semesters of course work spanning approximately 10 months, the candidates must attain a satisfactory grade in the Interpreting Practice course, which has a single, final examination. This final test reflects practical, real-life conference situations and is graded as either satisfactory or unsatisfactory. A team of professional interpreters, native speakers of the students' A, B, and C languages, and other professionals as deemed appropriate are able to follow the final examination and consult with the instructors about the status (satisfactory/unsatisfactory) of the student. Any students failing to successfully complete this final exam/aptitude test will not be awarded the degree.

## COURSE DESCRIPTIONS

**CINT 501 Theory of Interpretation**
Students will be acquainted with the theoretical aspects of interpretation; and will be familiarizing themselves with the research findings that have a bearing on interpretation like cognitive, psycholinguistic, neurolinguistic, sociolinguistic paradigms and communication and discourse studies.

**CINT 503 Introduction to the Practice of Interpreting**
This course aims to familiarize students with some basic communication skills, conference preparation techniques, professional ethics, conference procedures, working practices and conditions. They will learn about how they may attain the necessary skills to become effective communicators, how to keep up to date with world affairs in the various areas in which they work, how to improve their intuition and flexibility and develop their diplomatic skills.

**CINT 506 EU and International Institutions**
Students are familiarized with basic legal and economic notions and especially focus on understanding how EU institutions and international organizations operate to develop a know-how of institutional processes and procedures. They become familiar with specific terminology, registers, styles and discourses used in communication in the relevant settings.

**CINT 509 Advanced Consecutive Interpretation I**
In this first course on consecutive interpretation preliminary exercises in content analysis, memory exercises, summarization, sight translation and note-taking techniques will be studied. Students are prepared to be able to deliver fluent and effective consecutive interpretations of speeches into the mother tongue. Students are trained with authentic conference materials in which they will confront a diversity of subject areas, styles and registers. The length, information density and degree of technicality and specifity of the speeches will increase throughout the course.

**CINT 510 Advanced Consecutive Interpretation II**
Through a variety of advanced level exercises and speeches in which the information density and degree of technicality and specificity increases as the course progresses, students are trained to deliver fluent and effective consecutive interpretations into the target language, accurately reproducing the content of the original, using appropriate terminology and register.

**CINT 513 Advanced Simultaneous Interpretation I**
Students will be building on skills such as effective communication, content analysis, fluency of speech, memory exercises. Students will be acquainted with booth techniques and team interaction while acquiring the professional skill to interpret into the mother tongue from both active and passive foreign languages in actual conference settings and/or simulations in the booths. This is undertaken in order to enable them to reproduce the content of the original, using the appropriate terminology and register. The length, information density and degree of technicality and specifity of the speeches will increase throughout the course. Once they have mastered simultaneous interpreting skills, students will also be taught to interpret with the texts in front of them.

**CINT 514 Advanced Simultaneous Interpretation II**
Students will be trained to provide fluent and effective simultaneous interpretation of speeches into the target language undertaking advanced practice of simultaneous interpreting in the working languages in booths. Students will be attending conferences on diverse topics and they will analyze and criticize actual interpreting performance vis-à-vis actual conference situations. Through laboratory simulations and other opportunities they will be acquainted with the interpretation of diverse topics while undertaking research in relevant settings and terminology.

**CINT 516 Conference Interpreting I**
Students will be trained in the main types of work for conference interpreters. They will be acquainted with the types of interpreting necessary for committees and conferences, discussions between Heads of State, Prime Ministers, Ministers, business meetings and trade negotiations and court cases, working lunches, field trips, working on the ability to rapidly shift between mother tongue and the active language and from the passive language to the mother tongue.

**CINT 518 Cross Cultural Negotiations**
The aim of this course is to introduce students to the complexities of cross cultural negotiation and conflict resolution. Through simulations and case studies students will be encouraged to assess the effect of cultural influences on negotiation strategies, argumentation and persuasion tactics. Students will also be involved in a range of activities such as discussions, negotiations and debates that will further enhance their communicative skills in their active and passive foreign languages.

**CINT 520 Technology and Research for Interpreting**
This course aims to allow the student to familiarize with the technologies used in the interpretation milieu. They will be asked to research new virtual meeting technologies, use of multilingual communication in the media, multilingual chats, on-line communication on the Internet and new practices that may have relevance for their fields. Students will be acquainted with up-to date research techniques such as the use of terminology management systems in line with recent developments. They will also be made aware of interpreting practices for TV and radio interviews, and videoconferences.

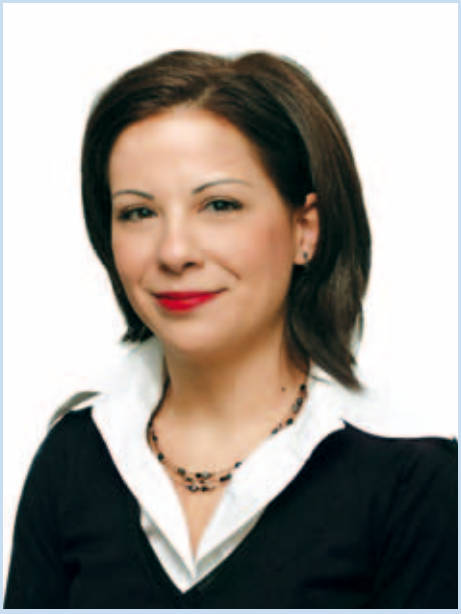
**CINT 590 Interpreting Seminar**
This course aims to allow students to practice the skills they attained throughout the two semesters in actual conferences and simulated conferences with the help of an advisor. The course has a single final examination that will reflect practical, real-life conference situations and will be graded as either satisfactory or unsatisfactory. A team of professional interpreters, native speakers of the students A, B, C languages and other professionals deemed necessary will be able to follow the final examination and consult with the advisor about the status (satisfactory/unsatisfactory) of the student.

## SAMPLE OF RECENT PUBLICATIONS


- A.S. Okyayuz, "Contribution of Translations and Adaptations to the Birth of Turkish Pop Music", *Asian J of Humanities and Social Sciences*, 4 (2016)

- A.S. Okyayuz, "Subtitling Historical Drama TV Series: Constraints and Considerations", *Int J of English Language and Translation Studies*, 4, 45-59 (2016)

- A.S. Okyayuz, "Translating Humor: A Case of Censorship vs. Social Translation", *European Scientific Journal*, 12, 204-224 (2016)



## Faculty Profile: Dr. Şirin Okyayuz, Assistant Professor, Department of Translation and Interpreting

Şirin Okyayuz completed an M.A. in Translation and Interpreting with research into norms in media translation, and a Ph.D. degree in linguistics at Hacettepe University with a dissertation about the "interpretive" factor in the translation of literature. Dr. Okyayuz, previously a European Commission Marie Curie Scholar, joined the Bilkent University School of Applied Languages in 2001. She has translated books about philosophy, Turkish politics, and history, as well as numerous historical novels, bestsellers, thrillers, and works of fantasy and children's literature and "chick lit." She was awarded a Readers' Prize for contributions to the field in 2003.

She has worked as an editor for publishing houses in Turkey, translated for the Ministry of Culture, and translated plays staged by the Turkish State Theatre. She is also the coauthor of several plays. Dr. Okyayuz is a member of the editorial boards of various scholarly journals, a co-compiler of several dictionaries, and the coauthor of a dictionary on translation terminology. She has also taken and taught courses on the use of technology in translation and translator training. Her various articles in national and international citation index-listed journals such as *META* deal with audiovisual translation literary translation, translation in politics, technical translation, and database compilation for translation dictionaries. She has served as the Turkish delegate to the Turkish Interpreters Associations at FIT, UNESCO.

Contact:
Valery Paternotte
(Coordinator)
Phone : +90 312 290 2774
Fax : +90 312 266 4383
valery@bilkent.edu.tr

# COMMUNICATION AND DESIGN

The Department of Communication and Design offers a Master of Arts in Media and Visual Studies and a Master of Fine Arts in Media and Design. The M.F.A. program is a joint program organized in collaboration with the Department of Graphic Design. The Department also offers a dual master's program with Tilburg University in the Netherlands, which is geared toward topics of contemporary interest.

## FACULTY

**YUSUF AKÇURA**, Cinematographer in Residence. B.A., French Language and Literature, Faculty of Letter, Dept. of Western Languages and Literatures, Ankara University, 1985. *Documantary and Cinematography.*

**EMEL ÖZDORA AKŞAK**, Assistant Professor. Ph.D., Mass Communication, College of Journalism and Communication, University of Florida, 2009. *Organizational communication, public relations, advertising, corporate social responsibility.*

**JÜLİDE AKŞİYOTE**, Lecturer. M.F.A., Photography and Related Media, School of Visual Arts, NY, 2000.

**BÜLENT ÇAPLI**, Professor in Residence. Ph.D., Istanbul University, 1990. *Media Ethics, Economics Politics of Media, Media Systems, Communication Sociology, Global Communications.*

**AHMET GÜRATA**, Assistant Professor and Department Chair. Ph.D., Cultural Studies and Humanities, University of London, 2003. *Film theory and history, documentary.*

**LEVENT Y. İNCE**, Instructor. MFA, Department of Graphic Design, Bilkent University, 2010. *Video Game Theory and Analysis, Layout Design, Interactive Design, Illustration.*

**COLLEEN BEVIN KENNEDY KARPAT**, Assistant Professor. Ph.D., French Literature and Culture, Rutgers University, 2011. *French and American Cinema Culture, Communication Studies, Analysis of Moving Image.*

**FULTEN LARLAR**, Instructor. M.F.A., Motion Pictures and Television, Academy of Art University, San Francisco, 2004. *Screenwriting, Film Directing and Producing.*

**ERSAN OCAK**, Assistant Professor. Ph.D., Graphic Design, Bilkent University, 2008. *Documentary, Video Arts, New Media.*

**KAĞAN OLGUNTÜRK**, Asistant Professor of Practice. Proficiency in Art, Marmara University, 2004. *Film directing and visual techniques.*

**UFUK ÖNEN**, Sound Designer in Residence. M.A., Communication and Design, Bilkent University, 2008. *Sound and music for media, music documentary.*

**ÖZLEM SAVAŞ**, Assistant Professor. Ph.D., Design History and Theory, University of Applied Arts, Vienna 2008. *Material Culture, Visual Culture, Visual Anthropology.*

**ANDREAS TRESKE**, Visiting Assistant Professor, M.A., Film Directing, Hochschule für Fernsehen und Film, Munich, 1992. *Video production, new media.*

**FUNDA ŞENOVA TUNALI**, Lecturer. Ph.D. Graphic Design, Bilkent University, 2012. *Visual communication design, typography, user interface design.*

## MASTER OF ARTS IN MEDIA AND VISUAL STUDIES

The M.A. program prepares students for careers in the media and communications sector as well as in academia. It provides students with a sophisticated conceptual framework and analytical skills, enabling them to make original contributions to media, visual, and cultural studies by specializing in a particular aspect of media such as film, television, the Internet, or print media. The program encourages free and creative thinking, as well as theoretical, interdisciplinary, and comparative approaches; it emphasizes research, analysis, interpretation, and criticism.

**Admission:** Applicants are required to have a bachelor's degree in a relevant field of design. They should take the ALES (*Akademik Personel ve Lisansüstü Eğitimi Giriş Sınavı*/ Academic Personnel and Postgraduate Education Entrance Examination) and must satisfy the announced minimum requirements. Applicants who are not Turkish citizens and Turkish citizen applicants who are residents of a foreign country may take the GRE (Graduate Record Examination) instead of the ALES. All nonnative speakers of English are required to submit proof of proficiency in English. Admittance to the graduate program is also determined by the result of an entrance examination that includes a portfolio presentation and an interview. The date and place of the examination are announced each year by the university. During the interview, applicants should present a body of well-defined original work as well as slides, videotapes, or photographs of previous work.

**Degree Requirements:** After the completion of at least 24 units of course work in two successive terms, candidates must take two seminar courses in their area of interest and prepare and submit a thesis. The maximum duration of the program is five semesters.

# MASTER OF FINE ARTS IN MEDIA AND DESIGN

The M.F.A. program prepares students primarily for careers in the media and graphic design sectors, and secondarily for positions in academia. Integrating practical, theoretical, interdisciplinary, and comparative approaches, the program provides students with a sophisticated theoretical and practical framework to enable them to make original contributions to both Turkish and international media and design production. The program encourages free and creative thinking, emphasizing research, analysis, interpretation, practice, and constructive criticism.

**Admission:** Applicants are required to have a bachelor's degree. Applicants should take the ALES (*Akademik Personel ve Lisansüstü Eğitimi Giriş Sınavı*/Academic Personnel and Postgraduate Education Entrance Examination) and must satisfy the announced minimum requirements. Applicants who are not Turkish citizens and Turkish citizen applicants who are residents of a foreign country may take the GRE (Graduate Record Examination) instead of the ALES. All nonnative speakers of English are required to submit proof of proficiency in English. Admittance to the program is also determined by the results of an interview and the evaluation of a portfolio consisting of previously prepared media and design works (fiction writing, drawings, illustrations, graphic designs, scripts, storyboards, slides, photographs, web designs, animation projects, and/or videos). The date and place of the interviews are announced each year by the University.

**Degree Requirements:** After the completion of at least 24 units of course work in two successive terms, the candidates must take two research seminars in their area of interest and prepare and submit a media and design thesis project that includes a written component. The duration of the program is four semesters.

## COURSE DESCRIPTIONS

**COMD 511 Theory and Method in Media Visual and Cultural Studies**
An overview of the fundamental research methods in media, visual, and cultural studies. Research methods include effect studies, media ethnography, content analysis, and other ways of studying media through close examination of its texts, institutions, audiences, and subcultures.

**COMD 513 Film and Genre**
This course aims to investigate the key terms of film theory such as narrative, mise-en-scene, subjectivity, the gaze, the voice, spectatorship, sexual difference, suture and so forth in relation to the question of "genre." Selections from various film genres will be examined.

**COMD 514 Identity, Space and Image**
This course will introduce students to debates on "identity" and "subjectivity" in contemporary visual and cultural studies. Drawing upon various theoretical and methodological sources, the course places the emphasis on how identity and subjectivity can be conceived in relation to the concepts of space, memory, belonging, hybridity and migrancy in contemporary global culture.

**COMD 515 Media Reception**
Drawing upon different theoretical and methodological approaches to the study of media reception, this course explores the relationship between media texts and their audiences. A variety of media and media genres including films, TV serials, comics and popular literature are discussed together with topics such as media effects, active audience theory, ethnography, fandom, gender, nation, and ethnicity.

**COMD 516 Turkish Cinema and Modernity**
This course aims to discuss Turkish cinema in relation to the question of "modernity." Making a critical analysis of the historical development of Turkish cinema in the context of Turkey's experience of modernity, the course will investigate the debates around "Yeþilçam cinema," "national cinema," "social realism," "third world cinema," "women's films", "art cinema," and "the new Turkish cinema."

**COMD 517 Topics in Media Studies**
This course gives the students the opportunity to critically engage with a specialized and an advanced field of study within Media Studies. The topics, readings, and projects of the course to be determined by the instructor for any given term.

**COMD 521 Body, Movement and Vision in Immersive and Interactive Media I**
This course examines the role of body, movement and vision in art and traditional and digital media including literature, cinema, computer and video games, multimedia and online systems and the Internet. Topics covered include: historical development of digital art and culture; cybernetics and systems theory; digital avant-garde; concepts of virtual and virtuality; theories of immersive and interaction in literature, visual and digital media; perception, attention and memory; conscious and unconscious information processing; design of interactive and Immersive systems and user interfaces; computer vision; aesthetics of digital media, information and interactive arts.

**COMD 522 Body, Movement and Vision in Immersive and Interactive Media II**
This course extends and applies the ideas studied in "Body, Movement and Vision in Immersive and Interactive Media I" to a wide range of contemporary art works that use computer and other forms of high technology. The focus is on critical examination and evaluation of artworks that have been created in the past ten years, however, earlier computer aided artworks are also studied. The course explores the ways in which art, science and technology are converging in the twenty-first century and how they might be integrated in the future. Emerging patterns of integration between art and various scientific disciplines and technologies are studied, but particular emphasis is put on the role of computers in visual arts. Concepts, methods and terminology derived from critical and media theory, philosophy, science and engineering are introduced to analyze emerging forms of "Hi-Tech" or "Information Art".

**COMD 523 Media and Everyday Life**
There is a growing emphasis on practices and strategies of everyday life in the study of contemporary societies, identities and political movements. Media has become an integral part of our everyday lives, as the modern everyday is increasingly mediated by television, Internet, visual images, films, advertisements, newspapers, and so on. This course addresses the leading theoretical debates on everyday life and examines entanglements of ordinary people and various media from an anthropological perspective. Drawing on ethnographically informed, historically grounded and context-specific case studies, this course aims to explore how people use and make sense of media texts and communication technologies in their everyday lives. A particular focus of this course is the role of media in aesthetics and politics of the everyday.

**COMD 531 Science and Media**
The Science and the Media course will introduce students to the history and current state of science reporting in various media and their specific journalistic forms. Students will also get to know different methodological alternatives for studying trends in science reporting as well as increase their abilities in media-oriented writing through practical journalistic exercises.

**COMD 541 Writing for Media**
Students in this course will be given methods for developing concepts for media projects through exercises in creative brainstorming, concept selection, development, and refinement, as well as research projects and seminars on topics related to media writing in the students' area of

interest such as fictional, documentary, or experimental screenwriting, or writing for digital and/or interactive media. Workshops of the students' writing will also be held throughout the term.

**COMD 566 Documentary Form and Practice**
Documentary has a long and rich tradition of theory and practice. Today digital technologies once again revitalize documentary productions. In this course students will be presented with an overview of central documentary issues. They will develop an understanding of the fundamental aesthetic tools of documentary production through lectures, screenings, exercises and individual short projects.

**COMD 590 Research Topics**

**COMD 599 Master's Thesis**

**GRA 501 Graduate Studio I**
Graduate Studio I examines and practices with visual communication and design problems within the framework of contemporary culture. It emphasizes a critical approach to existing solutions and encourages students to develop fresh perspectives through new concepts, alternative forms and relations parallel with the changing dynamics of the society. The students will be expected to exercise their own observations and interpretations around suggested topics and to communicate their concepts in design language with their desired media. The topics will cover real-life and/or fictional design scenarios and aim to motivate research, conceptual and visual experimentation, and a sophisticated integration of form and content towards a design solution.

**GRA 502 Graduate Studio II**
This course allows students to produce a media project in any fictional or semi-fictional time-and-motion-based medium or form. From traditional dramas or comedies to experimental, animated, or interactive projects or multimedia installations, students will carefully develop and design their own media concept and bring it to fruition, culminating in an exhibition at the end of term. The emphasis of the course will be on form expressing function.

**GRA 503 Illustration I**
Illustration is creating and using pictures to communicate a subject. This course aims to educate illustrator-artists for various fields of visual communication. Studies of different techniques and media; character generation; illustration for children's literature, fiction, and technical books as well as artistic illustration will be among the topics which will be determined depending on the students' talents and interests.

**GRA 504 Illustration II**
This course aims to enable students to carry out studies with wide practical applications of any field of illustration. From editorial to literary; commercial to technical illustrations different areas will be covered with an emphasis on developing individual methods.

**GRA 511 Typography I**
Typography is a means to make the written language visible. This class focuses on the issues of typographic form – readability, syntax, expression; typographic communication; image-type relationships; and the historical components in relation to technology and contemporary trends. The class will consist of lectures, critiques, research assignments and studio work which will aim the exploration of the typographic vocabulary, rethinking of the conventions, experimentation with new ideas and forms, and consequently the refinement of the typographic knowledge and skills.

**GRA 512 Typography II**
This studio course deals with advanced problems of typographic design and communication. The dynamics of letterform, word and text type, and their complex possibilities for visualizing the verbal language will be explored. The studio will serve as an open space that invites individual interests to study and experiment with a wide array of topics from "type as image" to "theories on language;" "type design" to "kinetic" and "computational typography."

**GRA 517 Image, Time and Motion I**
Through digital technology, our moving image culture is being redefined. The computer enables the mixture of images captured through many different means (cinema, stills, and drawings), and enables new levels of representation. Video gave birth to simultaneity; the computer extends simultaneity to multiplicity. "Cinema becomes therefore a particular branch of painting - painting in time. No longer a kino-eye, but a kino-brush." Will this shift through technology change the way we organize time and space to create forms of narrative, or are we developing new kinds of vertical narratives? This course will engage students to make meaningful generalizations for interpreting or evaluating local experiences and practices in digital media, art and communication.

**GRA 518 Image, Time and Motion II**
A continuation from "Image, Time and Motion I". The course is an extended attempt to think about popular developments of time-based media in digital environments. The focus as on the critical discourse created through the works of digital artisans, net artists and cyber entrepreneurs as well as the theoretical and analytical localization of current trends.

**GRA 519 Critical Approaches to Advertising Consumer Culture**
This course introduces students to the critical scholarship on advertising and the economic, social, and cultural context in which modern advertising has emerged, a context often called consumerism or consumer culture. While some emphasis is placed on the semiotics of advertising, more is placed on the ways in which advertising has become a crucial component in the complex whole of contemporary culture both informing and informed by that culture. Significant attention is thus given to the historical development of modern advertising; to the cultural/ ideological power of advertising, with regard to both form and content; and, to the implications of the material/ economic power of advertising as an industry that supports other cultural industries and forms (newspaper, magazines television, the Web, etc.)

**GRA 520 Critical Approaches to Popular Culture**
The aim of this course is to introduce students to a range of theoretical and methodological approaches to the study of popular culture. Particular emphasis is placed on current critical-cultural approaches arising out of cultural studies, postmodern theory, and feminism; attention is also given, however, to traditional communication theories, as well as to semiotic and sociological approaches.

**GRA 521 Animation**
Contemporary techniques for animated cartoons, movie and TV titles with emphasis on animation with computer imaging techniques, and the aesthetic issues of the medium and its relation to traditional visual arts and film.

**GRA 541 Graphic and Visual Representation**
The aim of this course is to make students familiar with conventional and recent theories, issues, and debates in the fields of graphic and visual arts. The course will begin with a discussion of the origins of graphic and pictorial representation in early human cultures. Then, the notion of representation with special emphasis on its aesthetic and visual aspects will be examined. The course will particularly focus on the relations between perception, image, language and subjectivity, and will examine several theories of visuality and image such as semiotics, psychoanalysis and postmodern approaches.

**GRA 542 Mass Media and Visual Technologies**
This course aims to present recent developments in the field of visual media and technologies. It begins with an overview of the transformation of vision since the Renaissance and examines the specificity of modern mass media as social institution and visual technology. Several theories of media and approaches to technology are discussed and particular emphasis is given to recent technologies such as television, computers and virtual reality as well as urban space as a visual and technological environment.

**GRA 555 On Critical Reasoning and Artwork**
The aim of this course is to teach students the basic concepts needed to analyze how critical reasoning and transformation of the world and the object has been articulated with artistic creativity. The course also aims to shed light on the ontological problematic of the artistic work within this context.

**GRA 556 What is Contemporary?**
In today's world "contemporary" plays a leading role not only as an art (istic) concept, but as a holistic one that determines even the art(istic) production. After the impact of modernism at the beginning of the 20th century, visual arts and many related fields continue to find answers to the question what is contemporary? The aim of the course is to give students a basic and paradigmatic

**GRA 558 Visual Communication Approach to Artistic Thinking**
This course focuses on the process of artistic thinking and creation understood in terms of visual communication and visual arts. The ways in which artistic thinking is shaped at the perceptual, conceptual and semiotic level of processing information will be explored. At the conceptual and semiotic levels the focus will be on the ways in which social, political and cultural factors generate patterns of visual communication. Examples from graphic art, painting, sculpture and architecture will be analyzed. The course will have a seminar format, combining lectures with student research on specific topics, which will be presented in class and discussed. The student presentation will be developed into term papers.

**GRA 561 Philosophy of Modern Art**
In-depth descriptions of contemporary art and the concepts underlying it in the international community. Analyses and evaluations of recent developments and new movements in fine arts during the 20th century. Discussion of the relationships between contemporary art and philosophy.

**GRA 562 Current Perspectives with Post-Modernity**
Specific works of art, images and objects are examined through diverse philosophical perspectives within post-modernity. In-depth investigations within post-modern condition in consideration of emerging visions and conceptions.

**GRA 565 Photography as a Contemporary Medium I**
A theoretical course on photography in general, with emphasis on the history of the medium as a means of artistic expression and its counterpart in the commercial area, as well as the recent theories on interpretation of photography.

**GRA 566 Photography as a Contemporary Medium II**
A continuation of GRA 565, focusing on the outcome of photographically produced imagery in artistic and commercial fields and the use of this imagery in electronic media such as video and computer graphics.

**GRA 567 Semiotics and the Work of Art I**
An examination of related terms and concepts such as sign and signification. Art as a signifying practice. First semiotics: linguistics and the emphasis on text. Second semiotics: the introduction of psychoanalysis and the role of the receiver. Current trends in semiotics and diverse approaches to art within a cultural context.

**GRA 568 Semiotics and the Work of Art II**
A continuation of Semiotics and the Work of Art I. This course offers a critical look into the classical notions of semiotics and the discussions they raise. It also places more emphasis on the relationship between theory and analysis. There is a focus on the nature of the critical discourse. Students are expected to produce written work on the analysis of works of art.

**GRA 590 Research Topics**

**GRA 599 Master's Thesis**

**IAED 511 Research Methods I**
A foundation course that deals with systematic methods regarding information acquisition, verification of sources, theory of interpretation, and hypothesis formulation for developing a critical ability to understand and study issues related to interiors.

**IAED 587 Spatial Practices**
Today, spatial practices (i.e., the relationship between bodies, spaces and the socio-cultural context) constitute the focus of a broad range of disciplines not necessarily confined to architecture, interior architecture and planning. Subjectivity and space are studied as part of a web of complex entanglements including issues of representation, identity and power mechanism. The aim of this course is twofold: on the one hand, it provides familiarity with recent theoretical developments regarding subject/space relationships; on the other hand, it provides the tools for interpretive explanations of concrete practices with particular focus on the materiality of space. Students are expected to do regular reading and to participate and share their individual research findings in class discussions.

**PNT 511 Philosophy of Art**
The leading views in the fine arts are discussed and analyzed from an artistic point of view. The social environment and world views in which painting, sculpture, and architecture arose and developed are investigated as well as the logic of artistic formation that appeared parallel to the social and artistic views.

**PNT 512 Psychology of Art**
Psychological nature of the artistic environment and artist. Relationship of the psychology of creation and artwork. Views of some researchers in that field.

**PNT 515 Issues and Problems in Contemporary Art I**
Contemporary issues and problems of art and artists are selected for analysis and discussion. Students are expected to participate in class discussions, conduct in-depth research, and write on the topics covered.

**PNT 516 Issues and Problems in Contemporary Art II**
Advanced issues and problems in contemporary art. Works by various artists are selected and analyzed in terms of approaches and trends. Students are encouraged to participate in class discussions and are expected to do in-depth research as well as write term papers on contemporary art issues.

**MAN 536 International Marketing Management**
This course provides the students with an understanding of marketing planning and strategy from international, multinational and global perspectives. The world should be viewed as a marketplace with a resulting need for familiarity with various environmental similarities and differences. These may necessitate adaptation and/or standardization of marketing programs, strategies and plans from nation to nation. A major focus of the course is on strategic marketing management techniques, issues, strategies and problems within an international marketing framework.

**MAN 538 Advertising Management**
This course deals with the strategic management of communications. Advertising is treated as a major form of communication and the role and nature of other communication and promotion activities are also discussed. The objective of the course is to provide analytical skills useful in strategic planning and evaluation of advertisements. An understanding of the advertising industry and agency/client relationship is also provided with the aid of cases, illustrations, and guest speakers.

**MAN 539 Consumer Behavior**
This course deals with the understanding of the behavior of people as consumers and the strategic implications of this understanding for marketing managers. Consumer analysis is one of the critical components of marketing analysis in examining the problems and reaching effective decisions. Principles from various social sciences are integrated to analyze the consumer judgment process. Marketing applications of the various concepts are illustrated using cases.

## SAMPLE OF RECENT PUBLICATIONS


• S. Atakan-Duman, E. Ozdora-Aksak, "The Role of Corporate Social Responsibility in Online Identity Construction: An Analysis of Turkey's Banking Sector", *Public Relations Review* (Forthcoming)

• E. Ozdora-Aksak, M.A. Ferguson, S. Atakan-Duman, "Corporate social responsibility and CSR fit as predictors of corporate reputation: A global perspective", *Public Relations Review*, 42, 79-81 (2016)

• E. Ozdora-Aksak, S. Atakan-Duman, "Gaining legitimacy through CSR: an analysis of Turkey's 30 largest corporations", *Business Ethics: A European Review*, 25, 238-257 (2016)

• E. Ozdora-Aksak, "An Analysis of Turkey's telecommunications sector's social responsibility practices online", *Public Relations Review*, 41, 365-369 (2015)

• E. Ozdora-Aksak, S. Atakan-Duman, "The online presence of Turkish banks: Communicating the softer side of corporate identity", *Public Relations Review*, 41, 119-128 (2015)

• E. Ozdora-Aksak, J.C. Molleda, "Immigrant Integration Through Public Relations and Public Diplomacy: An Analysis of the Turkish Diaspora in the Capital of the European Union", *Turkish Studies*, 15, 220-241 (2014)

• S. Atakan-Duman, E. Ozdora, *Insights from Turkey's Banking Sector,* Lambert Academic Publishing, (2014)

• A. Gurata, "New Waves and New Confusions: The Case of Birds of Exile (1964)", *Sweet Sixties*, G. Schollhammer, R. Arevshatyan (Eds.), pp. 365-373, Berlin/New York, Stemberg Press (2014)

• C. Kennedy-Karpat, "Self-Adaptation and Transnationality in Marjane Satrapi's Poulet aux prunes (2011)", *Adaptation*, 8, 68-88 (2015)

• C. Kenndy-Karpat, *Rogues, Romance, and Exoticism in French Cinema of the 1930s*, Madison NJ: Fairleigh Dickinson Univ, (2013)

• M. Yuksel, C. Kennedy-Karpat, "Generation Kill and the New Screen Combat", *American Militarism on the Small Screen*, S. Takacs, A. Froula (Eds.), pp. 245-260, New York: Routledge (2016)

• C. Kennedy-Karpat, "Viviane Romance: Queen of the 1930s Femmes Fatales", *French Cinema in Close-Up: La vie d'un acteur pour moi, M. Abecassis*, M. Block (Eds.), pp. 350-352, Dublin: Phaeton (2015)

• C. Kennedy-Karpat, "Charles Vanel: Seven Decades of Cinema", *French Cinema in Close-Up: La vie d'un acteur pour moi, M. Abecassis*, M. Block (Eds.), pp. 384-386, Dublin: Phaeton (2015)

• C. Kennedy-Karpat, "Bill Murray and Wes Anderson, or the Curmudgeon as Muse", *The Films of Wes Anderson: Critical Essays on an Indiewood Icon,* P.C. Kunze (Eds.), pp. 125-137, New York: Palgrave Macmillan (2014)

• O. Savas, "Taste Diaspora: The Aesthetic and Material Practice of Belonging", *J of Material Culture*, 19, 185-208 (2014)

• A. Treske, *Video Theory. Online Video Aesthetics or The Afterlife of Video,* Transcript Verlag, (2015)

• F. Senova-Tunali, "Interface: The Actual Story", *A Digital Janus: Looking Forward,* Looking Back, D. Mosser, S. Dun (Eds.), pp. 111-117, Oxford, United Kingdom: Inter-Disciplinary Press (2014)



Contact:
Dr. Ahmet Gürata
(Department Chair)
Phone : +90 312 290 1749
Fax : +90 312 290 2736
gurata@bilkent.edu.tr
esbe.bilkent.edu.tr

## Faculty Profile: Dr. Bülent Çaplı, Professor in Residence, Department of Communication and Design

Bülent Çaplı graduated from the AİTİA School of Journalism. He received an M.Sc. degree from Utah State University and a Ph.D. from İstanbul University. He has been the recipient of both Fulbright and Chevening scholarships, and a visiting fellow at the University of Manchester and the University of Florida. Dr. Çaplı's research and teaching interests include broadcast journalism, media policies, the political economy of media, media ethics, and documentary filmmaking.

He has written numerous books and articles on broadcasting policies, media ethics, and documentaries. He is also the director and co-director of many documentaries, and his works have won a number of awards in Turkey. Most notably, Dr. Çaplı has co-produced/directed award-winning television documentaries on Turkish political history, including *Halef, İsmet Paşa, 12 Mart*, and *Demir Kırat.*

# INTERIOR ARCHITECTURE AND ENVIRONMENTAL DESIGN

The Department of Interior Architecture and Environmental Design offers graduate programs leading toward the M.F.A. and Ph.D. degrees. The Master of Fine Arts program focuses on Building Science, Design Theories and Methods, and Environmental Psychology and Design. The Ph.D. program is tailored around a curriculum based on intensive research.

## FACULTY

**YASEMİN AFACAN**, Assistant Professor. Ph.D., Interior Architecture and Environmental Design, Bilkent University, 2008. *Inclusive design, residential environments for elderly people, kitchen design.*

**BURÇAK ALTAY**, Assistant Professor of Practice. Ph.D., Interior Architecture and Environmental Design, Bilkent University, 2000. *Value systems in design.*

**SERPİL ALTAY**, Instructor. M.Sc., Urban and Regional Planning, London School of Economics, 1972. *Product design, detailing, production, implementation.*

**ŞULE AYBAR**, Instructor. M.Arch., University of Texas at Arlington, 1990. *Elements and principles of interior design, design process, history of American art and architecture, architectural graphics, architectonic transformation.*

**HALİME DEMİRKAN**, Professor and Director of the Graduate School of Economics and Social Sciences. Ph.D., Architecture, Middle East Technical University, 1989. *Design methods and theories, human factors.*

**BURCU AYDINALP EGEL**, Instructor. M.F.A., Lighting Design and Theatre Production, University of Florida, 2001. *Interior architecture, architectural design and stage lighting.*

**ÇAĞRI İMAMOĞLU**, Assistant Professor. Ph.D., Architecture, University of Wisconsin-Milwaukee, 2002. *Environmental psychology.*

**TURHAN KAYASÜ**, Instructor. M.Arch., Middle East Technical University, 1976. Construction and materials, project design, detailing, implementation.

**ALPER KÜÇÜK**, Instructor. Ph.D., Architecture, Middle East Technical University, 2007. *Architectural theory, architectural graphics.*

**NİLGÜN OLGUNTÜRK**, Associate Professor and Acting Department Chair. Ph.D., Interior Architecture and Environmental Design, Bilkent University, 2000. *Color, lighting, universal design.*

**SERPİL ÖZALOĞLU**, Instructor. Ph.D., Architecture, Middle East Technical University, 2006. *History of architecture - Ottoman, Baroque.*

**MURAT ÖZDAMAR**, Instructor. M.F.A., Interior Architecture and Environmental Design, Bilkent University, 1998

**SINISA PRVANOV**, Lecturer. Ph.D., Architecture, National Technical University of Athens, 2000. *Furniture design and processing, History of furniture.*

**MUSTAFA PULTAR**, Adjunct Professor. Ph.D., Princeton University, 1965. *Structural design, architectural science, environmental analysis and design.*

**ELİF ERDEMİR TÜRKKAN**, Senior Lecturer. Ph.D., Interior Architecture and Environmental Design, Bilkent University, 1998. *Cultural impacts on space, object and interior space design.*

**TİJEN SONKAN TÜRKKAN**, Instructor. M.A., Architecture, Academy of Fine Arts, Hamburg, 1984. *Computer-Aided Design (CAD), Greek Orthodox churches.*

**SİBEL ERTEZ URAL**, Instructor. Ph.D., Architecture, Karadeniz Technical University, 1995. *Basic design, color dynamics.*

**SEMİHA YILMAZER**, Assistant Professor. Ph.D., Architecture, Karadeniz Technical University, 1998. *Building physics.*

## MASTER OF FINE ARTS IN INTERIOR ARCHITECTURE AND ENVIRONMENTAL DESIGN

This program's curriculum provides an interdisciplinary outlook, incorporating knowledge from related disciplines. Students are guided through an intensive schedule that emphasizes scholarly inquiry and research skills. The graduate studio combines theory and field research. Elective courses are chosen through consultation with an academic advisor.

**Admission:** Applicants are required to have a four-year undergraduate degree. Applicants should take the ALES (*Akademik Personel ve Lisansüstü Eğitimi Giriş Sınavı*/ Academic Personnel and Postgraduate Education Entrance Examination) and must satisfy the announced minimum requirements. Applicants who are not Turkish citizens and Turkish citizen applicants who are residents of a foreign country may take the GRE (Graduate Record Examination) instead of the ALES. All nonnative speakers of English are required to submit proof of proficiency in English; students are expected to be fluent in written and oral English in order to be admitted. Admittance to the program is determined through an interview.

**Degree Requirements:** After the completion of at least 24 units of course work in two successive terms, the candidates must take two seminar courses in their area of interest and prepare and submit a thesis.

## DOCTOR OF PHILOSOPHY IN INTERIOR ARCHITECTURE AND ENVIRONMENTAL DESIGN

The program promotes inquiry into various issues of design in both theoretical and practical fields by encouraging students to carry out research on unexplored topics. The research conducted is expected to be either a novel contribution to art and science, the introduction of a new method, or a completely innovative application of a widely known method. Through investigating pertinent past and current developments in Turkey and the world at large within a cross-cultural framework, students examine various aspects of processes in design, implementation, performance, and evaluation in order to achieve the objective of producing work that demonstrates competence in research.

**Admission:** Applicants are required to have a bachelor's and a master's degree in a relevant field. Applicants should take the ALES (*Akademik Personel ve Lisansüstü Eğitimi Giriş Sınavı*/Academic Personnel and Postgraduate Education Entrance Examination) and must satisfy the announced minimum requirements. Applicants who are not Turkish citizens and Turkish citizen applicants who are residents of a foreign country may take the GRE (Graduate Record Examination) instead of the ALES. All nonnative speakers of English are required to submit proof of proficiency in English. Admittance is also determined through an interview conducted before the beginning of each academic year. The date and place of the interviews are announced each year by the university.

**Degree Requirements:** The minimum course load for the Ph.D. program is 24 credit units. After completion of the courses, the Ph.D. candidate must take a qualifying examination, make a presentation related to his/her dissertation, and submit a dissertation proposal, which will be evaluated by a jury composed of well-known scholars in the field. Upon favorable evaluation by the jury, the candidate will proceed with work on the dissertation. After its completion, a similar jury will examine the candidate and make a final decision regarding conferral of the degree.

## COURSE DESCRIPTIONS

**IAED 501 Graduate Studio I**
An emphasis is placed on improving research skills, analysis, discussion, and a theoretical approach to spatial design. Students are expected to develop sensitivity towards socio-cultural issues, environmental concerns, and practices of users.

**IAED 502 Graduate Studio II**
Students are expected to conduct research on particular topics; critically analyze assigned readings and raise/engage in discussions on those topics. Within the generated theoretical framework, students work on specific design projects, furthering their skills of problem solving, space creation and design presentation.

**IAED 511 Research Methods I**
A foundation course which deals with system and methods regarding information acquisition, verification of sources, theory of interpretation and hypothesis formulation for developing a critical ability to understand and study the issues related to interiors.

**IAED 512 Statistical Analysis**
The principles of statistical analysis methods, concepts of data collection and structuring are discussed with the aim of providing the student with the necessary tools to deal with large amounts of data and to draw conclusions from such data.

**IAED 514 Research Methods II**
This is a tutorial course involving the conduct of an actual research project in interior and/or environmental design. The students shall be responsible, individually and in group work, for initiating, designing and conducting a research project under the guidance of the instructor. The work will include gathering and analyzing data, drawing conclusions and preparing a research report.

**IAED 543 Environmental Analysis I**
An interdisciplinary course designed to develop cognitive skills and sensitivity for the evaluation of the built environment. Investigation of techniques and methods pertaining to analysis, synthesis and physical, social aspects of spatial formations will be dealt. Students are expected to participate in seminars and work on case studies in the studio.

**IAED 544 Environmental Analysis II**
The methodology of environmental research and measurement technique for various aspects of environmental attitudes and user responses/behaviors are the major topics in this course. The students are expected to carry out empirical analyses for the measurement of any aspect in the field. IAED 543 is recommended as a preliminary.

**IAED 571 Lighting and Color**
Importance of light and color as design factors, physics of light, light and vision, light sources and lighting methods, symbolic and functional color, color in interiors.

**IAED 574 Art, Science and Technology**
A seminar-based course to investigate the characteristics of various disciplines that relate to art, science and technology and correlate to the unity of mankind.

**IAED 583 Design Principles and Theories**
The aim of the course is to develop a critical understanding of theories of architecture and principles of design. Course will explore, question and discuss classical, modern and contemporary theories of architecture, the works of some well-known architects as well as works of the students. The course will be on a mixture of lectures, seminars and applied studies. The students are expected to do regular reading and to take active part in seminar preparations and discussions.

**IAED 590 Seminar in Research Topics**

**IAED 599 Master's Thesis**

**IAED 690 Seminar in Advanced Research Topics**

**IAED 699 Ph.D. Dissertation**

## SAMPLE OF RECENT PUBLICATIONS


• Y. Afacan, "Exploring Effectiveness of Blended Learning in Interior Design Education", *Innovations in Education and Teaching International*, 53, 508-518 (2016)

• Y. Afacan, H. Demirkan, "The influence of sustainable design features on indoor environmental quality satisfaction in Turkish dwellings", *Architectural Science Review*, 59, 229-238 (2016)

• Y. Afacan, "Resident satisfaction for sustainable urban regeneration", *Proceedings of the ICE - Municipal Engineer*, 168, 1-15 (2015)

• Y. Afacan, "Exploring Older Workers' Interaction with Sustainable Office Environments", *The Design Journal*, 18, 57-82 (2015)

• Y. Afacan, M.O. Gurel, "Public Toilets: An Exploratory Study on the Demands, Needs and Expectations in Turkey", *Environment and Planning B- Planning and Design*, 42, 242-262 (2015)

• Y. Afacan, "Introducing sustainability to interior design students through industry collaboration", *Int J of Sustainability in Higher Education*, 15, 84-97 (2014)

• B. Altay, "Developing Empathy in Design: The Grandparent Experience", *Educational Gerontology* (Forthcoming)

• B. Altay, "*Faces/Places", Tracey: Drawing and Visualization Research Journal.*, 1-29 (2016)

• B. Altay, Developing empathy towards older adults in design, *Educational Gerontology* (2016)

• B. Altay, G. Ballice, E. Bengisu, S. Alkan-Korkmaz, E. Paykoc, "Embracing student experience in inclusive design education through learner-centred instruction", *Int J of Inclusive Education* (Forthcoming)

• B. Altay, "User-centered design through learner-centered instruction", *Teaching in Higher Education*, 19 (2014)

• B. Altay, H. Demirkan, "Inclusive design: developing students' knowledge and attitude through empathic modelling", *Int J of Inclusive Education*, 18, 196-217 (2014)

• H. Demirkan, "An inquiry into the learning-style and knowledge-building preferences of interior architecture students", *Design Studies*, 44, 28-51 (2016)

• A.F. Karakaya, H. Demirkan, "Collaborative digital environments to enhance the creativity of designers", *Computers in Human Behavior*, 42, 176-186 (2015)

• H. Demirkan, N. Olgunturk, "A priority-based 'design for all' approach to guide home designers for independent living", *Architectural Science Review,* 57, 90-104 (2014)

• H. Demirkan, "Frameworks for Decision-Making in Design for the Aging", *The Handbook of Interior Design*, J.A. Asher, N.H. Blossom (Eds.), pp. 212-225, West Sussex, UK Wiley Blackwell Publishers (2015)

• C. Imamoglu, M.O. Gurel, "Good Fences Make Good Neighbors: Territorial Dividers Increase User-Satisfaction and Efficiency in Library Study Spaces", *J of Academic Librarianship*, 42, 65-73 (2016)

• B. Ulusoy, N. Olgunturk, "Understanding responses to materials and colors in interiors", *Color Research and Application* (Forthcoming)

• B. Ulusoy, N. Olgunturk, "Effects of Color Pairs on Warmth Perception in Interiors", *J of Imaging Science and Technology*, 60, 504081-5040810 (2016)

• S. Odabasioglu, N. Olgunturk, "Effects of coloured lightimg on the perception of interior spaces", *Perceptual & Motor Skills*, 120, 183-201 (2015)

• N. Olgunturk, "Psychological Color Effects", *Encyclopedia of Color Science and Technology,* Ronnier Luo (Eds.), pp. 1077-1080, New York: Springer (2016)

• N. Olgunturk, "Color Scheme", *Encyclopedia of Color Science and Technology,* Ronnier Luo (Eds.), pp. 379-381, New York: Springer (2016)

• L. Swirnoff, N. Olguntürk, G. Olsson, "Color Contrast", *Encyclopedia of Color Science and Technology*, Ronnier Luo (Eds.), pp. 290-302, New York: Springer (2016)

• S. Ozaloglu, "An attempt to transform popular religious imaging into contemporary mosque architecture: Ahmet Hamdi Akseki Mosque", *J of Architectural and Planning Research* (Forthcoming)

• M. Ozdamar, "Design in Interior Architecture/Design and 'The Real Life", *The Global eLearning Journal*, 5, 1-9 (2016)

• S. Tasli-Pektas, N.S. Aybar, N.Y. Savut, W.H. McKinnon, "Integrating Green Building Approaches to Interior Architecture Education: A Cross-Cultural Study", *Open House International*, 40, 24-31 (2015)

• P.N. Dokmeci, S. Yilmazer, *Architectural and acoustical Evaluations of Cepa Shopping Center*, Lap Lambert Academic Publishing Gmbh&Co, (2011)

Contact:
Dr. Nilgün Olguntürk
(Acting Department Chair)
Phone : +90 312 290 1465
Fax : +90 312 266 4368
onilgun@bilkent.edu.tr

## Faculty Profile: Dr. Halime Demirkan, Professor, Department of Interior Architecture and Environmental Design

Halime Demirkan holds bachelor's and master's degrees in industrial engineering and a Ph.D. in architecture from Middle East Technical University. She currently is the Director of the Graduate School of Economics and Social Sciences. Her previous professional experience has included appointments as a research assistant and instructor in the departments of Industrial Engineering and Industrial Design at Middle East Technical University, and as a researcher at the Building Research Institute of the Scientific and Technical Research Council of Turkey.

She has published articles in various international journals, including *Creativity Research Journal*, the *Journal of Creative Behavior, Design Studies, Applied Ergonomics, Learning and Instruction,* the *Journal of Engineering Design,* and *Optics & Laser Technology*. Her work has also appeared in many edited books, such as *Creativity, Design and Education, Color and Design,* and *The Handbook of Interior Design*. Her current research and teaching interests include creativity in the architectural design process, design education, and design for an aging population.

# MUSIC

The graduate program in the Department of Music instructs professional artists in the areas of performance and creativity with an emphasis on studies in the fields of music education and research. Candidates are expected to have an undergraduate degree in a related field and must pass an admission examination and interview.

Students have the opportunity to study and develop skills under the direction of internationally renowned Turkish and foreign faculty members and to display the knowledge and experience they acquire in recitals and concerts. These public performances are held by the Faculty of Music and Performing Arts to give students advanced professional experience, thereby widening their horizons. The faculty's achievements as a leader in quality education and artistic activity have made it a center of excellence.

## FACULTY

**GÜRER AYKAL**, Adjunct Professor. D.M.A., Conducting, Academy of Santa Cecilia, 1973. "State Artist" Turkey, 1981. *Conducting.*

**CAVİD CAFER**, Instructor. B.M., Viola, Moscow Tchaikovsky State Conservatory, 1983. Member, Azerbaijan State Symphony Orchestra, 1983-1987. Conductor, Azerbaijan State Conservatory Quartet, 1989-1990. Principle Viola, Intendant, BSO. *Instrument, chamber music.*

**OZAN EVRUK**, Instructor. M.M., Royal Northern College of Music, 2008. Principal Bassoon, BSO. *Instrument.*

**ELENA GNEZDILOVA**, Instructor. B.M., Viola, Leningrad State Conservatory, 1981. Member, Leningrad State Conservatory Opera Orchestra, 1981-1992. Previous member, "Uzbek Soloists" State Chamber Orchestra, 1993. Member, BSO. *Instrument, chamber music.*

**LASZLO GYARMATI**, Instructor. M.M., Horn, Ferenc University, 1993. Principal Horn, BSO. *Instrument.*

**YOONIE HAN**, Assistant Professor. D.M.A., Piano, State University of Stony Brook, 2016. Steinway Concert & Recording Artist, First prize winner, World Piano Competition, Fulbright Concerto Competition, Washington International Competition.

**HAYRETTİN HOCA**, Instructor. B.M., Violoncello, Institute of Fine Arts, Tirana, Albania, 1982. Member, Albanian Radio and TV Orchestra, 1984. Principle Violoncello, BSO. *Instrument.*

**KAĞAN KORAD**, Associate Professor, Associate Dean and Department Chair. D.M.A., Proficiency in Art, Classical Guitar, Bilkent University, 2001. *Instrument, chamber music, ensemble.*

**JULIAN LUPU**, Instructor. B.M., Trumpet, Iasi Music Academy, Romania, 1992. Soloist and member, Philharmony State Orchestra of Ordea. Principle Trumpet, BSO. *Instrument.*

**SERGEY MARGULIS**, Instructor. B.M., Double Bass, Moscow State Conservatory, 1993. *Principle Double Bass, BSO.*

**AYDIN MECİD**, Instructor. D.M.A., Percussion, Bilkent University, 2009. Second prize winner, Zakavkasya Competition, 1987. Principle Percussion, Inspector, BSO. *Instrument, chamber music.*

**IŞIN METİN**, Assistant Professor. D.M., Proficiency in Art, Composition, Bilkent University, 2000. *Composition and orchestration.*

**IRINA NIKOTINA**, Instructor. D.M.A., Violin, Tashkent State Conservatory, 1983. First prize winner, Soviet Union Music Competition, 1980. *Member, BSO.*

**SARDOR RASULOV**, Instructor. M.M., Violoncello, Moscow "Tchaikovsky" State Conservatory, 1982. *Member, BSO.*

**ONUR TÜRKMEN**, Assistant Professor. Ph.D., Composition, I.T.U. Center for Advanced Research Musical, 2010.

**TAHSİN TOLGA YAYALAR**, Assistant Professor. Ph.D., Composition, Harvard University, 2010.

## MASTER OF ARTS IN MUSIC

The Master of Arts in Music program comprises a wide range of options for majors in creative and interpretational fields of musical art in three curriculum tracks:

**Music Performance and Interpretation**
The curriculum track for the music performance and interpretation option comprises majors in musical instruments or chamber music. The goal of the thesis program in music performance and interpretation is to assist advanced musicians who hold an undergraduate degree in honing their musical performance skills to reach an international standard, and to enhance their interpretative skills by building on what they have gained from previous studies in music theory, history and the relationship of these areas with other academic disciplines. A candidate choosing the Master of Arts program may expect to advance in a professional performing career as well as to develop academic skills in writing and research. The M.A. degree in music performance and interpretation

is offered in the following areas of specialization: flute, oboe, clarinet, bassoon, horn, trumpet, trombone, tuba, percussion, harp, piano, classical guitar, violin, viola, violoncello, double bass, operatic voice, and chamber music.

**Conducting**
The conducting program aims to provide highly gifted candidates with the practical and theoretical skills, tools, and knowledge to progress in this most demanding and complex discipline, enabling them to step into the role of conductor with an operatic or orchestral ensemble upon graduation. Students will receive individual instruction and training in conducting techniques and repertoire, along with musicianship, theory, and history courses and seminars as appropriate. They will gain an all-round understanding of the practical, technical, artistic, psychological, and business issues involved in the profession, and will have the opportunity to build podium and performance experience in order to achieve technical proficiency and develop artistic integrity.

**Composition**
The Master of Arts in composition program is designed to enable each student to contribute to the field of composition in a productive, resourceful, and personal way. The program provides intensive training through individual lessons, lecture courses, and weekly seminars in the student's field, supported by studies in theoretical and historical subjects.

***Students also participate actively in master classes to further promote their careers. Some recent master classes held at the Faculty of Music and Performing Arts***

Boris Berezovsky, piano
Branimir Slokar and Armin Bachmann, *trombone*
Olivier Charlier, *violin*
Sharon Isbin, *guitar*
Michele Crider, *voice*
Naoka Shimizu, *viola*
Gabor Boldoczki, *trumpet*
Emmanuel Phaud, *flute*
Patric De Ritis, *bassoon*
Anna Serafinska, *voice*
Mark Andre, *composer*
Riccardo Piacentini, *composer*
Roderic de Man, *composer*
Pamela Z, *voice*

## RECENT SCHOLARLY PUBLICATIONS

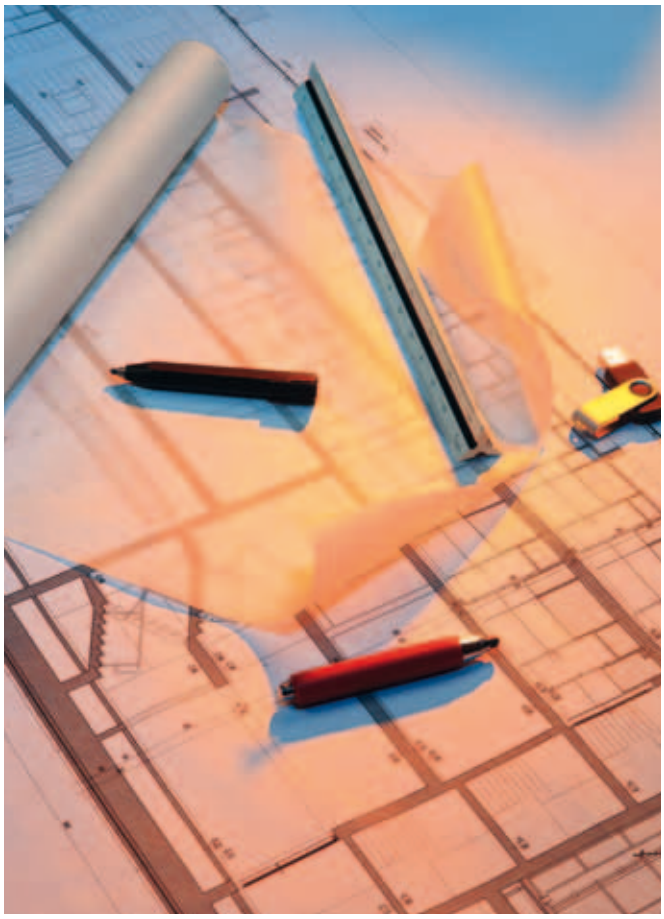
• L. Manko Sahin, "Ahmed Adnan Saygun's Concerto for Viola and Orchestra, Op. 59: A Western Perspective", *J of the American Viola Society*, 32, 15-26 (2016)

Contact:
Kağan Korad
(Associate Dean)
Phone : +90 312 290 1387
Fax : +90 312 266 4539
mssf@bilkent.edu.tr
mssf.bilkent.edu.tr

### Faculty Profile: Dr. Tolga Yayalar, Assistant Professor, Department of Music

Tolga Yayalar received a B.A. degree in jazz composition from Berklee College of Music in 2000, and a Ph.D. degree in composition from Harvard University in 2010. Since then, he has been an assistant professor of music at Bilkent University, where he teaches composition as well as courses related to music theory and electronic music. Mr. Yayalar's musical output includes mostly chamber and orchestral music with and without electronics. His artistic focus centers on the idea of creating a sonic experience with a sound world that goes beyond stylistic conventions. His recent music puts diverse historical materials into a foreign and unfamiliar context, in which the meaning of the musical material is completely transformed. Mr. Yayalar's music has been performed in the US, Europe, and Latin America by ensembles and soloists including Le Nouvel Ensemble Modern, Ensemble FA, the Ying Quartet, Alarm Will Sound, OrchestrUtopica, the Callithumpian Consort, the Hezarfen Ensemble, the Platypus Ensemble, Earplay, Chamber Players of the League/ISCM, Orchestre National de Lorraine, the Adorno Ensemble, the Millennium Chamber Players, the CNM Ensemble, the Yesaroun Duo, Samuel Z. Solomon, Mari Kimura, Benjamin Schwartz, Seda Roeder, and Garth Knox, and at festivals including the BeethovenFest, Berliner Festspiele – MaerzMusik, the New York City Electroacoustic Music Festival, ISCM World New Music Days, Acanthes, June in Buffalo, Mediterranean Contemporary Music Days and La Ciudad de las Ideas in Mexico. His awards and honors include the Donald Aird Memorial Prize, the Adelbert Sprague composition prize, the Blodgett String Quartet composition prize, the George Arthur Knight Prize, the Millennium Chamber Players competition prize, and the League of Composers/ISCM composition award. His music is published by BabelScores.

# ARCHITECTURE



The Department of Architecture offers the Master of Science in Architecture program to equip students with advanced skills in architectural design and in-depth critical thinking with regard to architectural theories. The program is designed for students who wish to excel in using current design technologies and broaden their creative thinking.

## FACULTY

**JESUS ESPINOZA ALVAREZ**, Instructor. M. Arch., Architecture, University of Arizona, 1996

**AYSU BERK**, Instructor. Ph.D., Architecture, University of Michigan, 2012. *Building technology.*

**CHEN-YU CHIU**, Assistant Professor. Ph.D., Architecture, University of Melbourne, 2011. *Building and planning.*

**MARK PAUL FREDERICKSON**, Visiting Associate Professor. Ph.D., Architecture, University of California Los Angeles, 1991. *Design education, sustainable community planning.*

**GIORGIO GASCO**, Visiting Assistant Professor. Ph.D., Architecture, Polytechnic University of Cataluna, 2007.

**MELTEM Ö. GÜREL**, Associate Professor and Department Chair. Ph.D., Architecture, University of Illinois at Urbana-Champaign, 2007. *Architectural theory/history/criticism, cross-cultural histories of modernism, gender and space, design education.*

**GLENN TERRY KUKKOLA**, Instructor. M.A., Divinity, University of Toronto, 2006.

**BURCU ŞENYAPILI ÖZCAN**, Associate Professor. Ph.D., Art, Design and Architecture, Bilkent University, 1998. *Computer aided design, design education.*

**ŞULE TAŞLI PEKTAŞ**, Assistant Professor. Ph.D., Art, Design and Architecture, Bilkent University, 2003. *Design methods, computer aided design, design education*

**SEGAH SAK**, Instructor. Ph.D., Interior Architecture and Environmental Design, Bilkent University, 2013.

## MASTER OF SCIENCE IN ARCHITECTURE

**Admission:** All applicants are required to have a Bachelor of Architecture degree or a B.S. degree in a related field of design. Students with a B.S. degree in a related field may be requested to take several undergraduate courses in architecture to acquire necessary background in the field. Evaluation of applicants is based on their ALES (*Akademik Personel ve Lisansüstü Eğitimi Giriş Sınavı*/Academic Personnel and Postgraduate Education Entrance Examination) scores, past academic records, reference letters, and an interview. Applicants who are not Turkish citizens and Turkish citizen applicants who are residents of another country may take the GRE instead of the ALES. All nonnative speakers of English are required to submit proof of satisfactory knowledge of English.

**Degree Requirements:** In addition to at least 24 credit units of course work, the M.S. degree candidate must prepare and successfully defend a thesis. The standard duration of study for the M.S. program is four semesters; the maximum duration is six semesters

## COURSE DESCRIPTIONS

**ARCH 513 Theory and Methodology**
Deciphering and understanding approaches for analyzing the built environment. Evaluation and interpretation of texts related to architectural histories and theories.

**ARCH 514 Architectural Readings**
Critical analysis of architectural texts; methods for analyzing architectural buildings; ways of deciphering digital and traditional (re)presentations of architecture.

**ARCH 515 Topics in Architectural Technology**
A look at architectural technologies; digital opportunities; contemporary construction applications, developments in building materials.

**ARCH 516 Computational Design Technologies**
Digital tools, media, digital geometries and parametric approaches that can be utilized in the process of producing architectural solutions.

**ARCH 517 Advanced Visualization Studio**
Advanced techniques in computer aided visualization. Virtual environments, internet based platforms and software packages for design related disciplines are utilized for creating design visualizations.

**ARCH 533 Analysis of Buildings**
Critical analysis of buildings both in the process of design and in their life cycles. Methods and stages of analysis; digital methods. Implementations through samples.

**ARCH 534 Structural Analysis**
Analysis of architectural designs and buildings in terms of load distribution, load bearing and formal properties. Decomposing the building structure into structural components; analysis of the design from the view point of physical behavior.

**ARCH 550 Current Issues in Architectural Design**
A look at the contemporary buildings both from our geography and from abroad. Studies on the current architectural discussions.

**ARCH 563 Modern Turkish Architecture**
Study of architectural developments in Turkey from 1900 to the present within a socio-cultural framework; particular emphasis on the interrelationship of architecture and political developments; survey of important buildings, key figures of architecture and urban design; extensive readings on the subject.

**ARCH 564 Space and Culture**
Investigations on the relationship between culture and the built environment, including the work of architects, designers, and planners as well as the ordinary people who create our surroundings. Focus is on the theoretical basis for architecture and cultural studies.

**ARCH 565 Contemporary Architecture and Theory**
Review of the developments in Western architectural culture from the turn of the twentieth century to the present; contemporary architectural movements and theories.

**ARCH 566 Architectural Theory and Criticism**
Investigation of architectural history, theory and criticism on special topics; social, cultural and political influences on architecture; readings of important theoretical and critical writings about a broad range of topics.

**ARCH 590 Graduate Seminar**
Academic presentations by graduate students on the theses they are preparing, answering relevant questions on the thesis, revisions.

**ARCH 599 Master's Thesis**
Preparations towards the presentation of the thesis to the thesis jury, necessary format adjustments according to the Institute requirements.

## SAMPLE OF RECENT PUBLICATIONS

• A. Berk, H. Giles, "Quadrilateral panelization of freefom surface structures", *Automation in Construction*, 76, 36-44 (2017)

• C. Chen-Yu, P. Goad, P. Myers, "China in Denmark: The transmission of Chinese art and architecture from the view of Jørn Utzon's Danish socio-cultural background", *Nordic J of Architectural Research* (Forthcoming)

• C. Chen-Yu, A. Niskanen, K. Song, "Humanizing Modern Architecture: The role of Das Japanische Wohnhaus in Alvar Aalto's design for his own house and studio in Riihitie", *J of Asian Architecture and Building Engineering*, 8, 1-8 (2017)

• C. Imamoglu, M.O. Gurel, "Good Fences Make Good Neighbors: Territorial Dividers Increase User-Satisfaction and Efficiency in Library Study Spaces", *J of Academic Librarianship*, 42, 65-73 (2016)

• E.B. Nasir, S.T. Ogut, M.O. Gurel, "Changing Uses of the Middle-Class Living Room in Turkey: The Transformation of the Closed-Salon Phenomenon", *Intercultural Understanding*, 4, 15-19 (2015)

• Y. Afacan, M.O. Gurel, "Public Toilets: An Exploratory Study on the Demands, Needs and Expectations in Turkey", *Environment and Planning B- Planning and Design*, 42, 242-262 (2015)

• M.O. Gurel, "Seashore Readings: The Road from Sea Baths to Summerhouses in Mid Twentieth Century Izmir", *Mid-Century Modernism in Turkey: Architecture Across Cultures in the 1950s and 1960s*, M.O. Gurel (Eds.), pp. 27-55, New York and London: Routledge (2016)

• M.O. Gurel, "Introduction", *Mid-Century Modernism in Turkey: Architecture Across Cultures in the 1950s and 1960s*, M.O. Gurel (Eds.), pp. 1-8, New York and London: Routledge (2016)

• M.O. Gurel, "Designing and Consuming the Modern in Turkey", *Routledge Companion to Design Studies*, F. Fisher, P. Sparke (Eds.), pp. 457-468, New York and London: Routledge (2016)

• M.O. Gurel, "*Seashore Readings: The Road from Sea Baths to Summerhouses in Mid-Twentirth Century Izmir*", Mid-Century Modernism in Turkey: Architecture Across Cultures in the 1950s and 1960s, M.O. Gurel (Eds.), pp. 27-55, New York and London: Routledge (2016)

• M.O. Gurel, "Introduction", *Mid-Century Modernism in Turkey: Architecture Across Cultures in the 1950s and 1960s*, M.O. Gurel (Eds.), pp. 1-8, New York and London: Routledge (2016)

• M.O. Gurel, "Designing and Consuming the Modern in Turkey", *Routledge Companion to Design Studies, F. Fisher*, P. Sparke (Eds.), pp. 457-468, New York and London: Routledge (2016)

• S. Tasli-Pektas, "The Virtual Design Studio on the Cloud: a Blended and Distributed Approach for Technology-mediated Design Education", *Architectural Science Review*, 58, 255-265 (2015)

• S. Tasli-Pektas, N.S. Aybar, N.Y. Savut, W.H. McKinnon, "Integrating Green Building Approaches to Interior Architecture Education: A Cross-Cultural Study", *Open House International*, 40, 24-31 (2015)

• S. Tasli-Pektas, "The Layered Dependency Structure Matrix for Managing Collaborative Design Processes", *Open House International*, 39, 26-35 (2014)

• S. Tasli-Pektas, M.O. Gurel, "Blended learning in design education: an analysis of students' experiences within the disciplinary differences framework", *Australasian Journal of Educational Technology,* 30, 31-44 (2014)

Contact:
Dr. Meltem Ö. Gürel
(Department Chair)
Phone : +90 312 290 3463
Fax : +90 312 266 44 02
mogurel@bilkent.edu.tr

## Faculty Profile: Dr. Meltem Ö. Gürel, Associate Professor, Department of Architecture

Meltem Ö. Gürel received her B.S. degree as well as a Master of Architecture degree (1990), and a Ph.D. in Architecture (2007) from the University of Illinois at Urbana-Champaign (UIUC). Her Ph.D. studies were supported by the Alan K. and Leonarda F. Laing Fellowship, the Edward L. Ryerson Traveling Award in Architecture, the Rexford Newcomb Award, and the Francis J. Plym Doctoral Fellowship; her doctoral dissertation received the ARCC/King Student Medal.

Prior to joining Bilkent University as a faculty member in 1994, Dr. Gürel practiced architecture in Illinois and New York; in 1997, she was a visiting scholar at UIUC's School of Architecture. She became the founding head of Bilkent's Department of Architecture in 2011 and currently continues as chair of the department. Previously, she had served as chair of the Department of Interior Architecture and Environmental Design (2010-2012).

Dr. Gürel's research interests include architectural theory and criticism, cross-cultural histories of modernism with an emphasis on social, gender, and cultural studies as they have influenced the built environment (especially in Turkey) in the mid-twentieth century, space-culture relationship, and design education. She has published numerous articles in journals including the *Journal of Architecture*, the *Journal of Architectural Education, Gender, Place and Culture*, the *Journal of Design History*, and the *Journal of Architectural and Planning Research*. Her work has also been published in a number of edited books, such as *The Routledge Companion to Design Studies and Performance, Fashion and the Modern Interior: From the Victorians to Today*. She is *the editor of Mid-Century Modernism in Turkey: Architecture Across Cultures in the 1950s and 1960s* (Routledge, 2016).

# CHEMISTRY

The Department of Chemistry aims to provide a fundamental understanding of chemical applications associated with innovative technologies, focusing on nanomaterials, electronics, sensors, solid-state devices, display systems, petrochemicals, medical diagnostics, cancer therapy, drug delivery, and automotive and aerospace applications. Current research areas are organic and inorganic chemistry, polymer/supramolecular chemistry, theoretical and computational chemistry, surface chemistry, catalysis, electrochemistry and nanostructured materials for sustainable energy systems, renewable energy generation, energy conversion, and chemical/electrical energy storage.

## FACULTY

**ENGİN UMUT AKKAYA**, Professor. Ph.D., Organic Chemistry, Ohio State University, 1989. *Supramolecular chemistry, fluorescent chemosensors, logic gates, self-assembly, rational design of sensitizers for DSSC and PDT, molecular devices.*

**BİLGE BAYTEKİN**, Assistant Professor. Ph.D., Chemistry, Freie Universität Berlin, 2008. *Mechanochemistry, organic materials chemistry, electrostatics.*

**ÖMER DAĞ**, Professor. Ph.D., Inorganic Chemistry, Middle East Technical University, 1994. *Synthesis characterization and spectroscopy of solid-state materials and coordination complexes, meso-structured metal oxides, metals, metal chalcogenides and liquid crystal precursors.*

**FERDİ KARADAŞ**, Assistant Professor. Ph.D., Inorganic Chemistry, Texas A&M University, 2009. *Porous inorganic materials, Gas adsorption chemistry, Molecular magnetism, Electrochemical and electrocatalytic properties of molecular multinuclear molecules.*

**ZEKİ C. KURUOĞLU**, Professor. Ph.D., Theoretical Chemistry/Chemical Physics, University of Florida, 1978. *Chemical reaction dynamics, quantum theory of scattering, few-body problems, numerical methods for quantum mechanical calculations.*

**EMRAH ÖZENSOY**, Associate Professor. Ph.D., in Physical Chemistry, Texas A&M University, 2004. *Catalytic properties of surfaces and nanostructures, model catalyst design at the atomic level, spectroscopic investigation of single crystals and ultra-thin metal-oxide films.*

**ULRIKE SALZNER**, Professor. Ph.D., Chemistry, Universität Erlangen, 1993. *Computational chemistry, quantum chemistry, band structure calculations, band gap engineering, polymer chemistry.*

**ŞEFİK SÜZER**, Professor. Department Chair. Ph.D., Chemistry, University of California, Berkeley, 1976. *Electron, ion and photon spectroscopic analyses of gases, solids and surfaces.*

**DÖNÜŞ TUNCEL**, Associate Professor. Ph.D., Organic and Polymer Chemistry, Cambridge University and Imperial College, London, 1999. *Supramolecular chemistry, synthesis and characterization of functional materials.*

**YUNUS EMRE TÜRKMEN**, Assistant Professor. Ph.D., Organic Chemistry, The University of Chicago, 2012. *Non-covalent interactions in organocatalysis, natural product total synthesis.*

**BURAK ÜLGÜT**, Assistant Professor. Ph.D., Physical Chemistry and Analytical Chemistry, Cornell University, 2007. *Electrochemical measurements, energy storage systems, in-situ spectroscopy and electrochemistry*

## MASTER OF SCIENCE IN CHEMISTRY

**Admission:** All applicants are required to have a B.S. degree in chemistry, chemical engineering, or a related field of science or engineering. Students with a B.S. degree in an area other than chemistry may be required to take certain undergraduate courses in order to acquire the necessary background in the field. Evaluation of applicants is based on their ALES (*Akademik Personel ve Lisansüstü Eğitimi Giriş Sınavı*/Academic Personnel and Postgraduate Education Entrance Examination) scores, past academic records, reference letters, and an interview. Applicants who are not Turkish citizens and Turkish citizen applicants who are residents of another country may take the GRE (Graduate Record Examination) instead of the ALES. All nonnative speakers of English are required to submit proof of satisfactory knowledge of English.

**Degree Requirements:** In addition to completing at least 21 credit units of course work, the M.S. degree candidate must prepare and successfully defend a thesis. The expected duration of study for the M.S. degree is 4 semesters; the maximum duration is 6 semesters.

## DOCTOR OF PHILOSOPHY IN CHEMISTRY

**Admission:** All applicants are required to have a B.S. degree in chemistry or a related field of science or engineering. Evaluation of applicants is based on their ALES (*Akademik Personel ve Lisansüstü Eğitimi Giriş Sınavı*/Academic Personnel and Postgraduate Education Entrance Examination) scores, past academic records, reference letters, and an interview. Applicants who are not Turkish citizens and Turkish citizen applicants who are residents of another country may take

the GRE (Graduate Record Examination) instead of the ALES. All nonnative speakers of English are required to submit proof of satisfactory knowledge of English.

**Degree Requirements:** The completion of 21 credit units of course work beyond the M.S. level is required. Ph.D. candidates must pass a qualifying exam, typically in their fourth semester, and then must prepare a dissertation proposal. Preparation and defense of a dissertation based on original research is the centerpiece of the program. The standard duration of study for the Ph.D. degree is 8 semesters for students who enter the program with an M.S. degree; the maximum duration is 12 semesters.

## COURSE DESCRIPTIONS

**CHEM 503 Chemical Kinetics**
Experimental and theoretical aspects of reactive and inelastic molecular processes, collision theory. Homogeneous reactions in gas and liquid phases. Surface reactions and solid state reactions. Theory of kinetic processes. Molecular beams. Lasers.

**CHEM 504 Group Theory and Its Chemical Applications**
Group theory, molecular symmetry, Ligand field theory. Applications: symmetry aspects of MO theory, spectroscopy of transition metal complexes, metal-ligand bonding, molecular vibrations and symmetry.

**CHEM 505 Nuclear and Radiochemistry**
The atomic nucleus. Nuclear masses and nuclear stability. Radioactive decay processes: alpha, beta, and gamma decay. Structure of nuclei, nuclear models, nuclear forces, nuclear reactions, fission, fusion. Nuclear processes in geology and astrophysics.

**CHEM 506 Chemical Thermodynamics**
The Laws of Thermodynamics. The Gibbsian approach to Thermodynamics: Fundamental equation, maximum entropy principle. Legendre transforms and thermodynamic potentials. Extremum principles for equilibrium states. Stability of thermodynamic systems, LeChatelier principle. Phase equilibria, phase transitions, phase diagrams. Critical phenomena. Thermodynamics of chemical reactions. Capillarity effects. Thermodynamics of systems in external fields. Introduction to Irreversible Thermodynamics.

**CHEM 507 Statistical Thermodynamics**
Review of Classical Thermodynamics: fundamental equation, maximum entropy principle, Legendre transforms and thermodynamic potentials. Basic notions of probability theory. Ensemble theory: microcanonical, canonical and grandcanonical ensembles. Partition functions. Fluctuations, equivalence of ensembles. Classical phase-space approach. Quantum statistics: Fermi-Dirac and Bose-Einstein distributions. Classical limit of quantum statistics. Applications to ideal gases, chemical equilibrium, models for adsorption and elasticity.

**CHEM 511 Quantum Chemistry I**
Classical mechanics, linear vector spaces and linear operators. Harmonic oscillator, H-atom, angular momentum. WKB method, perturbation theory. Variation method. Introduction to scattering theory.

**CHEM 513 Environmental Radiochemistry**
Radiochemical problems related to the environment. Analysis of current environmental issues using radioisotope techniques. Energy resources and utilization. Air and water pollution. Radiochronological techniques.

**CHEM 515 Molecular Spectroscopy**
Atomic spectra, rotational, vibrational and electronic spectra of molecules. Structural parameters. Molecular models. Group theory. Selection rules.

**CHEM 521 Surface Chemistry I**
The central idea of this course is to describe the present state of modern surface science within a context dictated by chemistry. The course offers understanding of the surface phenomena at molecular-level and their relation to the various surface processes. It is focused on the properties of the solid-gas and solid-liquid interfaces and could be interest to students of chemical, physical and engineering science.

**CHEM 523 Concepts in Materials Science**
Fundamental concepts in materials science will be covered. These topics include plastic deformation of crystalline solids and dislocations theory, defects in solids, diffusion phenomena, interfaces and kinetics of phase transformations. Nucleation and growth phenomena will also be covered. Several metallic, ceramic and polymeric systems will be investigated as case study examples.

**CHEM 531 Advanced Organic Chemistry I**
The important classes of organic reactions and methods by which chemists obtain information. The main focus of the course is on reaction mechanisms. The experimental evidence upon which the mechanistic ideas are built will be emphasized. This course will also emphasize heterolytic reactions.

**CHEM 532 Advanced Organic Chemistry II**
Physical Organic Chemistry: MO theory, population analysis, frontier orbital theory, pericyclic reactions, transition states, reactive intermediates, understanding reaction mechanisms.

**CHEM 534 NMR Spectroscopy for Organic Structure Determination**
Fundamental theory and practical aspects of Nuclear Magnetic Resonance (NMR) spectroscopy with special emphasis on chemical shifts, spin-spin couplings and spin systems. Applications of 1-D 1H- and 13C-NMR spectroscopic techniques. Strategies for the structure determination of unknown compounds.

**CHEM 537 Supramolecular Chemistry**
The course introduces general principles of molecular recognition, complex formation and host design, with emphasis on thermodynamics of multi-site host-guest complexation and nature of supramolecular interactions. Structure, properties, and synthesis of major categories of cation-, anion-, and neutral molecule-binding hosts are discussed, and crystal structures of enzyme-inhibitor complexes are analyzed from the point of view of the basic concepts of host-guest chemistry.

**CHEM 541 Advanced Inorganic Chemistry I**
Electronic spectra of complexes, reaction mechanism of d-block complexes, d- and f-block organometallic compounds, inorganic chains, rings, cages and clusters, catalysis and characterization of catalytic materials.

**CHEM 542 Advanced Inorganic Chemistry II**
Solid state synthesis, electronic and optical properties of solids. Solid state characterization methods.

**CHEM 551 Special Topics in Physical Chemistry I**
**CHEM 552 Special Topics in Physical Chemistry II**

**CHEM 556 Advanced Instrumental Analysis**
Principles, instrumentation and applications of modern instrumental methods, including spectroscopic techniques such as AAS, ICPMS, FTIR, Raman spectroscopy, Luminescence Spectroscopy, Mass Spectrometry.

**CHEM 561 Special Topics in Inorganic Chemistry I**
**CHEM 562 Special Topics in Inorganic Chemistry II**

**CHEM 571 Special Topics in Organic Chemistry I**
**CHEM 572 Special Topics in Organic Chemistry II**

**CHEM 573 Polymer Chemistry I**
Basic concepts of polymer science. Condensation, free radical, ionic, and coordination polymerizations. Synthesis, molecular structure, properties and uses of some common commercial polymers.

**CHEM 574 Polymer Chemistry II**
Measurement of molecular weight, thermal and mechanical analysis, morphology, crystallinity, rheology, polymer structure-property-performance relationship.

**CHEM 580 Advanced Photochemistry**
Introduction to photochemistry, light-matter interactions, basic and advanced experimental techniques, radiative and nonradiative processes, light induced chemistry, electron and proton transfer, organic photochemistry, inorganic photochemistry, photoelectrochemistry, supramolecular photochemistry, femtochemistry, laser-tissue interactions, photodynamic therapy, fluorescence imaging.

**CHEM 586 Electrochemistry**
Fundamentals of electrochemistry with special emphasis on electrode kinetics, thermodynamics and structure of the electrode electrolyte interface. Electrochemical measurement techniques involving controlled potential and current methods. Energy storage and conversion examples including supercapacitors, batteries and solar cells.

**CHEM 591 Graduate Seminar I**
This is a graduate (MS) seminar course. The instructor and students meet once a week for presentations and discussions. Topics of presentations are chosen by the mutual consent of the instructor and the students.

**CHEM 599 Master's Thesis**

**CHEM 691 Advanced Seminar I**
This is a graduate (PhD) seminar course. The instructor and students meet once a week for presentations and discussions. Topics of presentations are chosen by the mutual consent of the instructor and the students.

**CHEM 699 Ph.D. Dissertation**

## SAMPLE OF RECENT PUBLICATIONS


• B. Kilic, N. Yesilgul, V. Polat, Z. Gercek, E.U. Akkaya, "Bodipy-based photosensitizers with long alkyl tails at the meso position: efficient singlet oxygen generation in Cremophor-EL micelles", *Tetrahedron Letters*, 57, 1317-1320 (2016)

• I.S. Turan, D. Yildiz, A. Turksoy, G. Gunaydin, E.U. Akkaya, "A Bifunctional Photosensitizer for Enhanced Fractional Photodynamic Therapy: Singlet Oxygen Generation in the Presence and Absence of Light", *Angewandte Chemie International Edition*, 128, 2925-2928 (2016)

• S. Kolemen, T. Ozdemir, D. Lee, G. Kim, T. Karatas, J. Yoon, Engin U. Akkaya, "Remote-Controlled Release of Singlet Oxygen by the Plasmonic Heating of Endoperoxide-Modified Gold Nanorods: Towards a Paradigm Change in Photodynamic Therapy", *Angewandte Chemie International Edition*, 55, 3606-3610 (2016)

• T. Ozdemir, J.L. Bila, F. Sozmen, L.T. Yildirim, E.U. Akkaya, "Orthogonal Bodipy Trimers as Photosensitizers for Photodynamic Action", *Organic Letters*, 18, 4821-4823 (2016)

• I.S. Turan, O. Yilmaz, B. Karatas, E.U. Akkaya, "A sensitive and selective chemiluminogenic probe for palladium", *RSC Advances*, 5, 34535-34540 (2015)

• S. Erbas-Cakmak, F.P. Cakmak, S.D. Topel, T.B. Uyar, E.U. Akkaya, "Selective photosensitization through an and logic response: optimization of the pH and glutathione response of activatable photosensitizers", *Chemical Communications*., 12258-12261 (2015)

• S. Kolemen, M. Isik, G.M. Kim, D. Kim, H. geng, M. Buyuktemiz, T. Karatas, X-F. Zhang, Y. Dede, J. Yoon, E.U. Akkaya, "Intracellular Modulation of Excited State Dynamics in a Chromophore Dyad: Differential Enhancement of Photocytotoxicity Targeting Cancer Cells", *Angewandte Chemie International Edition*, 54, 5340-5344 (2015)

• A. Atilgan, E.T. Ecik, R. Guliyev, T.B. Uyar, S. Erbas-Cakmak, E.U. Akkaya, "Near-IR-Triggered, Remote-Controlled Release of Metal Ions: A Novel Strategy for Caged Ions", *Angewandte Chemie International Edition*, 53, 10678-10681 (2014)

• E. Ertem, A. Bekdemir, A. Atilgan, E.U. Akkaya, "Near IR Absorbing Bodipy-functionalized SPIONs: A Potential Magnetic Nanoplatform for Diagnosis and Therapy", *Pure and Applied Chemistry*, 86, 899-903 (2014)

• E. Tanriverdi-Ecik, A. Atilgan, R. Guliyev, T.B. Uyar, A. Gumus, E.U. Akkaya, "Modular logic gates: cascading independent logic gates via metal ion signals", *Dalton Transactions*, 43, 67-70 (2014)

• F. Sozmen, S. Kolemen, H.O. Kumada, M. Ono, H. Saji, E.U. Akkaya, "Designing Bodipy-based Probes for Fluorescence Imaging of beta-amyloid Plaques", *RSC Advances*, 4, 51032-51037 (2014)

• I.S. Turan, E.U. Akkaya, "Chemiluminescence Sensing of Fluoride Ions Using a Self-Immolative Amplifier", *Organic Letters*, 16, 1680-1683 (2014)

• I.S. Turan, F.P. Cakmak, D.C. Yildirim, R. Cetin-Atalay, E.U. Akkaya, "Near-IR Absorbing BODIPY Derivates as Glutathione-Activated Photosensitizers for Selective Photodynamic Action", *Chemistry - A European Journal*, 20, 16088-16092 (2014)

• M. Isik, R. Guliyev, S. Kolemen, Y. Altay, B. Senturk, T. Tekinay, E.U. Akkaya, "Designing an Intracellular Fluorescent Probe for Glutathione: Two Modulation Sites for Selective Signal Transduction", *Organic Letters*, 16, 3260-3263 (2014)

• S. Erbas-Cakmak, E.U. Akkaya, "Toward Singlet Oxygen Delivery at a Measured Rate: A Self-reporting Photosensitizer", *Organic Letters*, 16, 2946-2949 (2014)

• S. Kolemen, Y. Cakmak, T. Ozdemir, S. Erten-Ela, M. Buyuktemiz, Y. Dede, E.U. Akkaya, "Design and Synthesis of Bodipy Derivatives for Bulk Heterojunction Solar Cells", *Tetrahedron Letters*, 70, 6229-6234 (2014)

• S. Kolemen, Y. Cakmak, Z. Kostereli, E.U. Akkaya, "Atropisomeric Dyes: Axial Chirality in Orthogonal BODIPY Oligomers", *Organic Letters*, 16, 660-663 (2014)

• S.D. Topel, G.T. Cin, E.U. Akkaya, "Near IR Excitation of heavy-atom Free Photosensitizers through the Intermediacy of Upconverting Nanoparticles", *Chemical Communications*, 50, 8896-8899 (2014)

• T. Ozdemir, F. Sozmen, S. Mamur, T. Tekinay, E.U. Akkaya, "Fast Responding and Selective Near-IR Bodipy Dye for Hydrogen Sulfide Sensing", *Chemical Communications*, 50, 5455-5457 (2014)

• T. Ozdemir, Z. Kostereli, R. Guliyev, S. Yalcin, Y. Dede, E.U. Akkaya, "Ion Responsive Near-IR Bodipy Dyes: Two Isomers, Two Different Signals", *RSC Advances*, 4, 14915-14918 (2014)

• Y. Cakmak, T. Nalbantoglu, T. Durgut, E.U. Akkaya, "PEGylated calix[4]arene as a carrier for a Bodipy-based photosensitizer", *Tetrahedron Letters*, 45, 538-540 (2014)

• H.T. Baytekin, B. Baytekin, S. Huda, Z. Yavuz, B.A. Grzybowski, "Mechanochemical activation and patterning of an adhesive surface toward nanoparticle deposition", *J of American Chemical Society*, 137, 1726-1729 (2015)

• C. Li, B. Jiang, Z. Wang, Y. Li, Md.S.A. Hossain, J.H. Kim, T. Takei, J. Henzie, O. Dag, Y. Bando, Y. Yamauchi, "First Synthesis of Continuous Mesoporous Copper Films with Uniformly Sized Pores by Electrochemical Soft Templating", *Angewandte Chemie International Edition*, 55, 12746-12750 (2016)

• E. Tunkara, O. Dag, "Salt-Acid-Surfactant Lyotropic Liquid Crystalline Mesophases: Synthesis of Highly Transparent Mesoporous Calcium Hydroxyapatite Thin Films", European *J of Inorganic Chemistry.*, 2114-2121 (2016)

• E. Yilmaz, E.B. Olutas, G. Barim, J. Bandara, O. Dag, "Lithium salt–nonionic surfactant lyotropic liquid crystalline gel-electrolytes with redox couple for dye sensitized solar cells", *RSC Advances*, 6, 97430-97437 (2016)

• F.M. Balci, O.U. Kudu, E. Yilmaz, O. Dag, "Synthesis of Mesoporous Lithium Titanate Thin Films and Monoliths as an Anode Material for High-Rate Lithium-Ion Batteries", *Chemistry - A European Journal*, 22, 18873-18880 (2016)

• C. Li, O. Dag, T.D. Dao, T. Nagao, Y. Sakamoto, T. Kimura, O. Terasaki, Y. Yamauchi, "Electrochemical Synthesis of Mesoporous Au Films toward Mesospace-Stimulated Optical Properties", *Nature Communications*, 6, 6608 (2015)

• E.B. Olutas, F.M. Balci, O. Dag, "Strong Acid-Nonionic Surfactant Lyotropic Liquid Crystalline Mesophases as a Media for Organic and Inorganic Reactions", *Langmuir*, 31, 10265-10271 (2015)

• C. Albayrak, G. Barim, O. Dag, "Effect of Hygroscopicity of the Metal Salts on the Formation and Air Stability of Lyotropic Liquid Crystalline Mesophases in Hydrated Salt-Surfactant Systems", *J of Colloid and Interface Science*, 433, 26-33 (2014)

• C. Avci, A. Aydin, Z. Tuna, Z. Yavuz, Y. Yamauchi, N. Suzuki, O. Dag, "Molten Salt Assisted Self Assembly (MASA):Synthesis of Mesoporous Metal Titanate (CoTiO3, MnTiO3, and Li4Ti5O12) Thin Films and Monoliths", *Chemistry of Materials*, 26, 6050-6057 (2014)

• E. Tunkara, C. Albayrak, E.O. Polat, C. Kocabas, O. Dag, "Highly Proton Conducting Phosphoric Acid-Nonionic Surfactant Lyotropic Liquid Crystalline Mesophases and Application in Graphene Optical Modulators", *ACS Nano*, 8, 11007-11012 (2014)

• G. Barim, C. Albayrak, E. Yilmaz, O. Dag, "Highly Ion Conductive Hydrated Lithium Salt-Pluronic Lyotropic Liquid Crystalline Mesophases", *Langmuir*, 30, 6938-6945 (2014)

• A. Tekin, O. Karalti, F. Karadas, "A metal dicyanamide cluster with high CO2/N2 selectivity", *Microporous and Mesoporous Materials*, 228, 153-157 (2016)

• M. Aksoy, S.V.K. Nune, F. Karadas, "A Novel Synthetic Route for the Preparation of an Amorphous Co/Fe Prussian Blue Coordination Compound with High Electrocatalytic Water Oxidation Activity", *Inorganic Chemistry,* 55, 4301-4307 (2016)

• R. Mishra, E. Ulker, F. Karadas, "One-Dimensional Copper(II) Coordination Polymer as an Electrocatalyst for Water Oxidation", *ChemElectroChem* (Forthcoming)

• S.V.K. Nune, A.T. Basaran, E. Ulker, R. Mishra, F. Karadas, "Metal Dicyanamides as Efficient and Robust Water Oxidation Catalysts", *ChemCatChem* (Forthcoming)

• Z.C. Kuruoglu, "Direct numerical solution of the Lippmann-Schwinger equation in coordinate space without partial-wave decomposition", *Physical Review E*, 94, 053303-1--10 (2016)

• Z. Kuruoglu, "Multi-variate Bateman method for two-body scattering without partial-wave decomposition", *J of Mathematical Chemistry,* 52, 1857-1869 (2014)

• Z. Kuruoglu, "Finite-Rank Multivariate-Basis Expansions of the Resolvent Operator as a Means of Solving the Multivariable Lippmann-Schwinger Equation for Two-Particle Scattering", *Few-Body Systems*, 55, 1167-1183 (2014)

• Z.C. Kuruoglu, "Weighted-Residual Methods for the Solution of Two-Particle Lippmann-Schwinger Equation without Partial-Wave Decomposition", *Few-Body Systems*, 55, 69-84 (2014)

• D. Altunoz-Erdogan, M. Sevim, E. Kısa, D.B. Emiroglu, M. Karatok, E.I. Vovk, M. Bjerring, U. Akbey, O. Metin, E. Ozensoy, "Photocatalytic Activity of Mesoporous Graphitic Carbon Nitride (mpg-C3N4) Towards Organic Chromohores Under UV and VIS Light Illumination", *Topics in Catalysis*, 59, 1305-1318 (2016)

• M. Kurt, Z. Say, K.E. Ercan, E.I. Vovk, C.H. Kim, E. Ozensoy, "Sulfur Poisoning and Regeneration Behavior of Perovskite-Based Oxidation Catalysts", *Topics in Catalysis* (Forthcoming)

• S. Senozan, H. Ustunel, M. Karatok, E.I. Vovk, A.A. Shah, E. Ozensoy, S. Toffoli, "Comparative Analysis of Reactant and Product Adsorption Energies in the Selective Oxidative Coupling of Alcohols to Esters on Au(111)", *Topics in Catalysis*, 59, 1383-1393 (2016)

• S. Bertinetti, M. Minella, F. Barsotti, V. Maurino, C. Minero, E. Ozensoy, D. Vione, "A Methodology to Discriminate Between Hydroxyl Radical-induced Processes and Direct Charge-transfer Reactions in Heterogeneous Photocatalysis", *J of Adv. Oxidation Tech.*, 19, 236-245 (2016)

• W. Lu, A.D. Olaitan, M.R. Brantley, B. Zekavat, D.A. Erdogan, E. Ozensoy, T. Solouki, "Photocatalytic Conversion of Nitric Oxide on Titanium Dioxide: Cryotrapping of Reaction Products for Online Monitoring by Mass Spectrometry", *J of Physical Chemistry C*, 120, 8056-8067 (2016)

• Z. Say, M. Tohumeken, E. Ozensoy, "Spectroscopic investigation of sulfur-resistant Pt/K2O/ZrO2/TiO2/AlO2O3 NSR/LNT catalysts", *Catalysis Today*, 267, 167-176 (2016)

• A. Bulut, M. Yurderi, Z. Say, H.D. Kivrak, M. Gulcan, M. Kaya, E. Ozensoy, M. Zahmakiran, "MnOx-Promoted PdAg Alloy Nanoparticles for the Additive-Free Dehydrogeneration of Formic Acid at Room Temperature", *ACS Catalysis*, 5, 6099-6110 (2015)

• A.M. Soylu, M. Polat, D.A. Erdogan, H. Erguven, E. Ozensoy, "Influence of the Sol-Gel Synthesis Protocol on the Photocatalytic Activity of tiO2-Al2O3 Binary Mixed Oxide Catalysts", *Catalysis Today*, 241, 25-32 (2015)

• D.A. Erdogan, T. Solouki, E. Ozensoy, "A Versatile Bio-inspired Material Platform for Catalytic Applications: Micron-Sized "Buckyball-Shaped" TiO2 Structures", *RSC Advances*, 5, 41174 (2015)

• M. Karatok, E.I. Vovk, A. Shah, A. Turksoy, E. Ozensoy, "Acetaldehyde Partial Oxidation on the Au(111) Model Catalyst Surface: C-C bond Activation and Formation of Methyl Acetate as an Oxidative Coupling Product", *Surface Science*, 641, 289 (2015)

• S. Kalyoncu, D. Duzenli, I. Onal, A. Seubasi, D. Noon, S. Senkan, Z. Say, V.I. Vovk, E. Ozensoy, "NaCl-Promoted CuO-RuO2/SiO2 Catalysts for Propylene Epoxidation with O2 at Atmospheric Pressures: A Combinatorial Micro-reactor Study", *Catalysis Letters*, 145, 594-905 (2015)

• A.M. Soylu, M. Polat, D.A. Erdogan, Z. Say, C. Yildirim, O. Birer, E. Ozensoy, "TiO2-Al2O3 binary mixed oxide surfaces for photocatalytic Nox abatement", *Applied Surface Science*, 318, 142-149 (2014)

• D.A. Erdogan, M. Polat, R. Garifullin, M.O. Guler, E. Ozensoy, "Thermal evolution of structure and photocatalytic activity

in polymer microsphere templated TiO2 microbowls", *Applied Surface Science*, 308, 50-57 (2014)

• M.Y. Smirnov, A.V. Kalinkin, D.A. Nazimov, V.I. Bukhtiyarov, El Vovk, E. Ozensoy, "An XPS study of the interaction of model Ba/TiO2 AND Ba/ZrO2 NSR catalysts with NO2", *J of Structural Chemistry*, 55, 757-763 (2014)

• S. Andonova, E. Vovk, J. Sjoblom, E. Ozensoy, L. Olsson, "Chemical deactivation by phosphorous under lean hydrothermal conditions over Cu/BEA NH3-SCR catalysts", *Applied Catalysis B-Environmental*, 147, 251-263 (2014)

• Z. Say, M. Dogac, E.I. Vovk, Y.E. Kalay, C.H. Kim, W. Li, E. Ozensoy, "Palladium doped perovskite-based NO oxidation catalysts: The role of Pd and B-sites for Nox adsorption behavior via in-situ spectroscopy", *Applied Catalysis B-Environmental*, 154, 51-61 (2014)

• Z. Say, M. Tohumeken, E. Ozensoy, "NOx storage and reduction pathways on zirconia and titania functionalized binary and ternary oxides as NOx storage and reduction (NSR) systems", *Catalysis Today*, 231, 135-144 (2014)

• T. Mukhopadhyay, B. Puttaraju, S.P. Senanayak, A. Sadhanala, R. Friend, H.A. Faber, T.D. Anthopoulos, U. Salzner, A. Meyer, S. Patil, "Air-Stablen-channel Diketopyrrolopyrrole–Diketopyrrolopyrrole Oligomers for High Performance Ambipolar Organic Transistors", *ACS Applied Materials & Interfaces*, 8, 25415-25427 (2016)

• J. Dhar, T. Mukhopadhay, N. Yaacobi-Gross, T.D. Anthopoulos, U. Salzner, S. Swaraj, S. Patil, "Effect of Chalcogens on Electronic and Photophysical Properties of Vinylene-Based Diketopyrrolopyrrole Copolymers", *J of Physical Chemistry B*, 119, 11307-11316 (2015)

• U. Salzner, "Electronic structure of conducting organic polymers: insights from time-dependent density functional theory", *Wires Comput Mol Sci*, 4, 601-622 (2014)

• U. Salzner, "Effect of Donor-Acceptor Substitution on Optoelectronic Properties of Conducting Organic Polymers", *J of Chemical Theory and Computation*, 10, 4921-4937 (2014)

• C. Kanimozhi, N. Yaacobi-Gross, E.K. Burnett, A.L. Briseno, T.D. Anthopoulos, U. Salzner, S. Patil, "Use of side-chain for rational design of n-type diketopyrrolopyrrole-based conjugated polymers: what did we fing out?", *Physical Chemistry Chemical Physics*, 16, 17253-17265 (2014)

• J. Dhar, C. Kanimozhi, N. Yaccobi-Gross, T.D. Anthopoulos, U. Salzner, S. Patil, "Selenium in Diketopyrrolopyrrole-based Polymers: Influence on Electronic Properties and Charge Carrier Mobilities", *Israel J of Chemistry*, 54, 817-827 (2014)

• M. Copouroglu, D. Caliskan, H. Sezen, E. Ozbay, S. Suzer, "Location and Visualization of Working p-n and/or n-p Junctions by XPS", *Scientific Reports*, 6, 32482-1--9 (2016)

• M.S. Rubina, E.E. Kamitov, Y.V. Zubavichus, G.S. Peters, A.V. Naumkin, S. Suzer, A.Y. Vasilkov, "Collagen-chitosan scaffold modified with Au and Ag nanoparticles: Synthesis and structure", *Applied Surface Science*, 366, 365-371 (2016)

• N. Johnson, P. Aydogan, S. Suzer, A. Rockett, "Electrical properties from photo-induced charging on Cd-doped (100) surfaces of CuInSe2 epitaxial thin films", *J of Vacuum Science and Technology A*, 34, 031201 (2016)

• P. Aydogan, E.O. Polat, C. Kocabas, S. Suzer, "X-ray photoelectron spectroscopy for identification of morphological defects and disorders in graphene devices", *J of Vacuum Science and Technology A*, 34, 041516-1--5 (2016)

• P. Aydogan, N. Johnson, A. A. Rockett, S. Suzer, "Characterization of CuInSe2/CdS Thin-film Photovoltaics by X-Ray Photoelectron Spectroscopy", *Science Advances Today*, 2, 25240 (2016)

• P. Aydogan, O. Balci, C. Kocabas, S. Suzer, "Monitoring the operation of a graphene transistor in an integrated circuit by XPS", *Organic Electronics*, 37, 178-182 (2016)

• Z.S. Saifalden, K.R. Khedir, M.T. Camci, A. Ucar, S. Suzer, T. Karabacak, "The effect of polar end of long-chain fluorocarbon oligomers in promoting the superamphiphobic property over multi-scale rough Al alloy surfaces", *Applied Surface Science*, 379, 55-65 (2016)

• D. Caliskan, H. Sezen, E. Ozbay, S. Suzer, "Chemical Visualization of a GaN p-n junction by XPS", *Scientific Reports*, 5, 14091-1--7 (2015)

• P. Aydogan, E. Arslan, S. Cakmakyapan, E. Ozbay, W. Strupinski, S. Suzer, "Voltage contrast X-ray photoelectron spectroscopy reveals graphene-substrate interaction in graphene devices fabricated on the C- and Si- faces of SiC", *Applied Physics Letters*, 107, 121603-1--5 (2015)

• A. Ucar, M. Copuroglu, M.Z. Baykara, O. Arikan, S. Suzer, "Tribological interaction between polytetrafluoroethylene and silicon oxide surfaces", *J of Chemical Physics*, 141, 164702-1--6 (2014)

• H. Sezen, E. Ozbay, S. Suzer, "XPS for probing the dynamics of surface voltage and photovoltage in GaN", *Applied Surface Science*, 323, 25-30 (2014)

• I. Tunc, H. Sezen, H.O. Guvenc, S. Suzer, "Charge Storage and Release onto Au and Ag Nanoparticles in Aqueous Medium as probed by Optical Spectroscopy", *J of Spectroscopy and Dynamics*, 4, 1-5 (2014)

• M. Copuroglu, P. Aydogan, E.O. Polat, C. Kocabas, S. Suzer, "Gate-Tunable Photoemission from Graphene Transistors", *Nano Letters*, 14, 2837-2842 (2014)

• M. Taner-Camc, S. Suzer, "Dynamic XPS measurements of ultrathin polyelectrolyte films containing antibacterial Ag–Cu nanoparticles", *J of Vacuum Science and Technology A*, 32, 021510-1--5 (2014)

• M. Idris, M. Bazzar, B. Guzelturk, H.V. Demir, D. Tuncel, "Cucurbit[7]uril-threaded fluorene–thiophene-based conjugated polyrotaxanes", *RSC Advances*, 6, 98109-98116 (2016)

• Z. Soran-Erdem, T. Erdem, K. Gungor, J. Pennakalathil, D. Tuncel, H.V. Demir, "High-Stability, High-Efficiency Organic Monoliths Made of Oligomer Nanoparticles Wrapped in Organic Matrix", *ACS Nano*, 10, 5333-5339 (2016)

• B. Guzelturk, P.L. Hernandez-Martinez, V.K. Sharma, Y. Coskun, V. Ibrahimova, D. Tuncel, A.O. Govorov, X.W. Sun, Q. Xiong, H.V. Demir, "Study of exciton transfer in dense quantum dot nanocomposites", *Nanoscale*, 6, 11387-11394 (2014)

• E. Akhan, D. Tuncel, K.C. Akcali, "Nanoparticle labeling of bone marrow-derived rat Mesenchymal stem cells: tehir use in differentiation and tracking", *Biomed Research International.*, 298430 (2014)

• J. Pennakalathil, A. Ozgun, I. Durmaz, R. Cetin-Atalay, D. Tuncel, "pH-Responsive Near-Infrared Emitting Conjugated Polymer Nanoparticles for Cellular Imaging and Controlled-Drug Delivery", *J of Polymer Science Part A- Polymer Chemistry*, 53, 114-122 (2014)

• J. Pennakalathil, E. Jahja, E.S. Ozdemir, O. Konu, D. Tuncel, "Red emitting cucurbituril-capped, pH-responsive conjugated oligomer-based nanoparticles for drug delivery and cellular Imaging", *Biomacromolecules*, 15, 3366-3374 (2014)

• O. Gezici, I. Durmaz, E. Bilget Guven, O. Unal, A. Ozgun, R. Cetin-Atalay, D. Tuncel, "Dual functionality of conjugated polymer nanoparticles as an anticancer drug carrier and a fluorescent probe for cell imaging", *RSC Advances*, 4, 1302-1309 (2014)

• S. Gurbuz, M. Idris, D. Tuncel, "Cucurbituril-based supramolecularly engineered nanostructured materials", *Organic and Biomolecular Chemistry,* 13, 330-347 (2014)

• Y.E. Turkmen, M. Gravel, V.H. Rawal, "Studies Directed toward the Synthesis of Aspidophytine: Construction of Its Perhydroquinoline Core", *J of Organic Chemistry*, 81, 10454-10462 (2016)

• M.T. Camci, B. Ulgut, C. Kocabas, S. Suzer, "In-Situ XPS Monitoring and Characterization of Electrochemically Prepared Au Nanoparticles in an Ionic Liquid" *ACS Omega* 478−486 (2017)

• M.T. Camci, P. Aydogan, B. Ulgut, C. Kocabas, S. Suzer, "XPS enables visualization of electrode potential screening in an ionic liquid medium with temporal- and lateral-resolution", *Physical Chemistry Chemical Physics*, 18, 28434-28440 (2016)

Contact:
Dr. Şefik Süzer
(Department Chair)
Phone : +90 312 290 1027
Fax : +90 312 266 4068
suzer@fen.bilkent.edu.tr
chem.bilkent.edu.tr

## Faculty Profile: Dr. Şefik Süzer, Professor, Department of Chemistry

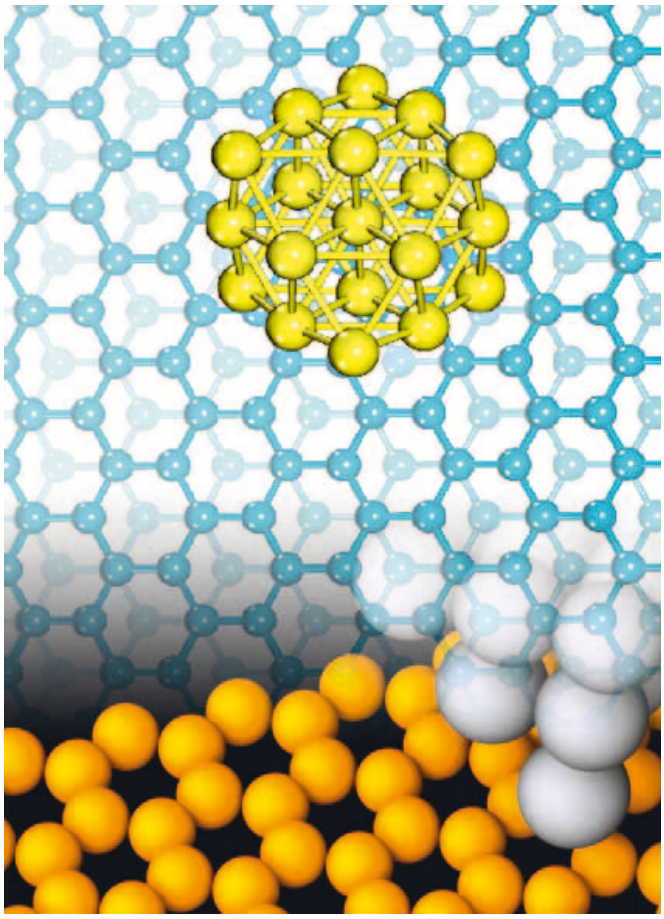
Şefik Süzer completed a B.S. in chemistry at Middle East Technical University, Ankara, Turkey, in 1970, and a Ph.D. in chemistry at the University of California, Berkeley, in 1976. He subsequently did postdoctoral research work at Sydney University and Freiburg University and worked in the Middle East Technical University Department of Chemistry before joining Bilkent University in 1992. He is currently serving his second stint as chair of the department, having previously held the post from 1992 to 2007. He has spent sabbaticals at the University of Virginia (1985-87), the University of Michigan (2000-01), the University of Delaware (2007-08), the Fritz-Haber Institute in Berlin (2013), and Osaka University (2014).

A recipient of an Alexander von Humboldt Fellowship, a Fulbright Research Scholarship, and the TÜBİTAK (Scientific and Technological Research Council of Turkey) Encouragement (1981) and Science Awards (1990), Prof. Süzer was elected a full member of the Turkish Academy of Sciences in 1993. He served as a member of TÜBİTAK's Science Board from 2000 to 2008 and was named a Fellow of the American Vacuum Society in 2010. He is a member of the Turkish Chemical Society, the American Chemical Society, the American Vacuum Society, the Society for Applied Spectroscopy, the Materials Research Society, and the American Association for the Advancement of Science.

He has twice served as a member of the editorial board of the *Journal of Electron Spectroscopy and Related Phenomena* (1980-1990 and 2008 to the present). He has also been an editor of *Applied Surface Science* (2008-2011) and *Surface Science Reports* (2013 to the present), and an associate editor of *Science Advances Today* (2016 to the present). He is currently a member of the editorial board of the *Journal of Electron Spectroscopy, Applied Surface Science, Spectroscopy and Dynamics*, and the *Turkish Journal of Chemistry.*

Dr. Süzer's research interests include spectroscopy, surface science and charge storage in nanostructured materials. His contributions have been highlighted as cover features in the *Journal of Physical Chemistry* (2004) and *Physical-Chemistry-Chemical-Physics* (2016).

# MATERIALS SCIENCE AND NANOTECHNOLOGY



**Program Director:** Dr. Hilmi Volkan Demir, Professor

The graduate program in Materials Science and Nanotechnology is interdisciplinary and is designed to develop scientists who can pursue creative, outstanding research in the various fields of nanoscience and nanotechnology, including nanobiotechnology and nanomedicine, atomic scale imaging, nano- and microelectronics, nanotextiles, nanophotonics, femtosecond lasers, spintronics, advanced materials design and manufacturing of nanofibers, and nanotribology, hydrogen economy and solar energy. The graduate program provides an in-depth understanding of materials at the nanometer scale and gives students an excellent background, starting with the quantum theory of matter and quantum statistical thermodynamics. The graduate courses to be taken by a student should focus on the subject of his/her thesis work.

## FACULTY

**H. TARIK BAYTEKİN**, Assistant Professor, Ph.D., Chemistry, Middle East Technical University, 2002, Organic and supramolecular chemistry, plasma treatment of *polymers, surface characterization methods, mechanism of static electricity generation (tribocharging) and development of charge dissipation methods on insulators.*

**SEYMUR CAHANGİROV**, Research Assistant Professor, Ph.D., Material Science and Nanotechnology, Bilkent University, 2012. *Computational physics, silicene, 2D materials, friction, nanowires and atomic chains.*

**AYKUTLU DANA**, Assistant Professor, Ph.D., Electrical Engineering, Stanford University, 2003. *Force microscopy and spectroscopy; micro and nano electro-opto-mechanical system and sensors; plasmon resonance based detection; novel microscopy and spectroscopy; photovoltaic materials and devices.*

**HİLMİ VOLKAN DEMİR**, Professor in the Department of Electrical and Electronics Engineering, Department of Physics and Director of Institute of Materials Science and Nanotechnology, Ph.D., Electrical Engineering, Stanford University, 2004. *Light-emitting diodes (LEDs), semiconductor nanocrystal optoelectronics, energy transfer driven devices and sensors, nanoparticles/nanocomposites, nanophotonics, RF sensing bioimplants and medical devices.*

**ENGİN DURGUN**, Assistant Professor, Ph.D., Physics, Bilkent University, 2007. *Computational materials design, solar fuels, cement chemistry, surface phenomena, multiferroics, hydrogen storage, nanowires/nanoclusters, magnetism/spintronics, nanotribology.*

**ÇAĞLAR ELBÜKEN**, Assistant Professor, Ph.D., Mechanical Engineering, University of Waterloo, 2009. *Microfluidies and lab-on-a-chip devices, specifically two-phase microfluidie systems. Point-of-care diagnostic devices, blood analysis devices. Sensing technologies for portable diagnostic systems. Design and characterization of bio-malpulation and bio-characterizationdevices.*

**TALİP SERKAN KASIRGA**, Research Assistant Professor, Ph.D., Physics, University of Washington, 2013. *Experimental investigation of strong electronic correlation effects at low dimensional systems and their applications in hydrogen sensing, novel logic and storage devices, new generation light emitting diodes, using vanadium oxides and layered transition metal dichalcogenides.*

**BÜLEND ORTAÇ**, Assistant Professor, Ph.D., Physics, Rouen University, 2004. *Fiber optic concepts; CW and pulsed laser; amplification systems; nonlinear optics; ultrafast laser physics; THz generation; application of laser systems.*

**URARTU ÖZGÜR ŞAFAK ŞEKER**, Research Assistant Professor, Ph.D. in Molecular Biology-Genetics and Biotechnology, İstanbul Technical University, 2009. *Synthetic Biotechnology, Genetic Engineering, Bioinspired Materials and Bionanotechnology.*

**AYŞE BEGÜM TEKiNAY**, Assistant Professor, Ph.D., Molecular Biology, Rockefeller University, 2006. *Nanobiotechnology, regenerative medicine, stem cell differentiation, drug delivery, biosensors, human genetics, molecular characterization of novel genes, animal models.*

**TAMER UYAR**, Associate Professor, Ph.D., Fiber & Polymer Science, North Caroline State University, 2005. *Multi-functional nanotextile materials, polymeric nanocomposites, functional polymeric and inorganic nanofibers.*

**EDA YILMAZ**, Visiting Research Assistant Professor, Ph.D., Chemistry, Bilkent University, 2011. *Electrochemical energy storage systems, lithium-oxygen batteries, lithium-ion batteries, surface characterization, spectroscopy, design and synthesis of nanomaterials.*

In addition, faculty members from Physics, Electrical and Electronics Engineering, Chemistry, Molecular Biology and Genetics, Mechanical Engineering, and Psychology are involved in this interdisciplinary program.

## MASTER OF SCIENCE IN MATERIALS SCIENCE AND NANOTECHNOLOGY

**Admission:** All applicants are required to have a B.S. degree in materials science and nanotechnology or a related field of science or engineering, such as physics, mathematics, chemistry, molecular biology and genetics, electrical and electronics engineering, mechanical engineering, chemical engineering, materials science and metallurgy, or food

engineering. Evaluation of applicants is based on their ALES (*Akademik Personel ve Lisansüstü Eğitimi Giriş Sınavı*/ Academic Personnel and Postgraduate Education Entrance Examination) scores, past academic records, reference letters, and an interview. Applicants who are not Turkish citizens and Turkish citizen applicants who are residents of another country may take the GRE (Graduate Record Examination) instead of the ALES. All nonnative speakers of English are required to submit proof of satisfactory knowledge of English.

**Degree Requirements:** In addition to completing at least 21 credit units of course work, the M.S. degree candidate must prepare and successfully defend a thesis. The expected duration of study for the M.S. degree is 4 semesters; the maximum duration is 6 semesters.

## DOCTOR OF PHILOSOPHY IN MATERIALS SCIENCE AND NANOTECHNOLOGY

**Admission:** All applicants are required to have a B.S. degree in materials science and nanotechnology or a related field of science or engineering such as physics, mathematics, chemistry, molecular biology and genetics, electrical and electronics engineering, mechanical engineering, chemical engineering, materials science and metallurgy, or food engineering. Evaluation of applicants is based on their ALES (*Akademik Personel ve Lisansüstü Eğitimi Giriş Sınavı*/ Academic Personnel and Postgraduate Education Entrance Examination) scores, past academic records, reference letters, and an interview. Applicants who are not Turkish citizens and Turkish citizen applicants who are residents of another country may take the GRE (Graduate Record Examination) instead of the ALES. All nonnative speakers of English are required to submit proof of satisfactory knowledge of English.

**Degree Requirements:** The completion of 21 credit units of course work beyond the M.S. level is required. Ph.D. candidates must pass a qualifying exam, typically in their fourth semester, and then must prepare a dissertation proposal. Preparation and defense of a dissertation based on original research is the centerpiece of the program. The standard duration of study for the Ph.D. degree is 8 semesters for students who enter the program with an M.S. degree; the maximum duration is 12 semesters.

### COURSE DESCRIPTIONS

**MSN 500 Concepts in Materials Science**
Fundamental concepts in materials science. Atom models; atomic and crystalline structure; mechanical (stres, strain, elasticity, deformation), electrical (conductivity, mobility, band structure, semiconductors), thermal (heat capacity, expansion, thermal conductivity), magnetic (ferromagnetism, domains and hysteresis, magnetic storage), and optical (radiation, refraction, transmission, luminescence, photoconductivity) properties of materials. The correlation between materials structure and its micro- and macroscopic properties.

**MSN 501 Atomic Structure, Mechanical and Thermal Properties of Materials**
Modern materials science and current trends; classification of materials; atomic structure; lattice; crystal; point and space groups; reciprocal lattice and k-space; x-ray diffraction; noncrystalline materials; imperfections:, binding and bonding; elastic and plastic properties; dynamics of atoms; dynamical matric and its symmetries; normal modes and phonons; Planck's distribution; thermal properties; free electron system; quantum size effect and confinement.

**MSN 510 Imaging Techniques in Materials Science and Nanotechnology**
Introduction to advanced imaging techniques including atomic force microscopy (AFM), scanning tunneling microscopy (STM), transmission electron microscopy (TEM), scanning electron microscopy (SEM), confocal microscopy.

**MSN 512 Biomedical Materials**
Types of biomedical materials and the material selection criteria. Chemical and physical properties of metals, and polymers for use in biomedical applications. Material - biological entity interaction; biocompatibility, biodegradation. Special biomedical products, biomaterials, tissue engineering, applications and issues; heart valves, artificial bones, implants, blood vessel grafts.

**MSN 513 Micro and Nanostructured Sensors**
Introductory and fundamental concepts in sensors and transducers. MEMS, MOEMS, and NEMS structures. Overview of fabrication technologies. Optical sensors including plasmonic sensors, fiber and waveguide based sensing. Coupling of physical and chemical effects to optical domain. Electronic sensors including thin films, semiconductor device based sensors and novel electronic sensors using nanostructures.

**MSN 517 Fundamentals of Nanoscience**
Introduction to nanoscience and nanotechnology; societal implications of nanoscience: ethical, legal and environmental implications; nanotools: characterization methods; nanotools: fabrication methods; physical properties and phenomena: materials, structure, and the nanosurface; energy at the nanoscale; the material continuum: basic quantum mechanics and the solid state, quantum size effects; nanothermodynamics; synthesis and modification: carbon - based nanomaterials, chemical ınteractions at the nanoscale, supramolecular chemistry; chemical synthesis and modification of nanomaterials; bionanoscience: natural nanomaterials; biomolecular nanoscience: DNA, RNA and protein synthesis.

**MSN 518 Fundamentals of Nanotechnology**
Perspectives of nanotechnology; nanometrology; standard and nanomanufacturing; nanoscale electronics; nanooptics, nanophotonics; nanomagnetism; nanomechanics; nanostructure and nanocomposite thin films, applications of thin films; nanocatalysis; nanocomposites and fibers; biological and environmental nanoengineering: nonobiotechnology, biomimetics; medical nanotechnology; environmental nanotechnology.

**MSN 519 Applications of Microfluidics and Nanofluidics**
Characteristics of micro/nanofluidics. Transport phenomena, non-dimensional numbers, diffusion, settling, wetting, fluidic components (pumps, valves, choice of material, fabrication/ production techniques). Lab-on-a-Chip (LOC) devices, diagnostic devices, LOC for cellular studies, high throughput studies, DNA/protein microarrays and tissue engineering. Organ-on-a-chip.

**MSN 521 Biotechnology**
Current developments in biotechnology. Drug discovery and development processes. Novel drugs, new platforms of drug discovery. Use of living organisms for environmental management. Bioreactors. Genetically engineered organisms to produce commercial products. Genetically modified crops. Techniques of the biotechnology industry, recombinant DNA technology, mammalian cell culture and protein purification and expression.

**MSN 522 Molecular Biomimicry and Synthetic Biology**
Fundamentals of molecular biomimicry, and synthetic biology. Structure of biological molecules, self-assembly in biological systems, biological nanostructures, biology inspired material systems design, control of biomolecular interactions. Fundamentals of synthetic biological device design.

**MSN 526 Chemistry of Functional Surfaces and Interface Engineering**
Surface chemistry in nanosciences and nanotechnology. Physical, physicochemical and chemical properties of

surfaces. Surface characterization methods. Chemical surface functionalization techniques, wet chemical techniques, UV, plasma, ozonolysis, and electrochemical techniques. Self-healing, dynamically switchable and responsive surfaces and interfaces. Surface reactivity, catalysis, nanocatalysts. Surface states, work function.

**MSN 533 Nanomaterials for Energy Conversation and Storage**
A general overview to energy conversion and storage systems, potentials and thermodynamics of electrochemical cells, electrochemical methods, nanomaterials for electrochemical energy systems, dye sensitized solar cells, photocatalytic water splitting, proton exchange membrane fuel cells, direct methanol and solid oxide fuel cells, microbial fuel cells, hydrogen storage, supercapacitors, concepts in battery technology, lithium-ion batteries, next generation secondary batteries.

**MSN 534 Polymeric Materials**
Characterization of polymeric materials, structural analysis, surface and surface analysis (nuclear magnetic resonance, RAMAN, infrared, X-ray photoelectron spectroscopy, X-ray diffraction, electron and optical microscopy), thermal analysis (thermogrovimetric differential scanning calorimetry), mechanical testing (tensile, dynamic mechanical analysis, rheological), molecular weight analysis (intrinsic viscosity, gel permeation chromatography).

**MSN 541 Nanobiotechnology**
Nanobiotechnology; lessons from nature; bioinformatics; materials at nanoscale; basic imaging techniques; biosensors; targeted drug delivery methods; biofilms; toxicity of nanotechnology products; use of nanotechnology in investigating basic cell biology; polymeric nanofibers.

**MSN 551 Introduction to Micro and Nanofabrication**
Introduction to conventional methods in macro and nanofabrication. Basics of film deposition techniques, optical and electron beam lithography, wet and dry etching methods, implantation and diffusion. Applications of microfabrication to CMOS fabrication and micro and nanoelectromechanical systems. Some non-conventional methods of micro and nanostructure fabrication.

**MSN 555 Nanomaterials Processing by Intense Laser Beam**
Fundamentals of laser materials interactions, laser ablation and thin film deposition, processing with ultrashort laser pulses, creating nanostructures with lasers, laser micro and nano machining, laboratory training and hand-on experiments.

**MSN 591 Nanotechnology and Its Impacts on Socio-Economic Structures**
Implications of nanotechnology on socio-economic structures; possible future scenarios; nanotechnology world economic trends; investments of various countries; nanotechnology, industry, business interactions; ethics, legal aspects; patent and intellectual property; national nanotechnology initiatives; world dynamics and decision systems, impacts on human life and society.

**MSN 598 Seminar I**
Seminars on state-of-the-art developments in the field of nanotechnology. Topics spanning computational nanoscience, nanobiotechnology, nanorobotics, bioengineering, nanophotonics, nanoelectronics and nanomaterials.

**MSN 599 Master's Thesis**

**MSN 698 Seminar II**
Seminars on state-of-the-art developments in the field of nanotechnology. Topics spanning computational nanoscience, nanobiotechnology, nanorobotics, bioengineering, nanophotonics, nanoelectronics and nanomaterials.

**MSN 699 Ph.D. Thesis**

## SAMPLE OF RECENT PUBLICATIONS


• H.T. Baytekin, B. Baytekin, S. Huda, Z. Yavuz, B.A. Grzybowski, "Mechanochemical activation and patterning of an adhesive surface toward nanoparticle deposition", *J of American Chemical Society,* 137, 1726-1729 (2015)

• C. Bacaksiz, S. Cahangirov, A. Rubio, R. T. Senger, F. M. Peeters, H. Sahin, "Bilayer SnS 2 : Tunable stacking sequence by charging and loading pressure", *Physical Review B*, 93, 125403-1--9 (2016)

• D. Solonenko, O.D. Gordan, G.L. Lay, H. Sahin, S. Cahangirov, D.R.T. Zahn, P. Vogt, "2D vibrational properties of epitaxial silicene on Ag(111)", *2D Materials*, 4, 015008-1--9 (2016)

• E. Torun, H. Sahin, S. Cahangirov, A. Rubio, F. M. Peeters, "Anisotropic electronic, mechanical, and optical properties of monolayer WTe2", *J Applied Physics*, 119, 074307-1--7 (2016)

• F. Ersan, S. Cahangirov, G. Gokoglu, A. Rubio, E. Aktürk, "Stable monolayer honeycomb-like structures ofRuX2(X=S,Se)", *Physical Review B*, 94, 155415-1--8 (2016)

• Lei Shi, Philip Rohringer, Kazu Suenaga, Yoshiko Niimi, Jani Kotakoski, Jannik C. Meyer, Herwig Peterlik, Marius Wanko, Seymur Cahangirov, Angel Rubio, Zachary J. Lapin, Lukas Novotny, Paola Ayala, Thomas Pichler, "Confined linear carbon chains as a route to bulk carbyne", *Nature Materials*, 15, 634-639 (2016)

• M. Wanko, S. Cahangirov, L. Shi, P. Rohringer, Z.J. Lapin, L. Novotny, P. Ayala, T. Pichler, A. Rubio, "Polyyne electronic and vibrational properties under environmental interactions", *Physical Review B*, 94, 195422-1--6 (2016)

• S. Cahangirov, V.O. Ozcelik, A. Rubio, S. Ciraci, "Silicite: The layered allotrope of silicon", *Physical Review B*, 90, 085426-1--5 (2014)

• S. Cahangirov, V.O. Ozcelik, X. Lede, J. Avila, S. Cho, M.C. Asensio, S. Ciraci, A. Rubio, "Atomic structure of 3x phase of silicene on Ag(111)", *Physical Review B*, 90, 035448-1--5 (2014)

• V.O. Ozcelik, S. Cahangirov, S. Ciraci, "Stable Single-Layer Honeycomblike Structure of Silica", *Physical Review Letters,* 112, 246803-1--5 (2014)

• G. Bakan, S. Ayas, E. Ozgur, K. Celebi, A. Dana, "Thermally-tunable ultrasensitive infrared absorption spectroscopy platforms based on thin phase-change films", *ACS Sensors* (Forthcoming)

• G. Cinar, A. Ozdemir, S. Hamsici, G. Gunay, A. Dana, A.B. Tekinay, M.O. Guler, "Local delivery of doxorubicin through supramolecular peptide amphiphile nanofiber gels", *Biomaterials Science* (Forthcoming)

• A.D. Ozkan, A.E. Topal, A. Dana, M.O. Guler, A.B. Tekinay, "Atomic force microscopy for the investigation of molecular and cellular behavior", *Micron*, 89, 60-76 (2016)

• G. Bakan, B. Gerislioglu, F. Dirisaglik, Z. Jurado, L. Sullivan, A. Dana, C. Lam, A. Gokirmak, H. Silva, "Extracting the temperature distribution on a phase-change memory cell during crystallization", *J Applied Physics*, 120, 164504-1--7 (2016)

• G. Bakan, S. Ayas, T. Saidzoda, K. Celebi, A. Dana, "Ultrathin phase-change coatings on metals for electrothermally tunable colors", *Applied Physics Letters*, 109, 071109-1--6 (2016)

• G. Kibar, A.E. Topal, A. Dana, A. Tuncel, "Newly designed silver coated-magnetic, monodisperse polymeric microbeads as SERS substrate for low-level detection of amoxicillin", *J of Molecular Structure,* 1119, 133-138 (2016)

• M. Serhatlioglu, S. Ayas, N. Biyikli, A. Dana, M.E. Solmaz, "Perfectly absorbing ultra thin interference coatings for hydrogen sensing", *Optics Letters*, 41, 1724-1727 (2016)

• S. Ayas, G. Bakan, A. Dana, "All-aluminum hierarchical plasmonic surfaces in the infrared", *Optical Materials Express*, 6, 823-830 (2016)

• S. Ayas, G. Bakan, E. Ozgur, K. Celebi, A. Dana, "Universal Infrared Absorption Spectroscopy Using Uniform Electromagnetic Enhancement", *Acs Photonics*, 3, 337-342 (2016)

• I. Orak, M. Urel, G. Bakan, A. Dana, "Memristive behavior in a junctionlesss flash memory cell", *Applied Physics Letters*, 106, 233506 (2015)

• O. Tokel, U.H. Yildiz, F. Inci, N.G. Durmus, O. Ekiz, B. Turker, C. Cetin, S. Rao, K. Sridhar, N. Natarajan, H. Shafee, A. Dana, U. Dermirci, "Portable Microfluidic Integrated Plasmonic Platform for Pathogen Detection", *Scientific Reports*, (2015)

• R. Mammadov, G. Cinar, M. Goktas, H. Kayhan, S. Tohumeken, A.E. Topal, I. Orujalipoor, A. Dana, S. Ide, A. Tekinay, M.O. Guler, "Virus-like nanostructures for tuning immune response", *Scientific Reports*, 5, 16728-1--15 (2015)

• S. Ayas, G. Bakan, A. Dana, "Rounding corners of nano-square patches for multispectral plasmonic metamaterial absorbers", *Optics Express*, 23, 11763-11770 (2015)

• A. Celebioglu, Z. Aytac, O.C.O. Umu, A. Dana, T. Tekinay, T. Uyar, "One-step synthesis of size-tunable Ag nanoparticles incorporated in electrospun PVA/cyclodextrin nanofibers", *Carbonhydrate Polymers*, 99, 808-816 (2014)

• S. Ayas, A. Cupallari, A. Dana, "Probing Hot-Electron Effects in Wide Area Plasmonic Surfaces using X-Ray Photoelectron Spectroscopy", *Applied Physics Letters,* 105, 221608 (2014)

• S. Ayas, A. Cupallari, G. Bakan, H. Guner, A. Dana, "Exploiting Native Al203 fro Multispectral Aluminum Plasmonics", *AcS Photonics*..(2014)

• S. Ayas, A. Cupallari, O.O. Ekiz, Y. Kaya, A. Dana, "Counting Molecules with a Mobile Phone Camera Using Plasmonic Enhancement", *AcS Photonics*, 1, 17-26 (2014)

• Y. Kaya, S. Ayas, A.E. Toptal, H. Guner, A. Dana, "Sensitivity Comparison of Localized Plasmon Resonance Structures and Prism Coupler", *Sensors and Actuators B: Chemical,* 191, 516-521 (2014)

• A.E. Topal, A.D. Ozkan, A. Dana, A.B. Tekinay, M.O. Guler, "Biosensors for Early Disease Diagnosis", *Therapeutic Nanomaterials*, Ayse B Tekinay, Mustafa O Guler (Eds.), pp. 235-270, New York, John Wiley & Sons (2016)

• A. Dana, "Hyperspectral Stochastic Optical Reconstruction Raman Microcopy for Label-free Super-Resolution Imaging using Surface Enhanced Raman Spectroscopy", *Nanotechnology to Aid Chemical and Biological Defense*, T.A. Camesano (Eds.), pp. 207-214, Springer (2015)

• A. Yeltik, S. Delikanli, M. Olutas, Y. Kelestemur, B. Guzelturk, H.V. Demir, "Experimental Determination of the Absorption Cross-Section and Molar Extinction Coefficient of Colloidal CdSe Nanoplatelets", *J of Physical Chemistry C* (Forthcoming)

• B. Guzelturk, H.V. Demir, "Near-Field Energy Transfer Using Nanoemitters For Optoelectronics", *Advanced Functional Materials* (Forthcoming)

• Y. Gao, L. Tobing, K.A. Dorian, D. H. Zhang, C. Dang, H.V. Demir, "Azimuthally Polarized, Circular Colloidal Quantum Dot Laser Beam Enabled by a Concentric Grating", *Acs Photonics* (Forthcoming)

• A. Alipour, E. Unal, S. Gokyar, H.V. Demir, "Development of a distance-independent wireless passive RF resonator sensor and a new telemetric measurement technique for wireless strain monitoring", *Sensors and Actuators A - Physical,* 255, 87-93 (2017)

• A. Nirmal, A. K. K. Kyaw, X.W. Sun, H.V. Demir, "Demonstration of the portability of porous microstructure architecture to indium-doped ZnO electron selective layer for enhanced light scattering in inverted organic photovoltaics", *J of Sol-Gel Science and Technology*, 78, 613-620 (2016)

• A. Perumal, S. Shendre, M. Li, Y. K. E. Tay, V. K. Sharma, S. Chen, Z. Wei, Q. Liu, Y. Gao, P. J. S. Buenconsejo, S. T. Tan, C. L. Gan, Q. Xiong, T. C. Sum, H.V. Demir, "High brightness formamidinium lead bromide perovskite nanocrystal light emitting devices", *Scientific Reports,* 6, 36733-1--10 (2016)

• B. Guzelturk, F. Menk, K. Philipps, Y. Kelestemur, M. Olutas, R. Zentel, H.V. Demir, "Colloidal Nanoplatelet/Conducting Polymer Hybrids: Excitonic and Material Properties", *J of Physical Chemistry C*, 120, 3573-3582 (2016)

• B. Ozbey, V.B. Erturk, H.V. Demir, A. Altintas, O. Kurc, "A Wireless Passive Sensing System for Displacement/Strain Measurement in Reinforced Concrete Members", *Sensors-Basel,* 16, 496 (2016)

• B. Ozbey, V.B. Erturk, O. Kurc, A. Altintas, H.V. Demir, "Multi-Point Single-Antenna Sensing Enabled by Wireless Nested Split-Ring Resonator Sensors", *IEEE Sensors Journal*, 16, 7744-7752 (2016)

• B. Zhu, S. T. Tan, W. Liu, S. Lu, Y. Zhang, S. Chen, N. Hasanov, X. Kang, H.V. Demir, "Modulating ohmic contact through InGaxNyOz interfacial layer for high-performance InGaN/GaN-based light-emitting diodes", *IEEE Photonics Journal,* 8, 1600808-1--9 (2016)

• B. Zhu, W.Liu, S. Lu, Y. Zhang, N. Hasanov, X. Zhang, Y. Ji, Z.-H. Zhang, S. T. Tan, H. Liu, H.V. Demir, "Decoupling contact and mirror: an effective way to improve the reflector for flip-chip InGaN/GaN-based light-emitting diodes", *J of Physics D*, 49, 265106-1--7 (2016)

• J. Frohleiks, S. Wepfer, Y. Kelestemur, H.V. Demir, G. Bacher, E. Nannen, "Quantum Dot / Light Emitting Electrochemical Cell Hybrid Device and Mechanism of its Operation", *ACS Applied Materials & Interfaces*, 37, 24692-24698 (2016)

• J. R. Murphy, S. Delikanli, T. Scrace, P. Zhang, T. Norden, T. Thomay, A. N. Cartwright, H.V. Demir, A. Petrou, "Time-resolved photoluminescence study of CdSe/CdMnS/CdS core/multi-shell nanoplatelets", *Applied Physics Letters*, 108, 242406-1--5 (2016)

• J. Xing, F. Yan, Y. Zhao, S. Chen, H. Yu, Q. Zhang, R. Zeng, H.V. Demir, X.W. Sun, A. Huan, Q. Xiong, "High-efficiency light-emitting diodes of organometal halide perovskite amorphous nanoparticles", *ACS Nano*, 10, 6623-6630 (2016)

• M. Adams, N. Gaponik, T. Erdem, Z. Soran-Erdem, H.V. Demir, "Colloidal Nanocrystals Embedded in Macrocrystals: Methods and Applications", *J of Physical Chemistry Letters*, 7, 4117-4123 (2016)

• M. Idris, M. Bazzar, B. Guzelturk, H.V. Demir, D. Tuncel, "Cucurbit[7]uril-threaded fluorene–thiophene-based conjugated polyrotaxanes", *RSC Advances*, 6, 98109-98116 (2016)

• M. Olutas, B. Guzelturk, Y. Kelestemur, K. Gungor, H.V. Demir, "Highly Efficient Nonradiative Energy Transfer from Colloidal Semiconductor Quantum Dots to Wells for Sensitive Noncontact Temperature Probing", *Advanced Functional Materials*, 26, 2891-2899 (2016)

• N. Hasanov, V. K. Sharma, P. L. Hernández-Martínez, S. T. Tan, H. V. Demir, "Critical role of CdSe nanoplatelets in color-converting CdSe/ZnS nanocrystals for InGaN/GaN light-emitting diodes", *Optics Letters*, 41, 2883-2886 (2016)

• O. Erdem, M. Olutas, B. Guzelturk, Y. Kelestemur, H.V. Demir, "Temperature-dependent emission kinetics of colloidal semiconductor nanoplatelets strongly modified by stacking", *J of Physical Chemistry Letters,* 7, 548-554 (2016)

• S. Akhavan, A. F. Cihan, A. Yeltik, B. Bozok, V. Lesnyak, N. Gaponik, A. Eychmüller, H.V. Demir, "Multiexciton Generation Assisted Highly Photosensitive CdHgTe Nanocrystal Skins", *Nano Energy*, 26, 324-331 (2016)

• S. Akhavan, C. Uran, B. Bozok, K. Gungor, Y. Kelestemur, V. Lesnyak, N. Gaponik, A. Eychmuller, H.V. Demir, "Flexible and Fragmentable Tandem Photosensitive Nanocrystal Skins", *Nanoscale*, 8, 4399-4758 (2016)

• S.V. Gaponenko, H.V. Demir, C. Seassal, U. Woggon, "Colloidal nanophotonics: the emerging technology platform", *Optics Express*, 24, 430-433 (2016)

• S. Yang, V. D. Ta, Y. Wang, R. Chen, T. He, H.V. Demir, H. Sun, "Reconfigurable Liquid Whispering Gallery Mode Microlasers", *Scientific Reports*, 6, 27200-1--9 (2016)

• T. Erdem, H.V. Demir, "Colloidal nanocrystals for quality lighting and displays: milestones and recent developments", *Nanophotonics*, 5, 74-95 (2016)

• T. Erdem, Z. Soran-Erdem, Y. Kelestemur, N. Gaponik, H.V. Demir, "Excitonic improvement of colloidal nanocrystals in salt powder matrix for quality lighting and color enrichment", *Optics Express*, 24, 74-84 (2016)

• T. He, Y. Gao, Y. Gao, X. Lin, R. Chen, W. Hu, X. Zhao, Y. Wang, H.V. Demir, Q. Fan, A.C. Grimsdale, H. Sun, "Unusual Fluorescent Properties of Stilbene Units and CdZnS/ZnS Quantum Dots Nanocomposites: White-Light Emission in Solution versus Light-Harvesting in Films", *Macr. Chem. Phys,* 217, 24-31 (2016)

• V. K. Sharma, A. Alipour, Z. Soran-Erdem, Y. Kelestemur, Z. G. Aykut, H.V. Demir, "Fluorescent heterodoped nanotetrapods as synergistically enhancing positive and negative MRI contrast agents", *ACS Applied Materials & Interfaces*, 8, 12352-12359 (2016)

• V.T. Kilic, E. Unal, H.V. Demir, "Wireless Metal Detection and Surface Coverage Sensing for All-Surface Induction Heating", *Sensors-Basel*, 16, 16030363 (2016)

• V.T. Kilic, E. Unal, E. Gonendik, N. Yilmaz, H.V. Demir, "Strongly Coupled Outer Squircle-Inner Circular Coil Architecture for Enhanced Induction Over Large Areas", *IEEE Trans on Industrial Electronics*, 63, 7478 (2016)

• X. Zhao, Y. Gao, B. Zhu, H.V. Demir, S. J. Wang, H. Sun, "Exciton energy recycling from ZnO defect levels: towards electrically driven hybrid quantum-dot white light-emitting-diodes", *Nanoscale*, 8, 5835-5841 (2016)

• Y. Gao, G. Yu, Y. Wang, S. C. Dang, T. C. Sum, H. Sun, H.V. Demir, "Green Stimulated Emission Boosted by Nonradiative Resonant Energy Transfer from Blue Quantum Dots", J of *Physical Chemistry Letters,* 7, 2772-2778 (2016)

• Y. Kelestemur, B. Guzelturk, O. Erdem, M. Olutas, K. Gungor, H.V. Demir, "Platelet-in-Box Colloidal Quantum Wells: CdSe/CdS@CdS Core/Crown@Shell Heteronanoplatelets", *Advanced Functional Materials*, 26, 3570-3579 (2016)

• Z. Soran-Erdem, T. Erdem, K. Gungor, J. Pennakalathil, D. Tuncel, H.V. Demir, "High-Stability, High-Efficiency Organic Monoliths Made of Oligomer Nanoparticles Wrapped in Organic Matrix", *ACS Nano*, 10, 5333-5339 (2016)

• Z.-H. Zhang, Y. Zhang, W. Bi, C. Geng, S. Xu, H.V. Demir, X. W. Sun, "A charge inverter for III-nitride light-emitting diodes", *Applied Physics Letters*, 108, 133502-1--6 (2016)

• Z.-H. Zhang, Y. Zhang, W. Bi, C. Geng, S. Xu, H.V. Demir, X. W. Sun, "On the hole accelerator for III-nitride light-emitting diodes", *Applied Physics Letters*, 108, 151105-1--6 (2016)

• B. Guzelturk, H.V. Demir, "Organic-Inorganic Composites of Semiconductor Nanocrystals for Efficient Excitons", *J of Physical Chemistry Letters*, 6, 2206-2215 (2015)

• B. Guzelturk, M. Olutas, S. Delikanli, Y. Kelestemur, O. Erdem, H.V. Demir, "Nonradiative energy transfer in colloidal CdSe nanoplatelet films", *Nanoscale*, 7, 2545-2551 (2015)

• B. Guzelturk, Y. Kelestemur, K. Gungor, A. Yeltik, M.Z. Akgul, Y. Wang, R. Chen, C. Dang, H. Sun, H.V. Demir, "Stable and Low-Threshold Optical Gain in CdSe/CdS Quantum Dots: An All-Colloidal Frequency Up-Converted Laser", *Advanced Materials*, 27, 2741-2746 (2015)

• B. Ozbey, H.V. Demir, O. Kurc, V.B. Erturk, A. Altintas, "Wireless Sensing in Complex Electromagnetic Media of Building Materials", *IEEE Sensors Journa*l, 15, 5545-5554 (2015)

• H. Keita, B. Guzelturk, J. Pennakalathil, T. Erdem, H.V. Demir, D. Tuncel, "Construction of multi-layered white emitting organic nanoparticles by clicking polymers", *J of Materials Chemistry,* 3, 10277-10284 (2015)

• H. Zare, M. Marandi, S. Fardindoost, V.K. Sharma, A. Yeltik, O. Akhavan, H.V. Demir, N. Taghavinia, "High-efficiency CdTe/CdS core-shell nanocrystals in water enabled by photo-induced colloidal hetero-epitaxy of CdS shelling at room temperature", *Nano Research,* 8, 2317-2328 (2015)

• K. McGilvray, E. Unal, K.T. Troy, B. Santoni, R. Palmer, J. Easley, H.V. Demir, C. Puttlitz, "Implantable Microelectromechanical Sensors for Diagnostic Monitoring and Post-Surgical Prediction of Bone Fracture Healing", *J of Orthopaedic Research*, 3, 1439-1446 (2015)

• M. Adam, T. Erdem, G. Stachowski, Z. Soran-Erdem, J. Lox, C. Bauer, J. Poppe, H.V. Demir, N. Gaponik, A. Eychmueller, "Implementation of High-Quality Warm-White Light-Emitting Diodes by a Model-Experimental Feedback Approach using Quantum Dot-Salt Mixed Crystals", *ACS Applied Materials & Interfaces*, 7, 23364-23371 (2015)

• M. Adam, Z. Wang, A. Dubavik, G.M. Stachowski, C. Meerbach, Z. Soran-Erdem, C. Rengers, H.V. Demir, N. Gaponik, A. Eychmuller, "Liquid-Liquid Diffusion-Assisted Crystallization: A Fast and Versatile Approach Toward High Quality Mixed Quantum Dot-Salt Crystals", *Advanced Functional Materials,* 25, 2638-2645 (2015)

• M. Olutas, B. Guzelturk, Y. Kelestemur, A. Yeltik, S. Delikanli, H.V. Demir, "Lateral Size-Dependent Spontaneous and Stimulated Emission Properties in Colloidal CdSe Nanoplatelets", *ACS Nano,* 9, 5041-5050 (2015)

• O. Akin, H.V. Demir, "Mid-wave infrared metasurface microlensed focal plane array for optical crosstalk suppression", *Optics Express*, 23, 27020-27027 (2015)

• S. Delikanli, B. Guzelturk, P.L. Hernandez-Martinez, T. Erdem, Y. Kelestemur, M. Olutas, M.Z. Akgul, H.V. Demir, "Continuously Tunable Emission in Inverted Type-I CdS/

CdSe Core/Crown Semiconductor Nanoparticles", *Advanced Functional Materials*, 25, 4282-4289 (2015)

• S. Delikanli, M.Z. Akgul, J.R. Murphy, B. Barman, Y. Tsai, T. Scrace, P. Zhang, B. Bozok, P.L. Hernandez-Martinez, J. Christodoulides, A.N. Cartwright, A. Petrou, H.V. Demir, "Mn2+-Doped CdSe/CdS Core/Multishell Colloidal Quantum Wells Enabling Tunable Carrier - Dopant Exchange Interactions", *ACS Nano*, 9, 12473-12479 (2015)

• S. Fardindoost, A. Alipour, S. Mohammadi, S. Gokyar, R. Sarvari, A. Iraji zad, H.V. Demir, "Flexible strain sensors based on electrostatically actuated graphene flakes", *J of Micromech. Microeng*., 25, 075016 (2015)

• T. Erdem, Z. Soran-Erdem, P.L. Hernandez-Martinez, V.K. Sharma, H. Akcali, I. Akcali, N. Gaponik, A. Eychmuller, H.V. Demir, "Sweet plasmonics: Sucrose macrocrystals of metal nanoparticles", *Nano Research*, 8, 860-869 (2015)

• T. Erdem, Z. Soran-Erdem, V. Kumar Sharma, Y. Kelestemur, M. Adam, N. Gaponik, H.V. Demir, "Stable and efficient colour enrichment powders of nonpolar nanocrystals in LiCl", *Nanoscale*, 7, 17611-17616 (2015)

• V. Sayevich, N. Gaponik, M. Ploetner, M. Kruszynska, T. Gemming, V. Dzhagan, S. Akhavan, D. Zahn, H.V. Demir, A. Eychmuller, "Stable dispersion of iodide-capped PbSe quantum dots for high-performance low-temperature processed electronics and optoelectronics", *Chemistry of Materials,* 27, 4328-4337 (2015)

• V.K. Sharma, A. Alipour, Z. Soran-Erdem, Z.G. Aykut, H.V. Demir, "Highly monodisperse low-magnetization magnetite nanocubes as simultaneous T1-T2 MRI contrast agents", *Nanoscale,* 23, 10519-10526 (2015)

• X. Xu, A.K.K.K. Kyaw, B. Peng, Q. Xiong, H.V. Demir, Y. Wang, T.K.S. Wong, X.W. Sun, "Influence of gold-silica nanoparticles on the performance of small-molecule bulk heterojunction solar cells", *Organic Electronics*, 22, 20-28 (2015)

• X. Yang, P.L. Hernandez-Martinez, C. Dang, E. Mutlugun, K. Zhang, H.V. Demir, X.W. Sun, "Electroluminescence Efficiency Enhancement in Quantum Dot Light-Emitting Diodes by Embedding a Silver Nanoisland Layer", *Advanced Optical Materials,* 3, 1439-1445 (2015)

• X. Zhao, Y. Gao, Y. Wang, H.V. Demir, S. Wang, H. Sun, "Manipulating Optical Properties of ZnO/Ga?ZnO Core-Shell Nanorods Via Spatially Tailoring Electronic Bandgap", *Advanced Optical Materials*, 3, 1066-1071 (2015)

• Y. Gao, V.D. Ta, X. Zhao, Y. Wang, R. Chen, E. Mutlugun, K.E. Fong, S.T. Tan, C. Dang, X.W. Sun, H. Sun, H.V. Demir, "Observation of polarized gain from aligned colloidal nanorods", *Nanoscale*, 7, 6481-6486 (2015)

• Y. Kelestemur, M. Olutas, S. Delikanli, B. Guzelturk, M.Z. Akgul, H.V. Demir, "Type-II Colloidal Quantum Wells: CdSe/CdTe Core/Crown Heteronanoplatelets", *J of Physical Chemistry Letters*, 119, 2177-2185 (2015)

• Y. Wang, K.E. Fong, S. Yang, V.D. Ta, Y. Gao, Z. Wang, V. Nalla, H.V. Demir, H. Sun, "Unravelling the ultralow threshold stimulated emission from CdZnS/ZnS quantum dot and enabling high-Q microlasers", *Laser & Photonics Review*, 9, 507-516 (2015)

• Y. Wang, K.S. Leck, V.D. Ta, R. Chen, V. Nalla, Y. Gao, T. He, H.V. Demir, H. Sun, "Blue Liquid Lasers from Solution of CdZnS/ZnS Ternary Alloy Quantum Dots with Quasi-Continuous Pumping", *Advanced Materials*, 27, 169-175 (2015)

• Y.P. Zhang, Z.H. Zhang, W. Liu, S.T. Tan, Z.G. Ju, X.L. Zhang, Y. Ji, L.C. Wang, Z. Kyaw, N. Hasanov, B.B. Zhu, S.P. Lu, X.W. Sun, H.V. Demir, "Nonradiative recombination - critical in choosing quantum well number for InGaN/GaN light-emitting diodes", *Optics Express*, 23, 34-42 (2015)

• Z. Soran-Erdem, T. Erdem, P.L. Hernandez-Martinez, M.Z. Akgul, N. Gaponik, H.V. Demir, "Macrocrystals of Colloidal Quantum Dots in Anthrancene: Exciton Trannsfer and Polarized Emission", *J of Physical Chemistry Letters*, 6, 1767-1772 (2015)

• Z.H. Zhang, Z. Kyaw, W. Liu, Y. Ji, L. Wang, S.T. Tan, X.W. Sun, H.V. Demir, "A hole modulator for InGaN/GaN light-emitting diodes", *Applied Physics Letters*, 106, 063501 (2015)

• A. Nirmal, A.K.K. Kyaw, X.W. Sun, H.V. Demir, "Microstructured porous ZnO thin film for increased light scattering and improved efficiency in inverted organic photovoltaics", *Optics Express*, 22, 1412-1421 (2014)

• A.O. Govorov, H. Zhang, H.V. Demir, Y.K. Gunko, "Photogeneration of hot plasmonic electrons with metal nanocrystals: Quantum description and potential applications", *Nano Today,* 9, 85-101 (2014)

• B. Guilhabert, C. Foucher, A-M. Haughey, E. Mutlugun, Y. Gao, J. Herrnsdorf, H.D. Sun, H.V. Demir, M.D. Dawson, N. Laurand, "Nanosecond colloidal quantum dot lasers for sensing", *Optics Express*, 22, 7803-7319 (2014)

• B. Guzelturk, O. Erdem, M. Olutas, Y. Kelestemur, H.V. Demir, "Stacking in Colloidal Nanoplatelets: Tuning Excitonic Properties", *ACS Nano,* 8, 12524-12533 (2014)

• B. Guzelturk, P.L. Hernandez-Martinez, V.K. Sharma, Y. Coskun, V. Ibrahimova, D. Tuncel, A.O. Govorov, X.W. Sun, Q. Xiong, H.V. Demir, "Study of exciton transfer in dense quantum dot nanocomposites", *Nanoscale*, 6, 11387-11394 (2014)

• B. Guzelturk, P.L.H. Martinez, Q. Zhang, Q. Xiong, H. Sun, X.W. Sun, A.O. Govorov, H.V. Demir, "Excitons of semiconductor quantum dots and wires for lighting and displays", *Laser & Photonics Review*, 8, 73-93 (2014)

• B. Guzelturk, Y. Kelestemur, M. Olutas, S. Delikanli, H.V. Demir, "Amplified Spontaneous Emission and Lasing in Colloidal Nanoplatelets", *ACS Nano*, 8, 6599-6605 (2014)

• B. Guzelturk, Y. Kelestemur, M.Z. Akgul, V.K. Sharma, H.V. Demir, "Ultralow Threshold One-Photon- and Two-Photon-Pumped Optical Gain Media of Blue-Emitting Colloidal Quantum Dot Films", *J of Physical Chemistry Letters*, 5, 2214-2218 (2014)

• B. Ozbey, H.V. Demir, O. Kurc, V.B. Erturk, A. Altintas, "Wireless Measurement of Elastic and Plastic Deformation by a Metamaterial-Based Sensor", *Sensors-Basel,* 14, 19609-19621 (2014)

• B. Ozbey, E. Unal, H. Ertugrul, O. Kurc, C.M. Puttlitz, V.B. Erturk, A. Altintas, H.V. Demir, "Wireless Displacement Sensing Enabled by Metamaterial Probes for Remote Structural Health Monitoring", *Sensors-Basel*, 14, 1691-1704 (2014)

• B. Peng, Z. Li, E. Mutlugun, P.L.H. Martinez, D. Li, Q. Zhang, Y. Gao, H.V. Demir, Q. Xiong, "Quantum dots on vertically aligned gold nanorod monolayer: plasmon enhanced fluorescence", *Nanoscale*, 6, 5592-5598 (2014)

• C. Uran, T. Erdem, B. Guzelturk, N. Kosku Perkgoz, S. Jun, E. Jang, H.V. Demir, "Highly polarized light emission by isotropic quantum dots integrated with magnetically aligned segmented nanowires", *Applied Physics Letters,* 105, 141116-1--4 (2014)

• E. Mutlugun, B. Guzelturk, A.P. Abiyasa, Y. Gao, X.W. Sun, H.V. Demir, "Colloidal Quantum Dot-Light-Emitting Diodes

Employing Phosphorescent Small Organic Molecules as Efficient Exciton Harvesters", *J of Physical Chemistry Letters*, 5, 2802-2807 (2014)

• H. Zhang, H.V. Demir, A.O. Govorov, "Plasmonic metamaterials and nanocomposites with the narrow transparency window effect in broad extinction spectra", *AcS Photonics*, 1, 822-832 (2014)

• P.L. Hernandez-Martinez, A.O. Govorov, H.V. Demir, "Förster-Type Nonradiative Energy Transfer for Assemblies of Arrayed Nanostructures: Confinement Dimension vs Stacking Dimension", *J of Physical Chemistry C*, 118, 4951-4958 (2014)

• S. Akhavan, A. Yeltik, H.V. Demir, "Photosensitivity Enhancement with TiO2 in Semitransparent Light-Sensitive Skins of Nanocrystal Monolayers", *ACS Applied Materials & Interfaces*, 6, 9023-9028 (2014)

• S. Akhavan, A.F. Cihan, B. Bozok, H.V. Demir, "Nanocrystal Skins with Exciton Funneling for Photosensing", *Small*, 10, 2470-2475 (2014)

• S.V. Zhokovsky, T. Ozel, E. Mutlugun, N. Gaponik, A. Eychmuller, A.V. Lavrinenko, H.V. Demir, S.V. Gaponenko, "Hyperbolic metamaterials based on quantum-dot plasmon resonator nanocomposites", *Optics Express,* 22, 18290-18298 (2014)

• V.K. Sharma, B. Guzelturk, T. Erdem, Y. Kelestemur, H.V. Demir, "Tunable White-Light-Emitting Mn-Doped ZnSe Nanocrystals", *ACS Applied Materials & Interfaces*, 6, 3654-3660 (2014)

• V.K. Sharma, S. Gokyar, Y. Kelestemur, T. Erdem, E. Unal, H.V. Demir, "Manganese Doped Fluorescent Paramagnetic Nanocrystals for Dual-Modal Imaging", *Small,* 10, 4961-4966 (2014)

• X. Xu, A.K.K. Kyaw, B. Peng, Q. Du, L. Hong, H.V. Demir, T.K.S. Wong, Q. Xiong, X.W. Sun, "Enhanced efficiency of solution-processed small-molecule solar cells upon incorporation of gold nanospheres and nanorods into organic layers", *Chemical Communications*, 50, 4451-4454 (2014)

• X. Xu, Q. Du, B. Peng, Q. Xiong, L. Hong, H.V. Demir, T.K.S. Wong, A.K.K. Kyaw, X.W. Sun, "Effect of shell thickness on small-molecule solar cells enhanced by dual plasmonic gold-silica nanorods", *Applied Physics Letters*, 105, 113306 (2014)

• X. Yang, E. Mutlugun, Y. Zhao, Y. Gao, K.S. Leck, Y. Ma, L. Ke, S.T. Tan, H.V. Demir, X.W. Sun, "Solution Processed Tungsten Oxide Interfacial Layer for Efficient Hole-Injection in Quantum Dot Light-Emitting Diodes", *Small*, 10, 246 (2014)

• X. Yang, K. Dev, J. Wang, E. Mutlugun, C. Dang, Y. Zhao, S. Liu, Y. Tang, S.T. Tan, X.W. Sun, H.V. Demir, "Light extraction efficiency enhancement of colloidal quantum dot light-emitting diodes using large-scale nanopillar arrays", *Advanced Functional Materials*, 24, 5977-5984 (2014)

• X. Yang, Y. Ma, E. Mutlugun, Y. Zhao, K.S. Leck, S.T. Tan, H.V. Demir, Q. Zhang, H. Du, X.W. Sun, "Stable, Efficient, and All-Solution-Processed Quantum Dot Light-Emitting Diodes with Double-Sided Metal Oxide Nanoparticle Charge Transport Layers", *ACS Applied Materials & Interfaces*, 6, 495-499 (2014)

• X. Zhou, O. Sppera, J. Plain, S. Jradi, X.W. Sun, H.V. Demir, X. Yang, C. Deeb, S. Gray, G. Wiederrecht, R. Bachelot, "Plasmon-based photopolymerization: near-field probing, advanced photonic nanostructures and nanophotochemistry", *J of Optics*, 16, 114002 (2014)

• Y. Ji, W. Liu, T. Erdem, R. Chen, S.T. Tan, Z-H. Zhang, Z. Ju, X. Zhang, H. Sun, X.W. Sun, Y. Zhao, S.P. DenBaars, S. Nakamura, H.V. Demir, "Comparative study of field-dependent carrier dynamics and emission kinetics of InGaN/GaN light-emitting diodes grown on (11 2 - 2) semipolar versus (0001) polar planes", *Applied Physics Letters*, 104, 143506-1--5 (2014)

• Y. Kelestemur, A.F. Cihan, B. Guzelturk, H.V. Demir, "Type-tunable amplified spontaneous emission from core-seeded CdSe/CdS nanorods controlled by exciton-exciton interaction", *Nanoscale*, 6, 8509-8514 (2014)

• Y. Wang, V.D. Ta, Y. Gao, T.C. He, R. Chen, E. Mutlugun, H.V. Demir, H.D. Sun, "Stimulated Emission and Lasing from CdSe/CdS/ZnS Core-Multi-Shell Quantum Dots by Simultaneous Three-Photon Absorption", *Advanced Materials*, 26, 2954-2961 (2014)

• Y. Zhao, J. Zhang, S. Liu, Y. Gao, X. Yang, K. S. Leck, A. P. Abiyasa, Y. Divayana, E. Mutlugun, S. T. Tan, Q. Xiong, H.V. Demir, X. W. Sun, "Transition metal oxides on organic semiconductors", *Organic Electronics*, 15, 871-877 (2014)

• Z. Kyaw, Z.-H. Zhang, W. Liu, S. T. Tan, Z. G. Ju, X. L. Zhang, Y. Ji, N. Hasanov, B. Zhu, S. Lu, Y. Zhang, X. W. Sun, H.V. Demir, "On the effect of N-GaN/P-GaN/N-GaN/P-GaN/N-GaN built-in junctions in the n-GaN layer for InGaN/GaN light-emitting diodes", *Optics Express*, 22, 809-816 (2014)

• Z. Kyaw, Z-H. Zhang, W. Liu, S.T. Tan, Z.G. Ju, X.L. Zhang, Y. Ji, N. Hasanov, B. Zhu, S. Lu, Y. Zhang, J.H. Teng, S.X. Wei, H.V.Demir, "Simultaneous enhancement of electron overflow reduction and hole injection prmotion by tailoring the last quantum barrier in InGaN/GaN light-emitting diodes", *Applied Physics Letters*, 104, 161113 (2014)

• Z.G. Ju, W. Liu, Z-H. Zhang, S.T. Tan, Y. Ji, Z. Kyaw, X.L. Zhang, S.P. Lu, Y.P. Zhang, B.B. Zhu, N. Hasanov, X.W. Sun, H.V. Demir, "Advantages of the Blue InGaN/GaN Light-Emitting Diodes with an AlGaN/GaN/AlGaN Quantum Well Structured Electron Blocking Layer", *Acs Photonics*, 1, 377-381 (2014)

• Z.-H. Zhang, W. L., S.T. Tan, Z. Ju, Y. Ji, Z. Kyaw, X. Zhang, N. Hasanov, B. Zhu, S. Lu, Y. Zhang, X.W. Sun, H.V. Demir, "On the mechanisms of InGaN electron cooler in InGaN/GaN light-emitting diodes", *Optics Express*, 22, 779-789 (2014)

• z.H. Zhang, W. Liu, S.T. Tan, Y. Ji, L. Wang, B. Zhu, Y. Zhang, S. Lu, X. Zhang, N. Hasanov, X.W. Sun, H.V. Demir, "A hole accelerator for InGaN/GaN light-emitting diodes", *Applied Physics Letters*, 105, 153503 (2014)

• Z.-H. Zhang, Z. Ju, W. Liu, S.T. Tan, Y. Ji, Z. Kyaw, X. Zhang, N. Hasanov, X.W. Sun, H.V. Demir, "Improving hole injection efficiency by manipulating the hole transport mechanism through p-type electron blocking layer engineering", *Optics Letters,* 39, 2483-2486 (2014)

• Z-H. Zhang, W. Li, Z. Ju, S.T. Tan, Y. Ji, Z. Kyaw, X. Zhang, L. Wang, X.W. Sun, H.V. Demir, "Self-screening of the quantum confined Stark effect by the polarization induced bulk charges in the quantum barriers", *Applied Physics Letters*, 104, 243501-1--5 (2014)

• Z-H. Zhang, W. Liu, Z. Ju, S.T. Tan, Y. Ji, X. Zhang, L. Wang, Z. Kyaw, X.W. Sun, H.V. Demir, "Polarization self-screening in [0001] oriented InGaN/GaN light-emitting diodes for improving the electron injection efficiency", *Applied Physics Letters*, 104, 251108-1--4 (2014)

• Z-H. Zhang, W. Liu, Z. Ju, S.T. Tan, Y. Ji, Z. Kyaw, X. Zhang, L. Wang, X.W. Sun, H.V. Demir, "InGaN/GaN multiple-quantum-well light-emitting diodes with a grading InN composition suppressing the Auger recombination", *Applied Physics Letters*, 105, 033506 (2014)

• Z-H. Zhang, Y. Ji, W. Li, S.T. Tan, Z. Kyaw, Z. Ju, X. Zhang, N. Hasanov, S. Lu, Y. Zhang, B. Zhu, X.W. Sun, H.V. Demir, "On the origin of the electron blocking effect by an n-type AlGaN electron blocking layer", *Applied Physics Letters,* 104, 073511-1--5 (2014)

• Z. Aytac, Z. I. Yildiz, F. Kayaci-Senirmak, N. O. San Keskin, S. I. Kusku, E. Durgun, T. Tekinay, T. Uyar, "Fast-Dissolving, Prolonged Release, and Antibacterial Cyclodextrin/ Limonene-Inclusion Complex Nanofibrous Webs via Polymer-Free Electrospinning", *J of Agricultural and Food Chemistry*, 64, 7325-7334 (2016)

• A. Celebioglu, F. Kayaci-Senirmak, S. İpek, E. Durgun, T. Uyar, "Polymer-free nanofibers from vanillin/cyclodextrin inclusion complexes: high thermal stability, enhanced solubility and antioxidant property", *Food and Function*, 7, 3141-3153 (2016)

• A. Celebioglu, H.S. Sen, E. Durgun, T. Uyar, "Molecular entrapment of volatile organic compounds (VOCs) by electrospun cyclodextrin nanofibers", *Chemosphere*, 144, 736-744 (2016)

• A. Onen, D. Kecik, E. Durgun, S. Ciraci, "GaN: From three- to two-dimensional single-layer crystal and its multilayer van der Waals solids", *Physical Review B*, 93, 085431-1--11 (2016)

• D. Kecik, E. Durgun, S. Ciraci, "Optical properties of single-layer and bilayer arsenene phases", *Physical Review B*, 94, 205410-1--9 (2016)

• D. Kecik, E. Durgun, S. Ciraci, "Stability of single-layer and multilayer arsenene and their mechanical and electronic properties", *Physical Review B*, 94, 205409-1--9 (2016)

• E. Cihan, S. İpek, E. Durgun, M.Z. Baykara, "Structural lubricity under ambient conditions", *Nature Communications,* 7, 12055-1--6 (2016)

• Z. Aytac, S.I. Kusku, E. Durgun, T. Uyar, "Encapsulation of gallic acid/cyclodextrin inclusion complex in electrospun polylactic acid nanofibers: Release behavior and antioxidant activity of gallic acid", *Materials Science and Engineering C,* 63, 231-239 (2016)

• Z. Aytac, S.I. Kusku, E. Durgun, T. Uyar, "Quercetin/B-cyclodextrin inclusion complex embedded nanofibers: Slow release and high solubility", *Food Chemistry,* 197, 864-871 (2016)

• D. Cakir, D. Kecik, H. Sahin, E. Durgun, F.M. Peeters, "Realization of a p-n junction in a single layer boron-phosphide", *Physical Chemistry Chemical Physics*, 17, 13013-13020 (2015)

• D. Kecik, C. Bacaksiz, R.T. Senger, E. Durgun, "Layer-and strain-dependent optoelectronic properties of hexagonal AlN", *Physical Review B*, 92, 165408 (2015)

• F. Kayaci, H.S. Sen, E. Durgun, T. Uyar, "Electrospun nylon 6.6 nanofibers functionalized with cyclodextrins fro removal of toluene vapor", *J of Applied Polymer Science*, 132, 41941 (2015)

• H. Manzano, E. Durgun, I. Lopez-Arbeloa, J.C. Grossman, "Insight on Tricalcium Silicate Hydration and Dissolution Mechanism from Mechanism from Molecular Simulations", *ACS Applied Materials & Interfaces*, 7, 14726-14733 (2015)

• V.O. Ozcelik, E. Durgun, S. Ciraci, "Modulation of electronic properties in laterally and commensurately repeating graphene and boron nitride composite nanostructures", *J of Physical Chemistry,* 119, 13248-13256 (2015)

• V.O. Ozcelik, D. Kecik, E. Durgun, S. Ciraci, "Adsorption of group IV elements on graphene, silicene, germanene and stanene: Dumbbell formation", *J of Physical Chemistry C,* 119, 845-853 (2015)

• V.O. Ozcelik, O.U. Akturk, E. Durgun, S. Ciraci, "Prediction of a two-dimensional crystalline structure of nitrogen atoms", *Physical Review B*, 92, 125420-1--8 (2015)

• Z. Aytac, H.S. Sen, E. Durgun, T. Uyar, "Sulfisoxazole/ cyclodextrin inclusion complex incorporated in electrospun hydroxyprpyl cellulose nanofibers as drug delivery system", *Colloids and Surfaces B: Biointerfaces*, 128, 331-338 (2015)

• E. Durgun, H. Manzano, P.V. Kumar, J.C. Grossman, "The Characterization, Stability and Reactivity of Synthetic Calcium Silicate Surfaces from First Principles", *J of Physical Chemistry C*, 118, 15214-15219 (2014)

• F. Kayaci , H.S. Sen, E. Durgun, T. Uyar, "Functional electrospun polymeric nanofibers incorporating geraniol-cyclodextrin inclusion complexes: High thermal stability and enhanced durability of geraniol", *Food Research Internationa*l, 62, 424-431 (2014)

• H.S. Sen, H. Sahin, F.M. Peeters, E. Durgun, "Monolayers of MoS2 as an oxidation protective nanocoating material", *J Applied Physics,* 116, 083508 (2014)

• M. Kanik, O. Aktas, H.S. Sen, E. Durgun, M. Bayindir, "Spontaneous High Piezoelectricity in Poly(vinylidene fluoride) Nanoribbons Produced by Iterative Thermal Size Reduction Technique", *ACS Nano*, 8, 9311-9323 (2014)

• T. Oztas, H.G. Sen, E. Durgun, B. Ortac, "Synthesis of Colloidal 2D/3D MoS2 Nanostructures by Pulsed Laser Ablation in Organic Liquid Environment", *J of Physical Chemistry C*, 118, 30120-30126 (2014)

• V.O. Ozcelik, E. Durgun, S. Ciraci, "New Phases of Germanene", *J of Physical Chemistry Letters,* 5, 2694-2699 (2014)

• H. Guner, E. Ozgur, G. Kokturk, M. Celik, E. Esen, A.E. Topal, S. Ayas, Y. Uludag, C. Elbuken, A. Dana, "A smartphone based surface plasmon resonance imaging (SPRi) platform for on-site biodetection", *Sensors and Actuators B: Chemical*, 239, 571-577 (2017)

• M. Kanik, M. Marcali, M. Yunusa, C. Elbuken, M. Bayindir, "Continuous Triboelectric Power Harvesting and Biochemical Sensing Inside Poly(vinylidene fluoride) Hollow Fibers Using Microfluidic Droplet Generation", *Advanced Materials Technology*., 1600190 (2016)

• M. Marcali, C. Elbuken, "Impedimetric detection and lumped element modelling of a hemagglutination assay in microdroplets", *Lab on a Chip*, 16, 2494-2503 (2016)

• P. Beyazkilic, U. Tuvshindorj, A. Yildirim, C. Elbuken, M. Bayindir, "Robust superhydrophilic patterning of superhydrophobic ormosil surfaces for high throughput on-chip screening applications", *RSC Advances*, 6, 80049-80054 (2016)

• Z. Isiksacan, M.T. Guler, B. Aydogdu, I. Bilican, C. Elbuken, "Rapid fabrication of microfluidic PDMS devices from reusable PDMS molds using laser ablation", *J of Micromech. Microeng*., 26, 035008-1-8 (2016)

• Z. Isiksacan, O. Erel, C. Elbuken, "A portable microfluidic system for rapid measurement of the erythrocyte sedimentation rate", *Lab on a Chip*, 16, 4682-4690 (2016)

• M.T. Guler, I. Bilican, S. Agan, C. Elbuken, "A simple approach for the fabrication of 3D microelectrodes for impedimetric sensing", *J of Micromech. Microeng*., 25, 095019 (2015)

• P.K. Isgor, M. Marcali, M. Keser, C. Elbuken, "Microfluidic droplet content detection using integrated capacitive sensors", *Sensors and Actuators B: Chemical*, 210, 669-675 (2015)

• T.S. Kasirga, J. McCoy, J.H. Park, D.H. Cobden, "Visualization of one-dimensional diffusion and spontaneous segregation of hydrogen in single crystals of VO2", *Nanotechnology*, 27, 345708-1--7 (2016)

• A. Demirel, T. Oztas, C. Kursungoz, I. Yilmaz, B. Ortac, "Synthesis of blue-shifted luminescent colloidal GaN nanocrystals through femtosecond pulsed laser ablation in organic solution", *J of Nanoparticle Research*, 18, 128-1--10 (2016)

• C. Koral, B. Ortac, H. Altan, "Terahertz Time-Domain Study of Silver Nanoparticles Synthesized by Laser Ablation in Organic Liquid", *IEEE Trans on Terahertz Science and Technology*, 6, 525-531 (2016)

• F. I. Chowdhury, A. Alnuaimi, S. Alkis, B. Ortac , S. Aktürk, M. Alevli, N. Dietz, A. K. Okyay, A. Nayfeh, "Enhancement in c-Si solar cells using 16 nm InN nanoparticles", *Materials Research Express*, 3, 056202-1--11 (2016)

• M. Serhatlioglu, B. Ortac, C. Elbuken, N. Biyikli, M. E. Solmaz, "CO2 laser polishing of microfluidic channels fabricated by femtosecond laser assisted carving", *J of Micromech. Microeng.*, 26, 115011 (2016)

• B. Tekcan, S. Alkis, M. Alevli, N. Dietz, B. Ortac, N. Biyikli, A.K. Okyay, "A Near-Infrared Range Photodetector Based on Indium Nitride Nanocrystals Obtained Through Laser Ablation", *IEEE Electron Device Letters*, 35, 936-938 (2014)

• E. Ucuncu, A.D. Ozkan, C. Kursungoz, Z.E. Ulger, T.T. Olmez, T. Tekinay, B. Ortac, E. Tunca, "Effects of laser ablated silver nanoparticles on Lemna minor", *Chemosphere*, 108, 251-257 (2014)

• N. El-Atab, F. Cimen, S. Alkis, B. Ortac, M. Alevli, N. Dietz, A.K. Okyay, A. Nayfeh, "Enhanced memory effect via quantum confinement in 16 nm InN nanoparticles embedded in ZnO charge trapping layer", *Applied Physics Letters*, 104, 253106 (2014)

• N.O. San, C. Kursungoz, Y. Tumtas, O. Yasa, B. Ortac, T. Tekinay, "Novel one step synthesis of silica nanoparticles from sugarbeet bagasse by laser ablation and effect on growth of fresh water algea culture", *Particulogy*, 17, 29-35 (2014)

• U.O.S. Seker, A.Y. Chen, R.J. Citorik, T.K. Lu, "Synthetic Biogenesis of Bacterial Amyloid Nanomaterials with Tunable Inorganic-Organic Interfaces and Electrical Conductivity", *ACS Synthetic Biology* (Forthcoming)

• G. Kabay, G. Kaleli, Z. Sultanova, T.T. Olmez, U.O.S. Seker, M. Mutlu, "Biocatalytic protein membranes fabricated by electrospinning", *Reactive & Functional Polymers*, 103, 26-32 (2016)

• U.O.S. Seker, V.K. Sharma, S. Akhavan, H.V. Demir, "Engineered Peptides for Nanohybrid Assemblies", *Langmuir,* 30, 2137-2143 (2014)

• G. Uzunalli, R. Mammadov, F. Yesildal, D. Alhan, S. Ozturk, T. Ozgurtas, M.O. Guler, A.B. Tekinay, "Angiogenic Heparin-Mimetic Peptide Nanofiber Gel Improves Regenerative Healing of Acute Wounds", *ACS Biomaterials Science and Engineering* (Forthcoming)

• O.S. Caliskan, M.S. Ekiz, A.B. Tekinay, M.O. Guler, "Spatial Organization of Functional Groups on Bioactive Supramolecular Glycopeptide Nanofibers for Differantiation of MSCs to Brown Adipogenesis", *Bioconjugate Chemistry* (Forthcoming)

• A. Ozdemir, M.S. Ekiz, G. Gunay, M.O. Guler, A.B. Tekinay, "Amphiphilic peptide coated superparamagnetic iron oxide nanoparticles for in vivo MR tumor imaging", *RSC Advances*, 6, 45135-45146 (2016)

• A.D. Ozkan, A.B. Tekinay, M.O. Guler, E.D. Tekin, "Effects of temperature, pH and counterions on the stability of peptide amphiphile nanofiber structures", *RSC Advances*, 6, 104201-14214 (2016)

• B. Mammadov, M. Sever, M. Gecer, F. Zor, S. Ozturk, H. Akgun, U.H. Ulus, Z. Orhan, M.O. Guler, A.B. Tekinay, "Sciatic nerve regeneration induced by glycosaminoglycan and laminin mimetic peptide nanofiber gels", *RSC Advances*, 6, 110535-1--13 (2016)

• B. Senturk, M.O. Cubuk, M.C. Ozmen, B. Aydin, M.O. Guler, A.B. Tekinay, "Inhibition of VEGF mediated corneal neovascularization by anti-angiogenic peptide nanofibers", *Biomaterials*, 107, 124-132 (2016)

• B. Senturk, S. Mercan, T. Delibasi, M.O. Guler, A.B. Tekinay, "Angiogenic Peptide Nanofibers Improve Wound Healing in STZ-Induced Diabetic Rats", *ACS Biomaterials Science and Engineering*, 2, 1180-1189 (2016)

• D. Mumcuoglu, M.S. Ekiz, G. Gunay, T. Tekinay, A.B. Tekinay, M.O. Guler, "Cellular Internalization of Therapeutic Oligonucleotides by Peptide Amphiphile Nanofibers and Nanospheres", *ACS Applied Materials & Interfaces,* 8, 11280-12287 (2016)

• E. Arslan, M.O. Guler, A.B. Tekinay, "Glycosaminoglycan-Mimetic Signals Direct the Osteo/Chondrogenic Differentiation of Mesenchymal Stem Cells in a Three-Dimensional Peptide Nanofiber Extracellular Matrix Mimetic Environment", *Biomacromolecules*, 17, 1280-1291 (2016)

• G. Gulseren, M.A. Khalily, A.B. Tekinay, M.O. Guler, "Catalytic supramolecular self-assembled peptide nanostructures for ester hydrolysis", *J of Materials Chemistry B*, 4, 4605-4611 (2016)

• G. Tansik, E. Kilic, M. Beter, B. Demiralp, G.K. Sendur, N. Can, H. Ozkan, E. Ergul, M.O. Guler, A.B. Tekinay, "A glycosaminoglycan mimetic peptide nanofiber gel as an osteoinductive scaffold", *Biomaterials Science*, 4, 1328-1339 (2016)

• M. Sever, M. Turkyilmaz, C. Sevinc, A. Cakir, B. Ocalan, M. Cansev, M.O. Guler, A.B. Tekinay, "Regenerative effects of peptide nanofibers in an experimental model of Parkinson's disease", *Acta Biomaterialia*, 46, 79-90 (2016)

• S.U. Yaylaci, M. Sen, O. Bulut, E. Arslan, M.O. Guler, A.B. Tekinay, "Chondrogenic Differentiation of Mesenchymal Stem Cells on Glycosaminoglycan-Mimetic Peptide Nanofibers", *ACS Biomaterials Science and Engineering,* 2, 871-878 (2016)

• S.U. Yaylaci, M.S. Ekiz, E. Arslan, N. Can, E. Kilic, H. Ozkan, I. Orujalipoor, S. Ide, A.B. Tekinay, M.O. Guler, "Supramolecular GAG-like Self-Assembled Glycopeptide Nanofibers Induce Chondrogenesis and Cartilage Regeneration", *Biomacromolecules*, 17, 679-689 (2016)

• D. Mumcuoglu, M. Sardan, T. Tekinay, M.O. Guler, A.B. Tekinay, "Oligonucleotide Delivery with Cell Surface Binding and Cell Penetrating Peptide Amphiphile Nanospheres", *Molecular Pharmeceutics*, 12, 1584-1591 (2015)

• F. Doldur-Balli, M.N. Ozel, S. Gulsuner, A.B. Tekinay, T. Ozcelik, O. Konu, M.M. Adams, "Characterization of a novel zebrafish (Danio rerio) gene, wdr81, associated with cerebellar ataxia, mental retardation and dysequilibrium syndrome (CAMRQ)", *BMC Neurosciences*, 16, 96-1--17 (2015)

• G. Gulseren, I.C. Yasa, O. Ustahuseyin, E.D. Tekin, A.B. Tekinay, M.O. Guler, "Alkaline Phosphatase-Mimicking Peptide Nanofibers for Osteogenic Differentiation", *Biomacromolecules*, 16, 2198 (2015)

• G. Uzunalli, Y. Tumtas, T. Delibasi, O. Yasa, S. Mercan, M.O. Guler, A.B. Tekinay, "Improving pancreatic islet in vitro functionality and transplantation efficiency by using heparin mimetic peptide nanofiber gels", *Acta Biomaterialia*, 22, 8 (2015)

• H. Gulsuner, H. Ceylan, M.O. Guler, A.B. Tekinay, "Multi-Domain Short Peptide Molecules for In situ Synthesis and Biofunctionalization of Gold Nanoparticles for Integrin-Targeted Cell Uptake", *ACS Applied Materials & Interfaces*, 7, 10677 (2015)

• H. Unal Gulsuner, N. Atalay Gengec, M. Kilinc, H.Y. Erbil, A.B. Tekinay, "Osteoselection supported by phase separeted polymer blend films", *Biomacromolecules*, 103, 154-161 (2015)

• I.C. Yasa, N. Gunduz, M. Kilinc, M.O. Guler, A.B. Tekinay, "Basal Lamina Mimetic Nanofibrous Peptide Networks for Skeletal Myogenesis", *Scientific Reports*, 5, 16460 (2015)

• M. Goktas, G. Cinar, I. Orujalipoor, S. Ide, A.B. Tekinay, M.O. Guler, "Self-Assembled Peptide Amphiphile Nanofibers and PEG Composite Hydrogels as Tunable ECM Mimetic Microenvironment", *Biomacromolecules*, 16, 1247-1258 (2015)

• M.A. Khalily, G. Gulseren, A.B. Tekinay, M.O. Guler, "Biocompatible Supramolecular Catalytic One-Dimensional Nanofibers for Efficient Labeling of Live Cells", *Bioconjugate Chemistry* (Forthcoming)

• Y. Loo, M. Goktas, A.B. Tekinay, M.O. Guler, C.A.E. Hauser, A. Mitraki, "Self-assembled proteins and peptides as scaffolds for tissue regeneration", *Advanced Healthcare Materials* (Forthcoming)

• A. Celebioglu, O.C.O. Umu, T. Tekinay, T. Uyar, "Antibacterial electrospun nanofibers from triclosan/cyclodextrin inclusion complexes", *Colloids and Surfaces B: Biointerfaces*, 116, 612-619 (2014)

• D.A. Tekdas, R. Garifulliin, B. Senturk, Y. Zorlu, U. Gundogdu, E. Atalar, A.B. Tekinay, A.A. Chernonosov, Y. Yerli, F. Dumoulin, M.O. Guler, V. ehsen, A.G. Gurek, "Design of a Gd-DOTA-Phythalocyanine Conjugate Combining MRI Contrast Imaging and Photobiology", *J of Photochemistry and Photobiology A-Chemistry,* 90, 1376-1386 (2014)

• E. Arslan, I.C. Garip, G. Gulseren, A.B. Tekinay, M.O. Guler, "Bioactive Supramolecular Peptide Nanofibers for Regenerative Medicine", *Advanced Healthcare Materials,* 3, 1357 (2014)

• G. Uzunalli, Z. Soran, T.S. Erkal, Y.S. Dagdas, E. Dinc, A.M. Hondur, K. Bilgihan, B. Aydin, M.O. Guler, A.B. Tekinay, "Bioactive self-assembled peptide nanofibers for corneal stroma", *Acta Biomaterialia*, 10, 1156-1166 (2014)

• H. Ceylan, S. Kocabey, H.U. Gulsuner, O.S. Balcik, M.O. Guler, A.B. Tekinay, "Bone-Like Mineral Nucleating Peptide Nanofibers Induce Differentiation of Human Mesenchymal Stem Cells into Mature Osteoblasts", *Biomacromolecules*, 15, 2407-2418 (2014)

• H. Unal-Gulumser, S. Gulsuner, F.N. Mercan, O.E. Onat, T. Walsh, H. Shahin, M.K. Lee, O. Dogu, T. Kansu, H. Topaloglu, B. Elibol, C. Akbostanci, M.C. King, T. Ozcelik, A.B. Tekinay, "Mitochondrial serine protease HTRA2 p.G399S in a kindred with essential tremor and Parkinson disease", *Proceedings of National Academy of Sciences USA*, 111, 18285-18290 (2014)

• M. Sardan, A. Yildirim, D. Mumcuoglu, A.B. Tekinay, M.O. Guler, "Noncovalent funstionalization of mesoporous silica nanoparticles with amphiphilic peptides", *J of Materials Chemistry B*, 2, 2168 (2014)

• M. Sever, B. Mammadov, M.O. Guler, A.B. Tekinay, "Tenascin-C Mimetic Peptide Nanofibers Direct Stem Cell Differentiation to Osteogenic Lineage", *Biomacromolecules*, 15, 4480-4487 (2014)

• N. Atalay Gengec, H. Unal Gulsuner, H.Y. Erbil, A.B. Tekinay, "Selective adsorption of L1210 leukemia cells/human leukocytes on micropatterned surfaces prepared from polystyrene/polypropylene-polyethylene blends", *Colloids and Surfaces B: Biointerfaces,* 113, 403-411 (2014)

• V. Estrada, A.B. Tekinay, H.W. Muller, "Neural ECM mimetics", *Progress in Brain Research*, 214, 391-413 (2014)

• M. Sever, I. Uyan, A.B. Tekinay, M.O. Guler, " Bioactive Nanomaterials for Neural Engineering", *Neural Engineering*, L.G. Zhang, D.L. Kaplan (Eds.), pp. 181-206, Springer International Publishing (2016)

• M. Karamane, M. Raihane, M.A. Tasdelen, T. Uyar, M. Lahcini, M. Ilsouk, Y. Yagci, "Preparation of fluorinated methacrylate/clay nanocomposite via in-situ polymerization: Characterization, structure, and properties", *J of Polymer Science Part A- Polymer Chemistry* (Forthcoming)

• S. Hamsici, G. Cinar, A. Celebioglu, T. Uyar, A.B. Tekinay, M.O. Guler, "Bioactive Peptide Functionalized Aligned Cyclodextrin Nanofibers for Neurite Outgrowth", *J of Materials Chemistry B* (Forthcoming)

• A. Senthamizhan, B. Balusamy, T. Uyar, "Glucose sensors based on electrospun nanofibers: a review", *Anal. Bioanal. Chem.,* 408, 1285-1306 (2016)

• A. Senthamizhan, B. Balusamy, A. Celebioglu, T. Uyar, ""Nanotraps" in porous electrospun fibers for effective removal of lead( ii ) in water", *J of Materials Chemistry A*, 4, 2484-2493 (2016)

• A. Senthamizhan, B. Balusamy, Z. Aytac, T. Uyar, "Grain boundary engineering in electrospun ZnO nanostructures as promising photocatalysts", *CrystEngComm*, 18, 6341-6351 (2016)

• A. Senthamizhan, B. Balusamy, Z. Aytac, T. Uyar, "Ultrasensitive electrospun fluorescent nanofibrous membrane for rapid visual colorimetric detection of H2O2", *Anal. Bioanal. Chem.*, 408, 1347-1355 (2016)

• O. Arslan, Z. Aytac, T. Uyar, "Superhydrophobic, Hybrid, Electrospun Cellulose Acetate Nanofibrous Mats for Oil/Water Separation by Tailored Surface Modification", *ACS Applied Materials & Interfaces*, 8, 19747-19754 (2016)

• O.F. Sarioglu, A. Celebioglu, T. Tekinay, T. Uyar, "Bacteria-immobilized electrospun fibrous polymeric webs for hexavalent chromium remediation in water", *Int J of Environment Sci.Tech.*, 13, 2057-2066 (2016)

• S. Vempati, Y. Ertas, V.J. Babu, T. Uyar, "Optoelectronic Properties of Layered Titanate Nanostructure and Polyaniline Impregnated Devices", *Chemistry Select,* 1, 5885-5891 (2016)

• Y. Ertas, T. Uyar, "Cross-linked main-chain polybenzoxazine nanofibers by photo and thermal curing: stable at high temperatures and harsh acidic", *Polymer*, 84, 72-80 (2016)

• Z. Aytac, T. Uyar, "Antioxidant activity and photostability of a-tocopherol/ß-cyclodextrin inclusion complex encapsulated electrospun polycaprolactone nanofibers", *European Polymer Journal*, 79, 140-149 (2016)

• Z. Aytac, Z.I. Yildiz, F. Kayaci-Senirmak, N.O.S. Keskin, T. Tekinay, T. Uyar, "Electrospinning of polymer-free cyclodextrin/geraniol–inclusion complex nanofibers: enhanced shelf-life of geraniol with antibacterial and antioxidant properties", *RSC Advances*, 6, 46089-46099 (2016)

• A. Senthamizhan, A. Celebioglu, T. Uyar, "Ultrafast on-site selective visual detection of TNT at Sub ppt level using single nanofiber incorporating fluorescent gold cluster", *Chemical Communications*, 51, 5590-5593 (2015)

• A. Senthamizhan, A. Celebioglu, T. Uyar, "Real-time selective visual monitoring of Hg2+ detection at ppt level: An approach to lighting electrospun nanofibers using gold nanoclusters", *Scientific Reports*, 5, 10403 (2015)

• A. Senthamizhan, A. Celebioglu, B. Balusamy, T. Uyar, "Immobilization of gold nanoclusters inside porous electrospun fibers for selective detection of Cu(II): A strategic approach to shielding pristine performance", *Scientific Reports*, 5, 15608 (2015)

• A. Senthamizhan, A. Celebioglu, S. Bayir, M. Gorur, E. Doganci, F. Yilmaz, T. Uyar, "Highly fluorescent pyrene-functional styrene copolymer nanofibers for enhanced sensing performance of TNT", *ACS Applied Materials & Interfaces*, 7, 21038-21046 (2015)

• B. Balusamy, B.E. Tastan, S.F. Ergen, T. Uyar, T. Tekinay, "Toxicity of Lanthanum oxide nanoparticles in aquatic environment", *Environmental Science - Process and Impacts,* 17, 1265-1270 (2015)

• C. Ozgit-Akgun, F. Kayaci, S. Bolat, B. Tekcan, A.K. Okyay, T. Uyar, N. Biyikli, "Low-temperature hollow cathode plasma-assisted atomic layer deposition of crystalline III-nitride thin films and nanostructures", *Physica Status Solidi C*, 12, 394-398 (2015)

• C. Ozgit-Akgun, F. Kayaci, S. Vempati, A. Haider, A. Celebioglu, E. Goldenberg, S. Kizir, T. Uyar, N. Biyikli, "Fabrication of flexible polymer-GaN core-shell nanofibers by the combination of electrospinning and hollow cathode plasma-assissted atomic layer deposition", *J of Materials Chemistry C*, 3, 5199 (2015)

• F. Kayaci, S. Vempati, C. Ozgit-Akgun, I. Donmez, N. Biyikli, T. Uyar, "Transformation of polymer-ZnO core-shell nanofibers into ZnO hollow nanofibers: Intrinsic defect reorganization in ZnO and its influence on the photocatalysis", *Applied Catalysis B-Environmental*, 176, 646 (2015)

• M. Arslan, T. Uyar, M.A. Tasdelen, Y. Yagci, "Poly(epsilon caprolactone)/clay nanocomposites via host-guest chemistry", *European Polymer Journal*, 71, 259-267 (2015)

• M. Aydin, T. Uyar, M.A. Tasdelen, Y. Yagci, "Polymer/Clay Nanocomposites through Multiple Hydrogen-bonding Interactions", *J of Polymer Science Part A- Polymer Chemistry,* 53, 650-658 (2015)

• N.O.S. Keskin, A. Celebioglu, T. Uyar, T. Tekinay, "Microalgae immobilized nanofibrous web for removal of reactive dyes from wastewater", *Industrial & Engineering Chemistry Research,* 54, 5802-5809 (2015)

• N.O.S. Keskin, A. Celebioglu, O.F. Sarioglu, T. Uyar, T. Tekinay, "Removal of Reactive Dye and Hexavalent Chromium by Reusable Bacteria Attached Electrospun Nanofibrous Web", *RSC Advances*, 5, 86867-86874 (2015)

• O.F. Sarioglu, A. Celebioglu, T. Tekinay, T. Uyar, "Evaluation of contact time and fiber morphology on bacterial immobilization for developşment of novel surfactant degrading nanofibrous webs", *RSC Advances,* 5, 102750-102758 (2015)

• S. Vempati, A. Celebioglu, T. Uyar, "Defect related emission versus intersystem crossing: Blue emitting ZnO/graphene oxide quantum dots", *Nanoscale*, 7, 16110-16118 (2015)

• S. Vempati, F. Kayaci, C. Ozgit-Akgun, N. Biyikli, T. Uyar, "Amorphous to tetragonal zirconia nanostructures and evolution of valance and core regions", *J of Physical Chemistry C*, 119, 23268 (2015)

• S. Vempati, F. Kayaci, C. Ozgit-Akgun, N. Biyikli, T. Uyar, "Surface ionic states and structure of titanete nanotubes", *RSC Advances*, 5, 82977 (2015)

• S. Vempati, S. Ozcan, T. Uyar, "Controlling the photoconductivity: Graphene oxide and polyaniline self assembled intercalation", *Applied Physics Letters*, 106, 051106 (2015)

• V.J. Babu, S. Vempati, T. Uyar, S. Ramakrishma, "A review on I-D and 2-D nanostructured materials for hydrogen generation", *Physical Chemistry Chemical Physics*, 17, 2960-2986 (2015)

• V.J. Babu, S. Vempati, Y. Ertas, T. Uyar, "Excitation dependent recombination studies on SnO2/TiO2 electrospun nanofibers", *RSC Advances*, 5, 66367-66375 (2015)

• A. Celebioglu, S. Demirci, T. Uyar, "Cyclodextrin- grafted electrospun cellulose acetate nanofibers via "Click" reaction for removal of phenanthrene", *Applied Surface Science*, 305, 581-588 (2014)

• A. Celebioglu, S. vempati, C. Ozgit-Akgun, N. Biyikli, T. Uyar, "Water-Soluble Non-Polymeric Electrospun Cyclodextrin Nanofiber Template for the Synthesis of Metal Oxide Tubes by Atomic Layer Deposition", *RSC Advances*, 4, 61698-61705 (2014)

• A. Senthamizhan, A. Celebioglu, T. Uyar, "Flexible and highly stabel electrospun nanofibrous membrane incorporating gold nanocluster as a efficient probe for visual colorimetric detection of Hg(II)", *J of Materials Chemistry A*, 2, 12717-12723 (2014)

• B.S. Munteanu, Z. Aytac, G.M. Pricope, T. Uyar, C. Vasile, "Polylactic acid (PLA)/Silver-NP/VitaminE bionanocomposite electrospun nanofibers with antibacterial and antioxidant activity", *J of Nanoparticle Research*, 16, 2643 (2014)

• F. Kayaci, T. Uyar, "Eletrospun Polyester/Cycledextrin Nanofibers for Entrapment of Volatile Organic Compounds", *Polymer Engineering and Science*, 54, 2970-2978 (2014)

• F. Kayaci, S. Vempati, C. Ozgit-Akgun, N. Biyikli, T. Uyar, "Enhanced photocatalytic activity of homoassembled ZnO nanostructures on electrospun polymeric nanofibers: A combination of atomic layer deposition and hydrothermal growth", *Applied Catalysis B-Environmental,* 156, 173-183 (2014)

• F. Kayaci, S. Vempati, C. Ozgit-Akgun, I. Donmez, N. Biyikli, T. Uyar, "Selective isolation of electron or hole in photocatalysis: ZnO-TiO2-ZnO Core-Shell Structured Heterojunction Babofibers via Electrospinning and Atomic Layer Deposition", *Nanoscale*, 6, 5735-5745 (2014)

• F. Kayaci, S. Vempati, I. Donmez, N. Biyikli, T. Uyar, "Role of Zinc Interstitials and Oxygen Vacancies of ZnO in Photocatalysis: A Bottom-Up Approach to Control the Defect Density", *Nanoscale*, 6, 10224-10234 (2014)

• M.F. Canbolat, A. Celebioglu, T. Uyar, "Drug delivery system based on cyclodextrin-naproxen inclusion complex incorporated in electrospun polycaprolactone nanofibers", *Colloids and Surfaces B: Biointerfaces*, 114, 15-21 (2014)

• N.O. San, A. Celebioglu, Y. tumtas, T. Uyar, T. Tekinay, "Reusable bacteria immobilized electrospun nanofibrous web fro decolorization of methylene blue dye in wastewatewr treatment", *RSC Advances*, 4, 32249-32255 (2014)

• S. Demirci Uzun, F. Kayaci, T. Uyar, S. Timur, L. Toppare, "Bioactive Surface Design Based on Functional Composite Electrospun Nanofibers for Biomolecule Immobilization and Biosensor Applications", *ACS Applied Materials & Interfaces*, 6, 5235-5243 (2014)

• S. Demirci, A. Celebioglu, T. Uyar, "Surface modification of electrospun cellulose acetate nanofibers via RAFT

polymerization for DNA adsorption", *Carbohydrate Polymers*, 113, 200-207 (2014)

• S. Demirci, A. Celebioglu, Z. Aytac, T. Uyar, "pH-responsive nanofibers with controlled drug release properties", *Polymer Chemistry,* 5, 2050-2056 (2014)

• S. Vempati, T. Uyar, "Fluorescence from graphene oxide and the influence of ionic, π π interactions and heterointerfaces: electron or energy transfer dynamics", *Physical Chemistry Chemical Physics*, 16, 21183-21203 (2014)

• S. Vempati, A. Celebioglu, T. Uyar, "Electron-phonon interaction in bulk layered graphene and its oxide in the presence of alcohols in a device: Equilibrium molecular doping", *J of Materials Chemistry C*, 2, 8585-8592 (2014)

• T.O. Lekesiz, K. Kaleli, T. Uyar, C. Kayran, J. Hacaloglu, "Preparation and characterization of polystyrene-b-poly(2-vinylpyridine) coordinated to metal ion nanoparticles", *J of Analytical and Applied Pyrolysis*, 106, 81-85 (2014)

• Y. Ertas, T. Uyar, "Main-chain polybenzoxazine nanofibers via electrospinning", *Polymer*, 55, 556-564 (2014)

• Z. Aytac, S.Y. Dogan, T. Tekinay, T. Uyar, "Release and antibacterial activity of ally1 isothiocyanate/B-cyclodextrin complex encapsulated in electrospun nanofibers", *Colloids and Surfaces B: Biointerfaces*, 210, 125-131 (2014)

• F.M. Balci, O.U. Kudu, E. Yilmaz, O. Dag, "Synthesis of Mesoporous Lithium Titanate Thin Films and Monoliths as an Anode Material for High-Rate Lithium-Ion Batteries", *Chemistry - A European Journal* (Forthcoming)

• A. Mohamed, T.A. Osman, M.S. Toprak, M. Muhammed, E. Yilmaz, A. Uheida, "Visible light photocatalytic reduction of Cr(VI) by surface modified CNT/titanium dioxide composites nanofibers", *J of Molecular Catalysis A: Chemical*, 424, 45-53 (2016)

• H.H. Susapto, O.U. Kudu, R. Garifullin, E. Yilmaz, M.O. Guler, "One-Dimensional Peptide Nanostructure Templated Growth of Iron Phosphate Nanostructures for Lithium-Ion Battery Cathodes", *ACS Applied Materials & Interfaces,* 8, 17421-17427 (2016)

Contact:
Dr. Hilmi Volkan Demir
(Program Director)
Phone : +90 312 290 2513
Fax : +90 312 266 4365
msn@unam.bilkent.edu.tr
unam@unam.bilkent.edu.tr
unam.bilkent.edu.tr

## Faculty Profile: Dr. Hilmi Volkan Demir, Professor, Department of Physics Department of Electrical and Electronics Engineering

Hilmi Volkan Demir is the Director of UNAM-Institute of Materials Science and Nanotechnology. He received a Ph.D. from Stanford University in 2004. Dr. Demir has made scientific contributions in areas related to energy-saving LED lighting and displays, including high-quality semiconductor lighting and the color science of nanocrystal emitters, the understanding of their excitonic energy transfer processes, and their utilization in LED lighting. One breakthrough achieved by his research was the demonstration of a record-high photometric performance for LEDs. This work was reviewed in *Nano Today* and highlighted in a letter in *Nature Photonics*. Another was the fabrication of the largest freestanding nanocrystal membrane (>50cm×50cm) for LED color conversion achieved to date, which was reported in *Nano Letters*.

Over the years, Dr. Demir has secured a total of over 20 million USD in research funding as a principal investigator, and has earned a number of fellowships and international awards, including the Singapore NRF Fellowship and the EURYI Award. He is also a winner of the 2014 Nanyang Award for Research Excellence, and a recipient of the TÜBİTAK Incentive Award and the TÜBA GEBİP Award. He has been recognized by the Junior Chamber International (JCI) with two Outstanding Young Person Awards, including the JCI international first prize for academic achievement and leadership.

His work has led to over 280 SCI journal publications, garnering over 6,000 citations, with a Hirsch index of 42 and an i10-index of 157, and more than 30 granted or pending patents. Dr. Demir has twice been highlighted in *Nature* as an example of a successful international scientist. He is a selected partner of the European Union FP7 Nanophotonics for Energy Network of Excellence (N4E NoE), and is currently serving as an editor for the SpringerBriefs series on *Nanoscience and Nanotechnology* and the Optical Society of America's *Optics Express journal*.

# MATHEMATICS

The aim of the Department of Mathematics graduate program is to develop students into mathematicians who can pursue original, creative research. The program emphasizes research in both pure and applied mathematics. At present, research in the graduate program is focused on algebra, algebraic geometry, algebraic topology, number theory, complex analysis, functional analysis, dynamical systems, nonlinear differential equations, and general relativity.

## FACULTY

**MEHMET AKÇAY**, Instructor. M.Sc., Applied Statistics, Gazi University, 1983. *Banking and financial statistics.*

**FATİHCAN ATAY**, Visiting Professor and Department Chair. Ph.D., Applied Mathematics, Brown University, 1994. *Dynamical systems, delay differential and difference equations, complex systems and networks, systems and control theory.*

**LAURENCE J. BARKER**, Associate Professor. Ph.D., Mathematics, Oxford University, 1992. *Finite groups, representation theory, local and Clifford theory, G-algebras,* G-posets.

**ALEXANDER DEGTYAREV**, Associate Professor. Ph.D., Mathematics, Steklov Mathematical Institute, 1988. *Algebraic topology, algebraic geometry.*

**MATTHEW GELVIN**, Visiting Assistant Professor Ph.D., Mathematics, Massachusetts Institute of Technology, 2010. *Algebraic topology, fusion systems, local group theory.*

**AURELIAN GHEONDEA**, Associate Professor. Ph.D., Mathematics, University of Bucharest 1990. *Functional analysis, operator theory, spectral theory.*

**ALEXANDER GONCHAROV**, Associate Professor. Ph.D., Mathematics, Rostov State University, 1986. *Functional analysis. Topological vector spaces, spaces of infinitely differentiable functions.*

**AHMET MUHTAR GÜLOĞLU**, Assistant Professor. Ph.D. Mathematics, Ohio State University, *2005. Analytic number theory, automorphic forms.*

**METİN GÜRSES**, Professor. Ph.D., Physics, Middle East Technical University, 1975. *General relativity, string theory, integrable systems, partial differential equations.*

**DİLEK GÜVENÇ**, Instructor. Ph.D., Statistics, Ankara University, 1984. *Probability and statistics.*

**HAKKI TURGAY KAPTANOĞLU**, Professor. Ph.D., Mathematics, University of Wisconsin –Madison, 1991. *Function theory and operator theory in spaces of holomorphic and harmonic functions of several variables.*

**ANARGYROS KATSAMPEKIS**, Instructor. Ph.D. Mathematics, University of Ioannina 2006. *Commutative algebra, algebraic geometry, algebraic combinatorics and graph theory.*

**AZER KERİMOV**, Professor. Ph.D., Mathematics, Landau Institute of Theoretical Physics and Academy of Sciences of Azerbaijan, 1988. *Mathematical theory of statistical physics, probability, mathematical analysis.*

**ALEXANDER KLYACHKO**, Visiting Professor. Ph.D., Mathematics, Saratov State University, 1973. *Algebra, algebraic geometry, number theory.*

**MEFHARET KOCATEPE**, Professor. Ph.D., Mathematics, University of Michigan, 1978. *Functional analysis, nuclear spaces, Köthe spaces.*

**YOSUM KURTULMAZ**, Instructor. Ph.D., Mathematics, Middle East Technical University, 1998. *Ring theory, number theory, formal concept analysis.*

**UĞURHAN MUĞAN**, Professor. Ph.D., Mathematics, Clarkson University, 1988. *Nonlinear ordinary and partial differential equations, asymptotic analysis, boundary value problems, singular integral equations.*

**AYDAN PAMİR**, Instructor. Ph.D., Mathematics, Middle East Technical University, 1992. *Numerical analysis.*

**ALİ SİNAN SERTÖZ**, Professor. Ph.D., Mathematics, University of British Columbia, 1984. *Algebraic geometry.*

**MÜFİT SEZER**, Associate Professor. Ph.D., Mathematics, Purdue University, 2003. *Invariant theory, commutative algebra.*

**OKAN TEKMAN**, Lecturer. Ph.D., Mathematics, University of Minnesota, 1992. *Automorphic forms, special values of L-functions.*

**BÜLENT ÜNAL**, Associate Professor. Ph.D., Mathematics, University of Missouri, 2000. *Differential geometry, Riemannian geometry, pseudo-Riemannian geometry and Lorentzian geometry, global analysis on manifolds, general relativity and quantum field theories.*

**ÖZGÜN ÜNLÜ**, Assistant Professor. Ph.D., Mathematics, University of Wisconsin-Madison, 2004. *Algebraic topology, geometric group theory.*

**ALİ SÜLEYMAN ÜSTÜNEL**, Visiting Professor Ph.D., Mathematics, University of Paris VI, 1981. *Probability and analysis: Stochastic calculus on nuclear spaces, stochastic partial differential equations, analysis on Wiener space, Malliavin calculus and its applications, Monge-Kantorovich* measure *transportation and Monge-Amphre equation on Wiener space.*

**ERGÜN YALÇIN**, Professor. Ph.D., Mathematics, University of Wisconsin Madison, 1998. *Cohomology of groups, finite group actions on topological spaces, geometric structures associated to groups.*

**HAMZA YEŞİLYURT**, Associate Professor. Ph.D., Mathematics, University of Illinois, Urbana-Champaign, 2004. *Analytic theory of partitions, elliptic functions, basic hypergeometric series and q-series.*

**NATALYA ZHELTUKHINA**, Instructor. Ph.D., Mathematics, Bilkent University, 2002. *Theory of entire functions, Pòlya frequency sequences.*

## MASTER OF SCIENCE IN MATHEMATICS

**Admission:** All applicants are required to have a B.S. degree in mathematics or a related field of science or engineering. Students with a B.S. degree in an area other than mathematics may be required to take certain undergraduate courses in order to acquire the necessary background in the field. Evaluation of applicants is based on their ALES *(Akademik Personel ve Lisansüstü Eğitimi Giriş Sınavı*/ Academic Personnel and Postgraduate Education Entrance Examination) scores, past academic records, reference letters, and an interview. Applicants who are not Turkish citizens and Turkish citizen applicants who are residents of another country may take the GRE (Graduate Record Examination) instead of the ALES. All nonnative speakers of English are required to submit proof of satisfactory knowledge of English.

**Degree Requirements:** In addition to completing at least 21 credit units of course work, the M.S. degree candidate must prepare and successfully defend a thesis. The expected duration of study for the M.S. degree is 4 semesters; the maximum duration is 6 semesters.

## DOCTOR OF PHILOSOPHY IN MATHEMATICS

**Admission:** All applicants are required to have a B.S. degree in mathematics or a related field of science or engineering. Evaluation of applicants is based on their ALES (*Akademik Personel ve Lisansüstü Eğitimi Giriş Sınavı*/Academic Personnel and Postgraduate Education Entrance Examination) scores, past academic records, reference letters, and an interview. Applicants who are not Turkish citizens and Turkish citizen applicants who are residents of another country may take the GRE (Graduate Record Examination) instead of the ALES. All nonnative speakers of English are required to submit proof of satisfactory knowledge of English.

**Degree Requirements:** The completion of 21 credit units of course work beyond the M.S. level is required. Ph.D. candidates must pass a qualifying exam, typically in their fourth semester, and then must prepare a dissertation proposal. Preparation and defense of a dissertation based on original research is the centerpiece of the program. The standard duration of study for the Ph.D. degree is 8 semesters for students who enter the program with an M.S. degree; the maximum duration is 12 semesters.

## COURSE DESCRIPTIONS

**MATH 500 Mathematical Analysis**
Metric spaces, sequences, completeness, Baire's theorem. Continuity. Completion of a metric space. Compactness and connectedness. Contraction mapping theorem and its applications. Product spaces.

**MATH 501 Real Analysis I**
Concepts of integration. Generalized Riemann Integral. Borel Sets, Bair Functions. Outer Measures. Measurable Sets. Lebesgue Measure. Lebesgue density theorem. Hausdorff Dimension. Measurable Functions. Lusin's and Egorov's Theorems. Limit Theorems for Lebesgue Integral. Differentiation of Lebesgue Integral. Spaces of Integrable Functions. Signed Measures. The Radon-Nikodym Theorem.

**MATH 502 Real Analysis II**
Topological vector spaces. Metrizability. Locally convex spaces. Boundedness and normability. Barreled spaces. Banach-Steinhaus theorem. Dual pairs and polar topologies. Topologies on spaces of linear mappings. Inductive and projective limits. Distributions. Elements of spectral theory.

**MATH 503 Complex Analysis I**
Complex differentiability and Cauchy-Riemann equations. Holomorphic functions and primitives. Local Cauchy theorems, Morera theorem, power series representations, and fundamental properties of holomorphic functions. Logarithms, winding numbers, and global Cauchy theorems. Singularities, Laurent series, and residue theorem. Argument principle and open mapping theorem. Conformal mapping, Schwarz-Pick lemma, and Mobius transformations. Normal families and Riemann mapping theorem. Harmonic and subharmonic functions, Poisson integrals, and Schwarz reflection principle. Simply connected plane domains.

**MATH 504 Complex Analysis II**
Runge theorem and Mittag-Leffler theorem. Infinite products and Weierstrass factorization theorem. Jensen formula and Blaschke products. Special functions. Caratheodory and Lindelof theorems. Analytic continuation, gap series, and monodromy theorem. Cauchy-Pompeiu formula and inhomogeneous d-bar equation. Spaces of holomorphic functions.

**MATH 505 Introduction to Complex Geometry**
Vector bundles. Sheaf theory and sheaf cohomology. Kahler manifolds. Chow rings. Lefschetz (1,1)-theorem. The hodge conjecture, i.e. the (p,p) version of Lefschetz's theorem.

**MATH 507 Introduction to Potential Theory**
Harmonic and subharmonic functions. Potentials and Energies. Equilibrium measures. Green functions. Capacities. Exceptional sets. Transfinite diameters and Chebyshev constants. Applications to Approximation Theory.

**MATH 509 Topics in Operator Theory**
Spectral theory of linear operators in normed linear spaces. Banach algebras. Spectral theory of compact operators. Bounded selfadjoint operators. Unbounded selfadjoint operators. Unbounded linear operators in quantum mechanics.

**MATH 523 Algebra I**
Category-theoretic language. Review of groups, rings, modules. Applications of Zorn's Lemma, including the algebraic closure of a field. Galois theory.

**MATH 524 Algebra II**
Rings, modules and endomorphism rings. Idempotents and indecomposable modules. Jacobson radical. Artinian and Noetherian rings. Artin-Wedderburn Theorem. Levitsky's Theorem. Krull-Schmidt Theorem. Maschke's Theorem and finite group representations.

**MATH 525 Group Representations**
Representation as linear action. Existence of invariant metric. Maschke theorem. Schur's lemma. Multiplicity of irreducible component in regular representation. Structure of group algebra. Characters and presentations of abelian groups, duality. Characters of nonabelian groups. Central idempotent and the first orthogonality relation. Completeness of the set of characters and the second orthogonality relation. Induced representations and characters. Mackey criterion of irreducibility.

Representations of symmetric group. Representations of supersolvable groups. Real representations and Schur's index. Other applications of induced representations. Degrees of irreducible representations. Compact groups, Haar measure. Linear representations of compact groups. Unitary trick. Representations of general linear and unitary groups.

**MATH 527 Topics in Representation Theory**
Induction, restriction, inflation, deflation. Construction of ordinary character tables. Burnside p-alpha q-beta Theorem and Frobenius Theorem on Frobenius groups. Mackey Decomposition Theorem, Clifford's Theorem. Jacobson radical. Modular representations of finite p-groups. Projective modules and primitive idempotents for finite-dimensional algebras. Splitting fields. The decomposition map. The cde triangle. Blocks of defect zero. Brauer characters, decomposition matrix, orthonormality relations. The Krull-Schmidt theorem. Vertices, sources and the Green correspondence. Defect groups of G-Algebras. The Brauer Correspondence. Source algebras.

**MATH 528 Invariant Theory**
Noetherian rings and modules. Krull dimension. Linear representations and algebra of invariants. Noether's bound for a number of generators. Linearly reductive algebraic groups, finite generation of invariants. Hilbert-Serre theorem. Poincare series. Minimal resolution. Hilbert syzygy theorem. Molien's theorem. Reflecting Hyperplanes. Groups generated by pseudoreflections. Polinomiality of invariant ring. The Shephard-Todd theorem. Geometric invariant theory. Spectrum of the ring of invariants. Stability.

**MATH 535 Topology of Algebraic Varieties**
Introduction: algebraic varieties, rigidity vs. flexibility, algebro-geometric vs. topological properties. Deformation invariance of topology. Singular vs. nonsingular and real vs. complex varieties. Simple case: Riemann surfaces. Genus, Riemann-Hurwitz formula, topological nature of discrete invariants. A brief introduction to singularities of curves and surfaces. Blow-ups and resolution of singularities. Singular plane curves. Components of the moduli space. The fundamental group. Introduction to Hodge theory (if needed). K3-surfaces: the global Torelli theorem, period spaces, curves and linear systems, topological classification (including singular, symmetric, and real surfaces). Polarized K3-surfaces: plane sextics and quartics in space. Hyperelliptic and trigonal curves in Hirzebruch surfaces; elliptic surfaces.

**MATH 541 Manifold Theory**
Differentiable manifolds, smooth mappings, tangent cotangent bundles, differential of a map, submanifolds, immersions, imbeddings, vector fields, tensor fields, differential forms, orientation on manifolds, integration on manifolds, Stokes' theorem. Lie derivative of tensor fields.

**MATH 543 Methods of Applied Mathematics I**
Functions spaces, orthogonal polynomials and Fourier analysis, generalized functions. Ordinary differential equations, Green's function, Sturm-Liouville problem, hypergeometric functions. Perturbation methods, regular perturbations, singular perturbations, boundary layer analysis, the WKB approximation.

**MATH 544 Methods of Applied Mathematics II**
Calculus of variations, necessary conditions for extrema, isoperimetric problems. Partial differential equations. Cauchy Kowalevsky theorem, linear, quasi-linear, half-linear equations. Initial and boundary value problem for the wave and heat equations, Riemann method. Laplace equation, minimum and maximum principles. Integral transforms. Stability and bifurcation. Inverse scattering transform.

**MATH 550 Probability and Statistics**
Mathematical foundations of Probability theory. Random walks. Consequence of probability measures. Sequences and sums of independent random variables. Markov chains. Percolation theory.

**MATH 551 Topics in Number Theory**
Local and global class field theory. p-adic analysis. Iwasawa theory. Modular forms. L-functions. Galois representations. Galois cohomology.

**MATH 553 Ergodic Theory**
Borel spaces. Borel automorphism. Poincare recurrence lemma. Ergodic theorem for permutations. Almost periodic functions. Birkhoff and Von Neumann ergodic theorems. Return times. Applications to the number theory. Ergodic theorem for Markov chains. Ergodicity. Mixing. Irrational rotation. Diadic adding machine. Bernoulli, Markov, Kolmogorov shifts. Entropy.

**MATH 573 Introduction to Financial Mathematics**
Basic knowledge and techniques in financial mathematics: basic Black and Scholes model and its sophistications. Theory of discrete and continuous martingales, semimartingales. Stochastic integral, Ito formula, construction and solution of stochastic differential equations. Applications to option pricing and hedging problems for the European options. American options and the numerical problems of the solutions of second order elliptic equations.

**MATH 574 Financial Mathematics**
Calculations practiced in option marketing. Fundamentals of Itô Calculus, and its applications to calculations.

**MATH 583 Topics in Mathematical Physics I**
Symmetries of differential equations, calculation of symmetry groups. Group invariant solutions, symmetry groups and conservations laws, variational calculus and symmetries.

**MATH 585 Topics in Ordinary Differential Equations I**
**MATH 586 Topics in Ordinary Differential Equations II**
Selected topics in ordinary differential equations. Existence and uniqueness theorems. Flows. Stability. Lyapunov theory. Behavior near equilibria and periodic solutions. Bifurcations. Delay equations.

**MATH 591 Topics in Algebraic Geometry I**
Introductory theorems from several complex variables. Sheaves and cohomology. Hodge decomposition. Algebraic varieties, Grasmannianss, Riemann-Hurwitz formula. Curves and their Jacobians. Chern classes. Hirzebruch-Riemann-Roch formula. Rational and irrational surfaces. Residues. Homological algebra. Quadric line complex.

**MATH 601 Topics in Real Analysis**
The aim of the course is to consider basic concepts and techniques in Approximation Theory. The course covers such subjects as polynomial interpolation (with estimation of norms of interpolating operators), direct and inverse theorems in polynomial approximation, existence and uniqueness of the best approximation, methods of Potential Analysis, approximation by splines.

**MATH 605 Topics in Functional Analysis I**
Banach Algebras and spectral theory. Commutative Banach algebras. Analytic functional calculus. C*-algebras. Normal operators. Representations of Banach *-algebras. Spectral measures. Compact operators. Trace ideals and duality. States and the GNS construction. Von Neumann algebras.

**MATH 606 Selected Topics in Functional Analysis**
Test functions and distributions, regular distributions, derivatives and multiplications with smooth functions, localizations, the Schwartz space and tempered distributions, the Fourier Transform, Sobolev spaces, embeddings, extensions, and traces. Prerequisite: Consent of the Instructor.

**MATH 609 Several Complex Variables**
General theory: Holomorphic functions of several complex variables, integral formulas, Bergman kernel, domains of holomorphy, holomorphic convexity, plurisubharmonicity,

d-bar problem. Special theory: Function theory on the unit ball, automorphisms, Hardy spaces, boundary behavior.

**MATH 611 Algebraic Topology I**
Categories and functors, homotopy of paths, homotopy of maps, fundamental groups, higher homotopy groups, homology of complexes, chain homotopy, standard simplices, the singular complex, singular homology, excision theorem, Mayer-Vietoris sequences, applications of homology.

**MATH 612 Fibre Bundles I**
Fibrations, fiber bundles, classifying spaces and classifying maps, characteristic classes (both ordinary and extraordinary), vector bundles, Schubert calculus, classical characteristic classes of vector bundles, the Thom isomorphism, the topological Riemann—Roch theorem, applications to manifolds (embeddings to Euclidean spaces, Wu's formulas, divisibility theorems, etc.)

**MATH 624 Compact Lie Groups**
Compact Lie groups. Classical examples. One parametric subgroups. Maximal tori. Invariant differential operators and Lie algebras. Relation between Lie groups and algebras. Killing invariant form. Universal enveloping algebra. Cartan subalgebras. Roots systems. Weyl group. Dynkin diagrams and classification of roots systems. Exceptional Lie groups and algebras.

**MATH 625 Homological Algebra**
The course starts with standard material on homological algebra and continues with a special interest topic with instructor's consent such as special applications and calculations in algebraic topology, algebraic geometry or cohomology of groups. The standard part includes material on modules, categories, extensions of modules, derived functors and spectral sequences.

**MATH 626 Cohomology of Groups**
Group extensions. Basic homological algebra. Definition and properties of group cohomology. Serre's theorem. Mislin's theorem. Quillen's stratification theorem. Even's norm map and Steenrod operations. HLS - spectral sequence. Group actions on cell complexes.

**MATH 630 Commutative Algebra**
We introduce the basic concepts of dimension theory and study Noether normalization and system of parameters. We introduce Kozsul complex and some other depth measuring techniques. Cohen-Macaulay and regular rings are also studied. We review some important foundational theorems in the area such as Hilbert Syzygy theorem and Auslander-Buschbaum formula.

**MATH 631 Topics in Commutative Algebra**
The main goal of the course is to develop an understanding of basic concepts of syzygies and Hilbert functions. We start with graded rings and modules their graded free resolutions. After the introduction of Betti numbers we consider Eliahou-Kervaire resolution and its applications. Basic properties Hilbert functions and its extremal properties are also covered. In this context we also study Lex and Gotzmann ideals and Macaulay's theorem.

**MATH 633 Algebraic Geometry I**
Transcendental theory; Complex algebraic varieties, line bundles and divisors, Riemann surfaces as algebraic curves, Hurwitz's theorem, Riemann-Roch theorem, uniformization, surfaces, Kodaira dimension, main classification theory of surfaces via birational theory, Chern classes, fixed point theorems, residues, spectral sequences.

**MATH 645 Riemannian Geometry I**
Smooth Manifolds, Riemannian Metrics and Levi-Civita Connections. Covariant Differentiation of Vector Fields. Riemannian Manifolds. Curvature, Geodesics, Exponential Map, Normal Coordinates. Sectional, Ricci and Scalar Curvatures. Gradient, Divergence and Laplacian Operators. Riemannian Submanifolds, Induced Connection, Second Fundamental Form, Formulae of Gauss and Weingarten. Equations of Gauss, Codazzi and Ricci.

**MATH 646 Riemannian Geometry II**
The Gauss lemma, Riemannian distance, Riemannian completeness, Hopf-Rinow theorem. Jacobi fields, symmetric spaces, isometries and killing vector fields. First and second variations, the index form, conjugate and focal points, homogeneous spaces, lie groups and lie algebras. Complex and almost complex manifolds. Hermitian and Kaehlerian manifolds.

**MATH 653 Introduction to Analytical Number Theory**
Primes in an arithmetic progression; Gauss' sum; primitive characters; Dirichlet's class number formula; the distribution of the primes; Riemann's zeta-function and Dirichlet $L$-functions; Explicit formulae and prime number theorems; the large sieve and Bombieri-Vinogradov theorem.

**MATH 654 Analytic Number Theory**
Integer points, trigonometric sums, infinite products, entire functions, the gamma function, the Riemann zeta-function, zeros of the zeta-function, the prime number theorem, Dirichlet-functions, primes in arithmetic progressions, the circle method, the Goldbach conjecture, Waring's problem.

## SAMPLE OF RECENT PUBLICATIONS


• L. Horstmeyer, F.M. Atay, "Characterization of Exact Lumpability for Vector Fields on Smooth Manifolds", *Differential Geometry and its Applications*, 48, 46-60 (2016)

• O. Karabacak, B. Alikoc, F.M. Atay, "Stability Regions for Synchronized τ-Periodic Orbits of Coupled Maps with Coupling Delay τ", *Chaos*, 26, 093101-1--9 (2016)

• W. Lu, F.M. Atay, "Local Pinning of Networks of Multi-Agent Systems With Transmission and Pinning Delays", *IEEE Trans on Automatic Control*, 61, 2657-2662 (2016)

• L. Barker, I. Tuvay, "A refinement of Alperin's conjecture for blocks of the endomorphism algebra of the Sylow permutation module", *Archiv der Mathematik* (Forthcoming)

• L. Barker, "A General Approach to Green Functors Using Bisets", *Communications in Algebra*, 44, 5351-5375 (2016)

• L. Barker, "Tornehave morphisms III: The reduced Tornehave morphism and the Burnside unit functor", *J of Algebra*, 446, 19-33 (2016)

• L. Barker, "Blocks of Mackey categories", *J of Algebra*, 446, 34-57 (2016)

• A. Degtyarev, "On the Neron-Severi lattice of a Delsarte surface", *Kyoto J of Mathematics*, 56, 611-632 (2016)

• A. Degtyarev, I. Itenberg, A.S. Sertoz, "Lines on quartic surfaces", *Mathematische Annalen* (Forthcoming)

• A. Degtyarev, I. Shimada, "On the topology of projective subspaces in complex Fermat varieties", *J of Math Soc Japan*, 68, 975-996 (2016)

• A. Degtyarev, V. Florens, A.G. Lecuona, "The Signature of a Splice", *Int Mathematics Research Notices*., 1-35 (2016)

• A. Degtyarev, "Lines generate the Picard groups of certain Fermat surfaces", *J of Number Theory*, 147, 454-477 (2015)

• A. Akyol, A. Degtyarev, "Geography of irreducible plane sextics", *Proc London Math Soc*, 111, 1307-1337 (2015)

• A. Degtyarev, "On the Artal-Carmona-Cogolludo construction", *J of Knot Theory and its Ramifications*, 23, 1450028-1--35 (2014)

• A. Degtyarev, "The Alexander module of a trigonal curve", *Revista Mathematica Iberoamericana*, 30, 25-64 (2014)

• A. Degtyarev, "Real trigonal curves and real elliptic surfaces of type I", *J fur die Reine und Angewandte Mathematik*, 686, 221-246 (2014)

• A. Degtyarev, *Topology of Algebraic Curves. An Approach via Dessins d'Enfants. De Gruyter Studies in Mathematics,* Berlin, Walter de Gruyter & Co, (2012)

• A. Degtyarev, *I. Itenberg, V. Kharlamov, Real Enriques Surfaces (Lecture Notes in Mathematics 1746)*, Springer-Verlag, (2000)

• A. Gheondea, M.E. Samci, "On the dynamics of a third order Newton's approximation method", *Mathematische Nachrichten* (Forthcoming)

• A. Gheondea, "On locally Hilbert spaces", *Opuscula Mathematica*, 36, 735-747 (2016)

• C-Gr. Ambrozie, A. Gheondea, "An Interpolation Problem for Completely Positive Maps on Matrix Algebras: Existence and Solvability", *Linear and Multilinear Algebra*, 63, 826-851 (2015)

• P. Cojuhari, A. Gheondea, "Triplets of Closely Embedded Hilbert Spaces", *Integral Equations and Operator Theory*, 21, 1-33 (2015)

• S. Ay, A. Gheondea, "Representations of *-semigroups associated to invariant kernels with values adjointable operators", *Linear Algebra and Its Applications*, 486, 361-388 (2015)

• A. Goncharov, "Best exponents in Markov's inequlities", *Mathematical Inequlities and Applications* (Forthcoming)

• A. Goncharov, B. Hatinoglu, "Widow Factors", *Potential Analysis* (Forthcoming)

• A. Goncharov, Z. Ural, "Mityagin's extension problem. Progress report", *J of Mathematical Analysis and Applications* (Forthcoming)

• G. Alpan, A. Goncharov, "Orthogonal Polynomials for the Weakly Equilibrium Cantor Sets", *Proc Amer Math Soc* (Forthcoming)

• G. Alpan, A. Goncharov, A.N. Simsek, "Asymptotic Properties of Jacobi Matrices for a Family of Fractal Measures", *Experimental Mathematics* (Forthcoming)

• A. Goncharov, "Weakly Equilibrium Cantor-Type Sets", *Potential Analysis*, 40, 143-161 (2014)

• G. Alpan, A. Goncharov, "Two measures on Cantor sets", *J of Approximation Theory*, 186, 28-32 (2014)

• Y. Akbal, A. Guloglu, "Waring's Problem with Piatetski-Shapiro numbers", *Mathematika*, 62, 524-550 (2016)

• Y. Akbal, A. Guloglu, "Piatetski-Shapiro meets Chebotarev", *ACTA Arithmetica*, 167, 301-325 (2015)

• W.D. Banks, A. Guloglu, R.C. Vaughan, "Waring's problem for Beatty sequences and a local to global principle", *J Theor. Nombres Bordeaux*, 26, 1-16 (2014)

• M. Gurses, A. Pekcan, "Traveling wave solutions of degenerate coupled multi-KdV equations", *J of Mathematical Physics*, 57, 103507-1--21 (2016)

• M. Gurses, C. Senturk, "Godel-type metrics in Einstein-Aether theory II - nonflat background in arbitrary dimensions", *General Relativity and Graviation*, 48, 68-1--14 (2016)

• M. Gurses, T.C. Sisman, B. Tekin, "From smooth curves to universal metrics", *Physical Review D*, 94, 044042-1--6 (2016)

• M. Gurses, T.C. Sisman, B. Tekin, "Gravity Waves in Three Dimensions", *Physical Review D*, 92, 084016-1--8 (2015)

• M. Gurses, A. Pekcan, "Travelling Wave Solution of Degenerate Coupled KdV Equations", *J of Mathematical Physics*, 55, 091501-1--28 (2014)

• M. Gurses, S. Tek, "Korteweg-de Vries surfaces", *Nonlinear Analysis: Theory, methods and applications*, 95, 11-22 (2014)

• M. Gurses, T.C. Sisman, B. Tekin, "AdS-Plane wave and pp-wave solutions of generic gravity theories", *Physical Review D*, 90, 124005-1--22 (2014)

• S. Gergun, H.T. Kaptanoglu, A.E. Ureyen, "Harmonic Besov Spaces on the Ball", *Int J of Mathematics*, 27, 1650070-1-59 (2016)

• H.T. Kaptanoglu, "Aspects of Multivariable Operator Theory on Weighted Symmetric Fock Spaces", *Communications in Contemporary Mathematics*, 16, 1350034-1--49 (2014)

• A. Kerimov, "Covering a rectangular chessboard with staircase walks", *Discrete Mathematics*, 338, 2229-2233 (2015)

• A. Kerimov, "A disagreement-percolation type uniqueness condition for Gibbs states in models with long-range interaction", *J of Statistical Mechanics: Theory and Experiment*, 10, 10014-1--7 (2014)

• Y. Kurtulmaz, "Very Cleaness of Generalized Matrices", *Bulletin of Iranian Mathematical Society* (Forthcoming)

• Y. Kurtulmaz, "Strongly J-clean skew triangular matrix rings", *Scientific Annals of A.I.I. Cuza* (Forthcoming)

• H. Chen, H. Kose, Y. Kurtulmaz, "Extensions of Strongly Pi-Regular Rings", *Bull. Korean Math. Soc.* (Forthcoming)

• H. Chen, H. Kose, Y. Kurtulmaz, "Strongly clean triangular matrix rings with endomorphisms", *Iranian J of Mathematics* (Forthcoming)

• H. Chen, H. Kose, Y. Kurtulmaz, "Factorization of matrices over projective-free rings", *Algebra Colloquium*, 23, 23-32 (2016)

• H. Chen, H. Kose, Y. Kurtulmaz, "Strongly Clean Matrices Over Power Series", *Kyungpook Mathematical Journal,* 56, 387-396 (2016)

• B. Ungor, Y. Kurtulmaz, S. Halicioglu, A. Harmanci, "Symmetric Modules over Their Endomorphism Rings", *Algebra and Discrete Mathematics Journal*, 19, 283-294 (2015)

• H. Chen, H. Kose, Y. Kurtulmaz, "On feckly clean rings", *J of Algebra and its Applications*, 14, 1550046-1--15 (2015)

• H. Chen, H. Kose, Y. Kurtulmaz, "Sytongly P-clean Rings and Matrices", *J of Algebra and its Applications*, 15, 116-131 (2014)

• S. Sertoz, "Dirichlet problem for polynomials on the unit disk", *Communications of the Korean Math Society*, 29, 415-420 (2014)

• M. Kohls, M. Sezer, "Degree of reductivity of a modular representation", *Communications in Contemporary Mathematics* (Forthcoming)

• M. Sezer, R.J. Shank, "Rings of invariants for modular representations of the Klein four group", *Trans of American Mathematical Society*, 368, 5655-5673 (2016)

• M. Sezer, W. Zhang, "Poincare duality in modular coinvariant rings", *Proc Amer Math Soc*, 144, 5113-5120 (2016)

• M. Kohls, M. Sezer, "On Cohen-Macaulayness and depth of ideals in invariant rings", *J of Pure and Applied Algebra*, 220, 2029-2037 (2016)

• M. Sezer, "Decomposing modular coinvariants", *J of Algebra*, 423, 87-92 (2015)

• E. Dufresne, J. Elmer, M. Sezer, "Separating invariants for arbitrary linear actions of the additive group", *Manuscripta Mathematica*, 143, 207-219 (2014)

• M. Kohls, M. Sezer, "On the top degree of coinvariants", *Int Mathematics Research Notices*, 22, 6079-6093 (2014)

• S. Shenawy, B. Unal, "The W2-curvature tensor on warped product manifolds and applications", *Int J of Geometric Methods in Modern Physics*, 13, 1-14 (2016)

• S. Shenawy, B. Unal, "2-Killing vector fields on warped product manifolds", *Int J of Mathematics*, 26, 1550065-1--17 (2015)

• E. Yalcin, "Equivariant Moore Spaces and the Dade Group", *Advances in Mathematics* (Forthcoming)

• I. Hambleton, E. Yalcin, "Group actions on spheres with rank one prime power isotropy", *Mathematical Research Letters* (Forthcoming)

• E. Yalcin, "Rank 3 finite p -group actions on products of spheres", *Bulletin of the London Mathematical Society*, 48, 325-340 (2016)

• I. Hambleton, E. Yalcin, "Group actions on spheres with rank one isotropy", *Trans of American Mathematical Society*, 368, 5971-5977 (2016)

• M. Gelvin, S.P. Reeh, E. Yalcin, "On the basis of the Burnside ring of a fusion system", *J of Algebra*, 432, 767-797 (2015)

• I. Hambleton, E. Yalcin, "Homotopy representations over the orbit category", *Homology, Homotopy and Applications*, 16, 345-369 (2014)

• S. Pamuk, E. Yalcin, "Relative group cohomology and the orbit category", *Communications in Algebra*, 42, 3220-3243 (2014)

• A. Berkovich, H. Yesilyurt, "On Rogers-Ramanujan functions, binary quadratic froms and eta-quotients", *Proc Amer Math Soc*, 142, 777-793 (2014)

• I. Habibullin, N. Zheltukhina, "Discretization of Liouville type nonautonomous equations preserving integrals", *J of Nonlinear Mathematical Physics*, 23, 620-642 (2016)

• K. Zheltukhina, N. Zheltukhina, "Semi-discrete hyperbolic equations admitting five dimensional characteristicx-ring", *J of Nonlinear Mathematical Physics*, 23, 351-367 (2016)

Contact:
Dr. Fatihcan Atay
(Department Chair)
Phone : +90 312 266 4377
Fax : +90 312 290 1797
f.atay@fen.bilkent.edu.tr
math.bilkent.edu.tr

## Faculty Profile: Dr. Fatihcan Atay, Visiting Professor, Department of Mathematics

Fatihcan Atay received a Ph.D. in applied mathematics from Brown University in 1994. He subsequently served on the faculty at Koç University and also gained several years of industrial experience at Artesis Technological Systems as a senior research scientist. From 2002 to 2016 he was with the Max Planck Institute for Mathematics in the Sciences in Leipzig, where he coordinated a research group on dynamical systems and network analysis. He joined Bilkent University in 2016 as chair of the Department of Mathematics.

Dr. Atay is a senior member of the Center for Dynamics at the Technical University of Dresden, and convenor of a five-year cooperative program on Discrete and Continuous Models in the Theory of Networks at the Center for Interdisciplinary Research of Bielefeld University (Germany). He is on the editorial boards of *Frontiers in Applied Mathematics and Statistics* and the *Springer* book series *Advances in Delays and Dynamics*. His research is in the areas of nonlinear dynamical systems, delay differential equations, complex systems and network theory, difference equations, systems and control theory, mathematical neuroscience, and applications of mathematics.

## Faculty Profile: Dr. Müfit Sezer, Associate Professor Department of Mathematics

Müfit Sezer received a B.S. degree in electrical engineering and mathematics from Boğaziçi University in 1994 and a Ph. D. in mathematics from Purdue University (USA) in 2003. Following this, he worked as a postdoctoral research associate at the University of Kent in Canterbury (UK). He held positions at Texas Tech University and Boğaziçi University before joining the Bilkent University Department of Mathematics in 2007. In the spring of 2014 he was a Fulbright Senior Scholar at the University of Nebraska.

Dr. Sezer's research interests include combinatorial and computational commutative algebra, invariant theory, and symbolic computation. He has, as principal investigator, directed several TÜBİTAK-funded research projects related to various aspects of his research interests. He has published papers in journals including *Advances in Mathematics, Transactions of the American Mathematical Society,* the *Journal of Algebra*, and *Mathematische Annalen*. He received the Turkish Academy of Sciences Distinguished Young Researcher Award in 2010, the Sedat Simavi Science Award in 2011 and the Önder Öztunalı Science Award in 2014.

# MOLECULAR BIOLOGY AND GENETICS

The graduate programs in the Department of Molecular Biology and Genetics are designed to provide an excellent background in basic and applied research areas of the field. The main research activities of the department are in the areas of molecular genetics (genetic predisposition to cancer, tumor suppressor genes, gene-disease associations), molecular biology (regulation of transcription, differential expression, epigenetics), molecular cell biology (cell cycle, apoptosis, signal transduction), immunology, bioinformatics, neurophysiology, and metabolic diseases. The medium of instruction is English.

## FACULTY

**MURAT ALPER CEVHER**, Assistant Professor. Ph.D., Biochemistry, City University of New York, 2009. *Gene regulation, gene expression, breast cancer, drug design, biochemistry, molecular biology.*

**ÇAĞLAR ÇEKİÇ**, Assistant Professor, Ph.D., Immunology, University of Louisville, 2009. *Cancer Immunotherapy, vaccine adjuvants, adaptive immune responses and inflammation.*

**ONUR ÇİZMECİOĞLU**, Assistant Professor. Ph.D., Cell Biology, University of Heidelberg and German Cancer Research Center, 2009. *Cancer therapy, mitogenic signaling pathways, prostate cancer, cancer drug resistance, cell cycle, centrosome duplication.*

**EBRU ERBAY**, Assistant Professor. Ph.D., University of Illinois, Urbana-Champaign, 2004. M.D., Ankara University, 1998. *Signal transduction, organelle stress, metabolism, inflammation, obesity, diabetes, atherosclerosis, cardiovascular disease, metabolic syndrome.*

**SERKAN İSMAİL GÖKTUNA**, Assistant Professor. Ph.D., Human Biology. Technical University of Munich 2010. *Cancer Biology, Tumor Immunology, Colorectal Cancer, Tumor Microenvironment, Inflammatory Bowel Diseases.*

**ALİ OSMAY GÜRE**, Associate Professor. M.D., University of Ankara, 1998. Ph.D., Immunology, Cornell University Graduate School of Medical Sciences, 1995. *Anti-tumor immune responses, prognostic and diagnostic bio-marker development, cancer epigenetics.*

**İHSAN GÜRSEL**, Professor. Ph.D., Biomaterials and Biology, Middle East Technical University, 1995. *Innate immunity, immunotherapy, drug delivery, biomaterials, biotechnology.*

**ÖZLEN KONU**, Associate Professor. Ph.D., Biology, Texas Tech University, 1999. *Microarray data analysis, gene networks in the pharmacological effects of nicotine.*

**TAYFUN ÖZÇELİK**, Professor and Dean. M.D., Istanbul University, 1986. *Human molecular genetics, somatic cell genetics, gene mapping, mutation analysis, identification of disease genes, DNA-based diagnosis.*

**ÖZGÜR ŞAHİN**, Assistant Professor. Ph.D., Cell and Systems Biology, University of Heidelberg and German Cancer Research Center, 2008. *Breast cancer, systems biology, signal transduction, drug resistance, metastasis, microRNAs and biomarkers.*

**IŞIK G.YULUĞ**, Associate Professor and Department Chair. Ph.D., Biochemistry and Molecular Genetics, University of London, 1996. *Cancer genetics, cancer epigenetics, gene identification, gene expression profiling.*

## MASTER OF SCIENCE IN MOLECULER BIOLOGY AND GENETICS

**Admission:** All applicants are required to have a B.S. degree in molecular biology and genetics, biology, or a related field of science or engineering. Students with a B.S. degree in chemistry, chemical engineering, physics, or a related field may also apply; however, such students may be required to take certain undergraduate courses in molecular biology and genetics in order to acquire the necessary background in the field. Evaluation of applicants is based on their ALES (*Akademik Personel ve Lisansüstü Eğitimi Giriş Sınavı*/ Academic Personnel and Postgraduate Education Entrance Examination) scores, past academic records, reference letters, and an interview. Applicants who are not Turkish citizens and Turkish citizen applicants who are residents of another country may take the GRE (Graduate Record Examination) instead of the ALES. All nonnative speakers of English are required to submit proof of satisfactory knowledge of English.

**Degree Requirements:** In addition to completing at least 21 credit units of course work, the M.S. degree candidate must prepare and successfully defend a thesis. The expected duration of study for the M.S. degree is 4 semesters; the maximum duration is 6 semesters.

## DOCTOR OF PHILOSOPHY IN MOLECULER BIOLOGY AND GENETICS

**Admission:** All applicants are required to have a B.S. degree in molecular biology and genetics or in biology. Holders of related professional degrees, such as the M.D. or D.V.M., may also apply. Evaluation of applicants is based on their ALES (*Akademik Personel ve Lisansüstü Eğitimi Giriş Sınavı*/

Academic Personnel and Postgraduate Education Entrance Examination) scores, past academic records, reference letters, and an interview. Applicants who are not Turkish citizens and Turkish citizen applicants who are residents of another country may take the GRE (Graduate Record Examination) instead of the ALES. All nonnative speakers of English are required to submit proof of satisfactory knowledge of English.

**Degree Requirements:** The completion of 21 credit units of course work beyond the M.S. level is required. Ph.D. candidates must pass a qualifying exam, typically in their fourth semester, and then must prepare a dissertation proposal. Preparation and defense of a dissertation based on original research is the centerpiece of the program. The standard duration of study for the Ph.D. degree is 8 semesters for students who enter the program with an M.S. degree; the maximum duration is 12 semesters.

## COURSE DESCRIPTIONS

**MBG 502 Advanced Cellular Biology**
Cell structure and function, the cytoskeleton, intracellular compartments, vesicular trafficking, the cell-division cycle, cell junctions, cell adhesion, extracellular matrix and development.

**MBG 503 Advanced Molecular Biology**
Chromosomal DNA and its packaging, higher-order organization of chromosomes, replication, recombination. Transcription and regulation chromatin modifying and remodeling complexes DNA repair, RNA splicing.

**MBG 505 Advanced Molecular Genetics**
Organization of the genome, Mendelian and non-Mendelian inheritance, mitochondrial genome, mutigene families and repetitive DNA, polymorphism and polymorphic markers, genetic mapping, physical mapping, models of studying gene structure and function.

**MBG 509 Special Topics in Molecular Biology I**
**MBG 510 Special Topics in Molecular Biology II**
Current topics in molecular biology, comprehensive reading, critical evaluations of scientific references, seminar presentations and class participation.

**MBG 511 Basic Protocols in Molecular Biology**
Basic techniques widely used in molecular biology and genetics will be discussed.

**MBG 513 Bioinformatics**
Commonly used databases in molecular biology, genetics and related fields, homology search for genes and proteins, primer design, molecular operations, restriction mapping, structure prediction.

**MBG 514 Stem Cell Biology**
The basic features of stem cell biology including concepts like self renewal, biological niches and differentiation. Derivation, manipulation, and differentiation of embryonic, adult, cancer stem cells in both mice and humans. Reproductive and therapeutic cloning. Existing as well as potential clinical applications and ethic considerations of stem cell therapy.

**MBG 515 Principles of Protein Structure**
Principles of protein structure, with examples of key proteins in their biological context. Discussions of selected research papers.

**MBG 516 Biomolecules, Biomaterials and Bioprocesses**
Basic biomolecules (from simple molecules such as aminoacids to macro molecules such as proteins and DNA) and principles of biology from material science perspective. This course must be a core course given very early in the curriculum.

**MBG 517 Computational Biology**
Sequence analysis, comparative genomics and phylogenetics, expression analysis, and systems biology.

**MBG 522 Recent Developments in Cellular Biology**
Recent developments in cellular structure and function, intracellular trafficking, cytoskeleton, cell adhesion, extracellular matrix and development. Related selected articles from leading journals will be discussed during the course.

**MBG 523 Recent Developments in Molecular Biology**
Latest developments and emerging issues in molecular biology including transcriptomics, proteomics, cancer biomarker, targeted therapy, epigenetics, RNA world. The selected articles from the periodical journals will be chosen to discuss the topics.

**MBG 599 Master's Thesis**

**MBG 601 Human Genetics**
Molecular genetics of human diseases, chromosomal abnormalities, biochemical genetics, genetic basis of cancer, genome projects, molecular medicine, genetic counseling, DNA based diagnostics, population genetics.

**MBG 602 Molecular and Cellular Immunology**
Basic elements of the immune system, molecular biology of antigen recognition, B and T lymphocytes, cellular and genetic basis of immunity, regulation and development of the immune system, immune system deficiencies in humans, vaccination and adaptive immunotherapy.

**MBG 603 Molecular Bases of Cancer**
Cancer as a multi-gene disease, oncogenes, tumor suppressor genes, mutator genes, gene therapy of cancer, germ-line and somatic mutations and cancer, genes involved in abnormal proliferation and metastatic behavior of cancer cells, immune response to cancer, familial cancers, virus-induced cancers.

**MBG 607 Gene Therapy**
Current topics in human somatic cell gene therapy, viral and nonviral gene transfer techniques, gene therapy applications in hereditary and acquired diseases, ethical issues in genetic modification of humans.

**MBG 608 Principles of Gene Expression**
Mechanisms of transcription, chromatin modifying and remodeling complexes, regulation of tissue specific gene expression, consequences of gene expression deregulation.

**MBG 612 Special Topics in Genetics I**
**MBG 613 Special Topics in Genetics II**
Current topics in molecular genetics, comprehensive reading, critical evaluation of scientific literature, seminar presentations and class participation.

**MBG 614 Advanced Protocols in Molecular Biology**
Hands-on experiments with a number of advanced protocols used in molecular biology (gene cloning, gene expression, purification of expressed proteins, western blotting, etc.)

**MBG 615 Recent Advances in Molecular Biology**
Latest developments and emerging issues on cancer, cell-cell interactions, extracellular matrix.

**MBG 616 Experimental Molecular Biology and Genetics I**
**MBG 617 Experimental Molecular Biology and Genetics II**
An introduction to basic molecular biology and genetics techniques. The student spends a half semester with one of the research groups and participates in some aspects of the research being pursued by the faculty member.

**MBG 618 Advanced Developmental Biology**
The concepts of development in a variety of organisms. Molecular mechanisms of embryonic development in model organisms. Early development, developmental abnormalities. The correlation between the expression and function of gene and cell fate and tissue interactions. Discussion of classic and current research articles.

**MBG 619 Advanced Membrane Biology**
Molecular structures of biological membranes, translocation and topogenesis of proteins in cell membrane with particular emphasis on translocation of solute transporters, structure-function relationships in membrane transporters, regulatory mechanisms controlling transporter expression and function in prokaryotes and in eukaryotes.

**MBG 620 Cell Proliferation and Death**
Molecular mechanisms that govern cell proliferation and programmed cell death, role of both processes in the development and homeostasis of multicellular organisms, aberrations of cell proliferation and apoptosis in diseases including cancer and degenerative diseases.

**MBG 622 Recent Developments in Immunology**
Signaling pathways involved in the ontogenesis of immune effector cells; Activation of T and B lymphocytes; Regulation of adaptive immunity by the innate immune system; Immune evasion of virally infected and tumoral cells; Immunity in diseases; Therapeutic approaches based on the manipulation of immune system. Topics will be discussed through the articles published in the leading journals of the field.

**MBG 623 Seminars in Molecular Genetics I**
**MBG 624 Seminars in Molecular Genetics II**
The course will be based on class presentations and discussions of novel concepts in Molecular Biology and Genetics. Articles selected by the staff will be introduced and discussed with the students in the form of paper presentations and seminars. Students will carry out a critical analysis of novel as well as milestone "classical" articles in the field of Molecular Biology and Genetics.

**MBG 699 Ph.D. Dissertation**

## SAMPLE OF RECENT PUBLICATIONS


• C. Cekic, J. Linden, "Purinergic regulation of the immune system", *Nature Reviews Immunology*, 16, 177-192 (2016)

• D. Sag, C. Cekic, R. Wu, J. Linden, C.C. Hedrick, "The Cholesterol transporter ABCG1 links cholesterol homeostasis and tumour immunity", *Nature Communications*, 6, 6354-1--14 (2015)

• R.N. Hanna, C. Cekic, ….S.K. Biswas, C.C. Hedrick, "Patrolling monocytes control tumor metastasis to the lung", *Science*, 350, 985-990 (2015)

• I. Cimen, B. Kocaturk, S. Koyuncu, O. Tufanli, U.I. Onat, A.D. Yildirim, O. Apaydin, S. Demirsoy, Z.G. Aykut, U.T. Nguyen, S.M. Watkins, G.S. Hotamisligil, E. Erbay, "Prevention of Atherosclerosis by Bioactive Palmitoleate Through Suppression of Organelle Stress and Inflammasome Activation", *Science Translational Medicine*, 8, 358-393 (2016)

• M. Nadir, O. Tufanli, E. Erbay, A. Atalay, "Identification of differentially expressed microRNAs during lipotoxic endoplasmic reticulum stress in RAW264.7 macrophages", *Turkish J of Biochemistry*, 41, 206-216 (2016)

• V.R. Babaev, M. Yeung, E. Erbay, L. Ding, Y. Zhang, J. May, S. Fazio, G.S. Hotamisligil, M.F. Linton, "Jnk1 deficiency in hematopoietic cells suppresses macrophage apoptosis and increases atherosclerosis in LDL-receptor null mice", Arteriosclerosis, *Thrombosis, and Vascular Biology*, 6, 1122-1162 (2016)

• E. Erbay, G.S Hotamisligil, "Inflammatory Causes of Obesity and Metabolic Diseases", *Handbook of Obesity*, G.A. Bray, C. Baouchard (Eds.), pp. 573-584, CRC Press (2014)

• S.I. Goktuna, C. Shostak K, L. Heukamp, B. Hennuy, HQ. Duong, A. Ladang, P. Close, I. Klevernic, F. Olivier, A. Florin, G. Ehx, F. Baron, M. Vandereyken, S. Rahmouni, L. Vereecke, G. van Loo, R. Büttner, FR. Greten, A. Chariot, " The pro-survival IKK-related kinase IKKepsilon integrates LPS and IL-17A signaling cascades to promote Wnt-dependent tumor development in the intestine", *Cancer Research*, 76, 2587-2599 (2016)

• K.M. Senses, M. Ghasemi, M.W. Akbar, M. Isbilen, A.L. Fallacara, S. Frankenburg, S. Schenone, M. Lotem, M. Botta, A.O. Gure, "Phenotype-based variation as a biomarker of sensitivity to molecularly targeted therapy in melanoma", *MedChemComm* (Forthcoming)

• M. Lotem, S. Merims, S. Frank, T. Hamburger, …, A.O. Gure, T. Peretz, "Adjuvant Autologous Melanoma Vaccine for Macroscopic Stage III Disease: Survival, Biomarkers, and Improved Response to CTLA-4 Blockade", *J of Immunology Research*., 8121985-1--12 (2016)

• M. Yanez-Mo, P.R.M. Siljander, …. , I. Gursel, M. Gursel, …, M.H.M. Wauben, O. de Wever, "Biological properties of extracellular vesicles and their physiological functions", *J of Extracellular Vesicles*, 4, 1-60 (2015)

• J. Shih, M. Rahman, Q.T. Luong, S.H. Lomeli, J. Riss, R.M. Prins, A.O. Gure, G. Zeng, "Dominant B-cell epitopes from cancer/stem cell antigen SOC2 recognized by serum samples from cancer patients", *American J of Clin Exp Immunol*, 3, 84-90 (2014)

• S. Atakan, H. Bayiz, S. Sak, A. Poyraz, B. Vural, A.S. Yildirim, F. Demirag, A.O. Gure, "Autologous anti-SOX2 antibody responses reflect intensity but not frequency of antigen expression in small cell lung cancer", *BMC Clinical Pathology*, 14, 1-8 (2014)

• S. Yilmaz-Ozcan, A. Sade, B. Kucukkaraduman, Y. Kaygusuz, K.M. Senses, S. Banerjee, A.O. Gure, "Epigenetic Mechanisms Underlying the Dynamic Expression of Cancer-Testis Genes, PAGE2, -2B and SPANX-B, during Mesenchymal-to-Epithelial Transition", *Plos One*, 9, 107905-1--11 (2014)

• Y. Kam, A. Rubinstein, S. Naik, I. Djavsarov, D. Halle, I. Ariel, A.O. Gure, A. Stojadinovic, H. Pan, V. Tsivin, A. Nissan, E. Yavin, "Detection of a long non-coding RNA (CCAT1) in living cells and human adenocarcinoma of colon tissues using FIT-PNA molecular beacons", *Cancer Letters*, 352, 90-96 (2014)

• B. Gungor, E. Adiguzel, I. Gursel, B. Yilmaz, M. Gursel, "Intestinal Microbiota in Patients with Spinal Cord Injury", *Plos One*, 11, 0145878-1--10 (2016)

• D. Bayik, I. Gursel, D.M. Kinman, "Structure, mechanism and therapeutic utility of immunosuppressive oligonucleotides", *Pharmacol Res*, 105, 216-225 (2016)

• D.C. Watson, D. Bayik, A. Srivatsan, C. Bergamaschi, A. Valentin, G. Niu, J. Bear, M. Monninger, M. Sun, A. Morales-Kastresana, J.C. Jones, B.K. Felber, X. Chen, I. Gursel, G.N. Pavlakis, "Efficient production and enhanced tumor delivery of engineered extracellular vesicles", *Biomaterials*, 105, 195-205 (2016)

• F. Stefano, F. Borras, E. Buzas, …, I. Gursel, …, A.B. Zavec, B. Giebel, "Evidence-Based Clinical Use of Nano-sized Extracellular Vesicles in Nanomedicine", *ACS Nano*, 10, 3886-3899 (2016)

• S. Yalcin, I. Gursel, G. Bilgen, G.T. Izzetoglu, B.H. Horuluoglu, G. Gucluer, "Egg storage duration and hatch window affect gene expression of nutrient transporters and intestine

morphological parameters of early hatched broiler chicks", *Animal*, 10, 805-811 (2016)

• S. Yildiz, E. Alpdundar, B. Gungor, T. Kahraman, B. Bayyurt, I. Gursel, M. Gursel, "Enhanced Immunostimulatory Activity of Cyclic Dinucleotides through Complexation with a Cell Penetrating Peptide or Combined Use with CpG ODN", *European J of Immunology*, 45, 1170-1179 (2015)

• B. Gungor, F.C. Yagci, I. Gursel, M. Gursel, "Forging a potent vaccine adjuvant: CpG ODN/cationic peptide nanorings", *Oncolmmunology*, 3, 950166-1--3 (2014)

• B. Gungor, F.C. Yagci, G. Tincer, B. Bayyurt, E. Alpdundar, S. Yildiz, M. Ozcan, I. Gursel, M. Gursel, "CpG ODN Nanorings Induce IFNx from Plasmacytoid Dendritic Cells and Demonstrate Potent Vaccine Adjuvant Activity", *Science Translational Medicine*, 6, 235-261 (2014)

• M. Gursel, I. Gursel, "Development of CpG ODN based vaccine adjuvant formulations", *Vaccine Design: Methods and Protocols*, Sunil Thomas (Eds.), pp. 289-298, Springer (2016)

• C. Sucularli, H. Shehwana, C. Kuscu, D. Dungul, H. Ozdag, O. Konu, "Functionally conserved effects of rapamycin exposure on zebrafish", *Molecular Medicine Reports*, 13, 4421-4430 (2016)

• M. Mutlu, O. Saatci, S.A. Ansari, E. Yurdusev, H. Shehwana, O. Konu, U. Raza, O. Sahin, "miR-564 acts as a dual inhibitor of PI3K and MAPK signaling networks and inhibits proliferation and invasion in breast cancer", *Scientific Reports*, 6, 32541-1--14 (2016)

• S. Tunçer, S. Tunçay Çağatay, A.G. Keşküş, M. Çolakoğlu, O. Konu, S. Banerjee, "Interplay between 15-lipoxygenase-1 and metastasis-associated antigen 1 in the metastatic potential of colorectal cancer", *Cell Proliferation*, 49, 448-459 (2016)

• G. Karahan, N. Sayar, G. Gozum, O. Konu, I. Yulug, "Relative expression of rRNA species and 45S rDNA promoter methylation status are dysregulated in tumors in comparison with adjacent normals in breast cancer", *Oncology Reports*, 33, 3131-3145 (2015)

• H. Alotaibi, M.F. Basilicata, H. Shehwana, T. Kosowan, I. Schreck, C. Braeutigam, O. Konu, T. Brabletz, M.P. Stemmler, "Enhancer cooperativity as a novel mechanism underlying the transcriptional regulation of E-cadherin during mesenchymal to epithelial transition", *Biochimica et Biophysica Acta*, 1849, 731-742 (2015)

• I. Mizrahi, H. Mazeh, R. Grinbaum, …, A.O. Gure, D. Halle, A. Nissan, "Colon Cancer Associated Transcript-1 (CCAT1) Expression in Adenocarcinoma of the Stomach", *J of Cancer*, 6, 105-110 (2015)

• N. Sayar, G. Karahan, O. Konu, B. Bozkurt, O. Bozdogan, I. Yulug, "Transgelin gene is frequently downregulated by promoter DNA hypermethylation in breast cancer", *Clinical Epigenetics*, 7, 104 (2015)

• J. Pennakalathil, E. Jahja, E.S. Ozdemir, O. Konu, D. Tuncel, "Red emitting cucurbituril-capped, pH-responsive conjugated oligomer-based nanoparticles for drug delivery and cellular Imaging", *Biomacromolecules*, 15, 3366-3374 (2014)

• T. Ersahin, L. Carkacioglu, T. Can, O. Konu, V. Atalay, *Plos One*, 9, 933141-1--14 (2014)

• T. Ozcelik, O.E. Onat, "Genomic landscape of the Greater Middle East", *Nature Genetics*, 48, 978-979 (2016)

• Kanaan SB, Onat OE, Balandraud N, Martin GV, Nelson JL, Azzouz DF, Auger I, Arnoux F, Martin M, Roudier J, T. Ozcelik, Lambert NC, "Evaluation of X chromosome inactivation with respect to HLA genetic susceptibility in rheumatoid arthritis and systemic sclerosis", *Plos One*, 11, 0158550-1--12 (2016)

• E. Bonora, F. Bianco, L. Cordeddu, …, T. Ozcelik, S. Palanduz, …, G. Romeo, R. De Giorgio, "Mutations in RAD21 Disrupt Regulation of APOB in Patients with Chronic Intestinal Pseudo-Obstruction", *Gastroenterology*, 148, 771-782 (2015)

• F. Doldur-Balli, M.N. Ozel, S. Gulsuner, A.B. Tekinay, T. Ozcelik, O. Konu, M.M. Adams, "Characterization of a novel zebrafish (Danio rerio) gene, wdr81, associated with cerebellar ataxia, mental retardation and dysequilibrium syndrome (CAMRQ)", *BMC Neurosciences*, 16, 96-1--17 (2015)

• G.M. Dal, B. Erguner, M.S. Sagiroglu, B. Yuksel, O.E. Onat, C. Alkan, T. Ozcelik, "Early postzygotic mutations contribute to de novo variation in a healthy monozygotic twin pair", *J of Medical Genetics*, 51, 455-459 (2014)

• H. Unal-Gulumser, S. Gulsuner, F.N. Mercan, O.E. Onat, T. Walsh, H. Shahin, M.K. Lee, O. Dogu, T. kansu, H. topaloglu, B. Elibol, C. Akbostanci, M.C. King, T. Ozcelik, A.B. Tekinay, "Mitochondrial serine protease HTRA2 p.G3999S in a kindred with essential tremor and Parkinson disease", *Proceedings of National Academy of Sciences USA* (Forthcoming)

• S. Knappskog, L.B. Gansmo, K. Dibirova, A. Metspalu, … , T. Ozcelik, P. Zalloua, F. Mouzaya, E. Bliznetz, …., O. Balanovsky, P.E. Lonning, "Population distribution and ancestry of the cancer protective MDM2 SNP285 (rs117039649)", *Oncotarget*, 5, 8223-8234 (2014)

• Chia-Chi Chang, Chenyu Zhang, Qingling Zhang, O. Sahin, Hai Wang, Jia Xu, Yi Xiao, Jian Zhang, Sumaiyah K. Rehman, Ping Li, Mien-Chie Hung, Fariba Behbod, Dihua Yu, "Upregulation of lactate dehydrogenase a by 14-3-3ζleads to increased glycolysis critical for breast cancer initiation and progression", *Oncotarget*, 7, 35270-35283 (2016)

• M. Mutlu, U. Raza, O. Saatci, E. Eyupoglu, E. Yurdusev, O. Sahin, "miR-200c: a versatile watchdog in cancer progression, EMT, and drug resistance", *J of Molecular Medicine*, 94, 629-644 (2016)

• Umar Raza, Özge Saatci, Stefan Uhlmann, Suhail A Ansari, Erol Eyüpoğlu, Emre Yurdusev, Merve Mutlu, Pelin Gülizar Ersan, Mustafa Kadri Altundağ, Jitao David Zhang, Hayriye Tatlı Doğan, Gülnur Güler, O. Sahin, "The miR-644a/CTBP1/p53 axis suppresses drug resistance by simultaneous inhibition of cell survival and epithelial-mesenchymal transition in breast cancer", *Oncotarget*, 7, 49859-1--19 (2016)

• O. Sahin, Q. Wang, S.W. Brady, K. Ellis, H. Wang, C-C. Chang, Q. Zhang, P. Priya, R. Zhu, S.T. Wong, M.D. Landis, W.J. Muller, F.J. Esteva, J. Chang, D. Yu, "Biomarker-guided sewuential targeted therapies to overcome therapy resistance in paridly evolving highly aggressive mammary tumors", *Cell Research*, 24, 542-559 (2014)

• A. Ward, K. Shukla, A. Balwierz, Z. Soons, R. Konig, O. Sahin, S. Wiemann, "MicroRNA-519a is a novel oncomir conferring tamoxifen resistance by targeting a network of tumour-suppressor genes in ER+ breast cancer", *J of Pathology*, 233, 368-379 (2014)

• R. Haller, J.D. Zhang, E.A. Moskalev, A. Braun, C. Otto, H. Geddert, Y. Riazalhosseini, A. Ward, A. Balwierz, ..., O. Sahin, "Combined DNA methylation and gene expression profiling in gastrointestinal stromal tumors reveals hypomethylation of SPP1 as an independent prognostic factor", *Int J of Cancer*, 136, 1013-1023 (2014)

• U. Raza, J.D. Zhang, O. Sahin, "MicroRNas: master regulators of drug resistance, stemness and metastasis", *J of Molecular Medicine*, 92, 321-336 (2014)

• O. Bozdogan, I. Vargel, T. Cavusoglu, A.A. Karabulut, G. Karahan, N. Sayar, P. Atasoy, I. Yulug, "Metaststic Suppressor Proteins in Cutaneous Squamous Cell Carcinoma", *Pathology Research and Practice*, 212, 608--615 (2016)

• O. Bozdogan, I. Yulug, I. Vargel, T. Cavusoglu, A.A. Karabulut, G. Karahan, N. Sayar, "Differential Expression Patterns of Metastasis Suppressor Proteins in Basal Cell Carcinoma", *Int J of Dermatology*, 54, 905-915 (2015)

• Y. Oztemur, T. Bekmez, A. Aydos, I. Yulug, B. Bozkurt, B. Gur-Dedeoglu, "A ranking-based meta-analysis reveals let-7 miRNAs as a meta-signature for grade classification in breast cancer", *Plos One* (Forthcoming)

Contact:
Dr. Işık Yuluğ
(Department Chair)
Phone : +90 312 266 5081
Fax : +90 312 266 5097
yulug@fen.bilkent.edu.tr
yildiz@bilkent.edu.tr

## Faculty Profile: Dr. Ali Osmay Güre, Associate Professor, Department of Molecular Biology and Genetics

Dr. Ali Osmay Güre is a medical doctor (University of Ankara) as well as a molecular immunologist (Cornell University Graduate School of Medical Sciences). He was a postdoctoral fellow at the Memorial Sloan Kettering Research Center and the Department of Pathology of the Weill Cornell Medical College in NYC from 1995 to 2000. From 2000 to 2006, he was an assistant member at the New York branch of the Ludwig Institute for Cancer Research, where he worked on tumor antigen discovery, with an emphasis on the regulation of cancer-testis (CT) gene expression in cancer, and the clinical relevance of these genes as biomarkers of disease. He joined the Bilkent University Department of Molecular Biology and Genetics in 2006.

Since then, the focus of Dr. Güre's group has developed to encompass the in silico discovery and the in vitro and ex vivo validation of biomarkers of clinical outcome and drug sensitivity in cancer, primarily colon cancer, gastric cancer, triple-negative breast cancer, and melanoma. He is also involved in the identification of diagnostic biomarkers, especially for lung cancer and mesothelioma. In addition, his group is investigating the molecular basis of EMT and how this relates to CT gene expression, as well as identifying potentially new strategies for drug repositioning based on the use of these two groups of biomarkers.

Dr. Güre is a partner in Poyraz Biotech Ltd., an SME founded by his students that focuses on the large-scale validation of clinically relevant tumor biomarkers. He is a co-inventor in more than 25 international patents related to tumor antigens/biomarkers. His research has been supported by the European Commission, the Ludwig Institute for Cancer Research, the Cancer Research Institute (USA), and the Turkish Scientific and Medical Council. He currently holds a grant from the Ministry of Science and Technology of Turkey for research related to the identification of treatment strategies for triple-negative breast cancer.

# NEUROSCIENCE

**Program Director:** Dr. Michelle M. Adams, Associate Professor

The Neuroscience graduate programs are designed to provide an excellent background in basic and applied research areas of cellular, developmental, and systems neuroscience. The main research activities of the department focus on the genetic basis of neurological disorders, the molecular and cellular causes of brain aging that alter memory, how neuronal activity controls behavior in normal and disease models, understanding the sensory and motor systems and other cognitive functions, and assessing the structural and functional architecture of the human brain as influenced by genetically rooted nervous system disorders.

## FACULTY

This program comprises faculty members from different fields including Psychology, Molecular Biology and Genetics, Physics, Electrical and Electronics Engineering, and Computer Engineering, reflecting an interdisciplinary approach.

## MASTER OF SCIENCE IN NEUROSCIENCE

**Admission:** All applicants are required to have an undergraduate degree in life sciences, medicine, biology, or a related field of science or engineering. Students with an undergraduate degree in chemistry, engineering, physics, psychology, or another related field may be required to take certain undergraduate courses related to the life sciences in order to acquire the necessary background in the field. Evaluation of applicants is based on their ALES (*Akademik Personel ve Lisansüstü Eğitimi Giriş Sınavı*/Academic Personnel and Postgraduate Education Entrance Examination) scores, past academic records, reference letters, and an interview. Applicants who are not Turkish citizens and Turkish citizen applicants who are residents of another country may take the GRE (Graduate Record Examination) instead of the ALES. All nonnative speakers of English are required to submit proof of satisfactory knowledge of English.

**Degree Requirements:** In addition to completing at least 21 credit units of course work, the M.S. degree candidate must prepare and successfully defend a thesis. The expected duration of study for the M.S. degree is 4 semesters; the maximum duration is 6 semesters.

## DOCTOR OF PHILOSOPHY IN NEUROSCIENCE

**Admission:** All applicants are required to have an undergraduate degree in life sciences, medicine, biology, or a related field of science or engineering. Students with an undergraduate degree in chemistry, engineering, physics, psychology, or another related field may be required to take certain undergraduate courses related to the life sciences in order to acquire the necessary background in the field. Evaluation of applicants is based on their ALES (*Akademik Personel ve Lisansüstü Eğitimi Giriş Sınavı*/Academic Personnel and Postgraduate Education Entrance Examination) scores, past academic records, reference letters, and an interview. Applicants who are not Turkish citizens and Turkish citizen applicants who are residents of another country may take the GRE (Graduate Record Examination) instead of the ALES. All nonnative speakers of English are required to submit proof of satisfactory knowledge of English.

**Degree Requirements:** The completion of 21 credit units of course work beyond the M.S. level or 42 credits of course work beyond the undergraduate level is required. Ph.D. candidates must pass a qualifying exam, typically in their fourth semester, and then must prepare a dissertation proposal. Preparation and defense of a dissertation based on original research is the centerpiece of the program. The expected duration of study for the Ph.D. degree is 8 semesters for students who enter the program with an M.S. degree, and 10 semesters for those who enter with a B.S. degree. The maximum durations are 12 and 14 semesters, respectively.

## COURSE DESCRIPTIONS

**NSC 510 Sensory and Motor Systems Neuroscience**
Neural regulation of sensory and motor systems. Functions such as vision, audition, olfaction, gustation, motor movement, reproduction, sleep and biological rhythms, emotion, learning and memory and psychopathology.

**NSC 511 Cellular, Molecular and Developmental Neuroscience**
The fundamental principles underlying neuronal biophysics; molecular, cellular and developmental processes. Cellular components of nervous tissue, membrane and action potentials, neurotransmitter regulation and intracellular signaling, neural induction and pattern formation, neurogenesis, migration and synaptic regulation.

**NSC 512 Research Methods in Neuroscience**
Behavioral experimental design and analysis. Computational Modeling. Neural Networks. Molecular and cellular methods in neurons.

**NSC 513 Behavioural Neuroscience**
Seminar course in which students read a wide range of articles that relate to the overview of the neurological processes underlying organismic behavior. Survey on neurobiological explanations of topics such as sensation, movement, motivation, emotion, sleep, learning, neurological disorders, and recovery mechanisms.

**NSC 514 Affective Neuroscience**
Biological basis of emotion. Overview of and historical basis for the field of affective neuroscience. Mapping affective experience and behavior to brain function, including cross-level integration of anatomical, chemical, and electrical data.

**NSC 515 Computational and Numerical Methods in Neuroscience**
Basic mathematical techniques for analysis and modeling of neural systems. Various methods in this highly active field are discussed.

**NSC 516 Neurobiology of Aging**
Biological basis of aging and neurodegenerative disease. Current cellular and brain imaging tools as they relate to understanding the aging and neurodegenerative disease process. Recent advances in research techniques related to aging and neurodegenerative disease.

**NSC 546 Computing for Neuroscience**
Experimental design and control in systems neuroscience, basics of signal processing, generating images, movies and sounds, basics of optimization and curve fitting, functions for statistical testing and bootstrapping, use of Matlab programming for neural signal processing, signal detection theory, receiver operating characteristic (ROC) analysis.

**NSC 591 Pro-thesis Seminar I**
Presentations on the current and classical literature.

**NSC 599 Neuroscience Master's Thesis**

**NSC 612 Selected Topics in Neuroscience I**
**NSC 613 Selected Topics in Neuroscience II**
Current topics in neuroscience. Survey of the literature related to a current selected topic of interest.

**NSC 670 Lab in Cellular, Molecular, and Developmental Neuroscience**
Experimental approaches in cellular, molecular and developmental neuroscience. Experiments on cell structure and organization of the vertebrate central nervous system, and mechanisms underlying neural signaling and plasticity. Laboratory instruction in anatomical, physiological, and biochemical methods for investigating the biology of nerve cells.

**NSC 671 Lab in Sensory and Motor Systems Neuroscience**
Experimental approaches in sensory and motor systems neuroscience. Laboratory instruction in neuroanatomy, sensory neurophysiology, modern neuroanatomical tracer techniques, psychophysics, and computational neuroscience.

**NSC 691 Pro-thesis Seminar II**
Presentations on the current and classical literature.

**NSC 699 Neuroscience Ph.D. Dissertation**

## SAMPLE OF RECENT PUBLICATIONS


• A. Arslan-Ergul, B. Erbaba, E.T. Karoglu, D. O. Halim, M. M. Adams, "Short-term dietary restriction in old zebrafish changes cell senescence mechanisms," *Neuroscience*, 334, 64-75, (2016)

• A. Arslan-Ergul, M.M. Adams, "Gene expression changes in aging zebrafish (Danio rerio) brains are sexually dimorphic," *BMC Neurosci*., 15, pp 29 (2014)

• H.B. Turkozer, Z. Pamir, H. Boyaci, "Contrast Affects fMRI Activity in Middle Temporal Cortex Related to Center–Surround Interaction in Motion Perception," *Frontiers in Psychology*, 7 (2016)

• Z. Pamir, H. Boyaci, "Context-dependent lightness affects perceived contrast," *Vision Research*, 124, 24-33 (2016)

• H. Boyaci, M.K. Simsek, M.K., E. Subası, "Effect of contiguity and figure-ground organization on the area rule of lightness," *Journal of Vision*, 14, pp 1-11 (2014)

• Clarke, A. M., Öğmen, H., & Herzog, M. H. "A computational model for reference-frame synthesis with applications to motion perception," *Vision Research*, 126, 242-253. (2016)

• Agaoglu, M. N., Clarke, A. M., Herzog, M. H., & Öğmen, H. "Motion-based nearest vector metric for reference frame selection in the perception of motion," *Journal of vision*, 16(7), 14-14. (2016)

• Manassi, M., Lonchampt, S., Clarke, A., & Herzog, M. H. "What crowding can tell us about object representations," *Journal of vision*, 16(3), 35-35. (2016)

• J.E. Corbett, "The Whole Warps the Sum of Its Parts: Gestalt-Defined-Group Mean Size Biases Memory for Individual Objects," *Psychological Science* (Forthcoming)

• J.E. Corbett, P. Venuti, D. Melcher, "Perceptual Averaging in Individuals with Autism Spectrum Disorder," *Frontiers in Psychology* (Forthcoming)

• E. Ilicak, L.K. Senel, E. Biyik, T. Cukur, "Profile-Encoding Reconstruction for Multiple Acquisition Balanced Steady-Staete Free Precession Imaging," *Magnetic Resonance in Medicine*, n/a–n/a (2016)

• T. Cukur, A.G. Huth, S. Nishimoto, J.L. Gallant, "Functional Subdomains within Scene-Selective Cortex: Parahippocampal Place Area, Retrosplenial Complex, and Occipital Place Area," *Journal of Neuroscience*, 36, 10257–10273 (2016)

• C.F. Koyuncu, E. Akhan, T. Ersahin, R. Cetin-Atalay, C. Gunduz-Demir, "Iterative h-minima-based marker-controlled watershed for cell nucleus segmentation," *Cytometry: Part A*, 89, 338-349 (2016)

• T. Gultekin, C.F. Koyuncu, C. Sokmensuer, C. Gunduz-Demir, "Two-tier tissue decomposition for histopathological image representation and classification," *IEEE Transactions on Medical Imaging*, 34, pp 275-283 (2015)

• S. Arslan, E. Ozyurek, C. Gunduz-Demir, "A color and shape based algorithm for segmentation of white blood cells in peripheral blood and bone marrow images," *Cytometry: Part A*, 85, pp 480-490 (2014)

• G. Olgun, C. Sokmensuer, C. Gunduz-Demir, "Local object patterns for tissue image representation and cancer classification," *IEEE Journal of Biomedical and Health Informatics (retitled from IEEE Transactions on Information Technology in Biomedicine)*, 18, pp 1390-1396 (2014)

• B. Akin, C. Ozdem, S. Eroglu, D. Taslak Keskin, F. Fang, K. Doerschner, D. Kersten, H. Boyaci, "Attention modulates neuronal correlates of interhemispheric integration and global motion perception," *Journal of Vision*, 14, pp 1-13 (2014)

• O. Yilmaz, K. Doerschner, "Detection and localization of specular surfaces using image motion cues," *Machine Vision and Applications*, 25, pp. 1333-1349 (2014)

• C. Oluk, A. Pavan, H. Kafaligonul, "Rapid motion adaptation reveals the temporal dynamics of spatiotemporal correlation between ON and OFF pathways," *Nature Scientific Reports*, volume 6, no.34073, 1-10, (2016)

• H. Kafaligonul. "Vision: a systems neuroscience perspective," *Journal of Neurobehavioral Sciences*, 1, pp 21-26 (2014)

• A. Khatibi, "Be precise and suffer less pain! A comment on "A brief intervention utilising visual feedback reduces pain and enhances tactile acuity in CLBP patients," *J of Back and Musculoskeletal Rehabilitation*, (Forthcoming)

• F. Akbari, M. Dehghani, A. Khatibi, T. Vervoort, "Incorporating Family Function into Chronic Pain Disability: The Role of Catastrophizing," *Pain Research and Management.*, 6838596-1--9 (2016)

• K Thangavel, E.U Saritas, "Aqueous paramagnetic solutions for MRI phantoms at 3 T: A detailed study on relaxivities," *Turkish J of Electrical Engineering & Computer Sciences*, (Forthcoming)

• M Utkur, Y Muslu, E.U Saritas, "Relaxation-based viscosity mapping for magnetic particle imaging," *Physics in Medicine and Biology*, (Forthcoming)

• O. Yilmaz, E.U. Saritas, T. Cukur, "Enhanced phase-sensitive SSFP reconstruction for fat-water separation in phased-array acquisitions," *Journal of Magnetic Resonance Imaging*, 44, 148–157 (2016)

• E.U. Saritas, D. Lee, T. Cukur , A. Shankaranarayanan, D.G. Nishimura, "Hadamard Slice Encoding for Reduced-FOV Diffusion-weighted Imaging," *Magnetic Resonance in Medicine*, 72, pp 1277-1290 (2014)

• F. Doldur-Balli, M.N. Ozel, S. Gulsuner, A.B. Tekinay, T. Ozcelik, O. Konu, M.M. Adams, "Characterization of a novel zebrafish (Danio rerio) gene, wdr81, associated with cerebellar ataxia, mental retardation and dysequilibrium syndrome (CAMRQ)," *BMC Neuroscience*, 16, 96-1--17 (2015)

• H. Unal-Gulsuner, S. Gulsuner, F.N. Mercan, O.E. Onat, T. Walsh, H. Shahin, M.K. Leeb, O. Dogu, T. Kansu, H. Topaloglu, B. Elibol, C. Akbostancı, M.C. King, T. Ozcelik, A.B. Tekinay. "Mitochondrial serine protease HTRA2 p.G399S in a kindred with essential tremor and Parkinson disease," *PNAS*, 111, pp 18285-18290. (2014)

• G. Uzunalli, Z. Soran, T.S. Erkal, Y.S. Dagdas, E. Dinc, A.M. Hondur, K. Bilgihan, B. Aydin, M.O. Guler, Tekinay AB. "Bioactive self-assembled peptide nanofibers for corneal stroma regeneration," *Acta Biomater*, 10, pp 1156-1166. (2014)

• V. Estrada, A. Tekinay, H.W. Müller. "Neural ECM mimetics," *Prog Brain Res*, 214, pp 391-413. (2014)

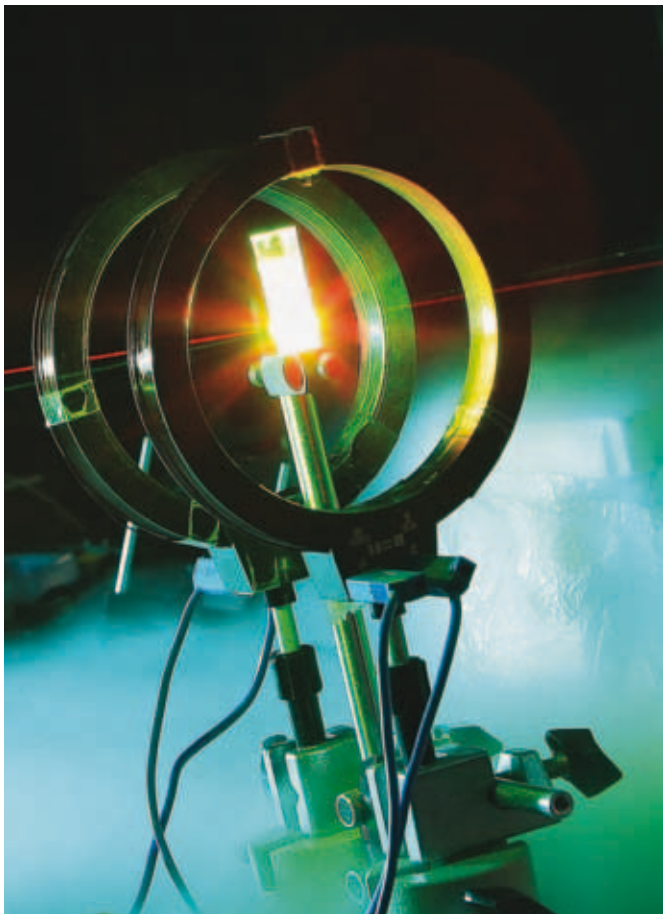
Contact:
Dr. Michelle M. Adams
(Program Director)
Phone : +90 312 290 3415
Fax : +90 312 290 2561
michelle@bilkent.edu.tr

## Faculty Profile: Dr. Michelle M. Adams, Associate Professor, Department of Psychology

Michelle M. Adams received a Ph.D. in neuroscience from the New York University-Mount Sinai School of Medicine in 2001. Her doctoral work focused on the relationships among brain aging, cognitive decline, estrogen, and glutamate receptors. After completing her Ph.D., Dr. Adams worked in the Howard Hughes Medical Institute at the Massachusetts Institute of Technology examining the functional consequences of altering glutamate receptor levels. In 2004, she went to the Neurobiology and Anatomy Department at the Wake Forest University School of Medicine to the study the effects of aging and caloric restriction on synaptic glutamate receptors. In 2005 she became an assistant professor at Wake Forest University and in 2009 joined the Bilkent University Department of Psychology, where she became an associate professor in 2013. Dr. Adams served as the acting chair of Psychology from August 2012 until October 2013, and currently holds the position of director of the Neuroscience program.

Her research is centered on the synaptic changes and cellular mechanisms underlying age-related cognitive decline and the potential of interventions such as caloric restriction to alter the course of brain aging. Her work has been awarded research grants by the National Institutes of Health in the United States and by TÜBİTAK in Turkey. In 2011 she was awarded an installation grant by the European Molecular Biology Organization; she is a participant in the organization's Young Investigator program. Dr. Adams has published over 30 papers, and her work has received over three thousand citations.

# PHYSICS



The goal of the graduate program in the Department of Physics is to develop students into scientists who can pursue original, creative research activities. The program is an important part of the research activity of the department, which aims to produce scientific output of international significance. The graduate program emphasizes research in various fields of condensed matter physics, in relation to rapidly developing high-technology fields such as photonics, nanoscience, and nanotechnology. The department's current research focuses on the physics of electrons in lower dimensionalities, nanoscience, statistical mechanics, many-body physics, strongly correlated electrons, properties of new materials, fabrication and theoretical analysis of new devices, computational physics, ultrafast optics, and soft condensed matter.

## FACULTY

**SERAP AKSU**, Assistant Professor. Ph.D., Materials Science and Engineering, Boston University, 2013. *Biophotonics, opto fluidics, optical antennas.*

**CEYHUN BULUTAY**, Associate Professor. Ph.D., Electrical Engineering, Middle East Technical University, 1997. *Condensed Matter Theory, computational semiconductor physics, quantum optics.*

**ŞAHİN BÜYÜKDAĞLI**, Assistant Professor. Ph.D., University Joseph Fourier, 2007. *Statistical physics of charged and polar liquids, ion channels, electrostatics of polymer translocation, statistical physics of DNA melting, critical phenomena, biophysical modelling.*

**SALIM ÇIRACI**, Professor. Ph.D., Condensed Matter Physics, Stanford University, 1974. *Nanomaterials, nanodevices, hydrogen storage, surface physics, electronic structures of solids, electron systems of lower dimensionality, mesoscopic physics, scanning tunneling and atomic force microscopy, chemisorption theory, metallization, strained semiconductor superlattices.*

**HİLMİ VOLKAN DEMİR**, Professor. Ph.D., Electrical Engineering, Stanford University, 2004. *Ultra-fast photonic switching devices, quantum-confined nano-structures, high-performance semiconductor devices, nano-photonics, ultrafast optoelectronics, integrated photonic circuits, micro-electro-mechanical systems, bio-implants, telecommunication systems, and semiconductor nano fabrication.*

**ATİLLA ERÇELEBİ**, Professor. Ph.D., Condensed Matter Physics, Middle East Technical University, 1980. *Polarons, electron-phonon interactions, excitons, low dimensional quantum well-heterostructure-type semiconducting systems.*

**AHMET GÖKALP**, Senior Lecturer. Ph.D., Nuclear Physics, Stanford University, 1980. *Radiative vector meson decays, QCD sum rules in phenomenological high energy physics, nuclear transport theory and nuclear many-body dynamics with applications to giant resonances, nuclear collisions, and nuclear fusion.*

**OĞUZ GÜLSEREN**, Professor and Department Chair. Ph.D., Condensed Matter Physics, Bilkent University, 1992. *Theoretical solid state physics, nanoscience, metal nanowires, carbon nanotubes, self organization, self assembly.*

**BALAZS HETENYI**, Assistant Professor. Ph.D., Chemical Physics, Columbia University, 1999. *Strongly correlated systems, density functional theory, computational physics, Monte Carlo and molecular dynamics methods.*

**FATİH ÖMER İLDAY**, Associate Professor. Ph.D., Cornell University, 2003. *Non-linear optics ultrafast optical phenomena.*

**COŞKUN KOCABAŞ**, Associate Professor. Ph.D., Physics, University of Illinois at Urbana-Champaign, 2007. *Chemical communication, soft robotics, high performance flexible microelectronics, unconventional electronic materials, electron transport in low dimensional systems, hierarchical assembly of low dimensional structures: micro and nano fabrication optofluidics, lab-on-a-chip systems, carbon based electronics.*

**MEHMET ÖZGÜR OKTEL**, Associate Professor. Ph.D., Physics, Massachusetts Institute of Technology, 2000. *Theoretical condensed matter physic, atomic physics.*

**EKMEL ÖZBAY**, Professor. Ph.D., Electrical Engineering, Stanford University, 1992. *Photonic band gap materials, physics and applications of nanostructures, photonic devices, micro electro¬mechanical devices, ultrafast phenomena, quantum optics.*

**BİLAL TANATAR**, Professor. Ph.D., Condensed Matter Physics, University of Delaware, 1987. *Theory of quantum solids and liquids, low dimensional electron systems, computational physics.*

**GIOVANNI VOLPE**, Assistant Professor. Ph.D., ICFO-The Institute of Photonic Sciences, 2008. *Soft matter, optical tweezers and optical manipulation, nanoscopic force measurement, statistical physics, microscopic swimmers, active Brownian motion, stochastic differential equations,* multiplicative noise.

**CEMAL YALABIK**, Professor. Ph.D., Condensed Matter Physics, Brown University, 1976. *Statistical mechanics: dynamics of phase transitions and critical phenomena, quantum mechanical simulation of electronic devices.*

## MASTER OF SCIENCE IN PHYSICS

**Admission:** Applicants are required to have a B.S. degree in physics or a related field of science or engineering. Students with a B.S. degree in an area other than physics may be required to take certain undergraduate courses

in order to acquire the necessary background in the field. Evaluation of applicants is based on their ALES (*Akademik Personel ve Lisansüstü Eğitimi Giriş Sınavı*/Academic Personnel and Postgraduate Education Entrance Examination) scores, past academic records, reference letters, and an interview. Applicants who are not Turkish citizens and Turkish citizen applicants who are residents of another country may take the GRE (Graduate Record Examination) instead of the ALES.All nonnative speakers of English are required to submit proof of satisfactory knowledge of English.

**Degree Requirements:** In addition to completing at least 21 credit units of course work, the M.S. degree candidate must prepare and successfully defend a thesis. The expected duration of study for the M.S. degree is 4 semesters; the maximum duration is 6 semesters.

## DOCTOR OF PHILOSOPHY IN PHYSICS

**Admission:** All applicants are required to have a B.S. degree in physics or a related field of science or engineering. Evaluation of applicants is based on their ALES (*Akademik Personel ve Lisansüstü Eğitimi Sınavı*/Academic Personnel and Postgraduate Education Entrance Examination) scores, past academic records, reference letters, and an interview. Applicants who are not Turkish citizens and Turkish citizen applicants who are residents of another country may take the GRE (Graduate Record Examination) instead of the ALES.All nonnative speakers of English are required to submit proof of satisfactory knowledge of English.

**Degree Requirements:** The completion of 21 credit units of course work beyond the M.S. level is required. Ph.D. candidates must pass a qualifying exam, typically in their fourth semester, and then must prepare a dissertation proposal. Preparation and defense of a dissertation based on original research is the centerpiece of the program. The standard duration of study for the Ph.D. degree is 8 semesters for students who enter the program with an M.S. degree; the maximum duration is 12 semesters.

## COURSE DESCRIPTIONS

**PHYS 515 Advanced Optics**
Photon and wave pictures of electromagnetic radiation. Huygen's principle, interference and interferometry, far-field and near-field diffraction, coherence, polarization, ray optics and optical resonators with ABCD matrix formalism. Selected modern topics such as fiber optics, optical communications, lasers, electro-optic modulation and nonlinear optics are discussed

**PHYS 520 Nanoscience and Nanotechnology I**
General survey of nanoscience and nanotechnology, Atomic scale characterization and processes: Scanning probe microscopies: STM/AFM and atomic manipulation, Nanofabrication, Carbon Nanotubes, Nanowires, Transport in nanostructures, Nanoelectronics, Nanomagnetism, Spintronics.

**PHYS 522 Self-Organized and Self-Assembled Systems from Nanoscience to Biotechnology**
Introduction to self-assembly and self-organization. Static/dissipative self-assembly/self-organization. Colloidal self-assembly/self-organization. Dynamics of nonlinear systems and far-from-equilibrium thermodynamic systems. Recent developments and state of the art examples ranging from nanoscience to computer science, to economy, finally to biotechnology.

**PHYS 538 Atomic molecular and optical physics**
One- and multi-electron atoms; atoms in classical static and AC fields; diatomic molecules; molecules in external fields; quantization of electromagnetic field; mode expansion of quantized light; coupling of two-level systems with light; electromagnetically-induced transparency; coherent control of matter with light.

**PHYS 541 Electromagnetic Theory I**
Electrostatics. Magnetostatics. Boundary-value problems. Time varying fields and Maxwell's equations. Plane electromagnetic waves. Wave guides and resonant cavities. Simple radiating systems and diffraction.

**PHYS 542 Electromagnetic Theory II**
Magnetohydrodnamics and plasma physics. Special theory of relativity. Relativistic particle kinematics and dynamics. Collisions. Radiation by moving charges. Bremsstrahlung. Radiative Beta-process. Multipole fields. Radiation damping. Self-fields of particles.

**PHYS 543 Advanced Quantum Mechanics I**
Basic principles of wave mechanics and Schrodinger Equation. Eigenvalues and Eigenfunctions. Angular momentum. Matrix formulation of quantum mechanics. Symmetry in quantum mechanics. Approximation methods. Many particles system. Scattering theory.

**PHYS 544 Advanced Quantum Mechanics II**
Approximation methods, many particle systems, scattering theory, second quantization.

**PHYS 545 Solid State Theory I**
Crystals. Group theory. One-electron approximation. Energy-band theory. Pseudopotential theory. Total energy and force calculations. Dynamics of electrons. Electron transport theory. Localization of electron states. Impurity states. Surfaces. Green's functions for defect states.

**PHYS 546 Solid State Theory II**
Lattice vibrations and phonons. Electron-phonon interactions. Collective excitations. Optical properties. Magnetic properties of solids. Superconductivity.

**PHYS 550 Physics of Semiconductor Devices**
Review of semiconductor physics. Electron Theory of solids. Semiconductors under equilibrium and non-equilibrium conditions. Impurity levels, excess carriers, radiative and nonradiative recombinations. Band line-up and heterojunction energy band diagrams. P-N heterojunction. Graded heterojunctions. Electrical properties of heterojunctions. New electronic and optoelectronic devices based on semiconductor superlattices.

**PHYS 551 Analytical Mechanics**
Constraints. Principle of least action and Lagrange equations. Symmetry and conservation laws. Hamilton equations of motion. Canonical transformations. Hamilton-Jacobi theory. Small oscillations. Mechanics of continuous media.

**PHYS 552 Statistical Physics**
Laws of thermodynamics, microcanonical ensemble, Liouville formalism, ergodicity, ensemble theory, phase transitions, critical phenomena, mean-field theory, scaling and renormalization, quantum statistical mechanics, Bose-Einstein condensation, superfluidity.

**PHYS 553 Methods of Mathematical Physics**
Sturm-Liouville theory. Special functions: Gamma functions, Bessel functions, Legendre polynomials, integral transforms, integral equations, calculus of variations.

**PHYS 559 Group Theory**
Abstract group theory; theory of group representations; physical applications of group theory, full rotation groups and angular momentum; applications in molecular and solid state physics; permutation symmetry applications to many particle systems.

**PHYS 561 Special Topics in Condensed Matter Physics I**
**PHYS 562 Special Topics in Condensed Matter Physics II**
**PHYS 565 Special Topics in Condensed Matter Physics III**
**PHYS 566 Special Topics in Condensed Matter Physics IV**
Exactly solved models in quantum and classical physics. Two-dimensional (sing model; dual lattices, transfer matrix, monodromoy matrix, star-triangle relations and the Yang-

Baxter equation; Ice models. The coordinate Bethe ansatz for some lattice (Heisenberg, Hubbard) and continuous models (Lieb-Liniger gas). The relation between the solution of one-dimensional quantum and two-dimensional classical models; algebraic Bethe ansatz. Introduction to numerical approaches which provide solutions to the above models including Monte Carlo methods and the density-matrix renormalization group method

**PHYS 564 Optical Trapping and Optical Manipulation**
Theory of optical forces within geometrical optics and dipole approximations. Mie scattering. Elements of T-matrix, finite-difference time domain (FDTD) and discrete dipole approximation (DDA). Brownian motion. Building an optical tweezers. Calibration of an optical tweezers. Applications of optical tweezers to the fields of molecular biology, cell biology, spectroscopy, optofluidics, lab on a chip, statistical physics, nanothermodynamics, plasmonics, atom trapping, atom cooling, and quantum mesoscale physics.

**PHYS 571 Special Topics in Applied Physics I**
Nonlinear optics: Linear and nonlinear polarization, Maxwell's constitutive and wave equations, harmonic and anharmonic oscillator, second harmonic generation, optical parametric oscillation, spontaneous and stimulated Raman scattering, two-photon absorption, coherent anti-stokes Raman scattering, degenerate four-wave mixing, Brillouin scattering, absorption.

**PHYS 572 Special Topics in Applied Physics II**
Important methods for calculating electronic energy spectra and electron-electron correlations in condensed matter: density functional theory, local density approximation argumented plane wave method, linear combination of muffin-tin orbital method, the pseudopotential method, configurational interaction, electron-electron in atoms and solids.

**PHYS 573 Special Topics in Applied Physics III**
Review of electronic band structure of semiconductors, vibrational properties, Electron-phonon interaction, optical constants and Kramers-Kroning relationships, Lattice and carrier absorption and reflection, recombination, excitonic recombination band-to-band and free-to-bound recombination, donor acceptor pair recombination, modulation spectroscopies, effects of quantum confinement onelectronic and vibrational properties, phonons in superlatices, folded acoustic modes, confined optical modes.

**PHYS 577 Ultrafast and Non Linear Optics**
General introduction to the field of ultrafast optics and nonlinear optics. Nonlinear and dispersive pulse propagation, optical solutions, laser dynamics, mode-locking, ultrafast lasers, commonly used nonlinear optical processes.

**PHYS 580 Experimental Methods in Applied Physics**
Introduction to experimental methods. Spectroscopy of semiconductors, photoluminescense, Raman scattering. Schottky diode fabrication, current and voltage measurements. Computer-based instrument control and data acquisition. Atomic physics, dye lasers, and optogalvanic spectroscopy.

**PHYS 591 Graduate Seminar I**
**PHYS 592 Graduate Seminar II**
This is a graduate (MS and PhD) seminar course. The instructor and students meet once a week for presentations and discussions. Topics of presentations are chosen by the mutual consent of the instructor and the students.

**PHYS 599 Master's Thesis**

**PHYS 612 Quantum Optics**
Quantization of the electromagnetic field; coherent and squeezed states; atom-field interaction; coherent trapping; electromagnetically-induced transparency; quantum theory of laser; cavity quantum electrodynamics; review of nonlinear optical effects; quantum theory of nonlinear optical susceptibility; low-light-level nonlinear optics.

**PHYS 651 Many Body Theory**
Exchange Symmetry, Fermions and Bosons, Second Quantization Formalism, Free Bosons, Bose-Einstein Condensation, Free Fermions, Temperature Dependence, Interactions, Hartree-Fock and Random Phase approximation, BCS theory, Gross-Pitaevskii equation, Bogoluibov de Gennes equation. Green's functions, diagrammatic perturbation theory. Second Quantization, Coherent state path integrals for Bosons and Fermions, Gell-Mann Low equation, Green's functions, diagrammatic perturbation theory, applications to weakly interacting Fermi and Bose Systems.

**PHYS 652 Advanced Statistical Mechanics**
Random variables and their transformations, the langevin and fokker-planck equations, boltzmann transport equation, the h-function, and its solutions the wigner function the master equation, detailed balance. The ising model, solution to the I-D model. The 2-D ising model-high and low temperature series, mean field theory. Introduction to phase transitions and critical phenomena-the critical exponents. The monte-carlo method, simulated annealing and molecular dynamics. The renormalization group theory and its application to the ising model. Other model systems with more complicated phase diagrams-multicriticality. Dynamic criticality-self ordered criticality.

**PHYS 673 Nuclear and Particle Physics**
Introduction to subatomic particles, nuclear models, elementary particles, symmetries, strong and weak interaction physics, and experimental techniques in nuclear and particle physics, accelerators.

**PHYS 699 Ph.D. Dissertation**

## SAMPLE OF RECENT PUBLICATIONS


• A. Cakan, C. Sevik, C. Bulutay, "Strained band edge characteristics from hybrid density functional theory and empirical pseudopotentials: GaAs, GaSb, InAs and InSb", *J of Physics D*, 49, 085104-1--9 (2016)

• Y. Aksu, C. Bulutay, "Nuclear Spin Squeezing via Electric Quadrupole Interaction", *Physical Review A*, 93, 013812 (2016)

• U. Keles, A. Cakan, C. Bulutay, "Disorder-free localization around the conduction band edge of crossing and kinked silicon nanowires", *J Applied Physics*, 117, 064308-1--8 (2015)

• C. Bulutay, E.A. Chekhovich, A.I. Tartakovskii, "Nuclear Magnetic Resonance Inverse Spectra of InGaAs Quantum Dots: Atomistic Level Structural Information", *Physical Review B*, 90, 205425-1--16 (2014)

• E. Okuyan, U. Gudukbay, C. Bulutay, K.H. Heinig, "MaterialVis: Material visualization tool using direct volume and surface rendering techniques", *J of Molecular Graphics and Modelling*, 50, 50-60 (2014)

• C. Bulutay, S. Ossicini, "Electronic and Optical Properties of Silicon Nanocrystals", *Silicon Nanocrystals*, L. Pavesi, R. Turan (Eds.), New York: John Wiley & Sons

• S. Buyukdagli, R. Blossey, "Correlation-induced DNA adsorption on like-charge membranes", *Physical Review E*, 94, 042502-1--17 (2016)

• S. Buyukdagli, R. Blossey, "Beyond Poisson-Boltzmann : fluctuations and fluid structure in a self-consistent theory", *J of Physics Condensed Matter*, 28, 343001-1--20 (2016)

• S. Buyukdagli, T. Ala-Nissila, "Electrostatics of polymer translocation events in electrolyte solutions", *J of Chemical Physics*, 145, 014902-1--12 (2016)

• S. Buyukdagli, T. Ala-Nissila, "Electrostatic energy barriers from dielectric membranes upon approach of translocating

DNA molecules", *J of Chemical Physics*, 144, 084902-1--12 (2016)

• S. Buyukdagli, "Electrostatic interactions in charged nanoslits within an explicit solvent theory", *J of Physics Condensed Matter,* 27, 455101-1--5 (2015)

• S. Buyukdagli, "Dielectric anisotropy in polar solvents under external fields", *J of Statistical Mechanics: Theory and Experiment.*, 08022 (2015)

• S. Buyukdagli, R. Blossey, T. Ala-Nissila, "Ionic current inversion in pressure-driven polymer translocation through nanopores", *Physical Review Letters*, 114, 088303-1--10 (2015)

• E. Akturk, O. Uzengi Akturk, S. Ciraci, "Single and bilayer bismuthene: "Stability at high temperature and mechanical and electronic properties,"", *Physical Review B*, 94, 014115-1--9 (2016)

• F. Ersan, E. Akturk, S. Ciraci, "Stable single-layer structure of group-V elements", *Physical Review B*, 94, 245417-1--9 (2016)

• F. Ersan, E. Akturk, S. Ciraci, "Interaction of adatoms and molecules with single-layer arsenene phyases", *J of Physical Chemistry C*, 120, 14345-14355 (2016)

• O. Uzengi Akturk, E. Akturk, S. Ciraci, "Effects of adatoms and physisorbed molecules on the physical properties of antimonene", *Physical Review B*, 93, 035450-1--8 (2016)

• O.U. Akturk, V.O. Ozcelik, S. Ciraci, "Single-layer crystalline phases of antimony: Antimonenes", *Physical Review B*, 91, 235446-1--10 (2015)

• V.O. Ozcelik, S. Ciraci, "High-performance planar nanoscale dielectric capacitors", *Physical Review B*, 91, 19454-1--5 (2015)

• H.H. Gunel, V.O. Ozcelik, S. Ciraci, "Dissociative adsorption of molecules on graphene and silicene", *J of Physical Chemistry C*, 118, 27574-27582 (2014)

• S. Cahangirov, V.O. Ozcelik, A. Rubio, S. Ciraci, "Silicite: The layered allotrope of silicon", *Physical Review B*, 90, 085426-1--5 (2014)

• S. Cahangirov, V.O. Ozcelik, X. Lede, J. Avila, S. Cho, M.C. Asensio, S. Ciraci, A. Rubio, "Atomic structure of 3x phase of silicene on Ag(111)", *Physical Review B*, 90, 035448-1--5 (2014)

• V.O. Ozcelik, S. Cahangirov, S. Ciraci, "Stable Single-Layer Honeycomblike Structure of Silica", *Physical Review Letters*, 112, 246803-1--5 (2014)

• A. Yeltik, S. Delikanli, M. Olutas, Y. Kelestemur, B. Guzelturk, H.V. Demir, "Experimental Determination of the Absorption Cross-Section and Molar Extinction Coefficient of Colloidal CdSe Nanoplatelets", *J of Physical Chemistry C* (Forthcoming)

• B. Guzelturk, H.V. Demir, "Near-Field Energy Transfer Using Nanoemitters For Optoelectronics", *Advanced Functional Materials* (Forthcoming)

• Y. Gao, L. Tobing, K. A. Dorian, D. H. Zhang, C. Dang, H.V. Demir, "Azimuthally Polarized, Circular Colloidal Quantum Dot Laser Beam Enabled by a Concentric Grating", *Acs Photonics* (Forthcoming)

• A. Alipour, E. Unal, S. Gokyar, H.V. Demir, "Development of a distance-independent wireless passive RF resonator sensor and a new telemetric measurement technique for wireless strain monitoring", *Sensors and Actuators A - Physical*, 255, 87-93 (2017)

• A. Nirmal, A. K. K. Kyaw, X. W. Sun, H.V. Demir, "Demonstration of the portability of porous microstructure architecture to indium-doped ZnO electron selective layer for enhanced light scattering in inverted organic photovoltaics", *J of Sol-Gel Science and Technology*, 78, 613-620 (2016)

• A. Perumal, S. Shendre, M. Li, Y. K. E. Tay, V. K. Sharma, S. Chen, Z. Wei, Q. Liu, Y. Gao, P. J. S. Buenconsejo, S. T. Tan, C. L. Gan, Q. Xiong, T. C. Sum, H.V. Demir, "High brightness formamidinium lead bromide perovskite nanocrystal light emitting devices", *Scientific Reports*, 6, 36733-1--10 (2016)

• B. Guzelturk, F. Menk, K. Philipps, Y. Kelestemur, M. Olutas, R. Zentel, H.V. Demir, "Colloidal Nanoplatelet/Conducting Polymer Hybrids: Excitonic and Material Properties", *J of Physical Chemistry C*, 120, 3573-3582 (2016)

• B. Ozbey, V.B. Erturk, H.V. Demir, A. Altintas, O. Kurc, "A Wireless Passive Sensing System for Displacement/Strain Measurement in Reinforced Concrete Members", *Sensors-Basel*, 16, 496 (2016)

• B. Ozbey, V.B. Erturk, O. Kurc, A. Altintas, H.V. Demir, "Multi-Point Single-Antenna Sensing Enabled by Wireless Nested Split-Ring Resonator Sensors", *IEEE Sensors Journal*, 16, 7744-7752 (2016)

• B. Zhu, S. T. Tan, W. Liu, S. Lu, Y. Zhang, S. Chen, N. Hasanov, X. Kang, H.V. Demir, "Modulating ohmic contact through InGaxNyOz interfacial layer for high-performance InGaN/GaN-based light-emitting diodes", IEEE Photonics Journal, 8, 1600808-1--9 (2016)

• B. Zhu, W. Liu, S. Lu, Y. Zhang, N. Hasanov, X. Zhang, Y. Ji, Z.-H. Zhang, S. T. Tan, H. Liu, H.V. Demir, "Decoupling contact and mirror: an effective way to improve the reflector for flip-chip InGaN/GaN-based light-emitting diodes", *J of Physics D*, 49, 265106-1--7 (2016)

• J. Frohleiks, S. Wepfer, Y. Kelestemur, H.V. Demir, G. Bacher, E. Nannen, "Quantum Dot / Light Emitting Electrochemical Cell Hybrid Device and Mechanism of its Operation", *ACS Applied Materials & Interfaces*, 37, 24692-24698 (2016)

• J. R. Murphy, S. Delikanli, T. Scrace, P. Zhang, T. Norden, T. Thomay, A. N. Cartwright, H.V. Demir, A. Petrou, "Time-resolved photoluminescence study of CdSe/CdMnS/CdS core/multi-shell nanoplatelets", *Applied Physics Letters*, 108, 242406-1--5 (2016)

• J. Xing, F. Yan, Y. Zhao, S. Chen, H. Yu, Q. Zhang, R. Zeng, H.V. Demir, X. W. Sun, A. Huan, Q. Xiong, "High-efficiency light-emitting diodes of organometal halide perovskite amorphous nanoparticles", *ACS Nano*, 10, 6623-6630 (2016)

• M. Adams, N. Gaponik, T. Erdem, Z. Soran-Erdem, H.V. Demir, "Colloidal Nanocrystals Embedded in Macrocrystals: Methods and Applications", *J of Physical Chemistry Letters*, 7, 4117-4123 (2016)

• M. Idris, M. Bazzar, B. Guzelturk, H.V. Demir, D. Tuncel, "Cucurbit[7]uril-threaded fluorene–thiophene-based conjugated polyrotaxanes", *RSC Advances,* 6, 98109-98116 (2016)

• M. Olutas, B. Guzelturk, Y. Kelestemur, K. Gungor, H.V. Demir, "Highly Efficient Nonradiative Energy Transfer from Colloidal Semiconductor Quantum Dots to Wells for Sensitive Noncontact Temperature Probing", *Advanced Functional Materials,* 26, 2891-2899 (2016)

• N. Hasanov, V. K. Sharma, P. L. Hernández-Martínez, S. T. Tan, H.V. Demir, "Critical role of CdSe nanoplatelets in color-converting CdSe/ZnS nanocrystals for InGaN/GaN light-emitting diodes", *Optics Letters*, 41, 2883-2886 (2016)

• O. Erdem, M. Olutas, B. Guzelturk, Y. Kelestemur, H.V. Demir, "Temperature-dependent emission kinetics of colloidal semiconductor nanoplatelets strongly modified by stacking", *J of Physical Chemistry Letters*, 7, 548-554 (2016)

• S. Akhavan, A. F. Cihan, A. Yeltik, B. Bozok, V. Lesnyak, N. Gaponik, A. Eychmüller, H.V. Demir, "Multiexciton Generation Assisted Highly Photosensitive CdHgTe Nanocrystal Skins", *Nano Energy*, 26, 324-331 (2016)

• S. Akhavan, C. Uran, B. Bozok, K. Gungor, Y. Kelestemur, V. Lesnyak, N. Gaponik, A. Eychmuller, H.V. Demir, "Flexible and Fragmentable Tandem Photosensitive Nanocrystal Skins", *Nanoscale*, 8, 4399-4758 (2016)

• S.V. Gaponenko, H.V. Demir, C. Seassal, U. Woggon, "Colloidal nanophotonics: the emerging technology platform", *Optics Express*, 24, 430-433 (2016)

• S. Yang, V. D. Ta, Y. Wang, R. Chen, T. He, H.V. Demir, H. Sun, "Reconfigurable Liquid Whispering Gallery Mode Microlasers", *Scientific Reports*, 6, 27200-1--9 (2016)

• T. Erdem, H.V. Demir, "Colloidal nanocrystals for quality lighting and displays: milestones and recent developments", *Nanophotonics*, 5, 74-95 (2016)

• T. Erdem, Z. Soran-Erdem, Y. Kelestemur, N. Gaponik, H.V. Demir, "Excitonic improvement of colloidal nanocrystals in salt powder matrix for quality lighting and color enrichment", *Optics Express*, 24, 74-84 (2016)

• T. He, Y. Gao, Y. Gao, X. Lin, R. Chen, W. Hu, X. Zhao, Y. Wang, H.V. Demir, Q. Fan, A.C. Grimsdale, H. Sun, "Unusual Fluorescent Properties of Stilbene Units and CdZnS/ZnS Quantum Dots Nanocomposites: White-Light Emission in Solution versus Light-Harvesting in Films", *Macr. Chem. Phys,* 217, 24-31 (2016)

• V. K. Sharma, A. Alipour, Z. Soran-Erdem, Y. Kelestemur, Z. G. Aykut, H.V. Demir, "Fluorescent heterodoped nanotetrapods as synergistically enhancing positive and negative MRI contrast agents", *ACS Applied Materials & Interfaces*, 8, 12352-12359 (2016)

• V.T. Kilic, E. Unal, H.V. Demir, "Wireless Metal Detection and Surface Coverage Sensing for All-Surface Induction Heating", *Sensors-Basel*, 16, 16030363 (2016)

• V.T. Kilic, E. Unal, E. Gonendik, N. Yilmaz, H.V. Demir, "Strongly Coupled Outer Squircle-Inner Circular Coil Architecture for Enhanced Induction Over Large Areas", *IEEE Trans on Industrial Electronics,* 63, 7478 (2016)

• X. Zhao, Y. Gao, B. Zhu, H.V. Demir, S. J. Wang, H. Sun, "Exciton energy recycling from ZnO defect levels: towards electrically driven hybrid quantum-dot white light-emitting-diodes", *Nanoscale*, 8, 5835-5841 (2016)

• Y. Gao, G. Yu, Y. Wang, S. C. Dang, T. C. Sum, H. Sun, H.V. Demir, "Green Stimulated Emission Boosted by Nonradiative Resonant Energy Transfer from Blue Quantum Dots", *J of Physical Chemistry Letters*, 7, 2772-2778 (2016)

• Y. Kelestemur, B. Guzelturk, O. Erdem, M. Olutas, K. Gungor, H.V. Demir, "Platelet-in-Box Colloidal Quantum Wells: CdSe/CdS@CdS Core/Crown@Shell Heteronanoplatelets", *Advanced Functional Materials*, 26, 3570-3579 (2016)

• Z. Soran-Erdem, T. Erdem, K. Gungor, J. Pennakalathil, D. Tuncel, H.V. Demir, "High-Stability, High-Efficiency Organic Monoliths Made of Oligomer Nanoparticles Wrapped in Organic Matrix", *ACS Nano*, 10, 5333-5339 (2016)

• Z.-H. Zhang, Y. Zhang, W. Bi, C. Geng, S. Xu, H.V. Demir, X. W. Sun, "On the hole accelerator for III-nitride light-emitting diodes", *Applied Physics Letters*, 108, 151105-1--6 (2016)

• Z.-H. Zhang, Y. Zhang, W. Bi, C. Geng, S. Xu, H.V. Demir, X. W. Sun, "A charge inverter for III-nitride light-emitting diodes", *Applied Physics Letters*, 108, 133502-1--6 (2016)

• B. Guzelturk, H.V. Demir, "Organic-Inorganic Composites of Semiconductor Nanocrystals for Efficient Excitons", *J of Physical Chemistry Letters*, 6, 2206-2215 (2015)

• B. Guzelturk, M. Olutas, S. Delikanli, Y. Kelestemur, O. Erdem, H.V. Demir, "Nonradiative energy transfer in colloidal CdSe nanoplatelet films", *Nanoscale*, 7, 2545-2551 (2015)

• B. Guzelturk, Y. Kelestemur, K. Gungor, A. Yeltik, M.Z. Akgul, Y. Wang, R. Chen, C. Dang, H. Sun, H.V. Demir, "Stable and Low-Threshold Optical Gain in CdSe/CdS Quantum Dots: An All-Colloidal Frequency Up-Converted Laser", *Advanced Materials,* 27, 2741-2746 (2015)

• B. Ozbey, H.V. Demir, O. Kurc, V.B. Erturk, A. Altintas, "Wireless Sensing in Complex Electromagnetic Media of Building Materials", *IEEE Sensors Journal*, 15, 5545-5554 (2015)

• H. Keita, B. Guzelturk, J. Pennakalathil, T. Erdem, H.V. Demir, D. Tuncel, "Construction of multi-layered white emitting organic nanoparticles by clicking polymers", *J of Materials Chemistry*, 3, 10277-10284 (2015)

• H. Zare, M. Marandi, S. Fardindoost, V.K. Sharma, A. Yeltik, O. Akhavan, H.V. Demir, N. Taghavinia, "High-efficiency CdTe/CdS core-shell nanocrystals in water enabled by photo-induced colloidal hetero-epitaxy of CdS shelling at room temperature", *Nano Research*, 8, 2317-2328 (2015)

• K. McGilvray, E. Unal, K.T. Troy, B. Santoni, R. Palmer, J. Easley, H.V. Demir, C. Puttlitz, "Implantable Microelectromechanical Sensors for Diagnostic Monitoring and Post-Surgical Prediction of Bone Fracture Healing", *J of Orthopaedic Research*, 3, 1439-1446 (2015)

• M. Adam, T. Erdem, G. Stachowski, Z. Soran-Erdem, J. Lox, C. Bauer, J. Poppe, H.V. Demir, N. Gaponik, A. Eychmueller, "Implementation of High-Quality Warm-White Light-Emitting Diodes by a Model-Experimental Feedback Approach using Quantum Dot-Salt Mixed Crystals", *ACS Applied Materials & Interfaces,* 7, 23364-23371 (2015)

• M. Adam, Z. Wang, A. Dubavik, G.M. Stachowski, C. Meerbach, Z. Soran-Erdem, C. Rengers, H.V. Demir, N. Gaponik, A. Eychmuller, "Liquid-Liquid Diffusion-Assisted Crystallization: A Fast and Versatile Approach Toward High Quality Mixed Quantum Dot-Salt Crystals", *Advanced Functional Materials*, 25, 2638-2645 (2015)

• M. Olutas, B. Guzelturk, Y. Kelestemur, A. Yeltik, S. Delikanli, H.V. Demir, "Lateral Size-Dependent Spontaneous and Stimulated Emission Properties in Colloidal CdSe Nanoplatelets", *ACS Nano*, 9, 5041-5050 (2015)

• O. Akin, H.V. Demir, "Mid-wave infrared metasurface microlensed focal plane array for optical crosstalk suppression", *Optics Express*, 23, 27020-27027 (2015)

• S. Delikanli, B. Guzelturk, P.L. Hernandez-Martinez, T. Erdem, Y. Kelestemur, M. Olutas, M.Z. Akgul, H.V. Demir, "Continuously Tunable Emission in Inverted Type-I CdS/CdSe Core/Crown Semiconductor Nanoparticles", *Advanced Functional Materials*, 25, 4282-4289 (2015)

• S. Delikanli, M.Z. Akgul, J.R. Murphy, B. Barman, Y. Tsai, T. Scrace, P. Zhang, B. Bozok, P.L. Hernandez-Martinez, J. Christodoulides, A.N. Cartwright, A. Petrou, H.V. Demir, "Mn2+-Doped CdSe/CdS Core/Multishell Colloidal Quantum Wells Enabling Tunable Carrier - Dopant Exchange Interactions", *ACS Nano*, 9, 12473-12479 (2015)

• S. Fardindoost, A. Alipour, S. Mohammadi, S. Gokyar, R. Sarvari, A. Iraji zad, H.V. Demir, "Flexible strain sensors based on electrostatically actuated graphene flakes", *J of Micromech. Microeng.*, 25, 075016 (2015)

• T. Erdem, Z. Soran-Erdem, P.L. Hernandez-Martinez, V.K. Sharma, H. Akcali, I. Akcali, N. Gaponik, A. Eychmuller, H.V.

Demir, "Sweet plasmonics: Sucrose macrocrystals of metal nanoparticles", *Nano Research*, 8, 860-869 (2015)

• T. Erdem, Z. Soran-Erdem, V. Kumar Sharma, Y. Kelestemur, M. Adam, N. Gaponik, H.V. Demir, "Stable and efficient colour enrichment powders of nonpolar nanocrystals in LiCl", *Nanoscale*, 7, 17611-17616 (2015)

• V. Sayevich, N. Gaponik, M. Ploetner, M. Kruszynska, T. Gemming, V. Dzhagan, S. Akhavan, D. Zahn, H.V. Demir, A. Eychmuller, "Stable dispersion of iodide-capped PbSe quantum dots for high-performance low-temperature processed electronics and optoelectronics", *Chemistry of Materials*, 27, 4328-4337 (2015)

• V.K. Sharma, A. Alipour, Z. Soran-Erdem, Z.G. Aykut, H.V. Demir, "Highly monodisperse low-magnetization magnetite nanocubes as simultaneous T1-T2 MRI contrast agents", *Nanoscale*, 23, 10519-10526 (2015)

• X. Xu, A.K.K.K. Kyaw, B. Peng, Q. Xiong, H.V. Demir, Y. Wang, T.K.S. Wong, X.W. Sun, "Influence of gold-silica nanoparticles on the performance of small-molecule bulk heterojunction solar cells", *Organic Electronics*, 22, 20-28 (2015)

• X. Yang, P.L. Hernandez-Martinez, C. Dang, E. Mutlugun, K. Zhang, H.V. Demir, X.W. Sun, "Electroluminescence Efficiency Enhancement in Quantum Dot Light-Emitting Diodes by Embedding a Silver Nanoisland Layer", *Advanced Optical Materials*, 3, 1439-1445 (2015)

• X. Zhao, Y. Gao, Y. Wang, H.V. Demir, S. Wang, H. Sun, "Manipulating Optical Properties of ZnO/Ga?ZnO Core-Shell Nanorods Via Spatially Tailoring Electronic Bandgap", *Advanced Optical Materials*, 3, 1066-1071 (2015)

• Y. Gao, V.D. Ta, X. Zhao, Y. Wang, R. Chen, E. Mutlugun, K.E. Fong, S.T. Tan, C. Dang, X.W. Sun, H. Sun, H.V. Demir, "Observation of polarized gain from aligned colloidal nanorods", *Nanoscale*, 7, 6481-6486 (2015)

• Y. Kelestemur, M. Olutas, S. Delikanli, B. Guzelturk, M.Z. Akgul, H.V. Demir, "Type-II Colloidal Quantum Wells: CdSe/CdTe Core/Crown Heteronanoplatelets", *J of Physical Chemistry Letters*, 119, 2177-2185 (2015)

• Y. Wang, K.E. Fong, S. Yang, V.D. Ta, Y. Gao, Z. Wang, V. Nalla, H.V. Demir, H. Sun, "Unravelling the ultralow threshold stimulated emission from CdZnS/ZnS quantum dot and enabling high-Q microlasers", *Laser & Photonics Review*, 9, 507-516 (2015)

• Y. Wang, K.S. Leck, V.D. Ta, R. Chen, V. Nalla, Y. Gao, T. He, H.V. Demir, H. Sun, "Blue Liquid Lasers from Solution of CdZnS/ZnS Ternary Alloy Quantum Dots with Quasi-Continuous Pumping", *Advanced Materials*, 27, 169-175 (2015)

• Y.P. Zhang, Z.H. Zhang, W. Liu, S.T. Tan, Z.G. Ju, X.L. Zhang, Y. Ji, L.C. Wang, Z. Kyaw, N. Hasanov, B.B. Zhu, S.P. Lu, X.W. Sun, H.V. Demir, "Nonradiative recombination - critical in choosing quantum well number for InGaN/GaN light-emitting diodes", *Optics Express*, 23, 34-42 (2015)

• Z. Soran-Erdem, T. Erdem, P.L. Hernandez-Martinez, M.Z. Akgul, N. Gaponik, H.V. Demir, "Macrocrystals of Colloidal Quantum Dots in Anthrancene: Exciton Trannsfer and Polarized Emission", *J of Physical Chemistry Letters,* 6, 1767-1772 (2015)

• Z.H. Zhang, Z. Kyaw, W. Liu, Y. Ji, L. Wang, S.T. Tan, X.W. Sun, H.V. Demir, "A hole modulator for InGaN/GaN light-emitting diodes", *Applied Physics Letters*, 106, 063501 (2015)

• U.O.S. Seker, V.K. Sharma, S. Akhavan, H.V. Demir, "Engineered Peptides for Nanohybrid Assemblies", *Langmuir*, 30, 2137-2143 (2014)

• A. Nirmal, A.K.K. Kyaw, X.W. Sun, H.V. Demir, "Microstructured porous ZnO thin film for increased light scattering and improved efficiency in inverted organic photovoltaics", *Optics Express*, 22, 1412-1421 (2014)

• A.O. Govorov, H. Zhang, H.V. Demir, Y.K. Gunko, "Photogeneration of hot plasmonic electrons with metal nanocrystals: Quantum description and potential applications", *Nano Today*, 9, 85-101 (2014)

• B. Guilhabert, C. Foucher, A-M. Haughey, E. Mutlugun, Y. Gao, J. Herrnsdorf, H.D. Sun, H.V. Demir, M.D. Dawson, N. Laurand, "Nanosecond colloidal quantum dot lasers for sensing", *Optics Express*, 22, 7803-7319 (2014)

• B. Guzelturk, O. Erdem, M. Olutas, Y. Kelestemur, H.V. Demir, "Stacking in Colloidal Nanoplatelets: Tuning Excitonic Properties", *ACS Nano*, 8, 12524-12533 (2014)

• B. Guzelturk, P.L. Hernandez-Martinez, V.K. Sharma, Y. Coskun, V. Ibrahimova, D. Tuncel, A.O. Govorov, X.W. Sun, Q. Xiong, H.V. Demir, "Study of exciton transfer in dense quantum dot nanocomposites", *Nanoscale*, 6, 11387-11394 (2014)

• B. Guzelturk, P.L.H. Martinez, Q. Zhang, Q. Xiong, H. Sun, X.W. Sun, A.O. Govorov, H.V. Demir, "Excitons of semiconductor quantum dots and wires for lighting and displays", *Laser & Photonics Review*, 8, 73-93 (2014)

• B. Guzelturk, Y. Kelestemur, M. Olutas, S. Delikanli, H.V. Demir, "Amplified Spontaneous Emission and Lasing in Colloidal Nanoplatelets", *ACS Nano*, 8, 6599-6605 (2014)

• B. Guzelturk, Y. Kelestemur, M.Z. Akgul, V.K. Sharma, H.V. Demir, "Ultralow Threshold One-Photon- and Two-Photon-Pumped Optical Gain Media of Blue-Emitting Colloidal Quantum Dot Films", *J of Physical Chemistry Letters*, 5, 2214-2218 (2014)

• B. Ozbey, H.V. Demir, O. Kurc, V.B. Erturk, A. Altintas, "Wireless Measurement of Elastic and Plastic Deformation by a Metamaterial-Based Sensor", *Sensors-Basel*, 14, 19609-19621 (2014)

• B. Ozbey, E. Unal, H. Ertugrul, O. Kurc, C.M. Puttlitz, V.B. Erturk, A. Altintas, H.V. Demir, "Wireless Displacement Sensing Enabled by Metamaterial Probes for Remote Structural Health Monitoring", *Sensors-Basel,* 14, 1691-1704 (2014)

• B. Peng, Z. Li, E. Mutlugun, P.L.H. Martinez, D. Li, Q. Zhang, Y. Gao, H.V. Demir, Q. Xiong, "Quantum dots on vertically aligned gold nanorod monolayer: plasmon enhanced fluorescence", *Nanoscale*, 6, 5592-5598 (2014)

• C. Uran, T. Erdem, B. Guzelturk, N. Kosku Perkgoz, S. Jun, E. Jang, H.V. Demir, "Highly polarized light emission by isotropic quantum dots integrated with magnetically aligned segmented nanowires", *Applied Physics Letters*, 105, 141116-1--4 (2014)

• E. Mutlugun, B. Guzelturk, A.P. Abiyasa, Y. Gao, X.W. Sun, H.V. Demir, "Colloidal Quantum Dot-Light-Emitting Diodes Employing Phosphorescent Small Organic Molecules as Efficient Exciton Harvesters", *J of Physical Chemistry Letters*, 5, 2802-2807 (2014)

• H. Zhang, H.V. Demir, A.O. Govorov, "Plasmonic metamaterials and nanocomposites with the narrow transparency window effect in broad extinction spectra", *AcS Photonics*, 1, 822-832 (2014)

• P.L. Hernandez-Martinez, A.O. Govorov, H.V. Demir, "Förster-Type Nonradiative Energy Transfer for Assemblies of Arrayed Nanostructures: Confinement Dimension vs Stacking Dimension", *J of Physical Chemistry C*, 118, 4951-4958 (2014)

• S. Akhavan, A. Yeltik, H.V. Demir, "Photosensitivity Enhancement with TiO2 in Semitransparent Light-Sensitive Skins of Nanocrystal Monolayers", *ACS Applied Materials & Interfaces*, 6, 9023-9028 (2014)

• S. Akhavan, A.F. Cihan, B. Bozok, H.V. Demir, "Nanocrystal Skins with Exciton Funneling for Photosensing", *Small*, 10, 2470-2475 (2014)

• S.V. Zhokovsky, T. Ozel, E. Mutlugun, N. Gaponik, A. Eychmuller, A.V. Lavrinenko, H.V. Demir, S.V. Gaponenko, "Hyperbolic metamaterials based on quantum-dot plasmon resonator nanocomposites", *Optics Express*, 22, 18290-18298 (2014)

• V.K. Sharma, B. Guzelturk, T. Erdem, Y. Kelestemur, H.V. Demir, "Tunable White-Light-Emitting Mn-Doped ZnSe Nanocrystals", *ACS Applied Materials & Interfaces*, 6, 3654-3660 (2014)

• V.K. Sharma, S. Gokyar, Y. Kelestemur, T. Erdem, E. Unal, H.V. Demir, "Manganese Doped Fluorescent Paramagnetic Nanocrystals for Dual-Modal Imaging", *Small,* 10, 4961-4966 (2014)

• X. Xu, A.K.K. Kyaw, B. Peng, Q. Du, L. Hong, H.V. Demir, T.K.S. Wong, Q. Xiong, X.W. Sun, "Enhanced efficiency of solution-processed small-molecule solar cells upon incorporation of gold nanospheres and nanorods into organic layers", *Chemical Communications*, 50, 4451-4454 (2014)

• X. Xu, Q. Du, B. Peng, Q. Xiong, L. Hong, H.V. Demir, T.K.S. Wong, A.K.K. Kyaw, X.W. Sun, "Effect of shell thickness on small-molecule solar cells enhanced by dual plasmonic gold-silica nanorods", *Applied Physics Letters*, 105, 113306 (2014)

• X. Yang, E. Mutlugun, Y. Zhao, Y. Gao, K.S. Leck, Y. Ma, L. Ke, S.T. Tan, H.V. Demir, X.W. Sun, "Solution Processed Tungsten Oxide Interfacial Layer for Efficient Hole-Injection in Quantum Dot Light-Emitting Diodes", *Small*, 10, 246 (2014)

• X. Yang, K. Dev, J. Wang, E. Mutlugun, C. Dang, Y. Zhao, S. Liu, Y. Tang, S.T. Tan, X.W. Sun, H.V. Demir, "Light extraction efficiency enhancement of colloidal quantum dot light-emitting diodes using large-scale nanopillar arrays", *Advanced Functional Materials*, 24, 5977-5984 (2014)

• X. Yang, Y. Ma, E. Mutlugun, Y. Zhao, K.S. Leck, S.T. Tan, H.V. Demir, Q. Zhang, H. Du, X.W. Sun, "Stable, Efficient, and All-Solution-Processed Quantum Dot Light-Emitting Diodes with Double-Sided Metal Oxide Nanoparticle Charge Transport Layers", *ACS Applied Materials & Interfaces*, 6, 495-499 (2014)

• X. Zhou, O. Sppera, J. Plain, S. Jradi, X.W. Sun, H.V. Demir, X. Yang, C. Deeb, S. Gray, G. Wiederrecht, R. Bachelot, "Plasmon-based photopolymerization: near-field probing, advanced photonic nanostructures and nanophotochemistry", *J of Optics*, 16, 114002 (2014)

• Y. Ji, W. Liu, T. Erdem, R. Chen, S.T. Tan, Z-H. Zhang, Z. Ju, X. Zhang, H. Sun, X.W. Sun, Y. Zhao, S.P. DenBaars, S. Nakamura, H.V. Demir, "Comparative study of field-dependent carrier dynamics and emission kinetics of InGaN/GaN light-emitting diodes grown on (11 2 - 2) semipolar versus (0001) polar planes", *Applied Physics Letters*, 104, 143506-1--5 (2014)

• Y. Kelestemur, A.F. Cihan, B. Guzelturk, H.V. Demir, "Type-tunable amplified spontaneous emission from core-seeded CdSe/CdS nanorods controlled by exciton-exciton interaction", *Nanoscale*, 6, 8509-8514 (2014)

• Y. Wang, V.D. Ta, Y. Gao, T.C. He, R. Chen, E. Mutlugun, H.V. Demir, H.D. Sun, "Stimulated Emission and Lasing from CdSe/CdS/ZnS Core-Multi-Shell Quantum Dots by Simultaneous Three-Photon Absorption", *Advanced Materials*, 26, 2954-2961 (2014)

• Y. Zhao, J. Zhang, S. Liu, Y. Gao, X. Yang, K. S. Leck, A. P. Abiyasa, Y. Divayana, E. Mutlugun, S. T. Tan, Q. Xiong, H.V. Demir, X. W. Sun, "Transition metal oxides on organic semiconductors", *Organic Electronics*, 15, 871-877 (2014)

• Z. Kyaw, Z.-H. Zhang, W. Liu, S. T. Tan, Z. G. Ju, X. L. Zhang, Y. Ji, N. Hasanov, B. Zhu, S. Lu, Y. Zhang, X. W. Sun, H.V. Demir, "On the effect of N-GaN/P-GaN/N-GaN/P-GaN/N-GaN built-in junctions in the n-GaN layer for InGaN/GaN light-emitting diodes", *Optics Express*, 22, 809-816 (2014)

• Z. Kyaw, Z-H. Zhang, W. Liu, S.T. Tan, Z.G. Ju, X.L. Zhang, Y. Ji, N. Hasanov, B. Zhu, S. Lu, Y. Zhang, J.H. Teng, S.X. Wei, H.V. Demir, "Simultaneous enhancement of electron overflow reduction and hole injection prmotion by tailoring the last quantum barrier in InGaN/GaN light-emitting diodes", *Applied Physics Letters*, 104, 161113 (2014)

• Z.G. Ju, W. Liu, Z-H. Zhang, S.T. Tan, Y. Ji, Z. Kyaw, X.L. Zhang, S.P. Lu, Y.P. Zhang, B.B. Zhu, N. Hasanov, X.W. Sun, H.V. Demir, "Advantages of the Blue InGaN/GaN Light-Emitting Diodes with an AlGaN/GaN/AlGaN Quantum Well Structured Electron Blocking Layer", *Acs Photonics*, 1, 377-381 (2014)

• Z.-H. Zhang, W. L., S.T. Tan, Z. Ju, Y. Ji, Z. Kyaw, X. Zhang, N. Hasanov, B. Zhu, S. Lu, Y. Zhang, X.W. Sun, H.V. Demir, "On the mechanisms of InGaN electron cooler in InGaN/GaN light-emitting diodes", *Optics Express*, 22, 779-789 (2014)

• Z.H. Zhang, W. Liu, S.T. Tan, Y. Ji, L. Wang, B. Zhu, Y. Zhang, S. Lu, X. Zhang, N. Hasanov, X.W. Sun, H.V. Demir, "A hole accelerator for InGaN/GaN light-emitting diodes", *Applied Physics Letters,* 105, 153503 (2014)

• Z.-H. Zhang, Z. Ju, W. Liu, S.T. Tan, Y. Ji, Z. Kyaw, X. Zhang, N. Hasanov, X.W. Sun, H.V. Demir, "Improving hole injection efficiency by manipulating the hole transport mechanism through p-type electron blocking layer engineering", *Optics Letters,* 39, 2483-2486 (2014)

• Z-H. Zhang, W. Li, Z. Ju, S.T. Tan, Y. Ji, Z. Kyaw, X. Zhang, L. Wang, X.W. Sun, H.V. Demir, "Self-screening of the quantum confined Stark effect by the polarization induced bulk charges in the quantum barriers", *Applied Physics Letters*, 104, 243501-1--5 (2014)

• Z-H. Zhang, W. Liu, Z. Ju, S.T. Tan, Y. Ji, X. Zhang, L. Wang, Z. Kyaw, X.W. Sun, H.V. Demir, "Polarization self-screening in [0001] oriented InGaN/GaN light-emitting diodes for improving the electron injection efficiency", *Applied Physics Letters*, 104, 251108-1--4 (2014)

• Z-H. Zhang, W. Liu, Z. Ju, S.T. Tan, Y. Ji, Z. Kyaw, X. Zhang, L. Wang, X.W. Sun, H.V. Demir, "InGaN/GaN multiple-quantum-well light-emitting diodes with a grading InN composition suppressing the Auger recombination", *Applied Physics Letters*, 105, 033506 (2014)

• Z-H. Zhang, Y. Ji, W. Li, S.T. Tan, Z. Kyaw, Z. Ju, X. Zhang, N. Hasanov, S. Lu, Y. Zhang, B. Zhu, X.W. Sun, H.V. Demir, "On the origin of the electron blocking effect by an n-type AlGaN electron blocking layer", *Applied Physics Letters*, 104, 073511-1--5 (2014)

• P.L. Hernandez-Martinez, A. Govorov, H.V. Demir, *Understanding and Modeling Förster-type Energy Transfer - FRET from Single Donor to Single Acceptor and Assemblies of Acceptors*, Vol. 2, Springer Singapore, (2017)

• H.V. Demir, P.L. Hernandez-Martinez, A. Govorov, *Understanding and Modeling Förster-type Energy Transfer - FRET-Applications*, Vol. 3, Springer Singapore, (2017)

• A. Govorov, P.L. Hernandez-Martinez, H.V. Demir, *Understanding and Modeling Förster-type Resonance Energy Transfer (FRET) - Introduction to FRET*, Vol. 1, Springer Singapore, (2016)

• A. Onen, D. Kecik, E. Durgun, S. Ciraci, "GaN: From three- to two-dimensional single-layer crystal and its multilayer van der Waals solids", *Physical Review B*, 93, 085431-1--11 (2016)

• D. Kecik, E. Durgun, S. Ciraci, "Stability of single-layer and multilayer arsenene and their mechanical and electronic properties", *Physical Review B*, 94, 205409-1--9 (2016)

• D. Kecik, E. Durgun, S. Ciraci, "Optical properties of single-layer and bilayer arsenene phases", *Physical Review B*, 94, 205410-1--9 (2016)

• V.O. Ozcelik, E. Durgun, S. Ciraci, "Modulation of electronic properties in laterally and commensurately repeating graphene and boron nitride composite nanostructures", *J of Physical Chemistry*, 119, 13248-13256 (2015)

• V.O. Ozcelik, D. Kecik, E. Durgun, S. Ciraci, "Adsorption of group IV elements on graphene, silicene, germanene and stanene: Dumbbell formation", *J of Physical Chemistry C*, 119, 845-853 (2015)

• V.O. Ozcelik, O.U. Akturk, E. Durgun, S. Ciraci, "Prediction of a two-dimensional crystalline structure of nitrogen atoms", *Physical Review B*, 92, 125420-1--8 (2015)

• V.O. Ozcelik, E. Durgun, S. Ciraci, "New Phases of Germanene", *J of Physical Chemistry Letters*, 5, 2694-2699 (2014)

• F. Acar, S. Ayik, O. Yilmaz, A. Gokalp, "Growth of Spinodal Instabilities in Nuclear Matter. II. Asymmetric matter", *Physical Review C*, 92, 034605 (2015)

• O. Yilmaz, S. Ayik, F. Acar, A. Gokalp, "Growth of spinodal instabilities in nuclear matter", *Physical Review C*, 91, 014605-1--8 (2015)

• S. Ayik, O. Yilmaz, B. Yilmaz, A.S. Umar, A. Gokalp, G. Turan, D. Lacroix, "Quantal description of nucleon exchange in a stochastic mean-field approach", *Physical Review C*, 91, 054601-1--5 (2015)

• A. Kouchaki, O. Gulseren, N. Hadipour, M. Mirzaei, "Relaxations of fluorouracil tautomers by decorations of fullerene-like SiCs: DFT studies", *Physics Letters A*, 380, 2160-2166 (2016)

• C. Sevik, D. Cakir, O. Gulseren, F.M. Peeters, "Peculiar Piezoelectric Properties of Soft Two-Dimensional Materials", *J of Physical Chemistry C*, 120, 13948-13953 (2016)

• D. Cakir, C. Sevik, O. Gulseren, F.M. Peeters, "Mo2C as a high capacity anode material: a first-principles study", *J of Materials Chemistry A*, 4, 6029-6035 (2016)

• Fatima, I.C. Oguz, D. Cakir, S. Hossain, R. Mohottige, O. Gulseren, N. Oncel, "On the structural and electronic properties of Ir-silicide nanowires on Si(001) surface", *J Applied Physics*, 120, 095303-1--6 (2016)

• M. Mirzaei, O. Gulseren, N. Hadipour, "DFT explorations of quadrupole coupling constants for planar 5-fluorouracil pairs", *Computational and Theoretical Chemistry*, 1090, 67-73 (2016)

• S. Niaz, A.D. Zdetsis, E.N. Koukaras, O. Gulseren, I. Sadiq, "Systematic spatial and stoichiometric screening towards understanding the surface of ultrasmall oxygenated silicon nanocrystal", *Applied Surface Science*, 387, 771-778 (2016)

• H. Unal, D. Gunceler, O. Gulseren, S. Ellialtioglu, E. Mete, "Hybrid functional calculated optical and electronic structures of thin anatese TiO2 nanowires with organic dye adsorbates", *Applied Surface Science*, 354, 437-442 (2015)

• H. Unal, D. Gunceler, O. Gulseren, S. Ellialtioglu, E. Mete, "Anatese TiO2 nanowires functionalized bu organic sensitizers for solar cells: A screened Coulomb hybrid density functional study", *J Applied Physics*, 118, 194301-1--10 (2015)

• M. Mirzaei, O. Gulseren, "DFT studies of CNT-functionalized uracil-acetate hybrids", *Physica E*, 73, 105-109 (2015)

• H. Unal, O. Gulseren, S. Ellialtioglu, E. Mete, "Electronic structures and optical spectra of thin anatese TiO2 nanowires through hybrid densşty functional and quasiparticle calculations", *Physical Review B*, 89, 205127-1--7 (2014)

• H. Unal, D. Gunceler, O. Gulseren, S. Ellialtioglu, E. Mete, "Range-Separated Hybrid Density Functional Study of Organic Dye Sensitizers on Anatase TiO2 Nanowires", *J of Physical Chemistry C*, 118, 24776-24783 (2014)

• J. Jilili, A. Abdurahman, O. Gulseren, U. Schwingenschlogl, "Non-covalent functionalization of single wall carbon nanotubes and graphene by a conjugated polymer", *Applied Physics Letters*, 105, 013103-1--5 (2014)

• B. Hetenyi, B. Tanatar, L.M. Martelo, "Variational Monte Carlo method for the Baeriswyl wave function: Application to the one-dimensional bosonic Hubbard model", *Physical Review B*, 93, 174518-1--6 (2016)

• B. Dora, M. Haque, F. Pollman, B. Hetenyi, "Quantum quench in two dimensions using the variational Baeriswyl wave function", *Physical Review B*, 93, 115124-1--6 (2016)

• F.N. Unal, B. Hetenyi, M.O. Oktel, "Impurity coupled to an artificial magnetic field in a Fermi gas in a trap", *Physical Review A,* 91, 053625-1--11 (2015)

• B. Hetenyi, "Drude Weight, Meissner Weight, Rotational Inertia of Bosonic Superfluid: How Are They Distinguished?", *J of Phys Soc Japan*, 83, 034711-1--7 (2014)

• B. Hetenyi, M. Yahyavi, "Cumulants associated with geometric phases", *EPL*, 105, 40005-1--5 (2014)

• C. Kerse, H. Kalaycioglu, P. Elahi, B. Cetin, D.K. Kesim, O. Akcaalan, S. Yavas, M.D. Asik, B. Oktem, H. Hoogland, R. Holzwarth, F.O. Ilday, "Ablation-cooled material removal with ultrafast bursts of pulses", *Nature*, 537, 84-88 (2016)

• E. Aytac-Kipergil, A. Demirkiran, N. Uluc, S. Yavas, T. Kayikcioglu, S. Salman, S.G. Karamuk, F.O. Ilday, M.B. Unlu, "Development of a Fiber Laser with Independently Adjustable Properties for Optical Resolution Photoacoustic Microscopy", *Scientific Reports*, 6, 38674-1--10 (2016)

• I. Gnilitskyi, F. Rotundo, C. Martini, I. Pavlov, S. Ilday, E. Work, F.O. Ilday, L. Orazi, "Nano patterning of AISI 316L stainless steel with Nonlinear Laser Lithography: Sliding under dry and oil-lubricated conditions", *Tribology International*, 99, 67-76 (2016)

• J.S. Freehan, F.O. Ilday, W.S. Broclesby, J.H.V. Price, "Simulations and experiments showing the origin of multiwavelength mode locking in femtosecond, Yb-fiber lasers", *J of Optical Soc Am B*, 33, 1668-1676 (2016)

• R. Iegorov, T. Teamir, G. Makey, F.O. Ilday, "Direct control of mode-locking states of a fiber laser", *Optica*, 3, 1312-1316 (2016)

• S. Ilday, F.O. Ilday, R. Hubner, T.J. Prosa, I. Martin, G. Nogay, I. Kabacelik, Z. Mics, M. Bonn, D. Turcihovich, H. Toffoli, D. Friedrich, B. Schmidt, K-H. Heinig, R. Turan, "Multiscale Self-Assembly of Silicon Quantum Dots into an Anisotropic Three-Dimensional Random Network", *Nano Letters*, 16, 1942-1948 (2016)

• H. Kalaycioglu, O. Akcaalan, S. Yavas, Y.B. Eldeniz, F.O. Ilday, "Burst-mode Yb-doped fiber amplifier system optimized for low-repetition-rate operation", *J of Optical Soc Am B*, 32, 900-906 (2015)

• L. Orazi, La Gnilitskyi, I. Pavlov, A.P. Serro, S. Ilday, F.O. Ilday, "Nonlinear laser lithography to control surface properties of stainless steel", *CIRP Annals - Manufacturing Technology*, 64, 193-196 (2015)

• S. Yilmaz, P. Elahi, H. Kalaycioglu, F.O. Ilday, "Amplified spontaneous emission in high-power burst-mode fiber lasers", *J of Optical Soc Am B*, 32, 2462-2466 (2015)

• Z. Zhang, D. Popa, V.J. Wittwer, S. Milana, T. Hasan, Z. Jiang, A.C. Ferrari, F.O. Ilday, "All-fiber nonlinearity- and dispersion-managed dissipative soliton nanotube mode-locked laser", *Applied Physics Letters*, 17, 241107-1--4 (2015)

• H. Keskin, H. Altan, S. Yavas, F.O. Ilday, K. Eken, A.B. Sahin, "Development of a rapid-scan fiber-integrated terahertz spectrometer", *Optical and Quantum Electronics*, 46, 495-503 (2014)

• I. Pavlov, E. Dulgergil, E. Ilbey, F.O. Ilday, "Diffraction-limited, 10-W, 5-ns, 100-kHz, all fiber laser at 1.55 um", *Optics Letters*, 39, 2695-2698 (2014)

• K. Gurel, P. Elahi, L. Budunoglu, C. Senel, P. Paltani, F.O. Ilday, "Prediction of pulse-to-pulse intensity fluctuation characteristics of high power ultrafast fiber amplifiers", *Applied Physics Letters*, 105, 011111 (2014)

• P. Elahi, S. Yilmaz, Y.B. Eldeniz, F.O. Ilday, "Generation of picosecond pulses directly from a 100 W, burst-mode, doping-managed Yb-doped fiber amplifier", *Optics Letters*, 39, 236-239 (2014)

• E.O. Polat, H.B. Uzlu, O. Balci, N. Kakenov, E. Kovalska, C. Kocabas, "Graphene-Enabled Optoelectronics on Paper", *Acs Photonics*, 3, 964-971 (2016)

• I. Baylam, O. Balci, N. Kakenov, C. Kocabas, A. Sennaroglu, "Graphene-gold supercapacitor as a voltage controlled saturable absorber for femtosecond pulse generation", *Optics Letters*, 41, 910-913 (2016)

• M.T. Camci, P. Aydogan, B. Ulgut, C. Kocabas, S. Suzer, "XPS enables visualization of electrode potential screening in an ionic liquid medium with temporal- and lateral-resolution", *Physical Chemistry Chemical Physics*, 18, 28434-28440 (2016)

• N. Kakenov, O. Balci, O. Salihoglu, S.H. Hur, S. Balci, C. Kocabas, "Weighing graphene with QCM to monitor interfacial mass changes", *Applied Physics Letters*, 109, 053105-1--6 (2016)

• N. Kakenov, O. Balci, T. Takan, V.A. Ozkan, H. Altan, C. Kocabas, "Observation of Gate-Tunable Coherent Perfect Absorption of Terahertz Radiation in Graphene", *Acs Photonics*, 3, 1531-1535 (2016)

• O. Salihoglu, N. Kakenov, O. Balci, S. Balci, C. Kocabas, "Graphene as a Reversible and Spectrally Selective Fluorescence Quencher", *Scientific Reports*, 6, 33911-1--7 (2016)

• O.Ozdemir, A.M. Aygar, O. Balci, C. Kocabas, H. Caglayan, E. Ozbay, "Enhanced tunability of V-shaped plasmonic structures using ionic liquid gating and grapheme", *Carbon*, 108, 515-520 (2016)

• P. Aydogan, E.O. Polat, C. Kocabas, S. Suzer, "X-ray photoelectron spectroscopy for identification of morphological defects and disorders in graphene devices", *J of Vacuum Science and Technology A*, 34, 041516-1--5 (2016)

• P. Aydogan, O. Balci, C. Kocabas, S. Suzer, "Monitoring the operation of a graphene transistor in an integrated circuit by XPS", *Organic Electronics*, 37, 178-182 (2016)

• S. Balci, O. Balci, N. Kakenov, F.B. Atar, C. Kocabas, "Dynamic tuning of plasmon resonance in the visible using graphene", *Optics Letters*, 41, 1241-1243 (2016)

• E. Karademir, S. Balci, C. Kocabas, A. Aydinli, "Lasing in a Slow Plasmon Moire Cavity", *Acs Photonics*, 2, 805 (2015)

• E.O. Polat, O. Balci, N. Kakenov, H.B. Uzlu, C. Kocabas, R. Dahiya, "Synthesis of Large Area Graphene for High Performance in Flexible Optoelectronic Devices", *Scientific Reports*, 5, 167441-1--10 (2015)

• F. Canbaz, N. Kakenov, C. Kocabas, U. Demirbas, A. Sennaroglu, "Graphene mode-locked Cr:LiSAF laser at 850nm", *Optics Letters*, 40, 4110-4113 (2015)

• N. Kakenov, O. Balci, E. Polat, H. Altan, C. Kocabas, "Broadband terahertz modulators using self-gated graphene capacitors", *J of the Optical Society of America B - Optical Physics*, 32, 1861-1866 (2015)

• N. Kakenov, T. Takan, V.A. Ozkan, O. Balci, E. Polat, H. Altan, C. Kocabas, "Graphene-enabled electrically controlled terahertz spatial light modulators", *Optics Letters*, 40, 1984-1987 (2015)

• O. Balci, O. E.O. Polat, N. Kakenov, C. Kocabas, "Graphene-enabled electrically switchable radar-absorbing surfaces", *Nature Communications*, 6, 6628-1--9 (2015)

• S. Balci, C. Kocabas, "Ultra hybrid plasmonics: strong coupling of plexcitons with plasmon polaritons", *Optics Letters*, 40, 3424-3427 (2015)

• S. Balci, E. Karademir, C. Kocabas, "Strong coupling between localized and propagating plasmon polaritons", *Optics Letters*, 40, 3177-3180 (2015)

• E. Karademir, S. Balci, C. Kocabas, A. Aydinli, "Plasmonic band gap engineering of plasmon-exciton coupling", *Optics Letters*, 39, 5697-5700 (2014)

• E. Karademir, S. Balci, C. Kocabas, A. Aydinli, "Plexcitonic crystals: a tunable platform for light-matter interactions", *Optics Express*, 22, 21912 (2014)

• E. Tunkara, C. Albayrak, E.O. Polat, C. Kocabas, O. Dag, "Highly Proton Conducting Phosphoric Acid-Nonionic Surfactant Lyotropic Liquid Crystalline Mesophases and Application in Graphene Optical Modulators", *ACS Nano*, 8, 11007-11012 (2014)

• E.O. Polat, O. Balci, C. Kocabas, "Graphene based flexible electrochromic devices", *Scientific Reports*, 4, 6484-1--8 (2014)

• M.N. Baylam, S. Cizmeciyan, S. Ozharar, E.O. Polat, C. Kocabas, A. Sennaroglu, "Femtosecond pulse generation with voltage-controlled graphene saturable absorber", *Optics Letters*, 39, 5180-5183 (2014)

• S. Balci, C. Kocabas, B. Kucukoz, A. Karatay, E. Akhuseyin, H.G. Yaglioglu, A. Elmali, "Probing ultrafast energy transfer between excitons and plasmons in the ultrastrong coupling regime", *Applied Physics Letters*, 105, 051105-1--5 (2014)

• S. Balci, E. Karademir, C. Kocabas, A. Aydinli, "Absorption enhancement of molecules in the weak plasmon-exciton coupling regime", *Optics Letters*, 39, 4994-4997 (2014)

• B. Renklioglu, M.O. Oktel, B. Tanatar, "Energy transfer in a bilayer Fermi gas in the non-linear regime", *Physica Status Solidi B* (Forthcoming)

• F.N. Unal, M.O. Oktel, "Pairing of Fermions with Unequal Effective Charges in an Artificial Magnetic Field", *Physical Review Letters*, 116, 045305-1--5 (2016)

• F.N. Unal, E.J. Mueller, M.O. Oktel, "Nonequilibrium fractional Hall response after a topological quench", *Physical Review A*, 94, 053604-1--7 (2016)

• A. Keles, M.O. Oktel, "Mott transition in a two-leg Bose-Hubbard ladder under an artificial magnetic field", *Physical Review A*, 91, 013629-1--9 (2015)

• F.Yilmaz, N. Unal, M.O. Oktel, "Evolution of the Hofstadter butterfly in a tunable optical lattice", *Physical Review A*, 91, 063628-1--10 (2015)

• N. Ghazanfari, A. Keles, M.O. Oktel, "Vortex lattices in dipolar two-compenent Bose-Einstein condensates", *Physical Review A*, 89, 025601-1--5 (2014)

• E. Arslan, M.K. Ozturk, E. Tiras, T. Tiras, S. Ozcelik, E. Ozbay, "Buffer effects on the mosaic structure of the HR-GaN grown on 6H-SiC substrate by MOCVD", *J of Mater Sci: Mater Electron* (Forthcoming)

• E. Ozgun, E. Ozbay, H. Caglayan, "Tunable Zero-Index Photonic Crystal Waveguide for Two-Qubit Entanglement Detection", *Acs Photonics* (Forthcoming)

• H. Hajian, H. Caglayan, E. Ozbay, "Long-range Tamm surface plasmons supported by graphene-dielectric metamaterials", *J Applied Physics* (Forthcoming)

• H. Koc, S. Palaz, A.M. Mamedov, E. Ozbay, "Optical, Electronic and Elastic Properties of Some A5B6C7 Ferroelectrics (A=Sb, Bi; B=S, Se; C=I, Br, Cl): first principle calculation", *Optical Properties of Ferroelectrics* (Forthcoming)

• O. Oltulu, A.M. Mamedov, E. Ozbay, "Wave Propagation and Acoustic Band Gaps of Two-Dimensional Liquid Crystal/ Solid Phononic Crystals", *Applied Physics A Materials Science & Processing* (Forthcoming)

• S. Palaz, H. Koc, H. Ozisik, E. Deligoz, A.M. Mamedov, E. Ozbay, "Optical and Magnetic Properties of Some XMnSb and Co2YZ Compounds: ab initio calculations", *Physica Status Solidi C* (Forthcoming)

• S. Palaz, O. Oltulu, A.M. Mamedov, E. Ozbay, "A5B6C7 Ferroelectrics as Novel Materials for Phononic Crystals", *Ferroelectrics* (Forthcoming)

• S. Simsek, S. Palaz, C. Akhundov, A.M. Mamedov, E. Ozbay, "AIBIIICVI2 (A=Cu, Ag; B=Ga, In; C=S, Se, Te) Based Photonic Crystal Superlattices: Optical Properties", *Physica Status Solidi C* (Forthcoming)

• A.E. Serebryannikov, A. Lakhtakia, E. Ozbay, "Single and cascaded, magnetically controllable metasurfaces as terahertz filters", *J of the Optical Society of America B - Optical Physics*, 33, 834-841 (2016)

• A.E. Serebryannikov, E. Colak, A. Petrov, P.V. Usik, E. Ozbay, "Multifrequency spatial filtering: A general property of two-dimensional photonic crystals", *Photonics and Nanostructures*, 18, 1-9 (2016)

• A.E. Serebryannikov, E. Colak, T. Magath, E. Ozbay, "Two types of single-beam deflection and asymmetric transmission in photonic structures without interface corrugations", *J of Optical Soc Am A Optics*, 33, 2450-2458 (2016)

• E. Colak, A.E. Serebryannikov, P.V. Usik, E. Ozbay, "Diffraction inspired unidirectional and bidirectional beam splitting in defect-containing photonic structures without interface corrugations", *J Applied Physics*, 119, 193108-1--10 (2016)

• E. Kutlu, P. Narin, G. Atmaca, B. Sarikavak-Lisesivdin, S.B. Lisesivdin, E. Ozbay, "Effect of substitutional As impurity on electrical and optical properties of ß-Si3N4 structure", *Materials Research Bulletin*, 83, 128-134 (2016)

• H. Haijan, E. Ozbay, H. Caglayan, "Enhanced transmission and beaming via a zero-index photonic crystal", *Applied Physics Letters,* 109, 031105-1--6 (2016)

• H. Hajian, I.D. Rukhlenko, P.T. Leung, H. Caglayan, E. Ozbay, "Guided Plasmon Modes of a Graphene-Coated Kerr Slab", *Plasmonics*, 11, 735-741 (2016)

• H. Ozisik, S. Simsek, E. Deligoz, A.M. Mamedov, E. Ozbay, "Optical and electronic properties of orthorhombic and trigonal AXO3 (A=Cd, Zn; X=Sn, Ge): first principle calculation", *Ferroelectrics*, 498, 73-79 (2016)

• M. Copouroglu, D. Caliskan, H. Sezen, E. Ozbay, S. Suzer, "Location and Visualization of Working p-n and/or n-p Junctions by XPS", *Scientific Reports*, 6, 32482-1--9 (2016)

• M.C. Cakir, D. Caliskan, B. Butun, E. Ozbay, "Planar Indium Tin Oxide Heater for Improved Thermal Distribution for Metal Oxide Micromachined Gas Sensors", *Sensors-Basel*, 16, 1612-1--7 (2016)

• O. Oltulu, S. Simsek, A.M. Mamedov, E. Ozbay, "Topological insulator based locally resonant phononic crystals: Wave propagation and acoustic band gaps", *Ferroelectrics*, 499, 123-129 (2016)

• P. Narin, E. Kutlu, B. Sarikavak-Lisesivdin, S.B. Lisesivdin, E. Ozbay, "Electronic properties of Li-doped zigzag graphene nanoribbons", *Physica E,* 84, 543-547 (2016)

• S. Ardali, E. Tiras, E. Arslan, E. Ozbay, "Complementary and alternative technique for the determination of electron effective mass: quantum Hall effect", *Optoelectronics and Advances Materials-Rapid Communications*, 10, 647-650 (2016)

• S. Corekci, S. Dugan, M. K. Ozturk, S. S. Cetin, M. Cakmak, S. Ozcelik, E. Ozbay, "Characterization of AlInN/AlN/GaN Heterostructures with Different AlN Buffer Thickness", *J of Electronic Materials*, 45, 3278-3284 (2016)

• Y. Ozturk, A.E. Yilmaz, E. Ozbay, "Conversion from constitutive parameters to dispersive transmission line parameters for multi-band metamaterials", *Waves in Random and Complex Media*, 26, 211-223 (2016)

• Z. Ozer, A.M. Mamedov, E. Ozbay, "BaTiO3 and TeO2 based gyroscopes for guidance systems: FEM analysis", *Ferroelectrics*, 497, 15-23 (2016)

• A. Ceylan, A.K. Rumaiz, D. Caliskan, S. Ozcan, E. Ozbay, J.C. Woicik, "Effects of rapid thermal annealing on the structural and local atomic properties of ZnO:Ge nanocomposite thin films", *J Applied Physics*, 117, 105303:1-5 (2015)

• A.E. Serebryannikov, M. Beruete, M. Mutlu, E. Ozbay, "Multiband one-way polarization conversion in complementary split-ring resonator based structures by combining chirality and tunneling", *Optics Express*, 23, 13517-13529 (2015)

• A.E. Serebryannikov, M. Mutlu, E. Ozbay, "Dielectric inspired scaling of polarization conversion subwavelength resonances in open ultrathin chiral structures", *Applied Physics Letters*, 107, 221907:1-5 (2015)

• A.E. Serebryannikov, S. Nojima, K.B. Alici, E. Ozbay, "Effect of in-material losses on terahertz absorption, transmission, and reflection in photonic crystals made of polar dielectrics", *J Applied Physics*, 118, 133101-1--11 (2015)

• B. Sarikavak-Lisesivdin, S.B. Lisesivdin, N. Balkan, G. Atmaca, P. Narin, H. Cakmak, E. Ozbay, "Energy Relaxation

of Electrons in InGaN Quantum Wells", *Metallurgical and Materials Transactions A*, 46, 1565-1570 (2015)

• D. Caliskan, H. Sezen, E. Ozbay, S. Suzer, "Chemical Visualization of a GaN p-n junction by XPS", *Scientific Reports*, 5, 14091-1--7 (2015)

• F.T. Gundogdu, A.E. Serebryannikov, A.O. Cakmak, E. Ozbay, "Asymmetric transmission in prisms using structures and materials with isotropic-type dispersion", *Optics Express*, 23, 24120-24132 (2015)

• H. Koc, S. Simsek, A.M. Mamedov, E. Ozbay, "Optical Properties of the Narrow-Band Ferroelectrics: First Principle Calculations", *Ferroelectrics*, 483, 43-52 (2015)

• I.K. Durukan, O. Bayal, G. Kurtulus, Y. Bas, A. Gultekin, M.K. Ozturk, S. Corekci, M. Tamer, S. Ozcelik, E. Ozbay, "Examination of the temperature related structural defects of InGaN/GaN solar cells", *Superlattices and Microstructures*, 86, 379-389 (2015)

• M. Turduev, M. Botey, I. Giden, R. Herrero, H. Kurt, E. Ozbay, K. Staliunas, "Two-dimensional complex parity-time-symmetric photonic structures", *Physical Review A*, 91, 023825:1-5 (2015)

• N.A. Cinel, S. Cakmakyapan, S. Butun, G. Ertas, E. Ozbay, "E-Beam lithography designed substrates for surface enhanced Raman spectroscopy", *Photonics and Nanostructures*, 15, 109-115 (2015)

• P. Aydogan, E. Arslan, S. Cakmakyapan, E. Ozbay, W. Strupinski, S. Suzer, "Voltage contrast X-ray photoelectron spectroscopy reveals graphene-substrate interaction in graphene devices fabricated on the C- and Si- faces of SiC", *Applied Physics Letters*, 107, 121603-1--5 (2015)

• S. Simsek, H. Koc, S. Palaz, O. Oltulu, A.M. Mamedov, E. Ozbay, "Dynamic Nonlinear Optical Processes in Some Oxygen-Octahedra Ferroelectrics: First Principle Calculations", *Ferroelectrics*, 483, 26-42 (2015)

• Z. Ozer, C. Kurtoglu, A.M. Mamedov, E. Ozbay, "Influence of Crown Margin Design on the Stress Distribution in Maxillary Canine Restored by All-Ceramic Crown: A Finite Element Analysis", *J of Korean Dent. Sci.*, 8, 28-35 (2015)

• A. Ilgaz, S. Gokden, R. Turk, A. Teke, S. Ozcelik, E. Ozbay, "Temperature dependent hot electron transport in slightly lattice mismatched AlInN/AlN/GaN heterostructures", *J of Optoelectronics and Advanced Materials*, 16, 1008-1014 (2014)

• A.E. Serebryannikov, E. Ozbay, S. Nojima, "Asymmetric transmission of terahertz waves using polar dielectrics", *Optics Express*, 22, 3075-3088 (2014)

• A.E. Serebryannikov, A.O. Cakmak, E. Colak, H. Caglayan, H. Kurt, E. Ozbay, "Multiple slow waves and relevant transverse transmission and confinement in chirped photonic crystals", *Optics Express*, 22, 21806-21819 (2014)

• A.E. Serebryannikov, P. Lalanne, A.Y. Petrov, E. Ozbay, "Wide-angle reflection-mode spatial filtering and splitting with photonic crystal gratings and single-layer rod gratings", *Optics Letters*, 39, 6193-6196 (2014)

• A.E. Serebryannikov, S. Nojima, E. Ozbay, "One-way absorption of terahertz waves in rod-type and multilayer structures containing polar dielectrics", *Physical Review B*, 90, 235126 (2014)

• D. Caliskan, B. Butun, M.C. Cakir, S. Ozcan, E. Ozbay, "Low dark current and high speed ZnO metal-semiconductor-metal photodetector on SiO2/Si substrate", *Applied Physics Letters,* 105, 161108-1--3 (2014)

• D. Caliskan, B. Butun, S. Ozcan, E. Ozbay, "Spectral response modification of TiO2 MSM photodetector with an LSPR filter", *Optics Express*, 22, 14096-14100 (2014)

• D. Ramaccia, L.Di Palma, D. Ates, E. Ozbay, A. Toscano, F. Bilotti, "Analytical Model of Connected Bi-Omega: Robust Particle for the Selective Power Transmission Through Sub-Wavelength Apertures", *IEEE Trans on Antennas Propagation*, 62, 2093-2101 (2014)

• E. Arslan, S. Cakmakyapan, O. Kazar, S. Butun, S.B. Lisesivdin, N.A. Cinel, G. Ertas, S. Ardali, E. Tiras, J. Hassan, E. Janzen, E. Ozbay, "SiC Substrate Effects on Electron Transport in the Epitaxial Graphene Layer", *Electronic Materials Letters*, 10, 387-391 (2014)

• E. Gungor, T. Gungor, D. Caliskan, A. Ceylan, E. Ozbay, "Co doping induced structural and optical properties of sol-gel prepared ZnO thin films", *Applied Surface Science*, 318, 309-313 (2014)

• F. Karaomerlioglu, A.M. Mamedov, E. Ozbay, "Organic semiconductor-based photonic crystals for solar cell arrays: band gap and optical properties", *J of Modern Optics*, 61, 1754-1760 (2014)

• F. Karaomerlioglu, A.M. Mamedov, E. Ozbay, "Optical properties of metamaterial-based devices modulated by a liquid crystal", *Applied Physics A Materials Science & Processing,* 117, 611-619 (2014)

• F. Karaomerlioglu, S. Simsek, A.M. Mamedov, E. Ozbay, "Ferroelectric Based Photonic Crystal Cavity by Liquid Crystal Infiltration", *Integrated Ferroelectrics*, 158, 1-12 (2014)

• H. Cakmak, E. Arslan, M. Rudzinski, P. Demirel, H.E. Unalan, W. Strupinski, R. Turan, M. Ozturk, E. Ozbay, "Indium rich InGaN solar cells grown by MOCVD", *J of Mater Sci: Mater Electron*, 25, 3652-3658 (2014)

• H. Koc, H. Ozisik, E. Deligoz, A.M. Mamedov, E. Ozbay, "Mechanical, electronic and optical properties of Bi2S3 and Bi2Se3 compounds: first principle investigations", *J of Molecular Modelling*, 20, 2180-1--12 (2014)

• H. Sezen, E. Ozbay, S. Suzer, "XPS for probing the dynamics of surface voltage and photovoltage in GaN", *Applied Surface Science*, 323, 25-30 (2014)

• I.H. Giden, D. Yilmaz, M. Turduev, H. Kurt, E. Colak, E. Ozbay, "Theoretical and experimental investigations of asymmetric light transport in graded index photonic crystal waveguides", *Applied Physics Letters*, 104, 03116-1--5 (2014)

• R. Tulek, E. Arslan, A. Bayrakli, S. Turhan, S. Gokden, O. Duygulu, A.A. Kaya, T. Firat, A. Teke, E. Ozbay, "The effect of GaN thickness inserted between two AlN layers on the transport properties of a lattice matched AlInN/AlN/GaN/AlN/GaN double channel heterostructure", *Thin Solid Films*, 551, 146-152 (2014)

• S. Cakmakyapan, H. Caglayan, E. Ozbay, "Coupling enhancement of split ring resonators on graphene", *Carbon*, 80, 351-355 (2014)

• S. Cakmakyapan, L. Sahin, F. Pierini, E. Ozbay, "Resonance tuning and broadening of bowtie nanoantennas on graphene", *Photonics and Nanostructures*, 12, 199-204 (2014)

• S. Cakmakyapan, N.A. Cinel, A.O. Cakmak, E. Ozbay, "Validation of electromagnetic field enhamcement in near-infrared through Sierpinski fractal nanoantennas", *Optics Express*, 22, 19504-19512 (2014)

• S. Simsek, H. Koc, V.A. Trepakov, A.M. Mamedov, E. Ozbay, "Electron Spectroscopy and the Electronic Structure of KNbO3: First Principle Calculations", *Ferroelectrics*, 461, 99-105 (2014)

• S.B. Lisesivdin, G. Atmaca, E. Arslan, S. Cakmakyapan, O. Kazar, S. Butun, J. Ul-Hassan, E. Janzen, E. Ozbay, "Extraction and scattering analyses of 2D and bulk carriers in epitaxial graphene-on-SiC structure", *Physica E*, 63, 87-92 (2014)

• T. Asar, S. Ozcelik, E. Ozbay, "Structural and electrical characterizations of InxGa1-xAs/InP structures for infrared photodetector applications", *J Applied Physics,* 115, 104502-1--8 (2014)

• T. Ciuk, S. Cakmakyapan, E. Ozbay, P. Caban, K. Grodecki, A. Krajewska, I. Pasternak, J. Szmidt, W. Strupinski, "Step-edge-induced resistance anisotropy in quasi-free-standing bilayer chemical vapor deposition graphene on SiC", *J Applied Physics*, 116, 123708-1--9 (2014)

• Y. Bas, P. Demirel, N. Akin, C. Baskose, Y. Ozen, B. Kinaci, M.K. Ozturk, S. Ozcelik, E. Ozbay, "Microstructural defect properties of InGaN/GaN blue light emitting diode structures", *J of Mater Sci: Mater Electron*, 25, 3924-3932 (2014)

• Z. Li, M. Mutlu, E. Ozbay, "Highly asymmetric transmission of linearly polarized waves realized with a multilayered structure including chiral metamaterials", *J of Physics D*, 47, 075107-1--6 (2014)

• Z. Li, S. Cakmakyapan, B. Butun, C. Daskalaki, S. Tzortzakis, X. Yang, E. Ozbay, "Fano resonances in THz metamaterials composed of continuous metallic wires and split ring resonators", *Optics Express*, 22, 26572-26584 (2014)

• I. Sydi, S.H. Abedinpour, B. Tanatar, "Effective Mass Calculations for Two-Dimensional Gas of Dipolar Fermions", *J of Low Temperature Physics* (Forthcoming)

• B. Renklioglu, B. Tanatar, M.O. Oktel, "Heat transfer through dipolar coupling: Sympathetic cooling without contact", *Physical Review A*, 93, 023620-1--8 (2016)

• V. Moldoveanu, I.V. Dinu, R. Dragomir, B. Tanatar, "Light-hole exciton mixing and dynamics in Mn-doped quantum dots", *Physical Review B*, 93, 165421-9 (2016)

• V. Moldoveanu, I.V. Dinu, B. Tanatar, "Non-equilibrium transport and spin dynamics in single-molecule magnets", *Superlattices and Microstructures*, 87, 71-76 (2015)

• V. Moldoveanu, I.V. Dinu, B. Tanatar, C.P. Moca, "Quantum turnstile operation of single-molecule magnets", *New J of Physics*, 17, 083020-1--12 (2015)

• A. Khan, S. Basu, B. Tanatar, "Investigating dirty crossover through fidelity susceptibility and density of states", *Int J of Modern Physics B*, 28, 1450083-1--12 (2014)

• S.H. Abedinpour, R. Asgari, B. Tanatar, M. Polini, "Ground-state and dynamical properties of two-dimensional dipolar Fermi liquids", *Annals of Physics*, 340, 25-36 (2014)

• A. Argun, G. Volpe, "Better Stability with Measurement Errors", *J of Statistical Physics*, 163, 1477-1485 (2016)

• E. Pince, S.K.P. Velu, A. Callegari, P. Elahi, S. Gigan, G. Volpe, G. Volpe, "Disorder-mediated crowd control in an active matter system", *Nature Communications*, 7, 10907-1--8 (2016)

• M. Mijalkov, A. McDaniel, J. Wehr, G. Volpe, "Engineering Sensorial Delay to Control Phototaxis and Emergent Collective Behaviors", *Physical Review X*, 6, 011008-1--16 (2016)

• S. Paladagu, A. Callegari, Y. Tuna, L. Barth, S. Dietrich, A. Gmabassi, G. Volpe, "Nonadditivity of critical Casimir forces", *Nature Communications*, 7, 11403-1--8 (2016)

• A. Callegari, M. Mijalkov, B. Gokoz, G. Volpe, "Computational toolbox for optical tweezers in geometrical optics", *J of the Optical Society of America B - Optical Physics*, 32, 11-19 (2015)

• D. Alj, S. Paladagu, G. Volpe, R. Caputo, C. Umeton, "Polar POLICRYPS diffractive structures generate cylindrical vector beams", *Applied Physics Letters*, 107, 201101-1--4 (2015)

• F. Kummel, P. Shabestari, C. Lozano, G. Volpe, C. Bechinger, "Formatio, compression and surface melting of colloidal clusters by active particles", *Soft Matter*, 11, 6187-6191 (2015)

• G. Pesce, G. Volpe, O.M. Marago, P.H. Jones, S. Gigan, A. Sasso, G. Volpe, "A step-by-step guide to the realisation of advanced optical tweezers", *J of the Optical Society of America B - Optical Physics*, 32, 84-98 (2015)

• J.B. Pereira, S. Aarsland, C.E. Ginestet, A.V. Lebedev, L-O. Wahlund, A. Simmons, G. Volpe, E. Westman, "Aberrant cerebral network topology and mild cognitive impairment in early Parkinson's disease", *Human Brain Mapping*, 36, 2980-2995 (2015)

• M.S. Aporvari, F. Kheirandish, G. Volpe, "Optical trapping and control of a dielectric nanowire by a nanoaperture", *Optics Letters*, 40, 4807-4810 (2015)

• S. Hottovy, A. McDaniel, J. Wehr, G. Volpe, "The Smoluchowski-Kramers limit of stochastic differential equations with arbitrary state-dependent friction", *Communications in Mathematical Physics*, 336, 1259-1283 (2015)

• F. Kummel, B.ten Hagen, R. Wittkowski, D. Takagi, I. Buttinoni, R. Eichhorn, G. Volpe, H. Lowen, C. Bechinger, "Kummel et. Al Reply", *Physical Review Letters*, 113, 029802-1--2 (2014)

• G. Pesce, G. Volpe, G. Volpe, A. Sasso, "Long-term influence of fluid inertia on the diffusion of a Brownian particle", *Physical Review E*, 90, 042309-1--5 (2014)

• G. Volpe, S. Gigan, "Brownian Motion in a Speckle Light Field: Tunable Anomalous Diffusion and Selective Optical Manipulation", *Scientific Reports*, 4, 3936-1--7 (2014)

• G. Volpe, L. Kurtz, A. Callegari, G. Volpe, S. Gigan, "Speckle optical tweezers: micromanipulation with random light fields", *Optics Express*, 22, 18159-18167 (2014)

• G. Volpe, S. Gigan, G. Volpe, "Simulation of the active Brownian motion of a microswimmer", *American J of Physics*, 82, 659-664 (2014)

• K. Leonhardt, S. Wuster, J.M. Rost, "Orthogonal flexible Rydberg aggregates", *Physical Review A*, 93, 022708-1--13 (2016)

• M. Genkin, D.W. Schonleber, S. Wuster, A. Eisfeld, "Non-Markovian dynamics in ultracold Rydberg aggregates", *J of Physics B-Atomic Molecular & Optical Physics*, 49, 134001-1--7 (2016)

• A.F. Yesil, C. Yalabik, "Dynamical phase transitions in totally asymmetric simple exclusion processes with two types of particles under periodically driven boundary conditions", *Physical Review E*, 93, 012123-1--7 (2016)

## Faculty Profile: Dr. F. Ömer İlday, Associate Professor, Department of Physics

F. Ömer İlday received a B.S. degree in theoretical physics from Boğaziçi University in 1998, and a Ph.D. from Cornell University. Following this, he did postdoctoral work in the Department of Electrical Engineering at the Massachusetts Institute of Technology (MIT) on a Research Laboratory of Electronics Fellowship. In 2005, he was named a research scientist at MIT; he joined the faculty of Bilkent University in 2006.

Dr. İlday was the first to propose the explicit management of the nonlinear dynamics of mode-locked lasers in order to improve their performance. (*J. Opt. Soc. Am. B, 2002*). This led to his invention of the similariton laser (*Phys. Rev. Lett., 2004*); in 2010, he invented the soliton-similariton laser (*Nature Photon., 2010*). He was also the first to propose the deliberate introduction of nonlinear feedback mechanisms into laser–material interactions. This approach has led to the invention of nonlinear laser lithography (*Nature Photon., 2013*) and ablation-cooled laser material removal (*Nature, 2016*) as well as an ERC Consolidator Grant.

In addition to his academic activities, Dr. İlday is a cofounder of FiberLAST, Inc., which has received numerous technology awards and is the first and only company to design and manufacture industrial fiber lasers in Turkey. Dr. İlday's contributions to the optics community include serving as a topical editor for *Optics Letters*, as well as doing stints as a guest editor for various publications including *Optics Express*. He regularly serves as a referee for a number of scientific journals and has been a technical committee member for numerous international conferences. Dr. İlday has coauthored more than 65 journal articles and given more than 150 invited talks, which have received close to 3,000 citations. He has received awards and honors that include the Findlay Award from Cornell University (2004), the TÜBA Outstanding Young Scientist Award (2006), the TÜBİTAK Incentive Award (2011), the Turkish Physical Society's Engin Arık Science Award (2012), and membership in the Science Academy (2016).

## Faculty Profile: Dr. Oğuz Gülseren, Professor, Department of Physics

Oğuz Gülseren, chair of the Department of Physics, received a B.Sc. from the Electronics and Electrical Engineering Department of Middle East Technical University, Ankara, Turkey (1986), and an M.Sc. (1988) and a Ph.D. (1992) in physics from Bilkent University. He went on to work at SISSA (1992 to 1995) and ICTP (1994 to 1995) in Italy, Bath University in the UK (1995 to 1998), and, in the USA, the Carnegie Institution of Washington (1998 to 1999), and the University of Pennsylvania and NIST (1999 to 2002). He joined the Bilkent University Department of Physics in 2002.

Prof. Gülseren's current research interests include properties of nanostructures such as graphene, nanotubes, and nanowires, novel 2D materials, theory of self-assembly and self-organization, dye-sensitized and perovskite solar cells, atomic-scale friction, and biomimetic adhesion from first principles calculations. He has coauthored around 85 refereed papers, and received the İstanbul University Science Award (2002), the TÜBİTAK-TWAS (Third World Academy of Science) Young Scientist Award (2003), and the TÜBİTAK Science Award (2016). He was an associate member of the Abdus Salam International Center for Theoretical Physics (ICTP) in Trieste (Italy) from 2005 to 2010, an associate member of the Turkish Academy of Sciences (TÜBA) from 2006 to 2012, and has been a full member of the Science Academy (İstanbul) since 2012.

Contact:
Dr. Oğuz Gülseren
(Department Chair)
Phone : +90 312 290 1937
Fax : +90 312 266 4579
gulseren@fen.bilkent.edu.tr
phys.bilkent.edu.tr

# COMPUTER ENGINEERING

The Department of Computer Engineering offers M.S. and Ph.D. degree programs with the possibility of specialization in various areas of research in the field. Current research areas are artificial intelligence, logic, computer vision, data mining, machine learning, pattern recognition, big data, data stream processing systems, data-intensive distributed systems, privacy enhancing technologies, applied cryptography, network and data security, recommender systems, bioinformatics, computational biology, genomics, biological networks, database systems, distributed database systems, object-oriented systems, information storage and retrieval, computer graphics, physically based animation, ray tracing, radiosity, user interfaces, image analysis, parallel processing, parallel algorithm design, task assignment, simulation of various applications on multicomputer architectures, multicores and manycores, cloud computing, high-performance computing, parallel methods for scientific computing, computer networks, mobile and wireless networking, combinatorial algorithms, graph theory, graph drawing, graph coloring, computational geometry, graph visualization, capacity planning for web services, and performance modeling.

## FACULTY

**VAROL AKMAN**, Professor. Ph.D., Electrical, Computer, and Systems Engineering, Rensselaer Polytechnic Institute, 1985. *Artificial intelligence, logic, philosophy of language, pragmatics, the Internet and society.*

**SELİM AKSOY**, Associate Professor. Ph.D., Electrical Engineering, University of Washington, 2001. *Computer vision, statistical and structural pattern recognition, machine learning, data mining.*

**CAN ALKAN**, Assistant Professor. Ph.D., Computer Science, Case Western Reserve University, 2005. *Bioinformatics, genomics, computational biology.*

**ERMAN AYDAY**, Assistant Professor. Ph.D., Electrical and Computer Engineering, Georgia Institute of Technology, 2011. *Security, privacy, big data analytics.*

**CEVDET AYKANAT**, Professor and Associate Provost. Ph.D., Electrical and Computer Engineering, Ohio State University, 1988. *Parallel computing, parallel scientific computing, parallel computer graphics applications, parallel data mining, combinatorial aspects of scientific/parallel computing, hypergraph-partitioning and load balancing.*

**MEHMET BARAY**, Professor. Ph.D., Electrical Engineering and Computer Science, University of California, Berkeley, California, 1970. *Computer architecture, parallel processing.*

**FAZLI CAN**, Visiting Professor. Ph.D., Computer Engineering, Middle East Technical University, 1985. *Information retrieval, data mining.*

**R. GÖKBERK CİNBİŞ**, Assistant Professor. Ph.D., Computer Science, Université de Grenoble, 2014. *Computer vision and machine learning, statistical image models, deep learning, weakly supervised learning.*

**A. ERCÜMENT ÇİÇEK**, Assistant Professor. Ph.D., Computer Science, Case Western Reserve University, 2013. *Bioinformatics, Computational Biology, Biological Network Analyses, Machine Learning.*

**LORİ RUSSELL DAĞ**, Instructor. M.S., Computer Engineering, Atılım University, 2006. *Object oriented programming, computer applications, computer science education.*

**DAVID DAVENPORT**, Lecturer. Ph.D., Electronic and Electrical Engineering, University of Birmingham, 1980. *Artificial intelligence, philosophy of information and mind, computers in education and learning, the Internet and society, information retrieval.*

**AYNUR DAYANIK**, Instructor. Ph.D., Computer Science, Rutgers University, 2006. *Machine learning, data mining, information retrieval, text mining, bioinformatics.*

**TUĞRUL DAYAR**, Professor. Ph.D., Computer Science, North Carolina State University, Raleigh, 1994. *Performance modeling and analysis, scientific computing (especially numerical linear algebra for stochastic matrices), bioinformatics, computer networks.*

**ÇİĞDEM GÜNDÜZ DEMİR**, Associate Professor. Ph.D., Computer Science, Rensselaer Polytechnic Institute, 2005. *Computational biology, machine learning, pattern recognition, medical image analysis, computer vision and information retrieval.*

**UĞUR DOĞRUSÖZ**, Professor. Ph.D., Computer Science, Rensselaer Polytechnic Institute, 1995. *Information visualization, bioinformatics, and graph algorithms.*

**HAKAN FERHATOSMANOĞLU**, Professor. Ph.D., Computer Science, University of California, Santa Barbara, 2001. *Database systems, data mining, bioinformatics.*

**BUĞRA GEDİK**, Associate Professor. Ph.D., Computer Science, Georgia Institute of Technology, College of Computing, 2006. *Data intensive distributed systems, distributed systems, data bases, and cloud computing.*

**UĞUR GÜDÜKBAY**, Professor. Ph.D., Computer Engineering and Information Science, Bilkent University, 1994. *Computer graphics (physically-based modeling crowd simulation, virtual and augmented reality), multimedia databases, and computational geometry.*

**H. ALTAY GÜVENİR**, Professor and Department Chair. Ph.D., Computer Engineering and Science, Case Western Reserve University, 1987. *Artificial intelligence, machine learning, data mining, big data.*

**İBRAHİM KÖRPEOĞLU**, Professor. Ph.D., Computer Science, University of Maryland, College Park, 2000. *Computer networks, mobile and wireless networks, distributed systems and algorithms, computer systems, cloud computing.*

**AYŞE SEMRA MUMCU**, Instructor. M.S., Electrical and Electronics Engineering, Middle East Technical University, 1990. *Computer architecture, technical computing.*

**HİLMİ ÖNCÜL**, Instructor. M.S., Computer Science, University of Wisconsin, 1971. *Computers and information processing.*

**MUSTAFA ÖZDAL**, Assistant Professor. Ph.D., Computer Science, University of Illinois at Urbana-Champaign, 2005. *High performance computing, parallel and heterogeneous computing, hardware/FPGA accelerators for big data applications.*

**BÜLENT ÖZGÜÇ**, Professor. Ph.D., Computer Science, University of Pennsylvania, USA, 1978. *Computer graphics, user interface design.*

**ÖZCAN ÖZTÜRK**, Associate Professor. Ph.D., Computer Science and Engineering, Pennsylvania State University, 2007. *On-chip multiprocessors, compiler optimizations, computer architecture, memory optimization, low-power system design, reliability.*

**İPEK SÖZEN**, Instructor. M.S., Computer Engineering, Middle East Technical University, 1989. *Programming languages, data structures.*

**ÖZNUR TAŞTAN**, Assistant Professor. Ph.D., Computer Science, Carnegie Mellon University, 2011. *Computational biology, bioinformatics, machine learning, data mining.*

**ÖZGÜR ULUSOY**, Professor and Associate Provost. Ph.D., Computer Science, University of Illinois at Urbana-Champaign, 1992. *Database systems, web information retrieval.*

**ASLI ÜSTÜNER**, Instructor. M.S., Mechanical Engineering, University of New Hampshire, 1993. *CAD design, technical computing.*

## MASTER OF SCIENCE IN COMPUTER ENGINEERING

**Admission:** All applicants are required to have a B.S. degree in computer engineering, computer science, or a related field of science or engineering. Students with a B.S. degree in an area other than computer engineering may be required to take certain undergraduate courses in order to acquire the necessary background in the field. Evaluation of applicants is based on their ALES (*Akademik Personel ve Lisansüstü Eğitimi Giriş Sınavı*/Academic Personnel and Postgraduate Education Entrance Examination) scores, past academic records, reference letters, and an interview. Applicants who are not Turkish citizens and Turkish citizen applicants who are residents of another country may take the GRE (Graduate Record Examination) instead of the ALES. All nonnative speakers of English are required to submit proof of satisfactory knowledge of English.

**Degree Requirements:** In addition to completing at least 21 credit units of course work, the M.S. degree candidate must prepare and successfully defend a thesis. The expected duration of study for the M.S. degree is 4 semesters; the maximum duration is 6 semesters.

## DOCTOR OF PHILOSOPHY IN COMPUTER ENGINEERING

**Admission:** All applicants are required to have a B.S. degree in computer engineering or a related field of science or engineering. Evaluation of applicants is based on their ALES (*Akademik Personel ve Lisansüstü Eğitimi Giriş Sınavı*/ Academic Personnel and Postgraduate Education Entrance Examination) scores, past academic records, reference letters, and an interview. Applicants who are not Turkish citizens and Turkish citizen applicants who are residents of another country may take the GRE (Graduate Record Examination) instead of the ALES. All nonnative speakers of English are required to submit proof of satisfactory knowledge of English.

**Degree Requirements:** The completion of 21 credit units of course work beyond the M.S. level is required. Ph.D. candidates must pass a qualifying exam, typically in their fourth semester, and then must prepare a dissertation proposal. Preparation and defense of a dissertation based on original research is the centerpiece of the program. The standard duration of study for the Ph.D. degree is 8 semesters for students who enter the program with an M.S. degree; the maximum duration is 12 semesters.

## COURSE DESCRIPTIONS

**CS 502 Algorithms II**
Minimum spanning trees: algorithms of Kruskal and Prim. Single-source shortest paths: Dijkstra's and Bellman- Ford algorithms, shortest paths in directed acyclic graphs. All-pairs shortest paths: Floyd-Warshall and Johnson's algorithms. Parallel algorithms: pointer jumping, CRCW versus EREW, Brent's theorem, prefix computation. Polynomials and the FFT. String matching: Rabin-Karp algorithm, string matching with finite automata, Knuth- Morris-Pratt and Boyer-Moore algorithms. Elementary computational geometry algorithms. Approximation algorithms: vertex-cover, traveling salesman and subset-sum problems.

**CS 510 Networked Entertainment**
Introduction to the key concepts involved with networked entertainment; concepts in generating, delivering and consuming multimedia content. Theory and principles in coding, packaging and securing multimedia data, with a focus on the methods for reliable and scalable transport over IP networks in the context of IPTV, video-on-demand and streaming applications. The best practices in network and operating system support for media transport, and the state-of-the-art in current deployments.

**CS 513 Implications of the Internet**
Basic concepts and history of the Internet. Origins of the information society. Access to information in the networked world. The Internet as a communications medium. Publishing on the Internet. Selling goods and services on the Internet. Entertainment on the Internet. Educational potential of the Internet. Security and privacy issues. Censorship and politics of the Internet. Tensions between local vs. global, individual vs. corporate, and democracy vs. authoritarianism in the context of Internet.

**CS 515 Mobile and Wireless Networking**
Wireless Link Characteristics, Wireless Media Access, Wireless and Mobile Network Architectures, Mobile Routing, Mobile IP, Transport Protocols over Wireless Networks, Wireless LANs, Bluetooth Technology and Applications, Wireless Cellular Networks, Ad-hoc Networks and Routing, Device and Service Discovery, QoS in Mobile Networks, Peer-to-Peer Networks and Applications.

**CS 527 Advances in Switching Networks**
Circuit switching and call models. Types of network connections. Unicast and multicast network models. Cellular permutation arrays. Rearrangeable networks. Benes and Waksman networks. Clos and Cantor Nonblocking

networks. Expanders, concentrators, superconcentrators, generalizers. Bassalygo-Pinsker networks. Generalized connectors.

**CS 528 Advances in Switching Networks II**
Packet switching models. Buffered concentrators. Buffered superconcentrators, generalizers. Buffered unicast networks. Buffered multicast networks. Packet routing and scheduling algorithms. Quantum information pro- cessing. Quantum packet switching.

**CS 531 Advances in Data Management Research**
High dimensional data management (indexing, similarity search, data analytics); bitmap indexing (compression, query processing), data streams, mining multimedia, time-series, and biological data.

**CS 533 Information Retrieval Systems**
Introduction to information storage and retrieval (IR). IR vs. DBMS. User perspective, search models, evaluation of IR systems. Formal IR models. Data structures and techniques including, inverted files, signature files, information filtering, clustering and cluster-based retrieval, hypertext and multimedia systems. IR and the Internet, browsing strategies, search engines, web robots and intelligent agents.

**CS 541 Chip Multiprocessors**
Introduction to chip multiprocessing (CMP), multicore and manycore architectures. Instruction level parallelism. Explicit parallelism: Shared instruction processors (SIMD) shared sequencer processors (VLIW), shared network processors (MPP), shared memory processors (SMP). The march to multicore and manycore: Power efficiency, DRAM access latency. Network interfaces: Network topologies, buses, switches, multistage networks, hyper- cubes. Parallel programming: PThreads, MPI, multicore programming, OpenMP. Parallel programming concepts: Coverage, granularity, locality. Graphics processing unit (GPU): Hardware overview, performance, software environment, programming models, GPU Memory, CUDA, OpenCL.

**CS 545 Fundamentals of Stream Processing**
Fundamental concepts of stream processing, data flow programming (static, dynamic, and nested composition), large-scale streaming application development (modularity, extensibility, distribution, debugging, and visualization), software architecture for streaming middleware, design principles and patterns for streaming applications (including non-functional topics such as parallelization, load balancing, load shedding, and fault tolerance), and basic stream processing and mining algorithms.

**CS 550 Machine Learning**
Introduction to basic machine learning concepts and algorithms. Bayesian decision theory. Decision trees. Artificial neural networks. Evaluation of classification algorithms. Unsupervised learning and clustering. Reinforcement learning. Genetic algorithms. Recent topics in machine learning. Ensemble learning. Cost-sensitive learning. Active learning. Deep learning.

**CS 551 Pattern Recognition**
Basics of statistical and structural pattern recognition. Feature extraction and selection. Bayesian decision theory. Parametric and non-parametric density estimation. Clustering. Unsupervised and supervised learning. Classifiers and discriminant functions. Ensemble methods. Syntactic pattern description. Applications.

**CS 553 Intelligent Data Analysis**
Differences between data and knowledge, assessing knowledge; Data analysis process, methods, tasks and tools; Practical data analysis; Data understanding, attribute understanding, data quality, data visualization, correlation analysis, outlier detection, missing values; Principles of modeling, model classes, fitting criteria and score functions, model fitting, types of errors; Data preparation, feature selection, dimensionality reduction, record selection, improving data quality; Use of machine learning and data mining techniques in intelligent data analysis.

**CS 557 Computational Systems Biology**
Short introduction to molecular biology and systems biology, gene; protein, function, biological data types; machine learning overview; analyzing and reconstructing biological networks, inferring protein signaling networks, inferring transcriptional regulatory networks, predicting host-pathogen networks; metabolic networks; regulatory motif finding; comparing and searching interaction networks, dynamical networks; annotating and predicting gene function.

**CS 559 Deep Learning**
Overview of machine learning and its applications. Loss functions, numerical optimization and back-propagation. Fundamentals of feedforward neural networks. Modern architectures and techniques for training deep networks. Convolutional neural networks: basics, visualization, and techniques for efficient spatial localization in images. Recurrent neural networks and their variants. Applications of recurrent neural networks in language and image understanding, and image captioning. Recent advances in generative models learning, generative adversarial networks and variational auto encoders. Unsupervised and self-supervised representation learning. Deep reinforcement learning.

**CS 564 Computational Geometry**
Algorithmic background, data structures, geometric preliminaries, models of computation. Geometric searching, point-location, problems, range-searching problems. Convex hulls, problem statement and lower bounds, con- vex hull algorithms in the plane, graham's scan, Jarvis's march, QUICKHULL techniques, dynamic convex hull, convex hull in 3D. Proximity problem, a collection of problems, a computational prototype: element uniqueness, lower bounds, the closets-pair problem: a divide-and-conquer approach, the Voronoi diagram, proximity problems solved by the Voronoi diagram triangulation, planar triangulations, Delaunay triangulation, intersections, application areas, planar applications: intersection of convex polygons, star-shaped polygons; intersection of line segments. 3D applications: intersection of 3D convex polyhedra; intersection of half-spaces.

**CS 565 Application of Computer Graphics**
Use of computer graphics in various engineering fields. Three dimensional modeling and representation. Color, shading and lighting methods. Representation of surfaces. Graphical databases, graphics standards. Hidden surface problem, motion and animation. Texture mapping, controlled deformations. Previous knowledge of computer graphics is required.

**CS 568 Advanced Topics in Computer Graphics**
Advanced topics in computer graphics. Physical simulation of natural phenomena. Cloth and membrane simulation. Hydrodynamics (fire and liquid) simulation and rendering. Motion capture. Deformation and fracture simulation. Particle systems.

**CS 573 Algorithms I**
Asymptotic notation. Divide and conquer: Strassen's algorithm for matrix multiplication, quicksort. Solving recurrences: substitution method, master method. Bounding summations. Randomized quicksort: analysis. Medians and order statistics. Heaps: heapsort, priority queues. Sorting in linear time. Dynamic programming: matrix-chain multiplication, longest common subsequence, O/1 Knapsack problem, resource allocation problem. Greedy algorithms: activity selection problem, Hufmann codes, task scheduling problem. Amortized analysis: aggregate, accounting and potential methods, dynamic tables.

**CS 577 Data Privacy**
Introduction to privacy, economics and incentives, crypto-based solution for privacy, hiding data from the database

user, hiding access patterns from the database owner, anonymous routing and TOR, privacy in online social networks, privacy in cellular and Wi-Fi networks, location privacy, privacy in e-cash systems, privacy in e-voting, genomic privacy.

**CS 586 Aspect-Oriented Software Development**
Advanced software design principles; separations of concerns; coupling and cohesion; software evolution problems; component-oriented software development; examples of crosscutting aspects; aspect-oriented programming using Aspect-J, Composition Filters, Hyper J, Cosmos and Demeter; aspect-oriented modeling; aspects at the requirements and architecture design level; reflection and delegation techniques; composition anomalies; language-based vs. framework-based AOP; interference of aspects

**CS 587 Model-Driven Software Development**
Software evolution problems, motivation for Model-Driven Software Development (MDSD), domain modeling, meta-modeling, model-driven architecture (MDA), model-driven engineering methods, model-to-text transformations, model-to-model transformations, domain specific languages, software factories, MDSD tools, Architecture- Driven Modernization (ADM), adaption strategies for setting up a model-driven approach, obstacles of MDSD.

**CS 590 Research Seminar I**
Presentation on the preliminary results of the graduate thesis work. Participation in the presentations given by other classmates.

**CS 599 Master's Thesis**

**CS 612 Algorithms for Electronic Design Automation**
Graph partitioning heuristics, floorplanning models and algorithms, simulated annealing, placement algorithms, routing topology generation, global routing, network flow formulation.

**CS 681 Advanced Topics in Computational Biology**
Methods for genomile analyses. Capillary sequencing and next generation sequencing. Read mapping, SNP, indel and structural variation discovery and genotyping. Genome assembly and scaffolding. RNA-RNA interactions.

**CS 683 Cloud Computing**
Cloud computing introduction, definition and types; fundamental tradeoffs and distributed algorithms, CAP theorem, consensus, Paxos; cloud computing platforms and infrastructures, datacenter networking, virtualization; algorithms, resource allocation, load-balancing, scheduling; distributed file systems, wide-area storage, NoSQL, replication; programming frameworks, MapReduce; practical systems, Dynamo, BigTable, Dryad, Hadoop; cloud computing providers, applications and services.

**CS 690 Research Seminar II**
Presentation on the preliminary results of the Ph.D. thesis work. Participation in the presentations given by other classmates.

**CS 699 Ph.D. Dissertation**

## SAMPLE OF RECENT PUBLICATIONS


• V. Akman, M.B. Senol, "The Truth about "It is True that..", *Pragmatics and Cognition* (Forthcoming)

• I.E. Sahin, V. Akman, "Analogy-making in situation theory", *Artificial Intelligence: New Research*, F. Columbus (Eds.), NY: Nova Science Publishers (Forthcoming)

• E. Mercan, S. Aksoy, L.G. Shapiro, D.L. Weaver, T.T. Brunye, J.G. Elmore, "Localization of Diagnostically Relevant Regions of Interest in Whole Slide Images: A Comparative Study", *Journal of Digital Imaging*, 29, 496-506 (2016)

• H.G. Akcay, S. Aksoy, "Automatic Detection of Compound Structures by Joint Selection of Region Groups from a Hierarchical Segmentation", *IEEE Trans on Geoscience and Remote Sensing*, 54, 3485-3501 (2016)

• C. Ari, S. Aksoy, "Detection of Compound Structures Using a Gaussian Mixture Model with Spectral and Spatial Constraints", *IEEE Trans on Geoscience and Remote Sensing*, 52, 6627-6638 (2014)

• J.C. Tilton, S. Aksoy, Y. Tarabalka, "Image Segmentation Algorithms for Land Categorization", *Remote Sensing Handbook: Vol 1: Remotely Sensed Data Charcterization, Classification, and Accuracies*, P.S. Thenkabail (Eds.), pp. 317-342, Francis & Taylor Group / CRC Press (2015)

• A.H. Freedman, R.M. Schweizer, D. O. Vecchyo, E. Han, B.W. Davis, I. Gronau, P.M. Silva, M. Galaverni, Z. Fan, P. Marx, B. Lorente-Galdos, O. Ramirez, F. Hormozdiari, C. Alkan, … , R.K. Wayne, J. Novembre, "Demographically-Based Evaluation of Genomic Regions under Selection in Domestic Dogs", *Plos Genetics*, 12, 1005851-1--23 (2016)

• C. Firtina, C. Alkan, "On genomic repeats and reproducibility", *Bioinformatics*, 32, 2243-2247 (2016)

• H. Xin, S. Nahar, R. Zhu, J. Emmons, G. Pekhimenko, C. Kingsford, Can Alkan, O. Mutlu, "Optimal seed solver: optimizing seed selection in read mapping", *Bioinformatics*, 32, 1632-1642 (2016)

• M.F. Cardone, P. D'Addabbo, Can Alkan, C. Bergamini, C.R. Catacchio, F. Anaclerio, G. Chiatante, A. Marra, G. Giannuzzi, R. Perniola, M. Ventura, D. Antonacci, "Inter-varietal structural variation in grapevine genomes", *The Plant Journal*, 88, 648-661 (2016)

• The Computational Pan - Genomics Consortium, … C. Alkan, "Computational pan-genomics: status, promises and challenges", *Briefings in Bionformatics* (Forthcoming)

• C. Kucuk, B. Jiang, X. Hu, W. Zhang, J. Chan, W. Xiao, N. Lack, C. Alkan, J. Williams, K. Avery, P. Kavak, A. Scuto, …., T. McKeithan, "Activating mutations of STAT5B and STAT3 in lymphomas derived from yS-T or NK cells", *Nature Communications*, 14, 6025:1-12 (2015)

• D. Lee, F. Hormozdiari, H. Xin, F. Hach, O. Mutlu, C. Alkan, "Fast and accurate mapping of Complete Genomics reads", *Methods*, 79, 3-10 (2015)

• H. Xin, J. Greth, J. Emmons, G. Pekhimenko, C. Kingsford, C. Alkan, O. Mutlu, "Shifted Hamming Distance: a fast and accurate SIMD-friendly filter to accelerate alignment verification in read mapping", *Bioinformatics*, 15, 1553-1560 (2015)

• O. Acar, E. Ozkurt, G. Demir, H. Sarac, C. Alkan, T. Esen, M. Somel, N.A. Lack, "Determining the origin of synchronous multifocal bladder cancer by exome sequencing", *BMC Genomics*, 15, 871 (2015)

• P. Kavak, B. Yuksek, S. Aksu, M.O. Kulukci, T. Gungor, F. Hach, S.C. Sahinalp, Turkish Human Genome Project, C. Alkan, M.S. Sagiroglu, "Robustness of massively parallel sequencing platforms", *Plos One*, 10, 0138259 (2015)

• P.H. Sudmant, T. Rausch, …, C. Alkan, …, The Genome Consortium, …, J.O. Korbel, "An integrated map of structural variation in 2.504 human genomes", *Nature*, 526, 75-81 (2015)

• C. Alkan, The 1000 Genomes Project Consortium, "A global reference for human genetic variation", *Nature*, 526, 98-74 (2015)

• C. Alkan, P. Kavak, M. Somel, O. Gokcumen, S. Ugurlu, C. Saygi, E. Dal, K. Bugra, T. Gungor, S.C. Sahinalp, N. Ozoren,

C. Bekpen, "Whole genome sequencing of Turkish genomes reveals functional private alleles and impact of genetic interactions with Europe, Asia and Africa", *BMC Genomics*, 15, 963-1--12 (2014)

• A.H. Freedman, I. Gronau, R.M. Schweizer, ..., C. Alkan, ...., T. Marques-Bonet, R.K. Wayne, J. Novembre, "Genome Sequencing Highlights the Dynamic Early History of Dogs", *Plos Genetics*, 10, 1004016-1--12 (2014)

• F. Hach, I. Sarrafi, F. Hormozdiari, C. Alkan, E.E. Eichler, S.C. Sahinalp, "mrsFAST-Ultra: a compact, SNP-aware mapper for high performance sequencing applications", *Nucleic Acids Research*, 42, 494-500 (2014)

• G. Tamazian, S. Simonov, P. Dobrynin, A. Makunin, A. Logachev, ..., C. Alkan, ..., S.J. O'Brien, "Annotated features of domestic cat-Felis catus genome", *GigaScience*, 3, 13 (2014)

• G.M. Dal, B. Erguner, M.S. Sagiroglu, B. Yuksel, O.E. Onat, C. Alkan, T. Ozcelik, "Early postzygotic mutations contribute to de novo variation in a healthy monozygotic twin pair", *J of Medical Genetics*, 51, 455-459 (2014)

• J. Huddleston, S. Ranade, M. Malig, F. Antonacci, M. Chaisson, L. Hon, P.H. Sudmant, ... , C. Alkan, ...., E.E. Eichler, "Reconstructing complex regions of genomes using long-read sequencing technology", *Genome Research*, 24, 688-696 (2014)

• M.J. Montague, G. Li, B. Gandolfi, R. Khan, B.L. Aken, ..., T. Marques-Bonet, C. Alkan, G.W.C. Thomas, ..., W.C. Warren, "Comparative analysis of the domestic cat genome reveals genetic signatures underlying feline biology and demiestication", *Proceedings of National Academy of Sciences USA*, 11, 17230-17235 (2014)

• M. Humbert, E. Ayday, A. Telenti, J.P. Hubaux, "Quantifying Interdependent Risks in Genomic Privacy", *ACM Trans on Privacy and Security* (Forthcoming)

• Z. Huang, E. Ayday, H. Lin, R.S. Aiyar, A. Molyneaux, Z. Xu, J. Fellay, L.M. Steinmetz, J-P. Hubaux, "A Privacy-Preserving Solution for Compressed Storage and Selective Retrieval of Genomic Data", *Genome Research* (Forthcoming)

• P.J. McLaren, J.L. Raisaro, A. Manel, M. Rotger, E. Ayday, I. Bartha, M.B. Delgado, Y. Vallet, H.F. Gunthard, M. Cavassini, H. Furrer, T. Doco-Lecompte, C. Mazolini, P. Schmid, C.Di Benedetto, A. Telenti, Swiss HIV Cohort Study, "Privacy-preserving genomic testing in the clinic: a model using HIV treatment", *Genetics in Medicine*, 18, 814-822 (2016)

• M. Naveed, E. Ayday, E.W. Clayton, J. Fellay, C.A. Gunter, J.P. Hubaux, B.A. Malin, X. Wang, "Privacy in the Genomic Era", *ACM Computing Surveys*, 48 (2015)

• E. Ayday, J.P. Hubaux, "Threats and Solutions for Genomic Data Privacy", *Medical Data Privacy Handbook*, A. Gkoulalas-Divanis, G. Loukides (Eds.), pp. 463-492, Springer (2015)

• O. Selvitopu, S. Acer, C. Aykanat, "A Recursive Hypergraph Bipartitioning Framework for Reducing Bandwidth and Latency Costs Simultaneously", *IEEE Trans on Parallel and Distributed Systems* (Forthcoming)

• F.S. Torun, M. Manguoglu, C. Aykanat, "Parallel minimum norm solution of sparse block diagonal column overlapped underdetermined systems", *ACM Trans Math Software*, 43, 31-1--21 (2017)

• O. Selvitopu, C. Aykanat, "Reducing latency cost in 2D sparse matrix partitioning models", *Parallel Computing,* 57, 1-24 (2016)

• S. Acer, O. Selvitopu, C. Aykanat, "Improving performance of sparse matrix dense matrix multiplication on large-scale parallel systems", *Parallel Computing*, 59, 71-96 (2016)

• O. Selvitopu, K. Akbudak, C. Aykanat, "Parallelization of Sparse Matrix Kernels for Big Data Applications", Resource Management for Big Data Platforms, Florin Pop, Joanna Kolodziej, Beniamino Di Martino (Eds.), pp. 367-382, Springer (2016)

• M.O. Karsavuran, K. Akbudak, C. Aykanat, "Locality-Aware Parallel Sparse Matrix-Vector and Matrix-Transpose-Vector Multiplication on Many-Core Processors", *IEEE Trans on Parallel and Distributed Systems*, 6, 1-14 (2015)

• R.O. Selvitopi, M.M. Ozdal, C. Aykanat, "A Novel Method for Scaling Iterative Solvers: Avoiding Latency Overhead of Parallel Sparse-Matrix Vector Multiplies", *IEEE Trans on Parallel and Distributed Systems,* 26, 632-645 (2015)

• E.K. Tabak, B.B. Cambazoglu, C. Aykanat, "Improving the Performance of Independent Task Assignment Heuristics MinMin, MaxMin and Sufferage", *IEEE Trans on Parallel and Distributed Systems,* 25, 1244-1256 (2014)

• K. Akbudak, C. Aykanat, "Simultaneous Input and Output Matrix Partitioning for Outer-product-parallel Sparse Matrix-Matrix Multiplication", *SIAM J on Scientific Computing*, 36, 568-590 (2014)

• V. Yazici, C. Aykanat, "Constrained Min-Cut Replication for K-Way Hypergraph Partitioning", *Informs Journal of Computing*, 36, 303-320 (2014)

• C. Toraman, F. Can, "A front-page news-selection algorithm based on topic modeling", *J of Information Science*, 41, 676-685 (2015)

• R.G. Cinbis, J. Verbeek, C. Schmid, "Weakly Supervised Object Localization with Multi-fold Multiple Instance Learning", *IEEE Trans on Pattern Analysis and Machine Intelligence*, 39, 189-203 (2017)

• A.E. Cicek, "k-shell decomposition reveals structural properties of gene co-expression network for neurodevelopment", *Turkish J of Biology* (Forthcoming)

• S. Battini, A. Imperiale, D. Taïeb, K. Elbayed, A.E. Cicek, F Sebag, L. Brunaud, I-J. Namer, "High-resolution magic angle spinning 1H nuclear magnetic resonance spectroscopy metabolomics of hyperfunctioning parathyroid glands", *Surgery*, 160, 384-394 (2016)

• S.J. Sanders, X. He, J. Willsey, …., A.E. Cicek, …., M.W. State, "Insights into autism spectrum disorder genomic architecture and biology from 71 risk loci", *Neuron,* 87, 1215-1233 (2015)

• X. He, A.E. Cicek, Y. Wang, M. Schulz, H.S. Le, Z. Bar-Joseph, "De-Novo Chip-Seq Analysis", *Genome Biology*, 16, 205:1-10 (2015)

• D. Davenport, "The Social Derivation of Technical Systems", *Handbook of Research in Socio-Technical Design*, B. Whitworth, A.de Aldo (Eds.), IBI Global

• T. Dayar, M.S. Orhan, "Steady-state Analysis of a Multi-class MAP/PH/c Queue with Acyclic PH Retrials", *J of Applied Probability* (Forthcoming)

• T. Dayar, M.C. Orhan, "Cartesian Product Partitioning of Multi-dimensional Reachable State Spaces", *Probability in the Engineering and Informational Sciences*, 30, 413-430 (2016)

• T. Dayar, M.C. Orhan, "On Vector-Kronecker Product Multiplication with Rectangular Factors", *SIAM J on Scientific Computing*, 37, 526-543 (2015)

• T. Dayar, *Analyzing Markov Chains using Kronecker Products: Theory and Applications*, New York: Springer, (2012)

• C.F. Koyuncu, E. Akhan, T. Ersahin, R. Cetin-Atalay, C. Gunduz-Demir, "Iterative h-minima-based marker-controlled watershed for cell nucleus segmentation", *Cytometry: Part A*, 89, 338-349 (2016)

• T. Gultekin, C.F. Koyuncu, C. Sokmensuer, C. Gunduz-Demir, "Two-tier tissue decomposition for histopathological image representation and classification", *IEEE Trans on Medical Imaging,* 34, 275-283 (2015)

• G. Olgun, C. Sokmensuer, C. Gunduz-Demir, "Local Object Patterns for Representation and Classification of Colon Tissue Images", *IEEE J of Biomedical and Health Informatics,* 18, 1390-1396 (2014)

• S. Arslan, E. Ozyurek, C. Gunduz-Demir, "A color and shape based algorithm for segmentation of white blood cells in peripheral blood and bone marrow images", *Cytometry: Part A*, 85, 480-490 (2014)

• B. Genc, U. Dogrusoz, "An Algorithm for Automated Layout of Process Description Maps Drawn in SBGN", *Bioinformatics*, 32, 77-84 (2016)

• J. Gao, J. Lindsay, S. Watt, I. Bahceci, …, U. Dogrusoz, T. Pugh, C. Sander, E. Cerami, N. Schultz, "The cBioPortal for cancer genomics and its application in precision oncology", *Cancer Research*, 76, 5277-5277 (2016)

• M. Sari, I. Bahceci, U. Dogrusoz, S.O. Sumer, B.A. Aksoy, O. Babur, E. Demir, "SBGNViz: a tool for visualization and complexity management of SBGN process description maps", *Plos One*, 10, 0128985 (2015)

• O. Babur, U. Dogrusoz, M. Cakir, B.A. Aksoy, N. Shultz, C. Sander, E. Demir, "Integrating biological pathways and genomic profiles with cHiBE 2", *BMC Genomics*, 15, 642-1--9 (2014)

• K. Bingol, B. Eravci, C.O. Ethemoglu, H. Ferhatosmanoglu, B. Gedik, "Topic-Based Influence Computation in Social Networks under Resource Constraints", *IEEE Trans on Services Computing* (Forthcoming)

• F. Bulut, M. Demirbas, H. Ferhatosmanoglu, "LineKing: Coffee Shop Wait-Time Monitoring Using Smartphones", *IEEE Trans on Mobile Computing*, 14, 2045-2058 (2015)

• I. Gur, M. Guvercin, H. Ferhatosmanoglu, "Scaling Forecasting Algorithms using Clustered Modeling", *VLDB Journal,* 24, 51-65 (2015)

• A. Turk, R.O. Selvitopi, H. Ferhatosmanoglu, C. Aykanat, "Temporal Workload-Aware Replicated Partitioning for Social Networks", *IEEE Trans on Knowledge and Data Engineering*, 26, 1-14 (2014)

• E. Eser, T. Can, H. Ferhatosmanoglu, "Div-BLAST: Diversification of Sequence Search Results", *Plos One*, 9 (2014)

• A.E. Sariyuce, B. Gedik, G. Jacques-Silva, K-L. Wu, U.V. Catalyurek, "SONIC: Streaming Overlapping Community Detection", *Data Mining and Knowledge Discovery*..

• B. Gedik, H.G. Ozsema, O. Ozturk, "Pipelined Fission for Stream Programs with Dynamic Selectivity and Partitioned State", *J of Parallel and Distributed Computing,* 96, 106-120 (2016)

• A.E. Sariyuce, B. Gedik, G. Jacques-Silva, K-L. Wu, U.V. Catalyurek, "Incremental k-core decomposition: Algorithms and evaluation", *VLDB Journal*, 25, 425-447 (2016)

• S. Schneider, B. Gedik, M. Hirzel, "Language Runtime and Optimizations in IBM Streams", *Bulletin of the IEEE Comp. Soc. Tech. Comm. On Data Eng.*, 38, 61-72 (2016)

• F. Basik, B. Gedik, H. Ferhatosmanoglu, M. Kalender, "S3-TM Scalable Streaming Short Text Matching", *VLDB Journal,* 24, 849-866 (2015)

• M. Dallachiesa, G. Jaque-Silva, B. Gedik, K-L. Wu, T. Palpanas, "Sliding windows over uncertain data streams", *Knowledge and Information Systems*, 45, 159-190 (2015)

• M.A. Abbasoglu, B. Gedik, H. Ferhatosmanoglu, "Aggregate Profile Clustering for Streaming Analytics", *Computer Journal*, 58, 2092-2108 (2015)

• R. Soule, B. Gedik, "RailwayDB: Adaptive Storage of Interaction Graphs", *VLDB Journal*..

• R. Soule, M. Hirzel, B. Gedik, R. Grimm, "River: An Intermediate Language for Stream Processing", *Software - Practice and Experience*..

• S. Schneider, M. Hirzel, B. Gedik, K-L. Wu, "Safe Data Parallelism for General Streaming", *IEEE Trans on Computers*, 64, 504-518 (2015)

• B. Gedik, R. Bordawekar, "Disk-based Management of Interaction Graphs", *IEEE Trans on Knowledge and Data Engineering*, 26, 2689-2702 (2014)

• B. Gedik, S. Schneider, M. Hirzel, K-L. Wu, "Elastic Scaling for Data Stream Processing", *IEEE Trans on Parallel and Distributed Systems*, 25, 1447-1463 (2014)

• M. Hirzel, R. Soute, S. Schneider, B. Gedik, R. Grimm, "A Catalog of Streaming Optimizations", *ACM Computing Surveys*, 46 (2014)

• H. Balci, U. Gudukbay, "Sun position estimation and tracking for virtual object placement in time-lapse videos", *Signal Image and Video Processing* (Forthcoming)

• S. Alipour, M. Ghodsi, U. Gudukbay, M. Golkari, "Appoximation algorithms for visibility computation testing over a terrain", *Applied Geomatics* (Forthcoming)

• F. Durupinar, U. Gudukbay, A. Aman, N.I. Badler, "Psychological Parameters for Crowd Simulation: from Audiences to Mobs", *IEEE Trans on Visualization and Computer Graphics*, 22, 2145-2159 (2016)

• S. Genc, M. Bastan, U. Gudukbay, V. Atalay, O. Ulusoy, "HandVR: a hand-gesture-based interface to a video retrieval system", *Signal Image and Video Processing*, 9, 1717-1726 (2015)

• N.C. Kiliboz, U. Gudukbay, "A Hand Gesture Recognition Technique for Human-Computer Interaction", *J of Visual Communication and Image Representation*, 28, 97-104 (2015)

• U. Gudukbay, S. Bayraktar, C. Koca, B. Ozguc, "Particle-based simulation of the interaction between fluid and knitwear", *Signal, Image and Video Processing*, 8, 415-422 (2014)

• C. Koca, U. Gudukbay, "A Hybrid Representation for Modeling, Iteractive Editing, and Real-time Visualization of Terrains with Volumetric Features", *Int J of Geographical Information Science*, 28, 1821-1847 (2014)

• E. Okuyan, U. Gudukbay, "BilKristal 2.0: A tool for pattern information extraction from crystal structures", *Computer Physics Communications*, 185, 442-443 (2014)

• E. Okuyan, U. Gudukbay, "Direct volume rendering of unstructured tetrahedral meshes using CUDA and OpenMP", *J of Supercomputing*, 67, 324-344 (2014)

• E. Okuyan, U. Gudukbay, C. Bulutay, K.H. Heinig, "MaterialVis: Material visualization tool using direct volume

and surface rendering techniques", *J of Molecular Graphics and Modelling*, 50, 50-60 (2014)

• U. Gultepe, U. Gudukbay, "Real-time Virtual Fitting with Body Measurement and Motion Smoothing", *Computers and Graphics*, 43, 31-43 (2014)

• E. Oto, S. Okutucu, D. Katircioglu-Öztürk, H.A. Güvenir, E. Karaagaoglu, M. Borggrefe, G. Breithardt, A. Goette, U. Ravens, G. Steinbeck, K. Wegscheider, A. Oto, P. Kirchhof, "Predictors of sinus rhythm after electrical cardioversion of atrial fibrillation: results from a data mining project on the Flec-SL trial data set", *EP Europace* (Forthcoming)

• S. Okutucu, D. Katircioglu-Ozturk, E. Oto, H.A. Guvenir, E. Karaagaoglu, A. Oto, T. Meinertz, A. Goette, "Data mining experiments on the Angiotensin II-Antagonist in Paroxysmal Atrial Fibrillation (ANTIPAF-AFNET 2) trial: 'exposing the invisible", *EP Europace* (Forthcoming)

• B. Demir, I. Kahyaoglu, H.A. Guvenir, N. Yerebasmaz, S.K. Altinbas, B. Dilbaz, S. Dilbaz, L. Mollamahmutoglu, "Progesterone change in the late follicular phase affects pregnancy rates both agonist and antagonist protocols in normoresponders: a case-controlled study in ICSI cycles", Gynecological Endocrinology*, 32, 361-365* (2016)

• H.A. Guvenir, G. Misirli, S. Dilbaz, O. Ozdegirmeci, B. Demir, B. Dilbaz, "Estimating the chance of success in IVF treatment using a ranking algorithm", *Medical & Biological Engineering & Computing*, 53, 911-920 (2015)

• U. Ravens, D. Katircioglu-Ozturk, E. Wettwer, T. Christ, D. Dobrev, N. Voight, C. Poulet, S. Loose, ….., H.A. Guvenir, "Application of the RIMARC algorithm to a large data set of action potentials and clinical parameters for risk prediction of atrial fibrillation", *Medical & Biological Engineering & Computing*, 53, 263-270 (2015)

• H. Aksu, I. Korpeoglu, O. Ulusoy, "An Analysis of Social Networks based on Tera-scale Telecommunication Datasets", *IEEE Trans on Emerging Topics in Computing* (Forthcoming)

• M. Koc, I. Korpeoglu, "Traffic- and Energy-Load-Based Sink Mobility Algorithms for Wireless Sensor Networks", *Int J of Sensor Networks* (Forthcoming)

• O. Sanli, I. Korpeoglu, A. Yazici, "Rule-Based Inference and Decomposition for Distributed In-Network Processing in Wireless Sensor Networks", *Knowledge and Information Systems* (Forthcoming)

• A.R. Ulucinar, I. Korpeoglu, "Distributed Joint Flow-Radio and Channel Assignment Using Partially Overlapping Channels in Multi-Radio Wireless Mesh Networks", *Wireless Networks*, 22, 83-104 (2016)

• C. Terzi, I. Korpeoglu, "Tree-based Channel Assignment Schemes for Multi-channel Wireless Sensor Networks", *Wireless Communications and Mobile Computing*, 16, 1694-1712 (2016)

• F. Deniz, H. Bagci, I. Korpeoglu, A. Yazici, "An Adaptive, Energy-Aware and Distributed Fault-Tolerant Topology-Control Algorithm for Heterogeneous Wireless Sensor Networks", *Ad Hoc Networks*, 44, 104-117 (2016)

• M. Tekkalmaz, I. Korpeoglu, "Distributed Power-Source-Aware Routing in Wireless Sensor Networks", *Wireless Networks*, 22, 1381-1399 (2016)

• A.R. Ilkhechi, I. Korpeoglu, O. Ulusoy, "Network-Aware Virtual Machine Placement in Cloud Data Centers with Multiple Traffic-Intensive Components", *Computer Networks Journa*l, 91, 508-527 (2015)

• C. Mergenci, I. Korpeoglu, "Routing in Delay-tolerant Networks with Periodic Connections", *Eurasip Journal on Wireless Communication and Networking*, 2015, 202 (2015)

• H. Aksu, M. Canim, Y-C. Chang, I. Korpeoglu, O. Ulusoy, "Efficient Community Identification and Maintenance at Multiple Resolutions on Distributed Datastores", *Data and Knowledge Engineering*, 100, 133-147 (2015)

• H. Bagci, I. Korpeoglu, A. Yazici, "A Distributed Fault-Tolerant Topology Control algorithm for Heterogeneous Wireless Sensor Networks", *IEEE Trans on Parallel and Distributed Systems,* 26, 914-923 (2015)

• M. Koc, I. Korpeoglu, "Coordinated Movement of Multiple Mobile Sinks in a Wireless Sensor Network for Improved Lifetime", *Eurasip Journal on Wireless Communication and Networking*, 2015, 245 (2015)

• A.R. Ulucinar, I. Korpeoglu, E. Karasan, "Effects of physical channel separation on application flows in a multi-radio multi-hop wireless mesh network: An experimental study on BilMesh testbed", *J of Network and Computer Applications*, 39, 253-265 (2014)

• H. Aksu, M. Canim, Y.C. Chang, I. Korpeoglu, O. Ulusoy, "Distributed k-Core View Materialization and Maintenance for Large Dynamic Graphs", *IEEE Trans on Knowledge and Data Engineering*, 26, 439-452 (2014)

• M. Koc, I. Korpeoglu, "Controlled Sink mobility Algorithms for Wireless Sensor Networks", *Int J of Distributed Sensor Networks*., 167508 (2014)

• M.C. Castro, A.J. Kassler, C.F. Chiasserini, C. Casetti, I. Korpeoglu, "Peer-to-Peer Overlay in Mobile Ad-hoc Networks", *Handbook of Peer-to-Peer Networking*, X. Shen, H. Yu, J. Buford, M. Akon (Eds.), Springer

• M.M. Ozdal, S. Yesil, T. Kim, A. Ayupov, J. Greth, S. Burns, O. Ozturk, "Graph Analytics Accelerators for Cognitive Systems", *IEEE Micro* (Forthcoming)

• D. Gucer, B. Ozguc, "Simulation of a flowing snow avalanche using molecular dynamics", *Turkish J of Electrical Engineering & Computer Sciences*, 22, 1596-1610 (2014)

• O. Ozturk, U. Orhan, W. Ding, M. Kandemir, P. Yedlapalli, "Cache Hierarchy-Aware Query Mapping On Emerging Multicore Architectures", *IEEE Trans on Computers* (Forthcoming)

• O. Ozturk, I. Akturk, I. Kadayif, S. Tosun, "Energy Reduction in 3D NoCs Through Communication Optimization", *Computing*, 97, 593-609 (2015)

• S. Tosun, O. Ozturk, E. Ozkan, M. Ozen, "Application mapping algorithms for mesh-based network-on-chip architectures", *J of Supercomputing*, 71, 995-1017 (2015)

• S. Tosun, V. Ajabshir, O. Mercanoglu, O. Ozturk, "Fault-Tolerant Topology Generation Method for Application-Specific Network-on-Chips", *IEEE Trans on Computer Aided Design,* 34, 1495-1508 (2015)

• A. Demiriz, N. Bagherzadeh, O. Ozturk, "Voltage Island Based Heterogeneous NoC Design Through Constraint Programming", *Computers and Electrical Engineerin*g, 40, 307-316 (2014)

• D. Demirbas, I. Akturk, O. Ozturk, U. Gudukbay, "Application-Specific Heterogeneous Network-on-Chip Design", *Computer Journal*, 57, 1117-1131 (2014)

• C. Yao, B.H. Chen, R. Joehanes, B. Otlu, X. Zhang, C. Liu, T. Huan, O. Tastan, L.A. Cupples, … , D. Levy, "Integromic Analysis of Genetic Variation and Gene Expression Identifies Networks for Cardiovascular Disease Phenotypes", *Circulation*, 131, 536-549 (2015)

• O. Tastan, A. Dutta, P. Booth, J. Klein-Seetharaman, "Retinal proteins as model systems for membrane protein folding", *Biochimica et Biophysica Acta*, 1837, 656-663 (2014)

• T. Jartti, O. palomares, M. Waris, O. Tastan, R. Nieminen, T. Puhakka, … , C.A. Akdis, "Distinct regulation of tonsillar immune response in virus infection", *Allergy*, 69, 658-667 (2014)

• F. Calisir, M. Bastan, O. Ulusoy, U. Gudukbay, "Mobile multi-view object image search", *Multimedia Tools and Applications* (Forthcoming)

• B. Kahveci, I.S. Altingovde, O. Ulusoy, "Integrating social features into mobile local search", *J of Systems and Software*, 122, 155-164 (2016)

• E. Sarigil, O. Yilmaz, I.S. Altingovde, R. Ozcan, O. Ulusoy, "A "Suggested" Picture of Web Search in Turkish", *ACM Trans on Asian and Low-Resource Language Inf. Processing*, 15, 24-1--11 (2016)

• D. Katsaros, G. Yavas, A. Nanopoulos, M. Karakaya, O. Ulusoy, Y. Manolopoulos, "Resource Allocation in Wireless Networks", *Encyclopedia of Data Warehousing and Mining*, John Wang (Eds.), IDEA Group Reference

Contact:
Dr. H. Altay Güvenir
(Department Chair)
Phone : +90 312 290 1218
Fax : +90 312 266 4047
guvenir@cs.bilkent.edu.tr
cs.bilkent.edu.tr

## Faculty Profile: Dr. Buğra Gedik, Associate Professor, Department of Computer Engineering

Buğra Gedik received a Ph.D. in computer science from the Georgia Institute of Technology in 2006. His research interests are in the area of large-scale data-intensive distributed systems. His recent focus has been on scalability, load balancing, parallel processing, fault tolerance, and performance profiling in the context of distributed data stream processing systems. Until 2012, he was a research staff member at the IBM T. J. Watson Research Center, working on the System S data stream processing project, supported by the U.S. Department of Defense. He is the co-inventor of the SPADE and SPL programming languages and for a time served as the chief architect of the InfoSphere Streams product.

After joining Bilkent University, Dr. Gedik received a BAGEP Young Scientist Award and an IBM Faculty award in 2013, and a Heroes of Science Association Young Scientist Award in 2015. He is coauthor of the book *Fundamentals of Stream Processing: Application Design, Systems, and Analytics* (Cambridge Press). Dr. Gedik has published over 90 peer-reviewed articles in the areas of distributed computing and data management. He is a co-recipient of the IEEE ICDCS (2003), IEEE DSN (2011), ACM DEBS (2011 and 2012), and IEEE ICWS (2013) best paper awards. His articles have appeared in journals such as *IEEE Transactions on Parallel and Distributed Systems, IEEE Transactions on Knowledge and Data Engineering, IEEE Transactions on Computers, IEEE Transactions on Mobile Computing*, and the *VLDB Journal*. He served as the planning committee co-chair for the 2007 IEEE CollaborateCom and 2009 ACM DEBS international conferences. He is an editor for the journals *IEEE Transactions on Services Computing*.

He is a former IBM Master Inventor and has applied for over 30 patents, most of them related to his work on streaming technologies.

## Faculty Profile: Dr. Selim Aksoy, Associate Professor, Department of Computer Engineering

Selim Aksoy received a Ph.D. degree from the University of Washington, Seattle (USA), in 2001. Before joining Bilkent University, he was a research scientist at Insightful Corporation in Seattle, where he was involved in image understanding and data mining research sponsored by the National Aeronautics and Space Administration, the U.S. Army, and the National Institutes of Health.

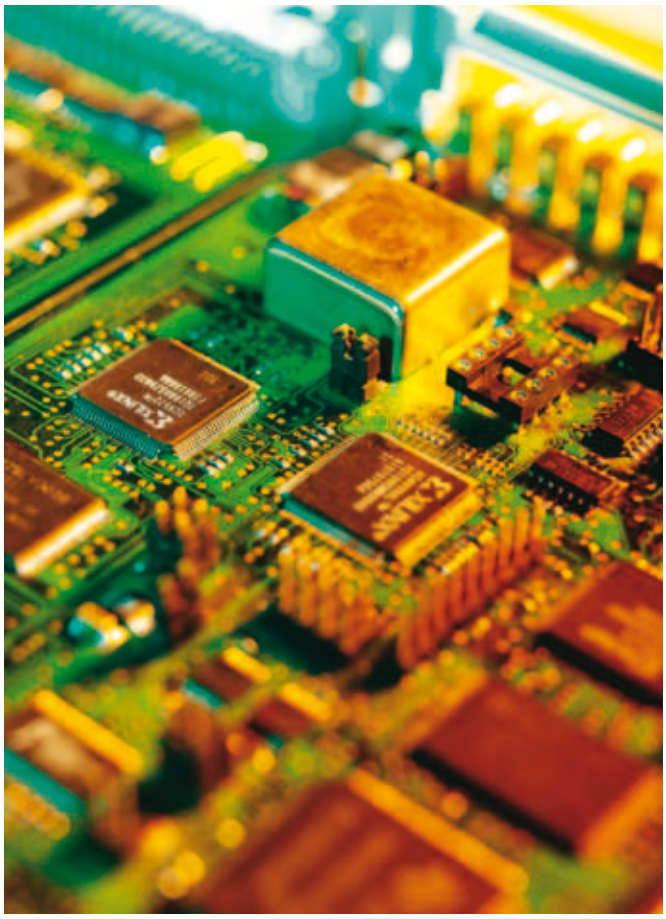
His research interests include computer vision, statistical and structural pattern recognition, machine learning and data mining with applications to remote sensing, medical imaging, and multimedia data analysis. His focus is on the development of new computer vision and machine learning algorithms for segmentation, object recognition, contextual classification, and content-based retrieval in very high-resolution satellite images, and localization and classification of cancerous structures in whole-slide breast histopathology images.

Dr. Aksoy has authored over 90 publications and has received more than 700 citations in ISI indices and 2,000 citations according to Google Scholar. He has been the principal investigator in research projects sponsored by TÜBİTAK and the European Commission. He has received a NATO Science Fellowship (1996), the TÜBİTAK Career Award (2004), a Marie Curie Fellowship from the European Commission (2005), a Fulbright Scholarship (2013), the Bilkent University Distinguished Teaching Award (2014), the Outstanding Young Scientist Award (GEBIP) from the Turkish Academy of Sciences (2015), the Distinguished Young Scientist Award (BAGEP) from the Science Academy Association (2016), and the Parlar Foundation's Research Incentive Award (2016).

He has served as an organizer or program committee member for more than 80 conferences, and as a guest editor for special issues on "Pattern Recognition in Remote Sensing" in *IEEE Transactions on Geoscience and Remote Sensing* (2007), *Pattern Recognition Letters* (2009), and the *IEEE Journal of Selected Topics in Applied Earth Observations and Remote Sensing* (2012). He was chair of International Association for Pattern Recognition's Technical Committee on Remote Sensing from 2006 to 2010, and an associate editor of *Pattern Recognition Letters* from 2009 to 2013.


Test Data
Test Data Filtered with Gabor
Test Data Filtered with Kirsch
wh1
wh2
wh3
Neural Network
Neural Network

# ELECTRICAL AND ELECTRONICS ENGINEERING



Graduate programs in the Department of Electrical and Electronics Engineering focus on those fields which are heavily in demand worldwide. Current research areas are signal and image processing, electronics, optics, acoustics, electromagnetics, nanotechnology, robotics, telecommunications and networks, biomedical engineering, and system and control theory. The department emphasizes research, which is supported by excellent laboratories, computing facilities, and libraries. These facilities are continuously upgraded through various grants from national and international sources. At present, there are image processing, signal processing, optics, electronics, telecommunications, robotics and control, microwave and antenna, nanophotonics, and biomedical laboratories.

## FACULTY

**NAİL AKAR**, Professor. Ph.D., Electrical and Electronics Engineering, Bilkent University, 1994. *Teletraffic analysis, performance evaluation, high-speed telecommunication networks, Internet technologies.*

**AYHAN ALTINTAŞ**, Professor. Ph.D., Electrical Engineering, Ohio State University, 1986. *Electromagnetic scattering, propagation, and radiation, antennas, fiber optics.*

**ERDAL ARIKAN**, Professor. Ph.D., Electrical Engineering and Computer Science, Massachusetts Institute of Technology, 1985. *Information theory, communications, data communication networks.*

**ORHAN ARIKAN**, Professor and Department Chair. Ph.D., Electrical and Computer Engineering, University of Illinois at Urbana-Champaign, 1990. *Signal processing, remote sensing, communications.*

**ABDULLAH ATALAR**, Professor and Rector. Ph.D., Electrical Engineering, Stanford University, 1978. *Analog and digital integrated circuit design, simulation of large circuits, micromachined sensors.*

**ERGİN ATALAR**, Professor. Ph.D., Electrical and Electronics Engineering, Bilkent University, 1991. *Image guided medical interventions, magnetic resonance imaging, antenna design for MRI.*

**ORHAN AYTÜR**, Professor and Vice Rector. Ph.D., Electrical Engineering, Northwestern University, 1991. *Optics and photonics, quantum optics, nonlinear optics, lasers, optoelectronics.*

**BİLLUR BARSHAN**, Professor. Ph.D., Electrical Engineering, Yale University, 1991. *Sensor-based robotics, sensor signal processing, intelligent sensing, ultrasonic, optical, and inertial sensing, multi-sensor data fusion, human activity recognition and classification, wearable sensing.*

**A. ENİS ÇETİN,** Professor. Ph.D., Electrical Engineering, University of Pennsylvania, 1987. *Image restoration and coding, time series analysis, wavelet theory, computer vision, big data analysis.*

**TOLGA ÇUKUR**, Assistant Professor. Ph.D., Electrical Engineering, Stanford University, 2009. *Areas of Expertise: Biomedical imaging, magnetic resonance imaging (MRI), signal processing, computational neuroscience*

**HİLMİ VOLKAN DEMİR**, Professor. Ph.D., Electrical Engineering, Stanford University, 2004. *Ultrafast photonic switching devices, quantum-confined nano-structures, high-performance semiconductor devices, nano-photonics, ultrafast optoelectronics, integrated photonic circuits, micro-electro-mechanical systems, bio-implants, telecommunication systems, and semiconductor nanofabrication.*

**TOLGA METE DUMAN**, Professor. Ph.D., Electrical and Computer Engineering, Northeastern University, 1998. *Wireless and mobile communications channel coding, coding for wirelesses communications, MIMO systems, underwater acoustic communications.*

**VAKUR B. ERTÜRK**, Professor. Ph.D., Electrical Engineering, Ohio State University, 2000. *Theoretical and computational electromagnetics, numerical methods, conformal antennas.*

**SİNAN GEZİCİ,** Associate Professor. Ph.D., Electrical Engineering, Princeton University, 2006. *Statistical signal processing, wireless communications, ultra-wideband (UWB) systems, wireless geolocation.*

**YUSUF ZİYA İDER**, Professor. Ph.D., Biomedical Engineering, Northwestern University, 1979. *Electrical impedance tomography, magnetic resonance imaging, acquisition and processing of physiological signals, PC based instrumentation.*

**FATİH ÖMER İLDAY**, Associate Professor. Ph.D., Cornell University, 2003. *Non-linear optics ultrafast optical phenomena.*

**EZHAN KARAŞAN**, Professor. Dean and Director of the Graduate School of Engineering and Science. Ph.D., Rutgers University, 1995. *Performance analysis and design of communication networks, optical networks, wireless networks.*

**S. SERDAR KOZAT**, Associate Professor. Ph.D., Electrical and Computer Engineering, University of Illinois at Urbana Champaign, 2004. *Digital signal processing, adaptive filtering, online learning and machine learning algorithms for signal processing.*

**HAYRETTİN KÖYMEN**, Professor. Ph.D., Electrical Engineering, University of Birmingham, 1979. *Acoustic imaging, linear and finite amplitude acoustics, medical instrumentation, processing and modeling of physiological signals.*

**MEHMET ALPER KUTAY**, Senior Lecturer. Ph.D., Electrical and Electronics Engineering, Bilkent University, 1999. *Signal detection, parameter estimation, active and passive target detection and tracking, radar signal processing, and time-frequency analysis.*

**ÖMER MORGÜL**, Professor. Ph.D., Electrical Engineering, University of California, Berkeley, 1989. *Linear and nonlinear systems, distributed parameter systems, control of flexible structures, nonlinear dynamics, robotics, neural networks.*

**LEVENT ONURAL**, Professor. Ph.D., Electrical and Computer Engineering, State University of New York at Buffalo, 1985. *Signal processing, image and video processing, holography, signal processing for diffraction and holography, 3DTV.*

**HALDUN ÖZAKTAŞ**, Professor. Ph.D., Electrical Engineering, Stanford University, 1991. *Optical information processing, signal and image processing, optoelectronic and optically interconnected computing systems.*

**EKMEL ÖZBAY**, Professor. Ph.D., Electrical Engineering, Stanford University, 1992. *Photonic band gap materials, physics and applications of nanostructures, photonic devices, micro electro-mechanical devices, ultrafast phenomena, quantum optics.*

**HİTAY ÖZBAY**, Professor and Associate Provost. Ph.D., Control Sciences and Dynamical Systems, University of Minnesota, 1989. *Robust control, distributed parameter systems, applications of control theory in wide areas engineering and sciences.*

**BÜLENT ÖZGÜLER**, Professor. Ph.D., Electrical Engineering, University of Florida, 1982. *Decentralized control, stability robustness, realization theory, linear matrix equations.*

**EMİNE ÜLKÜ SARITAŞ**, Assistant Professor. Ph.D., Electrical Engineering, Stanford University, 2009. *Biomedical imaging, magnetic resonance imaging (MRI), magnetic particle imaging (MPI), signal and image processing, safety limits of magnetic fields in medical imaging systems.*

**CEM TEKİN**, Assistant Professor. PhD, Electrical Engineering and Computer Science, University of Michigan, 2013. *Online learning, data mining, multi-armed bandits, multi-agent systems, healthcare informatics, recommender systems, dynamic spectrum access.*

## MASTER OF SCIENCE IN ELECTRICAL AND ELECTRONICS ENGINEERING

**Admission:** All applicants are required to have a B.S. degree in electrical and electronics engineering or a related field of science or engineering. Students with a B.S. degree in an area other than electrical and electronics engineering may be required to take certain undergraduate courses in order to acquire the necessary background in the field. Evaluation of applicants is based on their ALES (*Akademik Personel ve Lisansüstü Eğitimi Giriş Sınavı*/Academic Personnel and Postgraduate Education Entrance Examination) scores, past academic records, reference letters, and an interview. Applicants who are not Turkish citizens and Turkish citizen applicants who are residents of another country may take the GRE (Graduate Record Examination) instead of the ALES. All nonnative speakers of English are required to submit proof of satisfactory knowledge of English.

**Degree Requirements:** In addition to completing at least 21 credit units of course work, the M.S. degree candidate must prepare and successfully defend a thesis. The expected duration of study for the M.S. degree is 4 semesters; the maximum duration is 6 semesters.

## DOCTOR OF PHILOSOPHY IN ELECTRICAL AND ELECTRONICS ENGINEERING

**Admission:** All applicants are required to have a B.S. degree in electrical and electronics engineering or a related field of science or engineering. Evaluation of applicants is based on their ALES (*Akademik Personel ve Lisansüstü Eğitimi Giriş Sınavı*/Academic Personnel and Postgraduate Education Entrance Examination) scores, past academic records, reference letters, and an interview. Applicants who are not Turkish citizens and Turkish citizen applicants who are residents of another country may take the GRE (Graduate Record Examination) instead of the ALES. All nonnative speakers of English are required to submit proof of satisfactory knowledge of English.

**Degree Requirements:** The completion of 21 credit units of course work beyond the M.S. level is required. Ph.D. candidates must pass a qualifying exam, typically in their fourth semester, and then must prepare a dissertation proposal. Preparation and defense of a dissertation based on original research is the centerpiece of the program. The standard duration of study for the Ph.D. degree is 8 semesters for students who enter the program with an M.S. degree; the maximum duration is 12 semesters.

## MASTER OF SCIENCE IN ELECTRICAL AND ELECTRONICS ENGINEERING - TELECOMMUNICATIONS AND NETWORKING (Non-thesis)

The non-thesis M.S. program in Telecommunications and Networking (M.S.T.N.) is an interdisciplinary program specifically focused on the constantly evolving field of information technologies. Graduates of this program may expect to find employment in a broad range of businesses and organizations, including telecommunications equipment/software manufacturers, internet service providers, wireless network operators, mobile application development businesses, telecommunication chip manufacturers, telecommunications regulatory agencies, and military telecommunication systems development companies. The program is intended for recent graduates as well as engineers who are currently employed by such businesses/organizations and wish to obtain a specialized advanced degree in telecommunications and networking. Students in this program will learn what they need to become leader-engineers in the ever-changing world of global information networks and wireless/optical telecommunication systems and technologies. In order to obtain the M.S.T.N. degree, students are required to successfully complete courses in telecommunications and networking as well as a wide range of subjects including computer science, operations research, and information technology-related management and law.

**Admission:** Applicants are required to have a B.S. degree in electrical and electronics engineering or a related field of science or engineering. Evaluation of applicants is based on their ALES (*Akademik Personel ve Lisansüstü Eğitimi Giriş Sınavı*/Academic Personnel and Postgraduate Education Entrance Examination) scores, past academic records, reference letters, and an interview. Applicants who are not Turkish citizens and Turkish citizen applicants who are residents of another country may take the GRE (Graduate Record Examination) instead of the ALES. All nonnative speakers of English are required to submit proof of satisfactory knowledge of English.

Degree Requirements: Students are expected to complete at least 10 courses equivalent to at least 30 credit units of course work. Up to 3 of these courses can be selected from among undergraduate courses offered in related fields.

In addition to these courses, students must also complete a one-semester project under the supervision of a faculty member in the Department of Electrical and Electronics

Engineering. The expected duration of study for the M.S.T.N. degree is 2 semesters, and the maximum duration is 3 semesters.

## COURSE DESCRIPTIONS

**EEE 501 Linear System Theory**
Mathematical preliminaries: linear spaces, linear transformations, matrix algebra, normed linear spaces, inner product spaces, differential equations, distributions, Fourier transform. Dynamical system concepts: state, response, equivalence, linearity, time-invariance. Linear differential systems: solution, impulse response, stability, controllability and observability, time-invariant systems, periodically varying systems. Discrete-time systems. Some applications: linear quadratic optimization, estimation, filtering identification.

**EEE 511 Telecommunication Electronics**
Resonant circuits, impedance matching, filter sections. Bandwidth estimation, open circuit time constants, short circuit time constants. RF amplifiers. Nonlinear circuits. Oscillators. Mixers. Phase locked loop.

**EEE 512 Microwave Electronics**
Microstrip and stripline techniques. Transistor and amplifier measurement techniques. Small and large signal high frequency amplifier design. Noise considerations in amplifiers. RF power amplifiers. Neutralization in RF amplifiers. Computer-aided design of amplifiers. Recent topics in microwave electronics.

**EEE 514 Introduction to CMOS VLSI Design**
Introduction to CMOS circuits, MOS transistor theory, CMOS processing technology, CMOS circuit characterization. CMOS VLSI circuit design, clocking strategies, case studies. Recent topics and developments in Introduction to CMOS VLSI Design.

**EEE 515 Analog CMOS Integrated Circuits**
Review of MOS device physics, single stage amplifiers, differential amplifiers, current mirrors, frequency response of amplifiers, Miller effect, noise in amplifiers, feedback, operational amplifiers, slew rate, power supply rejection, stability and frequency compensation, bandgap references, switched capacitor circuits, nonlinearities, linearization, offset, oscillators, phase locked loops. Recent topics in CMOS design.

**EEE 518 Principles of Electronic Devices**
Crystal structure and growth techniques. Foundations of modern electronic. Energy bands in solids. Tunneling. Carrier concentrations and transport properties in semiconductors. Equilibrium states of PN junctions. Transient analysis of PN junction diodes. SS, MS, SIS junction characteristics and principles of special purpose diodes. BJT equilibrium states and Ebers-Moll static model. Secondary effects and transient states in BJTs. Small signal model. JFET characteristics and equilibrium states Principles of metal-insulator-semiconductor transistors and dc characteristics.

**EEE 519 Power Electronics**
Analysis and design of linear regulators, inverters, DC-DC converters, different topologies of converters, efficiencies of power conversion circuits, transformers and magnetic design, power semiconductor devices, power factor and power factor correction.

**EEE 520 Multirate Signal Processing and Wavelet Theory**
Sampling Theory, Upsampling, Downsampling, Decimation, and Interpolation, Perfect reconstruction filterbanks and subband coding. Wavelet basis of L2(R). Orthogonal wavelets and the relation between the prefect reconstruction filterbanks and wavelets. Biorthoghonal filterbanks, lifting structures. Applications: Image coding and JPEG-2000, MPEG Audio Coding, Signal Analysis using wavelets.

**EEE 521 Introduction to Radar Signal Processing**
Radar Fundamentals, radar equation, range and Doppler, system losses. Radar Cross Section of simple objects and models. CW and Pulsed Radars. Radar detection. Radar waveform analysis. Matched filter and ambiguity function. Pulse Compression. Pulse Compression. Radar Wave propagation. Clutter and moving target detection. Radar antennas. Single and multiple target tracking. Synthetic Aperture Radars and their applications.

**EEE 522 Optical Information Processing**
Two-dimensional signals and systems. Space-frequency representations. Signal transformations. Linear system formulation of propagation of light through free space, lenses, and lens-like media and their analogy with electrical systems. Analog signal and image processing with optical systems, including transformations, filtering, etc. Alternative mathematical formulations of optical propagation: geometrical optics, scalar wave theory, phase-space approaches, variational and Hamiltonian formulation, operator algebras. Invariants and conservation laws.

**EEE 523 Speech Processing**
Modeling of speech production, short-time Fourier analysis of speech, linear predictive coding (LPC), pitch estimation, code excited linear prediction (CELP) speech synthesis, introduction to speech recognition.

**EEE 525 Advanced Signal Processing**
Signal spaces, signal representation and approximation, wavelets, signal modeling: AR, MA, ARMA models, adaptive filters, iterative and recursive methods in signal processing, spectrum estimation, beam forming and array processing, inverse problems.

**EEE 526 Digital Image Processing**
Two-dimensional system fundamentals, image sampling and quantization, multi-dimensional transforms: DFT, Sine and Cosine, Hadamard, Walsh, KL transforms. Image models, image enhancement, image filtering and restoration, image analysis and computer vision. Image reconstruction from projections, image data compression. Inverse problems.

**EEE 527 Digital Coding of Waveforms**
Sampling of band limited waveforms; characteristics of speech and image waveforms; quantization of discrete time signals. Pulse code modulation (PCM), differential PCM. Vector quantization, tree and Trellis coders. Subband coding, KL transform, DCT, DHT, OWHT, transform coding. Run-length coding of binary waveforms. Recent topics on digital coding.

**EEE 528 Optics**
Geometrical, scalar wave and electromagnetic wave theories of light. Gaussian beam propagation. Signals and systems concepts for analyzing optical systems (Fourier optics) Interference, diffraction, imaging, frequency domain filtering, and holography. Polarization, propagation in anisotropic media, optical waveguides, fibers, resonators, and their applications. Temporal and spatial coherence. Recent topics and developments in optics.

**EEE 529 Photonics**
Photon theory of light and interaction of light with matter. Spontaneous emission, absorption, and stimulated emission. Principles of lasers and laser amplifiers. Semi-conductor lasers, light emitting diodes, and light detectors. Electro-optics, acousto-optics, and their applications. Introduction to nonlinear optics. Recent topics in photonics.

**EEE 530 Digital Communications Theory**
Physical layer aspects of digital communication systems. Signal representations, power spectrum. Optimum receivers for Gaussian noise channels. Linear modulations with memory: Channel coding, sequence detection. Carrier recovery and timing estimation. Communication in dispersive channels: Signal design, optimum receivers, equalization. Communication in fading channels: Channel

models, diversity techniques, maximum ratio combining receivers.

**EEE 533 Random Processes**
A first year graduate course on theory and applications of random processes. Review of probability theory. Random sequences. Autocorrelation and covariance. Ergodicity and stationarity. Stochastic calculus. Poisson process. Gaussian process. Brownian motion/Wiener process. Markov process. Shot noise process. Linear systems driven by stochastic inputs. Elementary queuing theory.

**EEE 534 Wireless Communications**
Evolution of radio communications and broadcast systems, new trends, economics of radio communications. Spectrum usage. Cellular concept, coverage, frequency re-use, interference. Broadcast concepts. Radio propagation. Large scale path loss, small scale fading and multipath. Modulation techniques for mobile radio and broadcast. Multiple access techniques for wireless communications. Networking and planning. Recent topics on wireless communications.

**EEE 536 Internet Architecture and Protocols**
Internet architecture. Hubs, switches, and routes. Data link layer protocols. Traffic engineering. Transport protocols: UDP, TCP. Quality of Service.

**EEE 538 Communication Network Analysis**
Layered network architecture. Point-to-point protocols and links. Queuing models. Networks of queues. Multiple access communications. Routing. Flow control.

**EEE 539 Detection and Estimation Theory**
Graduate course on the theory of detection and estimation. Hypothesis testing: Bayesian, minimax and Neyman-Pearson approaches. Signal detection in discrete time: Detector structures and performance evaluation. Parameter estimation: Bayesian estimation, nonrandom parameter estimation, maximum likelihood estimation. Signal estimation in discrete time: Linear estimation theory and Kalman-Bucy filtering.

**EEE 542 Nonlinear Systems**
Linear versus nonlinear. Basic nonlinear analysis. Nonlinear ordinary differential equations. Second order systems; Poincare-Bendixon theorem, limit cycles. Stability in the sense of Lyapunov. Input-output stability, passivity, small gain theorem. Singular Perturbations. Differential geometric methods. Recent topics on nonlinear systems.

**EEE 543 Neural Networks**
The structure of the brain. Learning in machines. Pattern recognition. Classification Techniques. Linear classifiers. Basic Neuron. Modeling the single neuron. The perceptron. The multiplayer perceptron. Kohonen self-organizing network. Hopfield network. Neural network Classifiers. Adaptive resonance theory. Cellular neural network. Recent topics and developments in neural networks.

**EEE 544 Robust Feedback Theory**
Review of time and frequency domain analysis and design of feedback systems. Internal stability, asymptotic tracking, performance. Robust stability and robust performance. Stabilization. Parameterization of stabilizing controllers. Loopshaping. Model Matching. Introduction to H-infinity control. Recent topics and developments Feedback Control Theory.

**EEE 546 Control and Optimization of Stochastic Systems**
Stochastic stability of dynamical and distributed systems under probabilistic uncertainty. Optimal control problems and dynamic programming. Partially observed models; introduction to filtering and average cost minimization problems. Team decision theory and information structures; static and dynamic teams. Networked control systems, stabilization and optimization.

**EEE 547 Introduction to Robotics**
Robot arm kinematics (forward and inverse kinematics); robot arm dynamics (equations of motion, equivalent formulations); planning of manipulator trajectories; range sensing (time-of-flight and triangulation systems, nown target size, optical flow), proximity sensing (optical, magnetic, capacitive, inductive, ultrasonic), tactile (touch) sensing, force and torque sensing, dead reckoning (odometry and inertial sensing); mobile robots (localization, mapping, path planning, navigation, obstacle avoidance, object classification); multi-sensor data fusion.

**EEE 549 Nanoscale Fabrication Technologies for Semiconductors**
Nanoscale fabrication methods used for semiconductor devices and VLSI technology. Revief of Semiconductor Technology, Review of Semiconductor Device Physics, Outline of a nanoscale CMOS fabrication process, Crystal Growth, Semiconductor Manufacturing, Cleanrooms and wafer cleaning, Nanolithography, Oxidation, Diffusion, Ion Implantation, Thin film deposition, Etching, and Backend technology.

**EEE 550 Nanoelectronic Devices: Physics and Technology**
Semiconductor electronics technology, overview of fabrication methods, physics of semiconductors in equilibrium and non-equilibrium, movement of free carriers in semiconductors, p-n and metal-semiconductor junctions, heterojunctions and quasi-electric fields, basic quantum mechanics for nanoscale semiconductor structures and quantum-effect devices, metal-oxide-semiconductor capacitor and MOS transistors, bipolar junction transistors, field effect transistors and nanowire FETs, high electron mobility transistors, resonant tunneling in semiconductor nanostructures, transistor scaling issues, ballistic transport and ballistic transistors, graphene transistors.

**EEE 551 Microwave Engineering**
Transmission lines and waveguides. Circuit theory for waveguiding systems, scattering matrix formulation. Excitation of waveguides. Impedance transformation and matching. Smith chart. Passive microwave devices. Recent topics and developments in microwave engineering.

**EEE 552 Antenna Engineering**
Fundamentals of electromagnetic radiation. Antennas and antenna impedance. Small and finite size dipole antennas. Ground interference effects. Loop antennas. Aperture antennas. Parabolic reflectors. Microstrip antennas. Other practical antenna configurations. Analysis and synthesis of linear arrays. Self impedance. Moment methods. Radio wave propagation. Recent topics on antenna engineering.

**EEE 554 High Frequency Techniques in Electromagnetics**
High frequency solutions to Maxwell's equations. Geometrical optics (GO), the geometrical theory of diffraction (GTD), the uniform geometrical theory of diffraction (UTD), equivalent current methods (ECM) and their application. Aperture integration, physical theory of diffraction (PTD) Curved surface diffraction.

**EEE 556 Computational Methods in Electromagnetics**
Classification of electromagnetics problems, finite difference schemes, finite difference time domain method, finite element method, method of moments.

**EEE 557 Acoustic Waves and Devices**
Plane waves in fluids, acoustic wave equation; transient and steady-state reflection and transmission; lumped elements; refraction; strings, membranes, and cavities; ray acoustics; absorption and dispersion; source theory; vibrating piston, transducers; diffraction.

**EEE 558 Electroacoustic Transduction**
Introduction to acoustics, wave equation, propagation basics. Piezoelectricity, piezoelectric materials, constitutive equations. Electric field, stress, strain, tensors. Resonance modes and lumped element modeling of piezoelectric materials. Application of circuit theory and microwave theory to transducers. Piezoelectric piston transducer and hydrophone design, transducer passive materials. Transducer measurements Radiation impedance and its interaction with transducer, radiated and reactive power, energy Performance: coupling coefficient, bandwidth, efficiency, noise Capacitive Transducers: Electrodynamic transduction Radiation impedance, surface particle velocity profile and radiation impedance interrelations.

**EEE 560 Nanoengineering and Nanodevices**
Fundamentals of nanophotonics and nanoelectronics, with emphasis on applications in modern semiconductor devices based on quantum properties of light and matter. Topics include: Schrödinger's equation, elements of quantum mechanics (including quantum confined structures, simple periodic structures), tunneling, semiconductor fundamentals, review of Maxwell's equations, light propagation, and reflection from dielectrics, plasmonics, photonic crystals, advanced electronic devices.

**EEE 573 Medical Imaging**
Fundamentals and applications of four medical imaging techniques: magnetic resonance imaging, ultrasound, nuclear medicine X-ray computed tomography.

**EEE 574 Foundations of Magnetic Resonance Imaging**
Basic principles of magnetic resonance imaging (MRI), instrumentation, and various methods used in MRI. Various research areas in this highly active field are discussed.

**EEE 580 Advanced Optoelectronics: Innovative Design**
Review of physics of optoelectronic devices. Heterostructures. Optical absorption, emission and refraction processes. Junction theory. Light emitting diodes. Laser diodes. Photodetectors. Solar cells. Modulators. Photonic switches. Integrated photonic devices. Nano-scale photonic devices. Innovative optoelectronic devices

**EEE 581 Biomedical Signals and Instrumentation**
Biophysics of cell membranes, models of neuron membrane potential, Hodgkin-Huxley equations for the action potential, propagation of the action potential, neurocommunication, simple neural networks which explain behavior, volume conductor fields, theory of Electroardiography (ECG), ECG amplifiers and instrumentation, ECG signal processing, EEG, EMG, and other bioelectric signals, model of the cardiovascular system, model of the respiratory system, model of the neurocardiac control system, transducers for bioelectric, cardiovascular and respiratory measurements, preconditioning circuits and instrumentation techniques. Recent topics and developments in biomedical signals and instrumentation.

**EEE 582 Computational Neuroscience**
Mathematical techniques for analysis and modeling of neural systems. Neural encoding: reverse-correlation and regression, receptive-field models. Representation: Hebbian learning (PCA), sparse coding (ICA). Cortical maps: clustering, dimensionality reduction, manifold models. Neural decoding: classification, identification, Bayesian inference. Connectomics: structural and functional connectivity.

**EEE-585 Statistical Learning and Data Analytics**
Goals and tools of machine learning. Overview of machine learning on diverse data acquired by: sensor networks, physiological devices, etc. Fundamental learning models. Applications: decision support, computer vision, recommender systems. Performance analysis by using probabilistic approach. Bayesian and frequentist machine learning. Neural networks. Deep learning. Kernel methods. Dimensionality reduction and distance metric learning. Online learning.

**EEE 591 Graduate Seminar I**
**EEE 592 Graduate Seminar II**
Seminars on recent topics in electrical and electronics engineering.

**EEE 596 Graduate Research Project in Telecommunications and Networking**
A technical project emphasizing engineering design principles on telecommunications and/or networks to be carried out by the graduate student under the supervision of a faculty member. Open to graduate students in the M.S. in Telecommunications and Networking program only.

**EEE 599 Master's Thesis**

**EEE 603 Advanced Electromagnetic Theory I**
Fundamentals of electrostatic and magnetostratic. Time varying fields Maxwell's equations. Plane, cylindrical, and spherical electromagnetic waves and boundary value problems. Waveguides and resonant cavities. Radiating systems and diffraction. Introduction to special relativity.

EEE 604 Advanced Electromagnetic Theory II
Electric-field, magnetic-field, and combined-field integral equations. Electromagnetic scattering from arbitrarily shaped conducting objects. Surface and volume integral equations for dielectric objects. Discretization of integral equations. Basis and testing functions. Iterative solutions of matrix equations.

**EEE 633 Coding Theory**
Error correction techniques used to protect digital information against noise. (i) Algebraic coding techniques, including BCH and RS codes and the Berlekamp-Massey decoding algorithm. (ii) Convolutional codes and the Viterbi decoding algorithm. (iii) Turbo and LDPC codes and the message passing decoding algorithm.

**EEE 634 Information Theory**
Fundamental information-theoretic concepts: Entropy, mutual information, asymptotic equipartition property. Lossiess data compression: Kraft inequality, Huffman codes. Shannon's coding theorem. Gaussian channel capacity. Network information theory: Multiple user channel capacity. Lossy data compression: Rate distortion theory.

**EEE-644 Advanced Robust Control Theory**
Review of multi-input-multi-output linear time invariant systems: stability, controllability and observability, Lyapunov methods. Linear Matrix Inequality (LMI)-based controller design. Passivity based methods: analysis and design. Frequency domain design and analysis of infinite dimensional systems: spatially distributed parameter systems, systems with time delays and applications.

**EEE 699 Ph.D. Dissertation**

## SAMPLE OF RECENT PUBLICATIONS


• A. Yazici, N. Akar, "The Finite/Infinite Horizon Ruin Problem with Multi-threshold Premiums: A Markov Fluid Queue Approach", *Annals of Operations Research* (Forthcoming)

• C. Tunc, N. Akar, "Fixed-point analysis of a network of routers with persistent TCP/UDP flows and class-based weighted fair queuing", *Telecommunication Systems* (Forthcoming)

• K. Vaezi, N. Akar, "Analytical Performance Modeling of Elastic Optical Links with Aligned Spectrum Allocation", *Computer Networks Journal*, 88, 40-50 (2015)

• S. Shahsavari, N. Akar, "A Two-Level Temporal Fair Scheduler for Multi-Cell Wireless Networks", *IEEE Wireless Communications Letters*, 4, 269-272 (2015)

• N. Akar, "Fitting Matrix Geometric Distributions by Model Reduction", *Stochastic Models*, 31, 292-315 (2015)

• C. Tunc, N. Akar, "Mapping Time-Varying IP Traffic to Flexible Optical Paths in Flexgrid Optical Networks", *Photonic Network Communications*, 29, 67-77 (2015)

• O. Ozturk, N. Akar, "A Novel Queue-aware Wireless Link Adaptation Mechanism and its Fixed-Point Analytical Model Journal", *Eurasip Journal on Wireless Communication and Networking,* 2015, 248 (2015)

• R. Yumer, N. Akar, E. Karasan, "Class-based First-Spectrum Allocation with Fragmentation Avoidance for Dynamic Flexgrid Optical Networks", *Optical Switching and Networking*, 15, 44-52 (2015)

• O. Ozturk, N. Akar, "Workload-dependent queuing model of an AQM-controlled wireless router with TCP traffic and its application to PER-based link adaptation", *Eurasip Journal on Wireless Communication and Networking*, 67.

• J. Brazio, P. T. Gia, N. Akar, A. Beben, W. Burakowski, M. Fiedler, E. Karasan, M. Menth, P. Olivier, K. Tutschku, S. Witterongel, *Analysis and Design of Advanced Multiservice Networks Supporting Mobility, Multimedia, and Internetworking*, Springer, (2006)

• V. Yurchenko, M. Ciydem, M. Gradziel, A. Murphy, A. Altintas, "Light-controlled photonics-based mm-wave beam switch", *Optics Express*, 24, 16471-1--8 (2016)

• A. Ali, B. Ozbey, S. Topcu, A. Altintas, "Feasibility Study of Installation of Solar Panels on a High Power HF Antenna Land", *Int J of RF and Microwave Computer Ailded Engineering*, 26, 379-384 (2016)

• V. Yurchenko, M. Ciydem, A. Altintas, "Light-Controlled Microwave Whispering-Gallery-Mode Resonators at 50W LED Array Illumination", *AIP Advances*, 5.

• I.O. Sukharevsky, A.I. Nosich, A. Altintas, "Manipulation of Backscattering from a Dielectric Cylinder of Triangular Cross-Section Using the Interplay of GO-Like Ray Effects and Resonances", *IEEE Trans on Antennas Propagation*, 63, 2162-2169 (2015)

• F. Kuyucuoglu, T. Oguzer, I. Avgin, A. Altintas, "Analysis of an arbitrary-profile, cylindirical, impedance reflector surface illuminated by an E-polarized complex line source beam", *J of Electromagnetic Waves and Applications*, 28, 360-377 (2014)

• B. Ghassemiparvin, A. Altintas, "Scattering from an Impedance Object at the Edge of a Perfectly Conducting Wedge", *IEEE Trans on Antennas Propagation*, 62, 852 (2014)

• I.O. Sukharevsky, O.V. Shapoval, A.I. Nosich, A. Altintas, "Validity and Limitations of the Median-Line Integral Equation Technique in the Scattering by Material Strips of Sub-Wavellength Thickness", *IEEE Trans on Antennas Propagation*, 62, 3623-3631 (2014)

• V.B. Yurchenko, M. Ciydem, M. Gradziel, J.A. Murphy, A. Altintas, "Double-sided split-step MM-wave Fresnel lenses: design, fabrication and focal field measurements", *J of the European Optical Society - Rapid Publications*, 9, 14007-1--5 (2014)

• I.O. Sukharevsky, A. Altintas, "Validation of Higher-Order Approximations and Boundary Conditions for Lossy Conducting Bodies", *IEEE Trans on Antennas Propagation*, 62, 4656-4663 (2014)

• E. Arikan, "On the origin of polar coding", *IEEE Journal on Selected Areas in Communication*, 34, 209-223 (2016)

• O. Dizdar, E. Arikan, "A High-Throughput Energy-Efficient Implementation of Successive Cancellation Decoder for Polar Codes Using Combinational Logic", *IEEE Trans Circuits and Systems I Fundamental theory and app*, 63, 436-447 (2016)

• E. Arikan, "Varentropy Decreases Under the Polar Transform", *IEEE Trans on Information Theory*, 62, 3390-33400 (2016)

• E. Arikan, N.ul Hassan, M. Lentmaier, G. Montorsi, J. Sayir, "Challenges and some new directions in channel coding", *J of Communications and Networking*, 17, 328-338 (2015)

• F. Arikan, S. Shukurov, H. Tuna, O. Arikan, T.L. Gulyaeva, "Performance of GPS slant total electron content and IRI-Plas-STEC for days with ionospheric disturbance", *Geodesy and Geodynamics*, 7, 1-10 (2016)

• A. Suhre, O. Arikan, A.E. Cetin, "Bandwidth Selection for Kernel Density Estimation Using Fourier Domain Constraints", *IET Signal Processing*, 10, 280-283 (2016)

• M. Dedeoglu, Y.K. Alp, O. Arikan, "FIR Filter Design by Convex Optimization Using Directed Iterative Rank Refinement Algorithm", *IEEE Trans on Signal Processing*, 64, 2209-2219 (2016)

• B. Ozer, O. Arikan, G. Moral, A. Altintas, "Extraction of primary and secondary frequency control from active power generation data of power plants", *Int J of Electrical Power and Energy Systems*, 73, 16-22 (2015)

• S. Ugur, O. Arikan, A.C. Gurbuz, "SAR image reconstruction by expectation maximization based matching pursuit", *Digital Signal Processing*, 37, 75-84 (2015)

• H. Tuna, O. Arikan, F. Arikan, "Regional model-based computerized ionospheric tomography using GPS measurements: IONOLAB-CIT", *Radio Science*, 50, 1062-1075 (2015)

• S.D. Yenen, T.L. Gulyaeva, F. Arikan, O. Arikan, "Association of ionospheric storms and substorms of global electron content with proxy AE index", *Advances in Space Research*, 56, 1343-1353 (2015)

• O. Arikan, R.S. Burachik, C.Y. Kaya, "'Backward Differential Flow' May Not Converge to a Global Minimizer of Polynomials", *J of Optimization Theory and Applications*, 167, 401-408 (2015)

• O. Teke, A. C. Gurbuz, O. Arikan, "A robust compressive sensing based technique for reconstruction of sparse radar scenes", *Digital Signal Processing*, 27, 23-32 (2014)

• H. Tuna, O. Arikan, F. Arikan, T.L. Gulyeva, U. Sezen, "User-friendly slant total electron content computation from IRI-Plas: IRI-Plas-STEC", *Space Weather*, 12, 64-75 (2014)

• A. Ucar, M. Copuroglu, M.Z. Baykara, O. Arikan, S. Suzer, "Tribological interaction between polytetrafluoroethylene and silicon oxide surfaces", *J of Chemical Physics*, 141, 164702-1--6 (2014)

• O. Arikan, F. Arikan, C.B. Erol, "3-D Ionospheric tomography with random field priors", *Mathematical Methods in Engineering*, K. Tas, D. Beleanu (Eds.), Springer Verlag

• V. Tas, A. Atalar, "An Optimized Isolation Network for the Wilkinson Divider", *IEEE Trans on Microwave Theory and Tech.*, 62, 3393-3402 (2014)

• A. Unlugedik, A.S. Tasdelen, A. Atalar, H. Koymen, "Designing Transmitting CMUT Cells for Airborne Applications", *IEEE Trans on Ultrasonics, Ferroelectrics and Frequency Cont*, 61, 1899-1910 (2014)

• A. Atalar, H. Koymen, H.K. Oguz, "Rayleigh-Bloch waves in CMUT arrays", *IEEE Trans on Ultrasonics*, Ferroelectrics and Frequency Cont, 61, 2139-2148 (2014)

• E. Aydogdu, A. Ozgurluk, A. Atalar, H. Koymen, "Parametric Nonlinear Lumped Element Model for Circular CMUTs in Collapsed Mode", *IEEE Trans on Ultrasonics, Ferroelectrics and Frequency Cont*, 61, 173-181 (2014)

• V. Acikel, A. Uslubas, E. Atalar, "Modeling of electrodes and implantable pulse generator cases for the analysis of implant tip heating under MR imaging", *Medical Physics*, 42, 3922 (2015)

• A.C. Ozen, M. Bock, E. Atalar, "Active Decoupling of RF Coils Using a Transmit Array System", *Magnetic Resonance Materials in Physics,Biology and Medicine*, 28, 565-576 (2015)

• D.A. Tekdas, R. Garifulliin, B. Senturk, Y. Zorlu, U. Gundogdu, E. Atalar, A.B. Tekinay, A.A. Chernonosov, Y. Yerli, F. Dumoulin, M.O. Guler, V. ehsen, A.G. Gurek, "Design of a Gd-DOTA-Phythalocyanine Conjugate Combining MRI Contrast Imaging and Photobiology", *J of Photochemistry and Photobiology A-Chemistry,* 90, 1376-1386 (2014)

• Z.G. Figen, O. Aytur, O. Arikan, "Idler-efficiency-enhanced long-wave infrared beam generation using aperiodic orientation-patterned GaAs gratings", *Applied Optics*, 55, 2404- (2016)

• B.Barshan, G. Secer, "Improved deterministic measurement model for consumer-grade accelerometers", *Electronics Letters* (Forthcoming)

• G. Secer, B. Barshan, "Improvements in deterministic error modeling and calibration of inertial sensors and magnetometers", *Sensors and Actuators A - Physical*, 247, 522-538 (2016)

• A. Yurtman, B. Barshan, "Human activity recognition using tag-based radio frequency localization", *Applied Artificial Intelligence*, 30, 153-179 (2016)

• B. Barshan, A. Yurtman, "Investigating inter-subject and inter-activity variations in activity recognition using wearable motion sensors", Computer Journal, 59, 1345-1362 (2016)

• B. Barshan, G. Secer, "Improved deterministic measurement model for consumer-grade accelerometers", Electronics Letters, 52, 529-531 (2016)

• A. Yurtman, B. Barshan, "Human activity recognition using tag-based radio frequency localization", *Applied Artificial Intelligence*, 30, 153-179 (2016)

• B. Barshan, M.C. Yuksek, "Recognizing daily and sports activities in two open source machine learning environments using body-worn sensor units", *Computer Journal*, 57, 1649-1667 (2014)

• A. Yurtman, B. Barshan, "Automated evaluation of physical therapy exercises using multi-template dynamic time warping on wearable sensor signals", *Computer Methods and Programs in Biomedicine*, 117, 189-207 (2014)

• A.T. Ozdemir, B. Barshan, "Detecting Falls with Wearable Sensors Using Machine Learning Techniques", *Sensors-Basel*, 14, 10691-10708 (2014)

• D. Stojanovic, B. Barshan, A. Papadopoulos, N. Van de Weghe, C. Claramunt, "Positioning Methods and Technologies in Mobile and Pervasive Computing", *Encyclopedia of Information Science and Technology*, M. Khosrow-Pour (Eds.), pp. 5713-5722, IGI Global (2015)

• F. Erden, S. Velipasalar, A.Z. Alkar, A.E. Cetin, "Sensors in assisted living: A survey", *IEEE Signal Processing Magazine* (Forthcoming)

• C.E. Akbas, O. Gunay, K. Tasdemir, A.E. Cetin, "Energy efficient cosine similarity measures according to a convex cost function", *Signal Image and Video Processing* (Forthcoming)

• F. Ahmad, A.E. Cetin, K.C. Dominic Ho, J. Nelson, "Signal Processing for Assisted Living: Developments and Open Problems", *IEEE Signal Processing Magazine*, 33, 25-26 (2016)

• M.T. Arslan, M. Tofighi, A.E. Cetin, "Range resolution improvement in FM-based passive radars using deconvolution", *Signal Image and Video Processing*, 10, 1481-1488 (2016)

• S. Cakir, A.E. Cetin, "Image quality assessment using twodimensional complex mel-cepstrum", *J of Electronic Imaging*, 25, 061604-1--13 (2016)

• F. Erden, S. Velipasalar, A.Z. Alkar, A.E. Cetin, "Sensors in Assisted Living: A survey of signal and image processing methods", *IEEE Signal Pro*cessing Magazine*, 33, 36-44 (2016)*

• M. Tofighi, O. Yorulmaz, K. Kose, D.C. Yildirim, R. Cetin-Atalay, A.E. Cetin, "Phase and TV Based Convex Sets for Blind Deconvolution of Microscopic Images", *IEEE J of Selected Topics in Signal Processing*, 10, 81-91 (2016)

• A.E. Cetin, M. Tofighi, "Projection-Based Wavelet Denoising", *IEEE Signal Processing Magazine,* 32, 120-124 (2015)

• F. Erden, A.Z. Alkar, A.E. Cetin, "Contact-free measurement of respiratory rate using infrared and vibration sensors", *Infrared Physics and Technology*, 73, 88-94 (2015)

• F. Erden, A.Z. Alkar, A.E. Cetin, "A robust system for counting people using an infrared sensor and a camera", *Infrared Physics and Technology,* 72, 127-134 (2015)

• A. Bozkurt, P. Duygulu, A.E. Cetin, "Classifying fonts and calligraphy styles using complex wavelet transform", *Signal Image and Video Processing*, 9, 225-234 (2015)

• D. Androutsos, K. Plataniotis, A.E. Cetin, "Editorial: In Memoriam: Anastasios (Tas) N. Venetsanopoulos", *Signal Image and Video Processing*, 9.

• N. Tofighi, K. Kose, A.E. Cetin, "Denoising Images Corrupted by Impulsive Noise Using Projections Onto the Epigraph Set of Total Variation Function (PES-TV)", *Signal Image and Video Processing,* 9, 41-48 (2015)

• Z. Deprem, A.E. Cetin, "Crossterm-free Time-frequency Distribution Reconstruction via Lifted Projections", *IEEE Trans on Aerospace and Electronic Systems*, 51, 479-491 (2015)

• Z. Deprem, A.E. Cetin, O. Arikan, "AM/FM Signal Estimation with micro Segmentation and Polynomial Fit", *Signal Image and Video Processing*, 8, 399-413 (2014)

• K. Tasdemir, A.E. Cetin, "Content-based video copy detection based on motion vectors estimated using a lower frame rate", *Signal Image and Video Processing*, 8, 1049-1057(2014)

• K. Kose, O. Gunay, A.E. Cetin, "Compressive sensing using the modified entropy functional", *Digital Signal Processing,* 24, 63-70 (2014)

• A.E. Cetin, T.C. Pearson, R.A. Sevimli, "System for removing shell pieces hazelnut kernels using impact vibration analysis", *Computers and Electronics in Agriculture*, 101, 11-16 (2014)

• F. Erden, A.E. Cetin, "Hand Gesture Based Remote Control System Using Infrared Sensors and a Camera", *IEEE Trans on Consumer Electronics*., 675-680 (2014)

• K. Kose, R. Cetin-Atalay, A.E. Cetin, "Special issue on microscopic image processing", *Signal Image and Video Processing,* 8, 1-3 (2014)

• A. Bozkurt, A. Suhre, A.E. Cetin, "Multi-scale directional-filtering-based method for follicular lymphoma grading", Signal Image and Video Processing, 8, 63-70 (2014)

• A.E. Cetin, B. Merci, O. Gunay, S. Verstockt, B. Toreyin, *Methods and Techniques Used for Fire Detection*, Elsevier, (2016)

• E. Ilicak, L.K. Senel, E. Biyik, T. Cukur, "Profile-Encoding Reconstruction for Multiple-Acquisition Balanced Steady-Staete Free Precession Imaging", *Magnetic Resonance in Medicine* (Forthcoming)

• T. Cukur, "Spectrally selective imaging with wideband balanced steady-state free precession MRI", *Magnetic Resonance in Medicine*, 75, 1132-1141 (2016)

• T. Cukur, A.G. Huth, S. Nishimoto, J.L. Gallant, "Functional Subdomains within Scene-Selective Cortex: Parahippocampal Place Area, Retrosplenial Complex, and Occipital Place Area", *J of Neuroscience*, 36, 10257-10273 (2016)

• T. Cukur, "Accelerated Phase-Cycled SSFP Imaging with Compressed Sensing", *IEEE Trans on Medical Imaging,* 34, 107-115 (2015)

• Y. Gao, L. Tobing, K. A. Dorian, D. H. Zhang, C. Dang, H.V. Demir, "Azimuthally Polarized, Circular Colloidal Quantum Dot Laser Beam Enabled by a Concentric Grating", *Acs Photonics* (Forthcoming)

• B. Guzelturk, H.V. Demir, "Near-Field Energy Transfer Using Nanoemitters For Optoelectronics", *Advanced Functional Materials* (Forthcoming)

• A. Yeltik, S. Delikanli, M. Olutas, Y. Kelestemur, B. Guzelturk, H.V. Demir, "Experimental Determination of the Absorption Cross-Section and Molar Extinction Coefficient of Colloidal CdSe Nanoplatelets", *J of Physical Chemistry C* (Forthcoming)

• A. Alipour, E. Unal, S. Gokyar, H.V. Demir, "Development of a distance-independent wireless passive RF resonator sensor and a new telemetric measurement technique for wireless strain monitoring", *Sensors and Actuators A - Physical,* 255, 87-93 (2017)

• A. Perumal, S. Shendre, M. Li, Y. K. E. Tay, V. K. Sharma, S. Chen, Z. Wei, Q. Liu, Y. Gao, P. J. S. Buenconsejo, S. T. Tan, C. L. Gan, Q. Xiong, T. C. Sum, H.V. Demir, "High brightness formamidinium lead bromide perovskite nanocrystal light emitting devices", *Scientific Reports*, 6, 36733-1--10 (2016)

• V.T. Kilic, E. Unal, E. Gonendik, N. Yilmaz, H.V. Demir, "Strongly Coupled Outer Squircle-Inner Circular Coil Architecture for Enhanced Induction Over Large Areas", *IEEE Trans on Industrial Electronics*, 63, 7478 (2016)

• M. Idris, M. Bazzar, B. Guzelturk, H.V. Demir, D. Tuncel, "Cucurbit[7]uril-threaded fluorene–thiophene-based conjugated polyrotaxanes", *RSC Advances*, 6, 98109-98116 (2016)

• T. Erdem, Z. Soran-Erdem, Y. Kelestemur, N. Gaponik, H.V. Demir, "Excitonic improvement of colloidal nanocrystals in salt powder matrix for quality lighting and color enrichment", *Optics Express*, 24, 74-84 (2016)

• V.T. Kilic, E. Unal, H.V. Demir, "Wireless Metal Detection and Surface Coverage Sensing for All-Surface Induction Heating", *Sensors-Basel,* 16, 16030363 (2016)

• Y. Kelestemur, B. Guzelturk, O. Erdem, M. Olutas, K. Gungor, H.V. Demir, "Platelet-in-Box Colloidal Quantum Wells: CdSe/CdS@CdS Core/Crown@Shell Heteronanoplatelets", *Advanced Functional Materials*, 26, 3570-3579 (2016)

• T. Erdem, H.V. Demir, "Colloidal nanocrystals for quality lighting and displays: milestones and recent developments", *Nanophotonics,* 5, 74-95 (2016)

• Z. Soran-Erdem, T. Erdem, K. Gungor, J. Pennakalathil, D. Tuncel, H.V. Demir, "High-Stability, High-Efficiency Organic Monoliths Made of Oligomer Nanoparticles Wrapped in Organic Matrix", *ACS Nano,* 10, 5333-5339 (2016)

• S. Yang, V. D. Ta, Y. Wang, R. Chen, T. He, H.V. Demir, H. Sun, "Reconfigurable Liquid Whispering Gallery Mode Microlasers", *Scientific Reports*, 6, 27200-1--9 (2016)

• V. K. Sharma, A. Alipour, Z. Soran-Erdem, Y. Kelestemur, Z. G. Aykut, H.V. Demir, "Fluorescent heterodoped nanotetrapods as synergistically enhancing positive and negative MRI contrast agents", *ACS Applied Materials & Interfaces,* 8, 12352-12359 (2016)

• J. Frohleiks, S. Wepfer, Y. Kelestemur, H.V. Demir, G. Bacher, E. Nannen, "Quantum Dot / Light Emitting Electrochemical Cell Hybrid Device and Mechanism of its Operation", *ACS Applied Materials & Interfaces*, 37, 24692-24698 (2016)

• Y. Gao, G. Yu, Y. Wang, S. C. Dang, T. C. Sum, H. Sun, H.V. Demir, "Green Stimulated Emission Boosted by Nonradiative Resonant Energy Transfer from Blue Quantum Dots", *J of Physical Chemistry Letters*, 7, 2772-2778 (2016)

• B. Guzelturk, F. Menk, K. Philipps, Y. Kelestemur, M. Olutas, R. Zentel, H.V. Demir, "Colloidal Nanoplatelet/Conducting Polymer Hybrids: Excitonic and Material Properties", *J of Physical Chemistry C*, 120, 3573-3582 (2016)

• S.V. Gaponenko, H.V. Demir, C. Seassal, U. Woggon, "Colloidal nanophotonics: the emerging technology platform", *Optics Express*, 24, 430-433 (2016)

• Z.-H. Zhang, Y. Zhang, W. Bi, C. Geng, S. Xu, H.V. Demir, X. W. Sun, "A charge inverter for III-nitride light-emitting diodes", *Applied Physics Letters*, 108, 133502-1--6 (2016)

• Z.-H. Zhang, Y. Zhang, W. Bi, C. Geng, S. Xu, H.V. Demir, X. W. Sun, "On the hole accelerator for III-nitride light-emitting diodes", *Applied Physics Letters*, 108, 151105-1--6 (2016)

• J. R. Murphy, S. Delikanli, T. Scrace, P. Zhang, T. Norden, T. Thomay, A. N. Cartwright, H.V. Demir, A. Petrou, "Time-resolved photoluminescence study of CdSe/CdMnS/CdS core/multi-shell nanoplatelets", *Applied Physics Letters*, 108, 242406-1--5 (2016)

• N. Hasanov, V. K. Sharma, P. L. Hernández-Martínez, S. T. Tan, H.V. Demir, "Critical role of CdSe nanoplatelets in color-converting CdSe/ZnS nanocrystals for InGaN/GaN light-emitting diodes", *Optics Letters*, 41, 2883-2886 (2016)

• T. He, Y. Gao, Y. Gao, X. Lin, R. Chen, W. Hu, X. Zhao, Y. Wang, H.V. Demir, Q. Fan, A.C. Grimsdale, H. Sun, "Unusual Fluorescent Properties of Stilbene Units and CdZnS/ZnS Quantum Dots Nanocomposites: White-Light Emission in Solution versus Light-Harvesting in Films", *Macr. Chem. Phys,* 217, 24-31 (2016)

• O. Erdem, M. Olutas, B. Guzelturk, Y. Kelestemur, H.V. Demir, "Temperature-dependent emission kinetics of colloidal semiconductor nanoplatelets strongly modified by stacking", *J of Physical Chemistry Letters,* 7, 548-554 (2016)

• X. Zhao, Y. Gao, B. Zhu, H.V. Demir, S. J. Wang, H. Sun, "Exciton energy recycling from ZnO defect levels: towards electrically driven hybrid quantum-dot white light-emitting-diodes", *Nanoscale,* 8, 5835-5841 (2016)

• M. Adams, N. Gaponik, T. Erdem, Z. Soran-Erdem, H.V. Demir, "Colloidal Nanocrystals Embedded in Macrocrystals: Methods and Applications", *J of Physical Chemistry Letters,* 7, 4117-4123 (2016)

• J. Xing, F. Yan, Y. Zhao, S. Chen, H. Yu, Q. Zhang, R. Zeng, H.V. Demir, X.W. Sun, A. Huan, Q. Xiong, "High-efficiency light-emitting diodes of organometal halide perovskite amorphous nanoparticles", *ACS Nano,* 10, 6623-6630 (2016)

• M. Olutas, B. Guzelturk, Y. Kelestemur, K. Gungor, H.V. Demir, "Highly Efficient Nonradiative Energy Transfer from Colloidal Semiconductor Quantum Dots to Wells for Sensitive Noncontact Temperature Probing", *Advanced Functional Materials*, 26, 2891-2899 (2016)

• S. Akhavan, A. F. Cihan, A. Yeltik, B. Bozok, V. Lesnyak, N. Gaponik, A. Eychmüller, H.V. Demir, "Multiexciton Generation Assisted Highly Photosensitive CdHgTe Nanocrystal Skins", *Nano Energy,* 26, 324-331 (2016)

• B. Zhu, W. Liu, S. Lu, Y. Zhang, N. Hasanov, X. Zhang, Y. Ji, Z.-H. Zhang, S. T. Tan, H. Liu, H.V. Demir, "Decoupling contact and mirror: an effective way to improve the reflector for flip-chip InGaN/GaN-based light-emitting diodes", *J of Physics D*, 49, 265106-1--7 (2016)

• B. Zhu, S. T. Tan, W. Liu, S. Lu, Y. Zhang, S. Chen, N. Hasanov, X. Kang, H.V. Demir, "Modulating ohmic contact through InGaxNyOz interfacial layer for high-performance InGaN/GaN-based light-emitting diodes", *IEEE Photonics Journal*, 8, 1600808-1--9 (2016)

• A. Nirmal, A. K. K. Kyaw, X. W. Sun, H.V. Demir, "Demonstration of the portability of porous microstructure architecture to indium-doped ZnO electron selective layer for enhanced light scattering in inverted organic photovoltaics", *J of Sol-Gel Science and Technology,* 78, 613-620 (2016)

• S. Akhavan, C. Uran, B. Bozok, K. Gungor, Y. Kelestemur, V. Lesnyak, N. Gaponik, A. Eychmuller, H.V. Demir, "Flexible and Fragmentable Tandem Photosensitive Nanocrystal Skins", *Nanoscale*, 8, 4399-4758 (2016)

• Y. Wang, K.S. Leck, V.D. Ta, R. Chen, V. Nalla, Y. Gao, T. He, H.V. Demir, H. Sun, "Blue Liquid Lasers from Solution of CdZnS/ZnS Ternary Alloy Quantum Dots with Quasi-Continuous Pumping", *Advanced Materials*, 27, 169-175 (2015)

• S. Delikanli, M.Z. Akgul, J.R. Murphy, B. Barman, Y. Tsai, T. Scrace, P. Zhang, B. Bozok, P.L. Hernandez-Martinez, J. Christodoulides, A.N. Cartwright, A. Petrou, H.V. Demir, "Mn2+-Doped CdSe/CdS Core/Multishell Colloidal Quantum Wells Enabling Tunable Carrier - Dopant Exchange Interactions", *ACS Nano*, 9, 12473-12479 (2015)

• M. Olutas, B. Guzelturk, Y. Kelestemur, A. Yeltik, S. Delikanli, H.V. Demir, "Lateral Size-Dependent Spontaneous and Stimulated Emission Properties in Colloidal CdSe Nanoplatelets", *ACS Nano*, 9, 5041-5050 (2015)

• M. Adam, Z. Wang, A. Dubavik, G.M. Stachowski, C. Meerbach, Z. Soran-Erdem, C. Rengers, H.V. Demir, N. Gaponik, A. Eychmuller, "Liquid-Liquid Diffusion-Assisted Crystallization: A Fast and Versatile Approach Toward High Quality Mixed Quantum Dot-Salt Crystals", *Advanced Functional Materials*, 25, 2638-2645 (2015)

• Y. Kelestemur, M. Olutas, S. Delikanli, B. Guzelturk, M.Z. Akgul, H.V. Demir, "Type-II Colloidal Quantum Wells: CdSe/CdTe Core/Crown Heteronanoplatelets", *J of Physical Chemistry Letters*, 119, 2177-2185 (2015)

• Z. Soran-Erdem, T. Erdem, P.L. Hernandez-Martinez, M.Z. Akgul, N. Gaponik, H.V. Demir, "Macrocrystals of Colloidal Quantum Dots in Anthrancene: Exciton Trannsfer and Polarized Emission", *J of Physical Chemistry Letters*, 6, 1767-1772 (2015)

• B. Guzelturk, Y. Kelestemur, K. Gungor, A. Yeltik, M.Z. Akgul, Y. Wang, R. Chen, C. Dang, H. Sun, H.V. Demir, "Stable and Low-Threshold Optical Gain in CdSe/CdS Quantum Dots: An All-Colloidal Frequency Up-Converted Laser", *Advanced Materials*, 27, 2741-2746 (2015)

• B. Guzelturk, M. Olutas, S. Delikanli, Y. Kelestemur, O. Erdem, H.V. Demir, "Nonradiative energy transfer in colloidal CdSe nanoplatelet films", *Nanoscale*, 7, 2545-2551 (2015)

• S. Delikanli, B. Guzelturk, P.L. Hernandez-Martinez, T. Erdem, Y. Kelestemur, M. Olutas, M.Z. Akgul, H.V. Demir, "Continuously Tunable Emission in Inverted Type-I CdS/CdSe Core/Crown Semiconductor Nanoparticles", *Advanced Functional Materials*, 25, 4282-4289 (2015)

• Y. Gao, V.D. Ta, X. Zhao, Y. Wang, R. Chen, E. Mutlugun, K.E. Fong, S.T. Tan, C. Dang, X.W. Sun, H. Sun, H.V. Demir, "Observation of polarized gain from aligned colloidal nanorods", *Nanoscale*, 7, 6481-6486 (2015)

• H. Keita, B. Guzelturk, J. Pennakalathil, T. Erdem, H.V. Demir, D. Tuncel, "Construction of multi-layered white emitting organic nanoparticles by clicking polymers", *J of Materials Chemistry*, 3, 10277-10284 (2015)

• H. Zare, M. Marandi, S. Fardindoost, V.K. Sharma, A. Yeltik, O. Akhavan, H.V. Demir, N. Taghavinia, "High-efficiency CdTe/CdS core-shell nanocrystals in water enabled by photo-induced colloidal hetero-epitaxy of CdS shelling at room temperature", *Nano Research*, 8, 2317-2328 (2015)

• M. Adam, T. Erdem, G. Stachowski, Z. Soran-Erdem, J. Lox, C. Bauer, J. Poppe, H.V. Demir, N. Gaponik, A. Eychmueller, "Implementation of High-Quality Warm-White Light-Emitting Diodes by a Model-Experimental Feedback Approach using Quantum Dot-Salt Mixed Crystals", *ACS Applied Materials & Interfaces*, 7, 23364-23371 (2015)

• V. Sayevich, N. Gaponik, M. Ploetner, M. Kruszynska, T. Gemming, V. Dzhagan, S. Akhavan, D. Zahn, H.V. Demir, A. Eychmuller, "Stable dispersion of iodide-capped PbSe quantum dots for high-performance low-temperature processed electronics and optoelectronics", *Chemistry of Materials*, 27, 4328-4337 (2015)

• B. Guzelturk, H.V. Demir, "Organic-Inorganic Composites of Semiconductor Nanocrystals for Efficient Excitons", *J of Physical Chemistry Letters*, 6, 2206-2215 (2015)

• X. Yang, P.L. Hernandez-Martinez, C. Dang, E. Mutlugun, K. Zhang, H.V. Demir, X.W. Sun, "Electroluminescence Efficiency Enhancement in Quantum Dot Light-Emitting Diodes by Embedding a Silver Nanoisland Layer", *Advanced Optical Materials*, 3, 1439-1445 (2015)

• V.K. Sharma, A. Alipour, Z. Soran-Erdem, Z.G. Aykut, H.V. Demir, "Highly monodisperse low-magnetization magnetite nanocubes as simultaneous T1-T2 MRI contrast agents", *Nanoscale*, 23, 10519-10526 (2015)

• T. Erdem, Z. Soran-Erdem, V. Kumar Sharma, Y. Kelestemur, M. Adam, N. Gaponik, H.V. Demir, "Stable and efficient colour enrichment powders of nonpolar nanocrystals in LiCl", *Nanoscale*, 7, 17611-17616 (2015)

• Y. Wang, K.E. Fong, S. Yang, V.D. Ta, Y. Gao, Z. Wang, V. Nalla, H.V. Demir, H. Sun, "Unravelling the ultralow threshold stimulated emission from CdZnS/ZnS quantum dot and enabling high-Q microlasers", *Laser & Photonics Review*, 9, 507-516 (2015)

• Y.P. Zhang, Z.H. Zhang, W. Liu, S.T. Tan, Z.G. Ju, X.L. Zhang, Y. Ji, L.C. Wang, Z. Kyaw, N. Hasanov, B.B. Zhu, S.P. Lu, X.W. Sun, H.V. Demir, "Nonradiative recombination - critical in choosing quantum well number for InGaN/GaN light-emitting diodes", *Optics Express*, 23, 34-42 (2015)

• Z.H. Zhang, Z. Kyaw, W. Liu, Y. Ji, L. Wang, S.T. Tan, X.W. Sun, H.V. Demir, "A hole modulator for InGaN/GaN light-emitting diodes", *Applied Physics Letters*, 106, 063501 (2015)

• X. Zhao, Y. Gao, Y. Wang, H.V. Demir, S. Wang, H. Sun, "Manipulating Optical Properties of ZnO/Ga?ZnO Core-Shell Nanorods Via Spatially Tailoring Electronic Bandgap", *Advanced Optical Materials*, 3, 1066-1071 (2015)

• B. Ozbey, H.V. Demir, O. Kurc, V.B. Erturk, A. Altintas, "Wireless Sensing in Complex Electromagnetic Media of Building Materials", *IEEE Sensors Journal*, 15, 5545-5554 (2015)

• S. Fardindoost, A. Alipour, S. Mohammadi, S. Gokyar, R. Sarvari, A. Iraji zad, H.V. Demir, "Flexible strain sensors based on electrostatically actuated graphene flakes", *J of Micromech. Microeng.*, 25, 075016 (2015)

• K. McGilvray, E. Unal, K.T. Troy, B. Santoni, R. Palmer, J. Easley, H.V. Demir, C. Puttlitz, "Implantable Microelectromechanical Sensors for Diagnostic Monitoring and Post-Surgical Prediction of Bone Fracture Healing", *J of Orthopaedic Research*, 3, 1439-1446 (2015)

• T. Erdem, Z. Soran-Erdem, P.L. Hernandez-Martinez, V.K. Sharma, H. Akcali, I. Akcali, N. Gaponik, A. Eychmuller, H.V. Demir, "Sweet plasmonics: Sucrose macrocrystals of metal nanoparticles", *Nano Research,* 8, 860-869 (2015)

• X. Xu, A.K.K.K. Kyaw, B. Peng, Q. Xiong, H.V. Demir, Y. Wang, T.K.S. Wong, X.W. Sun, "Influence of gold-silica nanoparticles on the performance of small-molecule bulk heterojunction solar cells", *Organic Electronics*, 22, 20-28 (2015)

• O. Akin, H.V. Demir, "Mid-wave infrared metasurface microlensed focal plane array for optical crosstalk suppression", *Optics Express*, 23, 27020-27027 (2015)

• X. Yang, Y. Ma, E. Mutlugun, Y. Zhao, K.S. Leck, S.T. Tan, H.V. Demir, Q. Zhang, H. Du, X.W. Sun, "Stable, Efficient, and All-Solution-Processed Quantum Dot Light-Emitting Diodes with Double-Sided Metal Oxide Nanoparticle Charge Transport Layers", *ACS Applied Materials & Interfaces*, 6, 495-499 (2014)

• Z.-H. Zhang, Z. Ju, W. Liu, S.T. Tan, Y. Ji, Z. Kyaw, X. Zhang, N. Hasanov, X.W. Sun, H.V. Demir, "Improving hole injection efficiency by manipulating the hole transport mechanism through p-type electron blocking layer engineering", *Optics Letters*, 39, 2483-2486 (2014)

• X. Yang, E. Mutlugun, Y. Zhao, Y. Gao, K.S. Leck, Y. Ma, L. Ke, S.T. Tan, H.V. Demir, X.W. Sun, "Solution Processed Tungsten Oxide Interfacial Layer for Efficient Hole-Injection in Quantum Dot Light-Emitting Diodes", *Small*, 10, 246 (2014)

• S. Akhavan, A.F. Cihan, B. Bozok, H.V. Demir, "Nanocrystal Skins with Exciton Funneling for Photosensing", *Small,* 10, 2470-2475 (2014)

• Y. Zhao, J. Zhang, S. Liu, Y. Gao, X. Yang, K. S. Leck, A. P. Abiyasa, Y. Divayana, E. Mutlugun, S.T. Tan, Q. Xiong, H.V. Demir, X.W. Sun, "Transition metal oxides on organic semiconductors", *Organic Electronics*, 15, 871-877 (2014)

• P.L. Hernandez-Martinez, A.O. Govorov, H.V. Demir, "Förster-Type Nonradiative Energy Transfer for Assemblies of Arrayed Nanostructures: Confinement Dimension vs Stacking Dimension", *J of Physical Chemistry C*, 118, 4951-4958 (2014)

• Z.-H. Zhang, W. L., S.T. Tan, Z. Ju, Y. Ji, Z. Kyaw, X. Zhang, N. Hasanov, B. Zhu, S. Lu, Y. Zhang, X.W. Sun, H.V. Demir, "On the mechanisms of InGaN electron cooler in InGaN/GaN light-emitting diodes", *Optics Express*, 22, 779-789 (2014)

• Y. Wang, V.D. Ta, Y. Gao, T.C. He, R. Chen, E. Mutlugun, H.V. Demir, H.D. Sun, "Stimulated Emission and Lasing from CdSe/CdS/ZnS Core-Multi-Shell Quantum Dots by Simultaneous Three-Photon Absorption", *Advanced Materials*, 26, 2954-2961 (2014)

• X. Xu, A.K.K. Kyaw, B. Peng, Q. Du, L. Hong, H.V. Demir, T.K.S. Wong, Q. Xiong, X.W. Sun, "Enhanced efficiency of solution-processed small-molecule solar cells upon incorporation of gold nanospheres and nanorods into organic layers", *Chemical Communications,* 50, 4451-4454 (2014)

• Z-H. Zhang, W. Liu, Z. Ju, S.T. Tan, Y. Ji, X. Zhang, L. Wang, Z. Kyaw, X.W. Sun, H.V. Demir, "Polarization self-screening in [0001] oriented InGaN/GaN light-emitting diodes for improving the electron injection efficiency", *Applied Physics Letters*, 104, 251108-1--4 (2014)

• Z-H. Zhang, W. Li, Z. Ju, S.T. Tan, Y. Ji, Z. Kyaw, X. Zhang, L. Wang, X.W. Sun, H.V. Demir, "Self-screening of the quantum confined Stark effect by the polarization induced bulk charges in the quantum barriers", *Applied Physics Letters*, 104, 243501-1--5 (2014)

• Z. Kyaw, Z-H. Zhang, W. Liu, S.T. Tan, Z.G. Ju, X.L. Zhang, Y. Ji, N. Hasanov, B. Zhu, S. Lu, Y. Zhang, J.H. Teng, S.X. Wei, H.V. Demir, "Simultaneous enhancement of electron overflow reduction and hole injection prmotion by tailoring the last quantum barrier in InGaN/GaN light-emitting diodes", *Applied Physics Letters*, 104, 161113 (2014)

• Z-H. Zhang, Y. Ji, W. Li, S.T. Tan, Z. Kyaw, Z. Ju, X. Zhang, N. Hasanov, S. Lu, Y. Zhang, B. Zhu, X.W. Sun, H.V. Demir, "On the origin of the electron blocking effect by an n-type AlGaN electron blocking layer", *Applied Physics Letters*, 104, 073511-1--5 (2014)

• Z.G. Ju, W. Liu, Z-H. Zhang, S.T. Tan, Y. Ji, Z. Kyaw, X.L. Zhang, S.P. Lu, Y.P. Zhang, B.B. Zhu, N. Hasanov, X.W. Sun, H.V. Demir, "Advantages of the Blue InGaN/GaN Light-Emitting Diodes with an AlGaN/GaN/AlGaN Quantum Well Structured Electron Blocking Layer", *Acs Photonics*, 1, 377-381 (2014)

• S. Akhavan, A. Yeltik, H.V. Demir, "Photosensitivity Enhancement with TiO2 in Semitransparent Light-Sensitive Skins of Nanocrystal Monolayers", *ACS Applied Materials & Interfaces*, 6, 9023-9028 (2014)

• Y. Ji, W.Liu, T. Erdem, R. Chen, S.T. Tan, Z-H. Zhang, Z. Ju, X. Zhang, H. Sun, X.W. Sun, Y. Zhao, S.P. DenBaars, S. Nakamura, H.V. Demir, "Comparative study of field-dependent carrier dynamics and emission kinetics of InGaN/GaN light-emitting diodes grown on (11 2 - 2) semipolar versus (0001) polar planes", *Applied Physics Letters*, 104, 143506-1--5 (2014)

• Y. Kelestemur, A.F. Cihan, B. Guzelturk, H.V. Demir, "Type-tunable amplified spontaneous emission from core-seeded CdSe/CdS nanorods controlled by exciton-exciton interaction", *Nanoscale*, 6, 8509-8514 (2014)

• B. Guilhabert, C. Foucher, A-M. Haughey, E. Mutlugun, Y. Gao, J. Herrnsdorf, H.D. Sun, H.V. Demir, M.D. Dawson, N. Laurand, "Nanosecond colloidal quantum dot lasers for sensing", *Optics Express*, 22, 7803-7319 (2014)

• H. Zhang, H.V. Demir, A.O. Govorov, "Plasmonic metamaterials and nanocomposites with the narrow transparency window effect in broad extinction spectra", *AcS Photonics*, 1, 822-832 (2014)

• A.O. Govorov, H. Zhang, H.V. Demir, Y.K. Gunko, "Photogeneration of hot plasmonic electrons with metal nanocrystals: Quantum description and potential applications", *Nano Today*, 9, 85-101 (2014)

• B. Peng, Z. Li, E. Mutlugun, P.L.H. Martinez, D. Li, Q. Zhang, Y. Gao, H.V. Demir, Q. Xiong, "Quantum dots on vertically aligned gold nanorod monolayer: plasmon enhanced fluorescence", *Nanoscale*, 6, 5592-5598 (2014)

• B. Guzelturk, P.L.H. Martinez, Q. Zhang, Q. Xiong, H. Sun, X.W. Sun, A.O. Govorov, H.V. Demir, "Excitons of semiconductor quantum dots and wires for lighting and displays", Laser & Photonics Review, 8, 73-93 (2014)

• U.O.S. Seker, V.K. Sharma, S. Akhavan, H.V. Demir, "Engineered Peptides for Nanohybrid Assemblies", *Langmuir*, 30, 2137-2143 (2014)

• Z. Kyaw, Z.-H. Zhang, W. Liu, S. T. Tan, Z. G. Ju, X. L. Zhang, Y. Ji, N. Hasanov, B. Zhu, S. Lu, Y. Zhang, X.W. Sun, H.V. Demir, "On the effect of N-GaN/P-GaN/N-GaN/P-GaN/N-GaN built-in junctions in the n-GaN layer for InGaN/GaN light-emitting diodes", *Optics Express*, 22, 809-816 (2014)

• B. Guzelturk, Y. Kelestemur, M.Z. Akgul, V.K. Sharma, H.V. Demir, "Ultralow Threshold One-Photon- and Two-Photon-Pumped Optical Gain Media of Blue-Emitting Colloidal Quantum Dot Films", *J of Physical Chemistry Letters*, 5, 2214-2218 (2014)

• E. Mutlugun, B. Guzelturk, A.P. Abiyasa, Y. Gao, X.W. Sun, H.V. Demir, "Colloidal Quantum Dot-Light-Emitting Diodes Employing Phosphorescent Small Organic Molecules as Efficient Exciton Harvesters", *J of Physical Chemistry Letters*, 5, 2802-2807 (2014)

• B. Guzelturk, P.L. Hernandez-Martinez, V.K. Sharma, Y. Coskun, V. Ibrahimova, D. Tuncel, A.O. Govorov, X.W. Sun, Q. Xiong, H.V. Demir, "Study of exciton transfer in dense quantum dot nanocomposites", *Nanoscale*, 6, 11387-11394 (2014)

• C. Uran, T. Erdem, B. Guzelturk, N. Kosku Perkgoz, S. Jun, E. Jang, H.V. Demir, "Highly polarized light emission by isotropic quantum dots integrated with magnetically aligned segmented nanowires", *Applied Physics Letters*, 105, 141116-1--4 (2014)

• B. Guzelturk, O. Erdem, M. Olutas, Y. Kelestemur, H.V. Demir, "Stacking in Colloidal Nanoplatelets: Tuning Excitonic Properties", *ACS Nano*, 8, 12524-12533 (2014)

• X. Yang, K. Dev, J. Wang, E. Mutlugun, C. Dang, Y. Zhao, S. Liu, Y. Tang, S. T. Tan, X.W. Sun, H.V. Demir, "Light extraction efficiency enhancement of colloidal quantum dot light-emitting diodes using large-scale nanopillar arrays", *Advanced Functional Materials*, 24, 5977-5984 (2014)

• S.V. Zhokovsky, T. Ozel, E. Mutlugun, N. Gaponik, A. Eychmuller, A.V. Lavrinenko, H.V. Demir, S.V. Gaponenko, "Hyperbolic metamaterials based on quantum-dot plasmon resonator nanocomposites", *Optics Express*, 22, 18290-18298 (2014)

• Z-H. Zhang, W. Liu, Z. Ju, S. T. Tan, Y. Ji, Z. Kyaw, X. Zhang, L. Wang, X.W. Sun, H.V. Demir, "InGaN/GaN multiple-quantum-well light-emitting diodes with a grading InN composition suppressing the Auger recombination", *Applied Physics Letters,* 105, 033506 (2014)

• X. Xu, Q. Du, B. Peng, Q. Xiong, L. Hong, H.V. Demir, T.K.S. Wong, A.K.K. Kyaw, X.W. Sun, "Effect of shell thickness on small-molecule solar cells enhanced by dual plasmonic gold-silica nanorods", *Applied Physics Letters,* 105, 113306 (2014)

• X. Zhou, O. Sppera, J. Plain, S. Jradi, X.W. Sun, H.V. Demir, X. Yang, C. Deeb, S. Gray, G. Wiederrecht, R. Bachelot, "Plasmon-based photopolymerization: near-field probing, advanced photonic nanostructures and nanophotochemistry", *J of Optics,* 16, 114002 (2014)

• z.H. Zhang, W. Liu, S. T. Tan, Y. Ji, L. Wang, B. Zhu, Y. Zhang, S. Lu, X. Zhang, N. Hasanov, X.W. Sun, H.V. Demir, "A hole accelerator for InGaN/GaN light-emitting diodes", *Applied Physics Letters*, 105, 153503 (2014)

• V.K. Sharma, B. Guzelturk, T. Erdem, Y. Kelestemur, H.V. Demir, "Tunable White-Light-Emitting Mn-Doped ZnSe Nanocrystals", *ACS Applied Materials & Interfaces*, 6, 3654-3660 (2014)

• B. Guzelturk, Y. Kelestemur, M. Olutas, S. Delikanli, H.V. Demir, "Amplified Spontaneous Emission and Lasing in Colloidal Nanoplatelets", *ACS Nano*, 8, 6599-6605 (2014)

• A. Nirmal, A.K.K. Kyaw, X.W. Sun, H.V. Demir, "Microstructured porous ZnO thin film for increased light scattering and improved efficiency in inverted organic photovoltaics", *Optics Express,* 22, 1412-1421 (2014)

• V.K. Sharma, S. Gokyar, Y. Kelestemur, T. Erdem, E. Unal, H.V. Demir, "Manganese Doped Fluorescent Paramagnetic Nanocrystals for Dual-Modal Imaging", *Small,* 10, 4961-4966 (2014)

• B. Ozbey, H.V. Demir, O. Kurc, V.B. Erturk, A. Altintas, "Wireless Measurement of Elastic and Plastic Deformation by a Metamaterial-Based Sensor", *Sensors-Basel*, 14, 19609-19621 (2014)

• I. Bahceci, M. Hasan, T.M. Duman, B.A. Cetiner, "Efficient Channel Estimation for Reconfigurable MIMO Antennas: Training Techniques and Performance Analysis", *IEEE Trans on Wireless Communications* (Forthcoming)

• A. ElMoslimany, M. Zhou, T.M. Duman, A. Papandreou-Suppappola, "An underwater acoustic communication scheme exploiting biological sounds", *Wireless Communications and Mobile Computing*, 16, 2194-2211 (2016)

• A. Salim, T.M. Duman, "Differential modulation for asynchronous two-way relay systems over frequency-selective fading channels", *Wireless Communications and Mobile Computing*, 16, 2422-2435 (2016)

• S. Rezaei, T.M. Duman, "Physical Layer Security for Space Shift Keying Transmission with Precoding", *IEEE Wireless Communications Letters*, 5, 180-183 (2016)

• A. ElMoslimany, T.M. Duman, "On the Capacity of Multiple-Antenna Systems and Parallel Gaussian Channels with Amplitude-Limited Inputs", *IEEE trans on Communications,* 64, 2888-2899 (2016)

• S. Sharifi, A.K. Tanc, T.M. Duman, "LDPC Code Design for the Two-User Gaussian Multiple Access Channel", *IEEE Trans on Wireless Communications*, 15, 2833-2844 (2016)

• M. Dabirnia, T.M. Duman, "On Code Design for Joint Energy and Information Transfer", *IEEE Trans on Communications*, 64, 2677-2686 (2016)

• M. Rahmati, T. Duman, "Upper Bounds on the Capacity of Deletion Channels Using Channel Fragmentation", *IEEE Trans on Information Theory*, 61, 146-156 (2015)

• A. Ozcelikkale, T.M. Duman, "Linear Precoder Design for Simultaneous Information and Energy Transfer over Two-User MIMO Interference Channels", *IEEE Trans on Wireless Communications,* 14, 5836-2547 (2015)

• A. Salim, T.M. Duman, "A Delay-Tolerant Asynchronous Two-Way-Relay System over Doubly-Selective Fading Channels", *IEEE Trans on Wireless Communications*, 14, 3850-3865 (2015)

• S. Sharifi, A.K. Tanc, T.M. Duman, "Implementing the Han-Kobayashi Scheme Using Low-Density Parity Check Codes Over Gaussian Interference Channels", *IEEE Trans on Communications,* 63, 337-350 (2015)

• A. Ozcelikkale, T.M. Duman, "Cooperative Precoding and Artificial Noise Design for Security Over Interference Channels", *IEEE Signal Processing Letters*, 22, 2234-2238 (2015)

• M. Rahmati, T. Duman, "Spectrally Effiecient Alamouti Code Structure in Asynchronous Cooperative Systems", *IEEE Signal Processing Letters*, 21, 545-549 (2014)

• A. Radosevic, R. Ahmed, T.M. Duman, J. Proakis, M. Stojanovic, "Adaptive OFDM Modulation for Underwater Acoustic Communications: Design Considerations and Experimental Results", *IEEE J of Oceanic Engineering,* 39, 357-370 (2014)

• M. Rahmati, T. Duman, "Achievable Rates for Noisy Channels with Synchronization Errors", *IEEE Trans on Communications*, 62, 3854-3863 (2014)

• A. Ozcelikkale, T. Duman, "Short Length Trellis-Based Codes for Gaussian Multiple Access Channels", *IEEE Signal Processing Letters,* 21, 1177-1181 (2014)

• M. Rahmati, T.M. Duman, "Achieving Delay Diversity in Asynchorous Underwater Acoustic (UWA) Cooperative Communication Systems", *IEEE Trans on Wireless Communications*, 13, 1367-1379 (2014)

• B. Ozbey, V.B. Erturk, O. Kurc, A. Altintas, H.V. Demir, "Multi-Point Single-Antenna Sensing Enabled by Wireless Nested Split-Ring Resonator Sensors", *IEEE Sensors Journal,* 16, 7744-7752 (2016)

• B. Ozbey, V.B. Erturk, O. Kurc, A. Altintas, H.V. Demir, "Multi-Point Single-Antenna Sensing Enabled by Wireless Nested Split-Ring Resonator Sensors", *IEEE Sensors Journa*l, 16, 7744-7752 (2016)

• B. Ozbey, V.B. Erturk, H.V. Demir, A. Altintas, O. Kurc, "A Wireless Passive Sensing System for Displacement/Strain Measurement in Reinforced Concrete Members", *Sensors-Basel*, 16, 496 (2016)

• M. Kalfa, V.B. Erturk, "Analysis of slotted sectoral waveguide arrays with multilayered radomes", *IEEE Trans on Antennas Propagation*, 64, 800-805 (2016)

• M. Takrimi, O. Ergul, V. B. Ertürk, "A novel broadband multilevel fast multipole algorithm with incomplete-leaf tree structures for multiscale electromagnetic problems", *IEEE Trans on Antennas Propagation*, 64, 2445-2456 (2016)

• E.P. Karabulut, V.B. Erturk, L. Alatan, S. Karan, B. Alisan, M.I. Aksun, "A novel approach for the efficient computation of 1-D and 2-D summations", *IEEE Trans on Antennas Propagation,* 64, 1014-1022 (2016)

• S. Kurudere, V.B. Erturk, "SIW based interdigital bandpass filter with harmonic suppression", *Microwave and Optical Tech Lett*, 57, 66-69 (2015)

• B. Ozbey, E. Unal, H. Ertugrul, O. Kurc, C.M. Puttlitz, V.B. Erturk, A. Altintas, H.V. Demir, "Wireless Displacement Sensing Enabled by Metamaterial Probes for Remote Structural Health Monitoring", *Sensors-Basel,* 14, 1691-1704 (2014)

• S. Karan, V.B. Erturk, "Analysis of input impedance and mutual coupling of microstrip antennas on multilayered circular cylinders usingclosed-form Green's function representations", *IEEE Trans on Antennas Propagation*, 62, 5485-5496 (2014)

• B. Ozbey, E. Unal, H. Ertugrul, O. Kurc, C.M. Puttlitz, V.B. Erturk, A. Altintas, H.V. Demir, "Wireless Displacement Sensing Enabled by Metamaterial Probes for Remote Structural Health Monitoring", *Sensors-Basel,* 14, 1691-1704 (2014)

• M.F. Keskin, M.N. Kurt, M.E. Tutay, S. Gezici, O. Arikan, "Maximization of average number of correctly received symbols over multiple channels in the presence of idle periods", *Digital Signal Processing*, 54, 95-118 (2016)

• M.R. Gholami, S. Gezici, E.G. Strom, "TW-TOA based positioning in the presence of clock imperfections", *Digital Signal Processing*, 59, 19-30 (2016)

• M.F. Keskin, E. Gonendik, S. Gezici, "Improved Lower Bounds for Ranging in Synchronous Visible Light Positioning Systems", *J of Lightwave Technology*, 34, 5496-5504 (2016)

• S. Gezici, S. Bayram, M. N. Kurt, M. R. Gholami, "Optimal jammer placement in wireless localization systems", *IEEE Trans on Signal Processing*, 64, 4534-4549 (2016)

• S. Bayram, B. Dulek, S. Gezici, "Joint Detection and Decoding in the Presence of Prior Information With Uncertainty", *IEEE Signal Processing Letters,* 23, 1602-1606 (2016)

• S. Gezici, M. R. Gholami, S. Bayram, and M. Jansson, "Jamming of wireless localization systems", *IEEE Trans on Communications*, 64, 2660-2676 (2016)

• A.D. Sezer, S. Gezici, "Average Capacity Maximization via Channel Switching in the Presence of Additive White Gaussian Noise Channels and Switching Delays", *IEEE Trans on Wireless Communications,* 15, 6228-6243 (2016)

• M.F. Keskin, S. Gezici, "Comparative theoretical analysis of distance estimation in visible light positioning systems", *J of Lightwave Technology*, 34, 854-865 (2016)

• A.B. Akbay, S. Gezici, "Noise benefits in joint detection and estimation problems", *Signal Processing*, 118, 235-247 (2016)

• M.E. Tutay, S. Gezici, H. Soganci, O. Arikan, "Optimal channel switching over Gaussian channels under average power and cost constraints", *IEEE Trans on Communications*, 63, 1907-1922 (2015)

• H. Soganci, S. Gezici, O. Arikan, "Optimal signal design for multi-parameter estimation problems", *IEEE Trans on Signal Processing*, 63, 6074-6085 (2015)

• E. Gonendik, S. Gezici, "Fundamental limits on RSS based range estimation in visible light positioning systems", *IEEE Communication Letters*, 19, 2138-2141 (2015)

• A.D. Sezer, S. Gezici, H. Inaltekin, "Optimal Channel Switching Strategy for Average Capacity Maximization", *IEEE Trans on Communications*, 63, 2143 (2015)

• B. Gulmezoglu, M.B. Guldogan, S. Gezici, "Multi-person tracjking with a network of ultra-wideband radar sensors based on Gaussian mixture PHD filters", *IEEE Sensors Journal,* 15, 2227-2237 (2015)

• B. Dulek, S. Gezici, R. Sawai, P. Kimura, "Power adaptation for cognitive radio systems under an average SINR loss constraint in the absense of path loss information", *Wireless Personal Communications*, 77, 151-172 (2014)

• S. Bayram, S. Gultekin, S. Gezici, "Noise enhanced hypothesis-testing according to restricted Neyman-Pearson criterion", *Digital Signal Processing*, 25, 17-27 (2014)

• A.D. Sezer, S. Gezici, M.C. Gursoy, "Optimal Detector Randomization in Cognitive Radio Systems in the Presence of Imperfect Sensing Decisions", *IEEE Communication Letters*, 18, 213-216 (2014)

• G. Ozcan, M.C. Gursoy, S. Gezici, "Error rate analysis of cognitive radio transmissions with imperfect channel sensing", *IEEE Trans on Wireless Communications* (Forthcoming)

• Dulek, B, M.E. Tutay, S. Gezici, P.K. Varshney, "Optimal Signaling and Detector Design for M-ary Communication Systems in the Presence of Multiple Additive Noise Channels", *Digital Signal Processing*, 26, 153-168 (2014)

• M.R. Gholami, E.G. Strom, H. Wymeersch, S. Gezici, "Upper bounds on position error of a single location estimate in wireless sensor networks", *EURASIP Journal on Advances in Signal Processing*, 4 (2014)

• A. Mallat, S. Gezici, D. Dardari, C. Craeye, L. Vandendorpe, "Statistics of the MLE and Approximate Upper and Lower Bounds- Part 1: Application to TOA Estimation", *IEEE Trans on Signal Processing*, 62, 5663-5676 (2014)

• A. Mallat, S. Gezici, D. Dardari, L. Vandendorpe, "Statistics of the MLE and Approximate Upper and Lower Bounds - Part 2: Threshold Computation and Optimal Signal Design", *IEEE Trans on Signal Processing*, 62, 5677-5689 (2014)

• Z. Sahinoglu, S. Gezici, I. Guvenc, *Ultra-wideband Positioning Systems: Theoretical Limits, Ranging Algorithms, and Protocols*, Cambridge University Press, (2008).

• M. R. Gholami, M. F. Keskin, S. Gezici, M. Jansson, "Cooperative positioning in wireless networks", *Wiley Encyclopedia of Electrical and Electronics Engineering*, J. Webster (Eds.), pp. 1-19, John Wiley & Sons, Inc (2016)

• O.F. Oran, Y.Z. Ider, "Feasibility of Conductivity Imaging Using Subject Eddy Currents Induced by Switching of MRI Gradients", *Magnetic Resonance in Medicine* (Forthcoming)

• N. Gurler, Y.Z. Ider, "Gradient Based Electrical Conductivity Imaging using MRI Phase", *Magnetic Resonance in Medicine* (Forthcoming)

• E.A. Turk, Y.Z. Ider, A.S. Ergun, E. Atalar, "An Approximate Fourier Domain Expression for Bloch-Siegert Shift", *Magnetic Resonance in Medicine*, 73, 117-125 (2015)

• N. Gurler, Y.Z. Ider, "Numerical Methods and Software Tools for Simulation, Design, and Resonant Mode Analysis of Radio Frequency Birdcage Coils Used in MRI", *Concepts in Magnetic Resonance Part B*, 45, 13-32 (2015)

• F.S. Hafalir, O.F. Oran, N. Gurler, Y.Z. Ider, "Convection-reaction equation based Magnetic Resonance Electrical Properties Tomography (cr-MREPT)", *IEEE Trans on Medical Imaging*, 33, 777-793 (2014)

• S. Ilday, F.O. Ilday, R. Hubner, T.J. Prosa, I. Martin, G. Nogay, I. Kabacelik, Z. Mics, M. Bonn, D. Turcihovich, H. Toffoli, D. Friedrich, B. Schmidt, K-H. Heinig, R. Turan, "Multiscale Self-Assembly of Silicon Quantum Dots into an Anisotropic Three-Dimensional Random Network", *Nano Letters*, 16, 1942-1948 (2016)

• C. Kerse, H. Kalaycioglu, P. Elahi, B. Cetin, D.K. Kesim, O. Akcaalan, S. Yavas, M.D. Asik, B. Oktem, H. Hoogland, R. Holzwarth, F.O. Ilday, "Ablation-cooled material removal with ultrafast bursts of pulses", *Nature,* 537, 84-88 (2016)

• I. Gnilitskyi, F. Rotundo, C. Martini, I. Pavlov, S. Ilday, E. Work, F.O. Ilday, L. Orazi, "Nano patterning of AISI 316L stainless steel with Nonlinear Laser Lithography: Sliding under dry and oil-lubricated conditions", *Tribology International*, 99, 67-76 (2016)

• J.S. Freehan, F.O. Ilday, W.S. Broclesby, J.H.V. Price, "Simulations and experiments showing the origin of multiwavelength mode locking in femtosecond, Yb-fiber lasers", *J of Optical Soc Am B*, 33, 1668-1676 (2016)

• R. Iegorov, T. Teamir, G. Makey, F.O. Ilday, "Direct control of mode-locking states of a fiber laser", *Optica*, 3, 1312-1316 (2016)

• E. Aytac-Kipergil, A. Demirkiran, N. Uluc, S. Yavas, T. Kayikcioglu, S. Salman, S.G. Karamuk, F.O. Ilday, M.B. Unlu, "Development of a Fiber Laser with Independently Adjustable Properties for Optical Resolution Photoacoustic Microscopy", *Scientific Reports,* 6, 38674-1--10 (2016)

• Z. Zhang, D. Popa, V.J. Wittwer, S. Milana, T. Hasan, Z. Jiang, A.C. Ferrari, F.O. Ilday, "All-fiber nonlinearity- and dispersion-managed dissipative soliton nanotube mode-locked laser", *Applied Physics Letters*, 17, 241107-1--4 (2015)

• H. Kalaycioglu, O. Akcaalan, S. Yavas, Y.B. Eldeniz, F.O. Ilday, "Burst-mode Yb-doped fiber amplifier system optimized for low-repetition-rate operation", *J of Optical Soc Am B*, 32, 900-906 (2015)

• L. Orazi, La Gnilitskyi, I. Pavlov, A.P. Serro, S. Ilday, F.O. Ilday, "Nonlinear laser lithography to control surface properties of stainless steel", *CIRP Annals - Manufacturing Technology*, 64, 193-196 (2015)

• S. Yilmaz, P. Elahi, H. Kalaycioglu, F.O. Ilday, "Amplified spontaneous emission in high-power burst-mode fiber lasers", *J of Optical Soc Am B*, 32, 2462-2466 (2015)

• P. Elahi, S. Yilmaz, Y.B. Eldeniz, F.O. Ilday, "Generation of picosecond pulses directly from a 100 W, burst-mode, doping-managed Yb-doped fiber amplifier", *Optics Letters*, 39, 236-239 (2014)

• I. Pavlov, E. Dulgergil, E. Ilbey, F.O. Ilday, "Diffraction-limited, 10-W, 5-ns, 100-kHz, all fiber laser at 1.55 um", *Optics Letters*, 39, 2695-2698 (2014)

• H. Keskin, H. Altan, S. Yavas, F.O. Ilday, K. Eken, A.B. Sahin, "Development of a rapid-scan fiber-integrated terahertz spectrometer", *Optical and Quantum Electronics*, 46, 495-503 (2014)

• K. Gurel, P. Elahi, L. Budunoglu, C. Senel, P. Paltani, F.O. Ilday, "Prediction of pulse-to-pulse intensity fluctuation characteristics of high power ultrafast fiber amplifiers", *Applied Physics Letters*, 105, 011111 (2014)

• M. Koseoglu, E. Karasan, L. Chen, "Cross-Layer Energy Minimization for Underwater ALOHA Networks", *IEEE Systems Journal* (Forthcoming)

• C. Aydogdu, E. Karasan, "Goodput and Throughput Comparison of Single-Hop and Multi-Hop Routing for IEEE 802.11 DCF based Wireless Networks under Hidden Terminal Existence", *Wireless Communications and Mobile Computing*, 16, 1078-1094 (2016)

• A.R. Ulucinar, I. Korpeoglu, E. Karasan, "Effects of physical channel separation on application flows in a multi-radio multi-hop wireless mesh network: An experimental study on BilMesh testbed", *J of Network and Computer Applications*, 39, 253-265 (2014)

• M. Koseoglu, E. Karasan, "Energy-optimum Throughput and Carrier Sensing Rate in CSMA-based Wireless Networks", *IEEE Trans on Mobile Computing*, 13.

• M. Koseoglu, E. Karasan, "Spatio-Temporal Analysis of Throughput for Single-Hop CSMA Networks", *IEEE Communication Letters*, 18, 564-567 (2014)

• N. D. Vanli, M. O. Sayin, I. Delibalta, S.S. Kozat, "Sequential Nonlinear Learning for Distributed Multi-Agent Systems via Feedforward Networks", *IEEE Trans on Neural Networks* (Forthcoming)

• M. M. Neyshabouri, O. Demir, I. Delibalta, S.S. Kozat, "Highly Efficient Nonlinear Regression for Big Data with Lexicographical Splitting", *Signal Image and Video Processing* (Forthcoming)

• I. Delibalta, K. Gokcesu, M. Simsek, L. Baruh, S.S. Kozat, "Online Anomaly Detection Using Soft Decision Trees", *IEEE Signal Processing Letters* (Forthcoming)

• F. O. Kilic, M. O Sayin, I. Delibalta, S.S. Kozat, "Computationally Highly Efficient Mixture of Adaptive Filters", *Signal Image and Video Processing* (Forthcoming)

• H. Ozkan, F. Ozkan, I. Delibalta, S.S. Kozat, "Efficient NP tests for Anomaly Detection over Birth-Death Type DTMCs", *J of Signal Processing Systems* (Forthcoming)

• F. Khan, I. A. Karatepe, S.S. Kozat, "Universal Nonlinear Regression on High Dimensional Data Using Adaptive Hierarchical Trees", *IEEE Trans on Big Data* (Forthcoming)

• N. D. Vanli, K. Gokcesu, M. O. Sayin, H. Yilmaz, S.S. Kozat, "Sequential Prediction over Hierarchical Structures", *IEEE Trans on Signal Processing* (Forthcoming)

• H. Ozkan, F. Ozkan, S.S. Kozat, "Online Anomaly Detection under Markov Statistics with Controllable Type-I Error", *IEEE Trans on Signal Processing,* 64, 1435-1445 (2016)

• N.D. Vanli, S. Tunc, M.A. Donmez, S.S. Kozat, "Growth Optimal Portfolios in Discrete-time Markets Under Proportional Transactions Costs", *Digital Signal Processing*, 48, 226-238 (2016)

• N. D. Vanli, H. Ozkan, S.S. Kozat, "Online Classification via Self-Organizing Space Partitioning", *IEEE Trans on Signal Processing,* 64, 3895-3908 (2016)

• H. Ozkan, O. Pelvan, S.S. Kozat, "Data Imputation through the Identification of Local Anomalies", *IEEE Trans on Neural Networks*, 26, 2381-2395 (2015)

• N.D. Vanli, S.S. Kozat, "A Unified Approach to Universal Prediction: Generalized Upper and Lower Bounds", *IEEE Trans on Neural Networks*, 26, 646-651 (2015)

• N.D. Vanli, M.A. Donmez, S.S. Kozat, "Robust Least Squares Methods Under Bounded Data Uncertainties", *Digital Signal Processing*, 36, 82-92 (2015)

• M.O. Sayin, Y. Yilmaz, A. Demir, S.S. Kozat, "The Krylov-proportionate Normalized Least Mean Fourth Approach: Formulation and Performance Anlaysis", *Signal Processing*, 109, 1-13 (2015)

• H. Ozkan, M.A. Donmez, S. Tunc, S.S. Kozat, "A Deterministic Analysis of an Online Convex Mixture of Experts Algorithm", *IEEE Trans on Neural Networks*, 26, 1575-1581 (2015)

• K. Kim, W. Choi, S.S. Kozat, A.C. Singer, "Low Complexity Turbo Equalization: A Clustering Approach", *IEEE Communication Letters,* 18, 1063-1066 (2014)

• H. Ozkan, A. Akman, S.S. Kozat, "A novel and robust parameter training approach for HMMs under noisy and partial access to states", *Signal Processing*, 94, 490-497 (2014)

• N.D. Vanli, S.S. Kozat, "A Comprehensive Approach to Universal Piecewise Nonlinear Regression Based on Trees", *IEEE Trans on Signal Processing*, 62, 5471-5486 (2014)

• M.O. Sayin, N.D. Vanli, S.S. Kozat, "A Novel Family of Adaptive Filtering Algorithms Based on the Logarithmic Cost", *IEEE Trans on Signal Processing*, 62, 4411-4424 (2014)

• M.O. Sayin, S.S. Kozat, "Compressive Diffusion Strategies Over Distributed Networks for Reduced Communication Load", *IEEE Trans on Signal Processing*, 62, 5308-5323 (2014)

• H. Koymen, A. Atalar, A.S. Tasdelen, "Bilateral CMUT Cells and Arrays: Equivalent Circuits, Diffraction Constants and Substrate Impedance", *IEEE Trans on Ultrasonics, Ferroelectrics and Frequency Cont* (Forthcoming)

• I. Uyanik, M.M. Ankarali, N.J. Cowan, U. Saranli, O. Morgul, "Identification of a Vertical Hopping Robot Model via Harmonic Transfer Functions", *Trans of the Institute of Measurement and Control* (Forthcoming)

• D. Kerimoğlu, O. Morgul, U. Saranlı, "Stability and control of planar compass gait walking with series-elastic ankle actuation", *Trans of the Institute of Measurement and Control* (Forthcoming)

• I. Uyanik, O. Morgul, U. Saranli, "Experimental Validation of a Feed-Forward Predictor for the Spring-Loaded Inverted Pendulum Template", *IEEE Trans on Robotics*, 31, 208-216 (2015)

• Z-H. Luo, B-Z Guo, O. Morgul, *Stability and Stabilization of Infinite Dimensional Systems with Applications*, Springer-Verlag, (1999).

• O. Kulce, L. Onural, H.M. Ozaktas, "Evaluation of the validity of the scalar approximation in optical wave propagation using a systems approach and an accurate digital electromagnetic model.", *J of Modern Optics*, 63, 2382-2391 (2016)

• L. Onural, *3D Video Technologies - An Overview of Research Trends*, SPIE, (2010)

• F.S. Oktem, H.M. Ozaktas, "Effect of spatial distribution of partial information on the accurate recovery of optical wave fields", *Applied Optics*, 56, 133-144 (2017)

• S.O. Arik, H.M. Ozaktas, "Optimal representation and processing of optical signals in quadratic-phase systems", *Optics Communications*, 366, 17-21 (2016)

• H.M. Ozaktas, T.C. Gulcu, M.A. Kutay, "Linear algebraic theory of partial coherence: continuous fields and measures of partial coherence", *J of Optical Soc Am A Optics*, 33, 2115-2124 (2016)

• A. Ozcelikkale, S. Yuksel, H.M. Ozaktas, "Unitary Precoding and basis Dependency of MMSE Performance for Gaussian Erasure Channels", *IEEE Trans on Information Theory*, 60, 7186-7203 (2014)

• H.M. Ozaktas, Z. Zalevsky, M.A. Kutay, *The Fractional Fourier Transform with Applications in Optics and Signal Processing*, John Wiley & Sons, (2000)

• A. Koc, F.S. Oktem, H.M. Ozaktas, M.A. Kutay, "Fast Algorithms for Digital Computation of Linear Canonical Transforms", *Linear Canonical Transforms*, J.J. Healy, M.A. Kutay, H.M. Ozaktas, J.T. Sheridan (Eds.), pp. 293-327, Springer (2016)

• F.S. Oktem, H.M. Ozaktas, "Linear Canonical Domains and Degrees of Freedom of Signals and Systems", *Linear Canonical Transforms*, J.J. Healy, M.A. Kutay, H.M. Ozaktas, J.T. Sheridan (Eds.), pp. 197-239, Springer (2016)

• J.J. Healy, H.M. Ozaktas, "Sampling and Discrete Linear Canonical Transforms", *Linear Canonical Transforms*, J.J. Healy, M.A. Kutay, H.M. Ozaktas, J.T. Sheridan (Eds.), pp. 241-256, Springer (2016)

• M.A. Kutay, H.M. Ozaktas, J.A. Rodrigo, "Optical Implementation of Linear Canonical Transforms", *Linear Canonical Transforms*, J.J. Healy, M.A. Kutay, H.M. Ozaktas, J.T. Sheridan (Eds.), pp. 179-194, Springer (2016)

• H. Hajian, H. Caglayan, E. Ozbay, "Long-range Tamm surface plasmons supported by graphene-dielectric metamaterials", *J Applied Physics* (Forthcoming)

• O. Oltulu, A.M. Mamedov, E. Ozbay, "Wave Propagation and Acoustic Band Gaps of Two-Dimensional Liquid Crystal/Solid Phononic Crystals", *Applied Physics A Materials Science & Processing* (Forthcoming)

• S. Palaz, O. Oltulu, A.M. Mamedov, E. Ozbay, "A5B6C7 Ferroelectrics as Novel Materials for Phononic Crystals", *Ferroelectrics* (Forthcoming)

• H. Koc, S. Palaz, A.M. Mamedov, E. Ozbay, "Optical, Electronic and Elastic Properties of Some A5B6C7 Ferroelectrics (A=Sb, Bi; B=S, Se; C=I, Br, Cl): first principle calculation", *Optical Properties of Ferroelectrics* (Forthcoming)

• S. Palaz, H. Koc, H. Ozisik, E. Deligoz, A.M. Mamedov, E. Ozbay, "Optical and Magnetic Properties of Some XMnSb and Co2YZ Compounds: ab initio calculations", *Physica Status Solidi C* (Forthcoming)

• S. Simsek, S. Palaz, C. Akhundov, A.M. Mamedov, E. Ozbay, "AIBIIICVI2 (A=Cu, Ag; B=Ga, In; C=S, Se, Te) Based Photonic Crystal Superlattices: Optical Properties", *Physica Status Solidi C* (Forthcoming)

• E. Ozgun, E. Ozbay, H. Caglayan, "Tunable Zero-Index Photonic Crystal Waveguide for Two-Qubit Entanglement Detection", *Acs Photonics* (Forthcoming)

• E. Arslan, M.K. Ozturk, E. Tiras, T. Tiras, S. Ozcelik, E. Ozbay, "Buffer effects on the mosaic structure of the HR-GaN grown on 6H-SiC substrate by MOCVD", *J of Mater Sci: Mater Electron* (Forthcoming)

• M. Copouroglu, D. Caliskan, H. Sezen, E. Ozbay, S. Suzer, "Location and Visualization of Working p-n and/or n-p Junctions by XPS", *Scientific Reports*, 6, 32482-1--9 (2016)

• Y. Ozturk, A.E. Yilmaz, E. Ozbay, "Conversion from constitutive parameters to dispersive transmission line parameters for multi-band metamaterials", *Waves in Random and Complex Media*, 26, 211-223 (2016)

• O.Ozdemir, A.M. Aygar, O. Balci, C. Kocabas, H. Caglayan, E. Ozbay, "Enhanced tunability of V-shaped plasmonic structures using ionic liquid gating and grapheme", *Carbon*, 108, 515-520 (2016)

• E. Kutlu, P. Narin, G. Atmaca, B. Sarikavak-Lisesivdin, S.B. Lisesivdin, E. Ozbay, "Effect of substitutional As impurity on electrical and optical properties of ß-Si3N4 structure", *Materials Research Bulletin*, 83, 128-134 (2016)

• E. Colak, A.E. Serebryannikov, P.V. Usik, E. Ozbay, "Diffraction inspired unidirectional and bidirectional beam splitting in defect-containing photonic structures without interface corrugations", *J Applied Physics*, 119, 193108-1--10 (2016)

• S. Corekci, S. Dugan, M. K. Ozturk, S. S. Cetin, M. Cakmak, S. Ozcelik, E. Ozbay, "Characterization of AlInN/AlN/GaN Heterostructures with Different AlN Buffer Thickness", *J of Electronic Materials*, 45, 3278-3284 (2016)

• H. Haijan, E. Ozbay, H. Caglayan, "Enhanced transmission and beaming via a zero-index photonic crystal", *Applied Physics Letters*, 109, 031105-1--6 (2016)

• A.E. Serebryannikov, A. Lakhtakia, E. Ozbay, "Single and cascaded, magnetically controllable metasurfaces as terahertz filters", *J of the Optical Society of America B - Optical Physics*, 33, 834-841 (2016)

• M.C. Cakir, D. Caliskan, B. Butun, E. Ozbay, "Planar Indium Tin Oxide Heater for Improved Thermal Distribution for Metal Oxide Micromachined Gas Sensors", *Sensors-Basel,* 16, 1612-1--7 (2016)

• A.E. Serebryannikov, E. Colak, T. Magath, E. Ozbay, "Two types of single-beam deflection and asymmetric transmission in photonic structures without interface corrugations", *J of Optical Soc Am A Optics*, 33, 2450-2458 (2016)

• S. Ardali, E. Tiras, E. Arslan, E. Ozbay, "Complementary and alternative technique for the determination of electron effective mass: quantum Hall effect", *Optoelectronics and Advances Materials-Rapid Communications*, 10, 647-650 (2016)

• Z. Ozer, A.M. Mamedov, E. Ozbay, "BaTiO3 and TeO2 based gyroscopes for guidance systems: FEM analysis", *Ferroelectrics*, 497, 15-23 (2016)

• H. Ozisik, S. Simsek, E. Deligoz, A.M. Mamedov, E. Ozbay, "Optical and electronic properties of orthorhombic and trigonal AXO3 (A=Cd, Zn; X=Sn, Ge): first principle calculation", *Ferroelectrics*, 498, 73-79 (2016)

• O. Oltulu, S. Simsek, A.M. Mamedov, E. Ozbay, "Topological insulator based locally resonant phononic crystals: Wave propagation and acoustic band gaps", *Ferroelectrics*, 499, 123-129 (2016)

• P. Narin, E. Kutlu, B. Sarikavak-Lisesivdin, S.B. Lisesivdin, E. Ozbay, "Electronic properties of Li-doped zigzag graphene nanoribbons", *Physica E*, 84, 543-547 (2016)

• A.E. Serebryannikov, E. Colak, A. Petrov, P.V. Usik, E. Ozbay, "Multifrequency spatial filtering: A general property of two-dimensional photonic crystals", *Photonics and Nanostructures*, 18, 1-9 (2016)

• H. Hajian, I.D. Rukhlenko, P.T. Leung, H. Caglayan, E. Ozbay, "Guided Plasmon Modes of a Graphene-Coated Kerr Slab", *Plasmonics*, 11, 735-741 (2016)

• M.E. Ahsen, H. Ozbay, S-I. Niculescu, "Analysis of a Gene Regulatory Network Model with Time Delay using the Secant Condition", *IEEE Life Sciences Letters*, 2, 5-8 (2016)

• P. Liu, P. Yan, Z. Zhang, H. Ozbay, "Robust Anti-windup Compensation for High Precision Tracking of a Piezoelectric Nano-stage", *IEEE Trans on Industrial Electronics*, 63, 6460-6470 (2016)

• F.T. Gundogdu, A.E. Serebryannikov, A.O. Cakmak, E. Ozbay, "Asymmetric transmission in prisms using structures and materials with isotropic-type dispersion", *Optics Express,* 23, 24120-24132 (2015)

• N.A. Cinel, S. Cakmakyapan, S. Butun, G. Ertas, E. Ozbay, "E-Beam lithography designed substrates for surface enhanced Raman spectroscopy", *Photonics and Nanostructures*, 15, 109-115 (2015)

• D. Caliskan, H. Sezen, E. Ozbay, S. Suzer, "Chemical Visualization of a GaN p-n junction by XPS", *Scientific Reports*, 5, 14091-1--7 (2015)

• A.E. Serebryannikov, S. Nojima, K.B. Alici, E. Ozbay, "Effect of in-material losses on terahertz absorption, transmission, and reflection in photonic crystals made of polar dielectrics", *J Applied Physics*, 118, 133101-1--11 (2015)

• S. Simsek, H. Koc, S. Palaz, O. Oltulu, A.M. Mamedov, E. Ozbay, "Dynamic Nonlinear Optical Processes in Some Oxygen-Octahedra Ferroelectrics: First Principle Calculations", *Ferroelectrics*, 483, 26-42 (2015)

• H. Koc, S. Simsek, A.M. Mamedov, E. Ozbay, "Optical Properties of the Narrow-Band Ferroelectrics: First Principle Calculations", *Ferroelectrics*, 483, 43-52 (2015)

• I.K. Durukan, O. Bayal, G. Kurtulus, Y. Bas, A. Gultekin, M.K. Ozturk, S. Corekci, M. Tamer, S. Ozcelik, E. Ozbay, "Examination of the temperature related structural defects of InGaN/GaN solar cells", *Superlattices and Microstructures*, 86, 379-389 (2015)

• P. Aydogan, E. Arslan, S. Cakmakyapan, E. Ozbay, W. Strupinski, S. Suzer, "Voltage contrast X-ray photoelectron spectroscopy reveals graphene-substrate interaction in graphene devices fabricated on the C- and Si- faces of SiC", *Applied Physics Letters*, 107, 121603-1--5 (2015)

• Z. Ozer, C. Kurtoglu, A.M. Mamedov, E. Ozbay, "Influence of Crown Margin Design on the Stress Distribution in Maxillary Canine Restored by All-Ceramic Crown: A Finite Element Analysis", *J of Korean Dent. Sci.*, 8, 28-35 (2015)

• A.E. Serebryannikov, M. Mutlu, E. Ozbay, "Dielectric inspired scaling of polarization conversion subwavelength resonances in open ultrathin chiral structures", *Applied Physics Letters*, 107, 221907:1-5 (2015)

• A. Ceylan, A.K. Rumaiz, D. Caliskan, S. Ozcan, E. Ozbay, J.C. Woicik, "Effects of rapid thermal annealing on the structural and local atomic properties of ZnO:Ge nanocomposite thin films", *J Applied Physics*, 117, 105303:1-5 (2015)

• M. Turduev, M. Botey, I. Giden, R. Herrero, H. Kurt, E. Ozbay, K. Staliunas, "Two-dimensional complex parity-time-symmetric photonic structures", *Physical Review A,* 91, 023825:1-5 (2015)

• A.E. Serebryannikov, M. Beruete, M. Mutlu, E. Ozbay, "Multiband one-way polarization conversion in complementary split-ring resonator based structures by combining chirality and tunneling", *Optics Express,* 23, 13517-13529 (2015)

• B. Sarikavak-Lisesivdin, S.B. Lisesivdin, N. Balkan, G. Atmaca, P. Narin, H. Cakmak, E. Ozbay, "Energy Relaxation of Electrons in InGaN Quantum Wells", *Metallurgical and Materials Transactions A*, 46, 1565-1570 (2015)

• A.E. Serebryannikov, A.O. Cakmak, E. Colak, H. Caglayan, H. Kurt, E. Ozbay, "Multiple slow waves and relevant transverse transmission and confinement in chirped photonic crystals", *Optics Express*, 22, 21806-21819 (2014)

• T. Ciuk, S. Cakmakyapan, E. Ozbay, P. Caban, K. Grodecki, A. Krajewska, I. Pasternak, J. Szmidt, W. Strupinski, "Step-edge-induced resistance anisotropy in quasi-free-standing bilayer chemical vapor deposition graphene on SiC", *J Applied Physics*, 116, 123708-1--9 (2014)

• S. Cakmakyapan, H. Caglayan, E. Ozbay, "Coupling enhancement of split ring resonators on graphene", *Carbon*, 80, 351-355 (2014)

• S. Cakmakyapan, N.A. Cinel, A.O. Cakmak, E. Ozbay, "Validation of electromagnetic field enhamcement in near-infrared through Sierpinski fractal nanoantennas", *Optics Express*, 22, 19504-19512 (2014)

• S.B. Lisesivdin, G. Atmaca, E. Arslan, S. Cakmakyapan, O. Kazar, S. Butun, J. Ul-Hassan, E. Janzen, E. Ozbay, "Extraction and scattering analyses of 2D and bulk carriers in epitaxial graphene-on-SiC structure", *Physica E*, 63, 87-92 (2014)

• H. Koc, H. Ozisik, E. Deligoz, A.M. Mamedov, E. Ozbay, "Mechanical, electronic and optical properties of Bi2S3 and Bi2Se3 compounds: first principle investigations", *J of Molecular Modelling*, 20, 2180-1--12 (2014)

• F. Karaomerlioglu, A.M. Mamedov, E. Ozbay, "Optical properties of metamaterial-based devices modulated by a liquid crystal", *Applied Physics A Materials Science & Processing*, 117, 611-619 (2014)

• E. Arslan, S. Cakmakyapan, O. Kazar, S. Butun, S.B. Lisesivdin, N.A. Cinel, G. Ertas, S. Ardali, E. Tiras, J. Hassan, E. Janzen, E. Ozbay, "SiC Substrate Effects on Electron Transport in the Epitaxial Graphene Layer", *Electronic Materials Letters,* 10, 387-391 (2014)

• S. Simsek, H. Koc, V.A. Trepakov, A.M. Mamedov, E. Ozbay, "Electron Spectroscopy and the Electronic Structure of KNbO3: First Principle Calculations", *Ferroelectrics,* 461, 99-105 (2014)

• D. Ramaccia, L.Di Palma, D. Ates, E. Ozbay, A. Toscano, F. Bilotti, "Analytical Model of Connected Bi-Omega: Robust Particle for the Selective Power Transmission Through Sub-Wavelength Apertures", *IEEE Trans on Antennas Propagation*, 62, 2093-2101 (2014)

• S. Cakmakyapan, L. Sahin, F. Pierini, E. Ozbay, "Resonance tuning and broadening of bowtie nanoantennas on graphene", *Photonics and Nanostructures*, 12, 199-204 (2014)

• T. Asar, S. Ozcelik, E. Ozbay, "Structural and electrical characterizations of InxGa1-xAs/InP structures for infrared photodetector applications", *J Applied Physics,* 115, 104502-1--8 (2014)

• D. Caliskan, B. Butun, S. Ozcan, E. Ozbay, "Spectral response modification of TiO2 MSM photodetector with an LSPR filter", *Optics Express*, 22, 14096-14100 (2014)

• R. Tulek, E. Arslan, A. Bayrakli, S. Turhan, S. Gokden, O. Duygulu, A.A. Kaya, T. Firat, A. Teke, E. Ozbay, "The effect of GaN thickness inserted between two AlN layers on the transport properties of a lattice matched AlInN/AlN/GaN/AlN/GaN double channel heterostructure", *Thin Solid Films*, 551, 146-152 (2014)

• A.E. Serebryannikov, E. Ozbay, S. Nojima, "Asymmetric transmission of terahertz waves using polar dielectrics", *Optics Express*, 22, 3075-3088 (2014)

• Z. Li, M. Mutlu, E. Ozbay, "Highly asymmetric transmission of linearly polarized waves realized with a multilayered structure including chiral metamaterials", *J of Physics D*, 47, 075107-1--6 (2014)

• I.H. Giden, D. Yilmaz, M. Turduev, H. Kurt, E. Colak, E. Ozbay, "Theoretical and experimental investigations of asymmetric light transport in graded index photonic crystal waveguides", *Applied Physics Letters*, 104, 03116-1--5 (2014)

• H. Sezen, E. Ozbay, S. Suzer, "XPS for probing the dynamics of surface voltage and photovoltage in GaN", *Applied Surface Science,* 323, 25-30 (2014)

• A. Ilgaz, S. Gokden, R. Turk, A. Teke, S. Ozcelik, E. Ozbay, "Temperature dependent hot electron transport in slightly lattice mismatched AlInN/AlN/GaN heterostructures", *J of Optoelectronics and Advanced Materials*, 16, 1008-1014 (2014)

• F. Karaomerlioglu, A.M. Mamedov, E. Ozbay, "Organic semiconductor-based photonic crystals for solar cell arrays: band gap and optical properties", *J of Modern Optics*, 61, 1754-1760 (2014)

• H. Cakmak, E. Arslan, M. Rudzinski, P. Demirel, H.E. Unalan, W. Strupinski, R. Turan, M. Ozturk, E. Ozbay, "Indium rich InGaN solar cells grown by MOCVD", *J of Mater Sci: Mater Electron*, 25, 3652-3658 (2014)

• A.E. Serebryannikov, P. Lalanne, A.Y. Petrov, E. Ozbay, "Wide-angle reflection-mode spatial filtering and splitting with photonic crystal gratings and single-layer rod gratings", *Optics Letters*, 39, 6193-6196 (2014)

• D. Caliskan, B. Butun, M.C. Cakir, S. Ozcan, E. Ozbay, "Low dark current and high speed ZnO metal-semiconductor-metal photodetector on SiO2/Si substrate", *Applied Physics Letters,* 105, 161108-1--3 (2014)

• Z. Li, S. Cakmakyapan, B. Butun, C. Daskalaki, S. Tzortzakis, X. Yang, E. Ozbay, "Fano resonances in THz metamaterials composed of continuous metallic wires and split ring resonators", *Optics Express,* 22, 26572-26584 (2014)

• Y. Bas, P. Demirel, N. Akin, C. Baskose, Y. Ozen, B. Kinaci, M.K. Ozturk, S. Ozcelik, E. Ozbay, "Microstructural defect properties of InGaN/GaN blue light emitting diode structures", *J of Mater Sci: Mater Electron*, 25, 3924-3932 (2014)

• A.E. Serebryannikov, S. Nojima, E. Ozbay, "One-way absorption of terahertz waves in rod-type and multilayer structures containing polar dielectrics", *Physical Review B,* 90, 235126 (2014)

• E. Gungor, T. Gungor, D. Caliskan, A. Ceylan, E. Ozbay, "Co doping induced structural and optical properties of sol-gel prepared ZnO thin films", *Applied Surface Science*, 318, 309-313 (2014)

• F. Karaomerlioglu, S. Simsek, A.M. Mamedov, E. Ozbay, "Ferroelectric Based Photonic Crystal Cavity by Liquid Crystal Infiltration", *Integrated Ferroelectrics*, 158, 1-12 (2014)

• A.T. Koru, A. Delibasi, H. Ozbay, "Dwell Time Based Stabilization of Switched Delay Systems Using Free-Weighting Matrices", *Int J of Control* (Forthcoming)

• M. Wakaiki, Y. Yamamoto, H. Ozbay, "Sensitivity Reduction by Stable Controllers for MIMO Infinite Dimensional Systems via the Tangential Nevanlinna-Pick Interpolation", *IEEE Trans on Automatic Control*, 59, 1099-1105 (2014)

• P. Yan, H. Ozbay, M. Sansal, "Robust Stabilization of Parameter Varying Time Delay Systems by Switched Controllers", *Applied and Computational Mathematics*, 13, 31-45 (2014)

• M.E. Ahsen, H. Ozbay, S.I. Niculescu, "On the Analysis of a Dynamical Model Representing Gene Regolatory Networks under Negative Feedback", *Int J of Robust and Nonlinear Control,* 24, 864-874 (2014)

• M.E. Ahsen, H. Ozbay, S.UI. Niculescu, *Analysis of Deterministic Cyclic Gene Regulatory Network Models with Delays,* Birkhauser, Basel, (2015)

• H. Ozbay, "Robust Control of Infinite Dimensional Systems", *Encyclopedia of Systems and Control,* J. Baillieul, T. Samad (Eds.), Springer-Verlag, London (2014)

• A. Yildiz, A.B. Ozguler, "Foraging motion of swarms with leaders as Nash equilibria", *Automatica*, 73, 163-168 (2016)

• A. Yildiz, A.B. Ozguler, "Partially Informed Agents can Form a Swarm in a Nash Equilibrium", *IEEE Trans on Automatic Control*, 60, 3089-3094 (2015)

• A.B. Ozguler, A. Yildiz, "Foraging swarms as Nash equilibria of dynamic games", *IEEE Trans on Cybernetics*, 44, 979-987 (2014)

• K. Saadaoui, A.B. Ozguler, *Fixed Order Controller Design: A parametric approach*, LAP Lambert Academic Publishing, (2010)

• A.B. Ozguler, *Linear Multichannel Control: A system matrix approach*, Prentice-Hall, (1994)

• K Thangavel, E.U Saritas, "Aqueous paramagnetic solutions for MRI phantoms at 3 T: A detailed study on relaxivities", *Turkish J of Electrical Engineering & Computer Sciences* (Forthcoming)

• M Utkur, Y Muslu, E.U Saritas, "Relaxation-based viscosity mapping for magnetic particle imaging", *Physics in Medicine and Biology* (Forthcoming)

• E. Ilicak, S. Cetin, E. Bulut, K.K. Oguz, E.U. Saritas, G. Unal, T. Cukur, "Targeted vessel reconstruction in non-contrast-enhanced steady-state free precession angiography", *NMR in Biomedicine*, 29, 532-544 (2016)

• O. Yilmaz, E.U. Saritas, T. Cukur, "Enhanced Phase-Sensitive SSFP Reconstruction for Fat-Water Separation in Phased-Array Acquisitions", *J of Magnetic Resonance Imaging*, 44, 148-157 (2016)

• E. Ilicak, S. Cetin, E. Bulut, K.K. Oguz, E.U. Saritas, G. Unal, T. Cukur, "Targeted vessel reconstruction in non-contrast-enhanced steady-state free precession angiography", *NMR in Biomedicine*, 29, 532-544 (2016)

• LR Croft, PW Goodwill, JJ Konkle, H Arami, DA Price, AX. Li, E.U. Saritas, SM Conolly, "Low drive field amplitude for improved image resolution in magnetic particle imaging", *Medical Physics*, 43, 424-435 (2016)

• S Banerjee, DG Nishimura, A Shankaranarayanan, E.U. Saritas, "Reduced field-of-view DWI with robust fat suppression and unrestricted slice coverage using tilted 2DRF excitation", *Magnetic Resonance in Medicine* (Forthcoming)

• E.U. Saritas, P.W. Goodwill, S.M. Connolly, "Effects of Pulse Duration on Magnetostimulation Thresholds", *Medical Physics,* 42, 3005-3012 (2015)

• E.U. Saritas, D. Lee, T. Cukur, A. Shankaranarayanan, D.G. Nishimura, "Hadamard Slice Encoding for Reduced-FOV Diffusion-Weighted Imaging", *Magnetic Resonance in Medicine*, 72, 1277-1290 (2014)

• C. Tekin, J. Yoon, M. van der Schaar, "Adaptive Ensemble Learning with Confidence Bounds", *IEEE Trans on Signal Processing* (Forthcoming)

• C. Shen, C. Tekin, M. van der Schaar, "A Non-Stochastic Learning Approach to Energy Efficient Mobility Management", *IEEE Journal on Selected Areas in Communication* (Forthcoming)

• S. Amuru, C. Tekin, M. Van der Schaar, R.M. Buehrer, "Jamming bandits - A novel learning method for optimal jamming", *IEEE Trans on Wireless Communications*, 15, 2792-2808 (2016)

• K. Kanoun, C. Tekin, D. Atienza, M. van der Schaar, "Big-Data Streaming Applications Scheduling Based on Staged Multi-armed Bandits", *IEEE Trans on Computers*, 65, 3591-3605 (2016)

• C. Tekin, M. Van der Schaar, "Distributed online learning via cooperative contextual recommender systems", *IEEE Trans on Signal Processing*, 63, 3740-3754 (2015)

• C. Tekin, M. Van der Schaar, "RELEAF: An algorithm for learning and exploiting relevance", *IEEE J of Selected Topics in Signal Processing*, 9, 716-727 (2015)

• J. Xu, C. Tekin, M. Van der Schaar, "Distributed multi-agent online learning based on global feedback", *IEEE Trans on Signal Processing*, 63, 2225-2238 (2015)

• C. Tekin, M. Van der Schaar, "Contextual online learning for multimedia content aggregation", *IEEE Trans on Multimedia, 17, 549-561* (2015)

• C. Tekin, M. Van der Schaar, "Active learning in context-driven stream mining with an application to image mining", *IEEE Trans on Image Processing*, 24, 3666-3679 (2015)

Contact:
Dr. Orhan Arıkan
(Department Chair)
Phone : +90 312 266 4307
Fax : +90 312 266 4192
arikan@ee.bilkent.edu.tr
ee.bilkent.edu.tr

## Faculty Profile: Dr. Tolga Mete Duman, Professor, Department of Electrical and Electronics Engineering

Tolga Mete Duman received a B.S. degree from Bilkent University in 1993, and M.S. and Ph.D. degrees from Northeastern University, Boston (USA), in 1995 and 1998, all in electrical engineering. Prior to joining Bilkent University in September 2012, he was with the School of Electrical, Computer and Energy Engineering at Arizona State University (ASU), Tempe (USA), as an assistant professor (1998-2004), associate professor (2004-2008), and a professor (2008-2015). He is currently an adjunct member of the ASU faculty.

Dr. Duman's current research interests are in systems, with particular focus on communication and signal processing, including wireless and mobile communications, coding/modulation, coding for wireless communications, information theory, data storage systems, and underwater acoustic communications.

He is a Fellow of IEEE (elected in 2011), and a recipient of the National Science Foundation CAREER Award and the IEEE Third Millennium medal. His publications include a book on MIMO Communications (Wiley, 2007), around 80 journal papers and over 120 conference papers. He has served as an editor for *IEEE Transactions on Wireless Communications* (2003-2008), *IEEE Transactions on Communications* (2007-2012), *IEEE Communications Surveys and Tutorials* (2002-2007), and *Physical Communication* (2010-2016). He is currently the coding and communication theory area editor for *IEEE Transactions on Communications* (since 2011), an editor for *IEEE Transactions on Wireless Communications* (since 2016), and the editor-in-chief of *Physical Communication* (since 2016).

## Faculty Profile: Dr. Emine Ülkü Sarıtaş, Assistant Professor, Department of Electrical and Electronics Engineering

Emine Ülkü Sarıtaş received a B.S. degree in electrical and electronics engineering from Bilkent University in 2002. She was awarded the Lucent Technologies Stanford Graduate Fellowship for her graduate studies in electrical engineering at Stanford University, where she received her M.S. and Ph.D. degrees in 2004 and 2009. She then worked as a postdoctoral researcher at the Department of Bioengineering at the University of California, Berkeley, from 2010 to 2013 on a Siebel Stem Cell Institute postdoctoral fellowship. Dr. Sarıtaş joined Bilkent University in 2013.

Her research focuses on developing novel biomedical imaging techniques, with an emphasis on biological and diagnostic applications. She works on novel contrast methods and high-resolution imaging techniques; specifically, she conducts research on magnetic resonance imaging and magnetic particle imaging systems. She is the recipient of the Technological and Scientific Council of Turkey's Career Award (2014), the Turkish Academy of Sciences' Young Scientist Outstanding Achievement Award (2015), and the Science Academy's Young Scientist Award (2016). Dr. Sarıtaş is currently serving as an associate editor for *IEEE Transactions on Medical Imaging* and as an editorial board member for *Nature Scientific Reports*.

# INDUSTRIAL ENGINEERING


The overall objective of the graduate programs in the Department of Industrial Engineering is to conduct fundamental research in industrial engineering and operations research in accordance with ongoing scientific and technological developments, and to provide students with a strong analytical basis for advanced theoretical work or development of new approaches to applications. Current research areas are optimization theory/mathematical programming (linear and nonlinear optimization, combinatorial and integer optimization, graph theory and network optimization, large-scale optimization, optimization under uncertainty), stochastic systems (queuing models, maintenance, inventory control, modeling and optimization), statistics (estimation in stochastic systems, nonparametric analysis, Bayesian methods, data analysis), manufacturing systems (advanced manufacturing technologies, robotics, flexible manufacturing systems, micro/nanotechnologies, modeling and analysis of production systems), simulation, supply chain management and logistics, pricing and revenue optimization, scheduling, production planning and control systems, operations research methods in finance and energy, and sustainable operations.

## FACULTY

**M. SELİM AKTÜRK**, Professor and Department Chair. Ph.D., Industrial Engineering, Lehigh University, 1990. *Production management systems, advanced manufacturing technologies, production scheduling, airline disruption management.*

**ÇAĞIN ARARAT**, Assistant Professor. Ph.D., Operations Research and Financial Engineering, Princeton University, 2015. *Financial mathematics, risk measures, multivariate risk, systemic risk, incomplete preferences. Convex analysis, set optimization, random sets, Aumann integrals.*

**SAVAŞ DAYANIK**, Associate Professor. Ph.D., Industrial Engineering and Operations Research, Columbia University, 2002. *Stochastic processes and modeling, stochastic dynamic programming, stochastic optimal control. Applications to financial engineering, statistics, and operations management.*

**NESİM ERKİP**, Professor. Ph.D., Industrial Engineering and Engineering Management, Stanford University, 1984. *Inventory theory, supply chain management, flexible manufacturing, scheduling, just-in-time production, solid waste management.*

**KAĞAN GÖKBAYRAK**, Assistant Professor. Ph.D., Manufacturing Engineering, Boston University, 2001. *Simulation, queueing systems, perturbation analysis, optimal control, applications in manufacturing, inventory systems, telecommunications and Internet.*

**ÜLKÜ GÜRLER**, Professor. Ph.D., Statistics, University of Pennsylvania, 1990. *Stochastic inventory/maintenance models, Bayesian applications to inventory, nonparametric estimation, reliability and survival analysis. Analysis of censored and truncated observations.*

**ÖZLEM ÇAVUŞ İYİGÜN**, Assistant Professor. Ph.D., Operations Research, Rutgers University, 2012. *Stochastic optimization, Risk-Averse Optimization, Markov Decision Processes, medical decision making.*

**OYA EKİN KARAŞAN**, Professor. Ph.D., Operations Research, Rutgers University, 1997. *Combinatorial optimization, robust optimization, network design, scheduling.*

**YİĞİT KARPAT**, Associate Professor. Ph.D., Industrial and Systems Engineering, Rutgers University, 2007. *Manufacturing systems and processes.*

**ÖZLEM KARSU**, Assistant Professor. Ph.D., Operational Research, London School of Economics, 2014. *Multicriteria decision making, inequity-averse optimization, health care resource allocation, assignment problems.*

**AYŞE SELİN KOCAMAN**, Assistant Professor. Ph.D., Earth and Environmental Engineering, Columbia University, 2014. *Sustainable energy system, power systems optimization, renewable energy sources, networking design.*

**EMRE NADAR**, Assistant Professor. Ph.D., Operations Management and Manufacturing, Carnegie Mellon University, 2012. *Stochastic dynamic programming, queueing theory, supply chain management, sustainable operations.*

**OSMAN OĞUZ**, Associate Professor. Ph.D., Management Sciences, University of Waterloo, 1978. *Mathematical programming, linear and integer programming, scheduling.*

**MUSTAFA Ç. PINAR**, Professor. Ph.D., Systems Engineering, University of Pennsylvania, 1992. *Non-linear programming, robust optimization, applications in telecommunications and finance.*

**NİL ŞAHİN**, Instructor, Ph.D., Mathematics, Middle East Technical University, 2012. *Commutative algebra and algebraic geometry, arf rings and semigroups, Hilbert Functions of Arf Rings, Gorenstein Rings, singularity theory, standard bases and neat semigroups.*

**ALPER ŞEN**, Associate Professor. Ph.D., Business Administration, University of Southern California, 2000. *Revenue management, inventory theory, supply chain management, machine scheduling.*

**AYŞEGÜL TOPTAL**, Assistant Professor. Ph.D. Industrial Engineering, Texas A&M University 2003. *Supply chain management, inventory theory, production scheduling.*

**FİRDEVS ULUS**, Assistant Professor. Ph.D., Operations Research and Financial Engineering, Princeton University, 2015. *Multi-objective optimization, multiple criteria decision making, financial applications.*

**EMRE UZUN**, Instructor. Ph.D., Management, Rutgers University 2015. *Simulation, heuristics in optimization, security analysis of access control systems.*

**HANDE YAMAN**, Professor. Ph.D., Operations Research, Université Libre de Bruxelles, 2002. *Combinatorial optimization, polyhedral analysis, facility and hub location, network design, robust optimization.*

**BAHAR YETİŞ**, Professor. Ph.D., Industrial Engineering, Bilkent University, 1999. *Distribution logistics, hub location, hazardous materials transportation, network design, integer optimization, humanitarian logistics.*

## MASTER OF SCIENCE IN INDUSTRIAL ENGINEERING

**Admission:** Applicants are required to have a B.S. degree in industrial engineering or a related field of science or engineering. Students with a B.S. degree in an area other than industrial engineering may be required to take certain undergraduate courses in order to acquire the necessary background in the field. Evaluation of applicants is based on their ALES (*Akademik Personel ve Lisansüstü Eğitimi Giriş Sınavı*/Academic Personnel and Postgraduate Education Entrance Examination) scores, past academic records, reference letters, and an interview. Applicants who are not Turkish citizens and Turkish citizen applicants who are residents of another country may take the GRE (Graduate Record Examination) instead of the ALES. All nonnative speakers of English are required to submit proof of satisfactory knowledge of English.

**Degree Requirements:** In addition to completing at least 21 credit units of course work, the M.S. degree candidate must prepare and successfully defend a thesis. The expected duration of study for the M.S. degree is 4 semesters; the maximum duration is 6 semesters.

## DOCTOR OF PHILOSOPHY IN INDUSTRIAL ENGINEERING

**Admission:** All applicants are required to have a B.S. degree in industrial engineering or a related field of science or engineering. Evaluation of applicants is based on their ALES (*Akademik Personel ve Lisansüstü Eğitimi Giriş Sınavı*/ Academic Personnel and Postgraduate Education Entrance Examination) scores, past academic records, reference letters, and an interview. Applicants who are not Turkish citizens and Turkish citizen applicants who are residents of another country may take the GRE (Graduate Record Examination) instead of the ALES. All nonnative speakers of English are required to submit proof of satisfactory knowledge of English.

**Degree Requirements:** The completion of 21 credit units of course work beyond the M.S. level is required. Ph.D. candidates must pass a qualifying exam, typically in their fourth semester, and then must prepare a dissertation proposal. Preparation and defense of a dissertation based on original research is the centerpiece of the program. The standard duration of study for the Ph.D. degree is 8 semesters for students who enter the program with an M.S. degree; the maximum duration is 12 semesters.

## COURSE DESCRIPTIONS

**IE 500 Mathematics of Operations Research**
Introduction to methods of proof, sets and functions, metric spaces, functions on metric spaces, differential and integral equations, fundamentals of linear algebra.

**IE 505 Mathematical Programming**
Fermat rule, Lagrange multipliers, duality theory, Karush-Kuhn-Tucker conditions, convexity, conic optimization, linear optimization, networks, integer programming.

**IE 507 Discrete Mathematical Models**
This course is designed to illustrate both the applications of discrete mathematics to a broad range of topics in the social, biological and environmental sciences, and the influence of those applications on the development of mathematics. The use of mathematical modeling will be emphasized by encompassing tools such as graphs, weighted digraphs, Markov chains, and n-person games.

**IE 510 Computational Complexity**
Introduction to computability and complexity theory. Turing machine computational model. The notion of undecidability. Time and space complexity classes. Main focus on complexity classes such as P, NP, CO-NP, Log Space and Pspace. Fundamental results in Logic most relevant to the development of complexity theory. Approximation algorithms for some provably hard problems.

**IE 512 Graph Theory**
Undirected and directed graphs and their subgraphs. Traversal of graphs. Trees. Connectivity. Shortest paths. Optimal spanning trees. Euler tours. Hamilton cycles. Matchings. Independent sets and cliques. Vertex and edge colorings. Planar graphs. Maximum flow and its applications to structure of graphs. Cycle and co-cycle spaces. Data structures for representation of graphs and trees. Perfect graphs.

**IE 513 Linear Programming**
Theory, algorithms, and computational aspects of linear programming. Formulation of problems as linear programs. Development of simplex algorithm, geometry of simplex method, duality theory, and economic interpretations. Sensitivity analysis. Variants of simplex method. Introduction to interior point methods and other approaches to solving linear programs.

**IE 514 Network Flows**
Flow problems on networks. Transportation and assignment problems, special purpose algorithms and advanced computational techniques. Maximum flow problem, theory, algorithms, and applications. Shortest paths. Minimum cost flows. Network simplex method. Multicommodity flow problems. Generalized networks.

**IE 515 Convex Analysis**
Convex sets in IR and their basic properties, separation of convex sets, properties of convex polyhedra (and polytones). Convex functions continuity and differentiability properties, sub differentiability, duality of convex sets, Fenchel dual of a convex function, bipolar theorem. Convex programming, dual convex programs, perturbation and Lagrangian approaches to duality, the connection between the two approaches, saddle point theorems. Applications of convex analysis: inequalities, interior-point methods, approximation, merit functions.

**IE 518 Discrete Optimization**
The models and methods of integer programming. Structure of integer programs, pure integer and mixed integer programming problems. Zero-one programming, branch and bound methods. Cutting plane and polyhedral approach. Lagrangean relaxation. Applications to combinatorial optimization, heuristic methods, and dynamic programming. Applications in resource allocation, facility location, scheduling, capital budgeting. Computer implementation.

**IE 519 Approximation Algorithms**
The course covers combinatorial and mathematical programming techniques to derive approximation algorithms for np-hard optimization problems. Possible topics include greedy algorithms for vertex/set cover, approximation schemes via dynamic programming, rounding LP relaxations of integer programs, and semi definite relaxations. The course is complemented by the implementation of selected algorithms using a high-level language such as matlab.

**IE 521 Stochastic Processes**
Stochastic processes, non-homogeneous and compound Poisson processes. Discrete time Markov chains (classification of states, ergodic properties), random walks, branching processes. Continuous-time Markov processes, Kolmogorov's differential equations. Birth and death processes, applications to Markov queueing models. Renewal process, renewal reward process, alternating and regenerative processes, semi-Markov processes. Applications to reliability and inventory models.

**IE 522 Queueing Systems**
Classification of queueing systems. Markov processes in discrete and continuous time. Birth and death processes. Markov queueing system M/M/k/m. Little's formula. Bulk arrival and service systems. Non-Markov queueing systems. Semi-Markov processes. Systems M/G/1/∞ and G/G/1/∞. Jackson's type queueing networks, balance equations, stationary distribution. Approximate methods in queueing models. Applications in manufacturing, computer networks, information systems.

**IE 523 Probabilistic Analysis**
Axiomatic construction of probability theory, properties of probability, conditional probability, independence. Discrete and continuous random variables and vectors (distribution function, expectation, variance, moments). Chebyshev inequality and law of large numbers. Conditional expectation. Transformations of random variables. Generating and characteristics functions. Asymptotic methods in probability theory, types of convergence of random variables. Sums of independence random variables, central limit theorem, Poisson theorem. Selected topics.

**IE 524 Simulation**
The design and analysis of simulations. The use of simulation for estimation, comparison of policies, and optimization. Variance estimation techniques including regenerative methods, time series methods, and batch means. Variance reduction. Simulation optimization, statistical analysis of output of simulations, applications to modeling stochastic systems in computer science, engineering and operations research.

**IE 525 Advanced Statistics**
Basic statistical definitions. Notion of statistical estimator, unbiased, consistent, asymptotically normal estimators. Empirical distribution function. Efficient estimators, Cramer-Rao inequality, sufficient statistics. Confidence intervals. Moment and maximum likelihood methods. Method of least squares. Regression, linear and multiple regression. Testing hypotheses. Goodness of fit tests. Chi-square test, hypothesis of independence. Neyman-Pearson theorem. Selected topics from factor analysis, classification theory time series analysis nonparametric estimation, statistical quality control and reliability.

**IE 528 Dynamic Programming**
Deterministic and discrete-time stochastic dynamic programming; principle of optimality, forward and backward formulations, Markov decision processes under discounted and average payoff criteria, bandit problems, stochastic games. Applications; shortest path problems, resource allocation, stock options, inventory control, maintenance problems, knapsack and assignment problems.

**IE 530 Advanced Logistics Modeling and Optimization**
Modeling advanced logistics problems. Extensions of network design, location and routing problems and formulations. Solution methodologies.

**IE 534 Stochastic Models in Operations Research**
Review of conditional probability; Markov chains, example models, Markov Chains with rewards; Markov decision processes, solution algorithms; an introduction to renewal theory and applications; queueing models, example applications in service systems; reliability models; other topics.

**IE 535 Stochastic and Risk-Sensitive Optimization**
Models, solution methods, and theory for optimization problems under uncertainty and risk. Introduction to stochastic programming, optimization problems with probabilistic constraints, two-stage and multi-stage stochastic programming problems, Markov decision processes, utility functions, mean-risk optimization models, coherent measures of risk, and concept of stochastic dominance.

**IE 540 Introduction to Financial Engineering**
Financial markets (bonds, stocks, futures, forwards, options, interest rates and their term structures), models of security prices (Brownian motion, geometric Brownian motions, Ornstein-Uhlenbeck processes, Cox-Ross-Rubinstein binomial model, Merton-Black-Scholes model), pricing and hedging financial derivatives (Ito's rule, stochastic integration, diffusion processes, probabilistic solutions of PDEs, no-arbitrage pricing in a complete market of futures, forwards, European and American type options, pricing in incomplete markets), Hedging with futures and options, bond hedging, numerical methods (pricing using trees, Monte-Carlo simulations, finite-difference methods), mean-variance analysis of portfolios, value at risk, optimal consumption and portfolio strategies (formulations and solutions of appropriate dynamic programming models and Hamilton-Jacobi-Bellman equations).

**IE 543 Multiple Criteria Decision Making**
Discrete and continuous multiple criteria problems. Solution methods for multiple criteria decision making problems. Methods of generating nondominated solutions. Interactive approaches. Multiple criteria ranking and sorting techniques. Multiple criteria decision making applications.

**IE 551 Applied Statistics**
Exploratory data analysis, kernel density estimation, multivariate regression, nonparametric and semiparametric regression, scatterplot smoothing, linear mixed models, logistic regression, recursive partitioning, anova, ancova, hidden Markov models, dynamic linear models, graphical models, principal component analysis. Applications on real datasets using statistical software.

**IE 561 Manufacturing Systems**
Application of systems analysis and industrial engineering to the design, planning, and analysis of manufacturing systems. Characteristics of flexible manufacturing systems (FMS). Elements of systems and their interaction with each other. Consideration of technical and economic aspects of equipment and process design. Integration aspects of the elements of manufacturing systems.

**IE 563 Game Theory with Applications in Operations Management**
Introduction to Game Theory: Pre-commitment, the normal form, the extensive form; static games with complete information: pure strategy Nash equilibrium, mixed strategy Nash equilibrium; dynamic games with complete information: sub-game perfect equilibrium; games with incomplete information: Bayesian Nash equilibrium, perfect Bayesian Nash equilibrium; applications: oligopoly, supply chain management, queueing, competitive location.

**IE 568 Theory of Pricing and Revenue Management**
An introduction to pricing and revenue management and its applications. Single-resource capacity allocation. Network capacity control. Modeling customer-behavior and market response. Estimation and forecasting for pricing and revenue management. Dynamic pricing. Assortment optimization.

**IE 571 Analytical Models for Supply Chain Management**
Theoretical and practical issues in the design and management of the supply chain. Logistic network configuration, risk pooling and multi-echelon inventory systems, value of information and bullwhip effect in supply chains, coordination of the supply chain using contracts, distribution strategies and strategic alliances for the supply chain and product design for supply chain efficiency.

**IE 573 Theory of Machine Scheduling**
An overview of computational complexity, heuristic problem solving, and implicit enumeration. Deterministic machine scheduling problems: single stage, open shop, flow shop, and job shop problems with single and parallel machines. Dynamic scheduling problems and priority dispatching. A survey of other scheduling problems. Applications in manufacturing systems.

**IE 574 Location and Layout Optimization**
Single or multiple facilities location in the plane with minimum or minimax criteria. Discrete or continuous layout optimization. Single facility network location. Applications in public service, production, distribution, warehousing, emergency service and flexible manufacturing.

**IE 577 Facility Location on Networks**
Applications, modeling, theory and algorithms for optimal location of service facilities on distribution, transportation and communication networks. The course progresses from simple models to complex models. Well-known median and center problems as well as other models will be covered. Theory and algorithms will also be given for sensitivity and parametric analysis and time dependent location/relocation. The course ends with a discussion of areas open to research.

**IE 580 Design and Analysis of Experiments**
Basic design for scientific and industrial experiments: single-factor, and multiple-factor, completely randomized designs, randomized blocks, incomplete blocks, orthogonal contrasts, general regression approach, Latin squares, quantitative factors. Use of statistical packages.

**IE 586 Computational Optimization**
Strong models and valid inequalities. Extended formulations. Cutting plane and column generation algorithms. Decomposition approaches in deterministic and stochastic optimization. Applications in production planning, network design and logistics.

**IE 590 Research Topics in IE and OR**
Seminars on research topics in industrial engineering and operations research.

**IE 599 Master's Thesis**

**IE 612 Graph Theory Algorithms**
Data structures for trees and graphs. Elements of data structures: lists, heaps, dynamic trees, etc. Traversal of trees and graphs, BFS and DFS. Connectivity. Spanning trees, shortest paths. Branchings. The maximum flow problem. Matchings, including blossom algorithm. Planarity testing algorithms. Some classes of perfect graphs. The network simplex method. Gaussian elimination.

**IE 613 Advanced Linear Programming**
Theory of simplex method. Duality. Polyhedral theory. Theorems of alternatives. Parametric analysis. Dantzig-Wolfe decomposition. Generalized and variable upper bounding. LU decomposition and stable implementation of simplex method. Non-simplex approaches to LP, ellipsoidal and interior point algorithms.

**IE 614 Nonlinear Programming**
Local and global optima. Newton-type, quasi-Newton, and conjugate gradient methods for unconstrained optimization. Kuhn-Tucker theory and Lagrangean duality. Algorithms for linearly constrained optimization, including steepest ascent and reduced gradient methods with applications to linear and quadratic programming. Non-linearly constrained optimization, including penalty and barrier function methods, reduced and projected gradient methods, Lagrangean methods. Computer implementation.

**IE 616 Combinatorial Optimization**
Polyhedral combinatorics, integral polyhedra, polarity, blocking and anti-blocking theory, total dual integrality, matroids, matchings, TSP, vehicle routing, linear ordering, polyhedral approach to NP-Hard problems.

**IE 660 Performance Analysis of Manufacturing Systems**
Design and performance issues in production, transfer lines, production/inventory systems, networks of production/inventory systems, and flexible manufacturing systems. Phase-type processing times, failures and service completion processes. Buffering and blocking issues. Decomposition methods. Control policies in pure inventory and production/inventory systems.

**IE 674 Advanced Models of Facility Location**
Location theory, algorithms, and analysis for joint optimization of where to locate facilities and how to distribute flows. P-center and p-median problems. Single or multi-stage distribution systems. Capacitated and uncapacitated facility location. Relocation, stochastic location, and location with inexact data.

**IE 681 Forecasting and Time Series Analysis**
Analysis of forecasting models for discrete time series. Identification and estimation of parameters in autoregressive, moving average, and mixed autoregressive moving average processes. Autocorrelation functions. Box-Jenkins approaches to problems of identification, estimation, and forecasting. Linear stationary and nonstationary models. Kalman filters. Bayesian forecasting techniques.

**IE 690 Advanced Research Topics in IExOR**
Seminars on research topics in industrial engineering and operations research.

**IE 691 Research Practice**
An introduction to research techniques in industrial engineering and operations research for the direct Ph.D. program students; a written individual research report requirement under the supervision of a faculty member.

**IE 699 Ph.D. Dissertation**

## SAMPLE OF RECENT PUBLICATIONS


• U. Arikan, S. Gurel, M.S. Akturk, "Flight network-based approach for integrated airline recovery with cruise time control", *Transportation Science* (Forthcoming)

• H. Gurkan, A. Tula, M.S. Akturk, "Automated robotic assembly line design with unavailability periods and tool changes", *European J of Industrial Engineering*, 10, 499-526 (2016)

• H. Gurkan, S. Gurel, M.S. Akturk, "An integrated approach for airline scheduling, aircraft fleeting and routing with cruise speed control", *Transportation Research Part C: Emerging Technologies*, 68, 38-57 (2016)

• U. Arikan, S. Gurel, M.S. Akturk, "Integrated aircraft and passenger recovery with cruise time controllability", *Annals of Operational Research*, 236, 295-317 (2016)

• A.S. Duran, S. Gurel, M.S. Akturk, "Robust airline scheduling with controllable cruise times and chance constraints", *IIE Transactions*, 47, 1-20 (2015)

• M.S. Akturk, A. Atamturk, S. Gurel, "Aircraft rescheduling with cruise speed control", *Operations Research*, 62, 829-845 (2014)

• O. Cavus, A. Ruszczynski, "Risk-Averse Control of Undiscounted Transient Markov Models", *SIAM J on Control and Optimization*, 52, 3935-3966 (2014)

• O. Cavus, A. Ruszczynski, "Computational Methods for Risk-Averse Undiscounted Transient Markov Models", *Operations Research*, 62, 401-417 (2014)

• S. Dayanik, S.O. Sezer, "Sequential sensor installation for Wiener disorder detection", *Mathematics of Operations Research*, 41, 827-850 (2016)

• E. Dogruoz, S. Dayanik, G. Budak, I. Sabuncuoglu, "Analysis of the vitro nanoparticle-cell interactions via a smoothing-splines mixed-effects model", *Artificial Cells, Nanomedicine and Biotechnology*, 44, 800-810 (2016)

• N. Cenk, G. Budak, S. Dayanik, I. Sabuncuoglu, "Artificial Neural Network Modeling and Simulation of In-Vitro Nanoparticles-Cell Interactions", *J of Computational and Theoretical Nanoscience*, 11, 272-282 (2014)

• E.Z. Demirci, N. Erkip, "Designing an intervention strategy for public-interest goods - The California electric vehicle market case", *Omega - Int J of Management Science* (Forthcoming)

• Z. Atan, N. Erkip, "Note on "The Backroom Effect in Retail Operations"", *Production and Operations Management*, 24, 1833-1834 (2015)

• O.O. Ozener, R. Gullu, N. Erkip, "Near-Optimal Modified Base Stock Policies for the Capacitated Inventory Problem with Stochastic Demand and Fixed Cost", *Asia Pacific J of Operational Research*, 31, 1450019-1--27 (2014)

• K. Gokbayrak, E.A. Yildirim, "Exact and heuristic approaches based on noninterfering transmissions for joint gateway selection, time slot allocation, routing and power control for wireless mesh networks", *Computers and Operations Research*, 81, 102-118 (2017)

• U. Gurler, D. Yenigun, M. Caglar, E. Berk, "On the Modeling of CO2 EUA and CER Prices of EU-ETS for the 2008-2012 Period", *Applied Stochastic Models in Business and Industry*, 32, 375-395 (2016)

• U. Gurler, O. Alp, N.C. Buyukkramikli, "Coordinated inventory replenishment and outsourced transportation operatoins", *Transportation Research E*, 70, 400-415 (2014)

• N.C. Buyukkaramikli, U. Gurler, O. Alp, "Coordinated Logistics- Replenishment with Capacitated Transportation for a Supply Chain", *Production and Operations Management*, 23, 110-126 (2014)

• R. Kian, U. Gurler, E. Berk, "The dynamic lot-sizing problem with convex economic production costs and setups", *Int J of Production Economics*, 155, 361-379 (2014)

• E. Berk, U. Gurler, "Newsboy Inventory Problem[reprint]", *Methods and Applications of Statistics in Business*, Finance and Management Science, N. Balakrishnan (Eds.), John Wiley & Sons, Inc.

• E. Berk, U. Gurler, "Inventory Theory", *Decision Sciences Theory and Practice*, Raghu Nandan Sengupta, Aparna Gupta, Joydeep Dutta (Eds.), pp. 351-414, CRC Press (2016)

• U. Gurler, "Reverse Hazard", *Wiley StatsREf: Statistics Reference Online*, John Wiley& Sons (2016)

• U. Gurler, E. Berk, "Queueing Theory", *DECISION SCIENCES Theory and Practice*, Raghu Nandan Sengupta Aparna Gupta , Joydeep Dutta (Eds.), pp. 289-351, CRC Press (2016)

• R. Kian, E. Berk, U. Gurler, "An Integrated Replenishment and Transportation Model: Computational Performance Assessment", *Global Logistics Management*, B.Y. Kara, I. Sabuncuoglu, B. Biranda (Eds.), pp. 271-294, CRC Press (2015)

• M.R. Taner, B.Y. Kara, "Endogenous Effects of Hubbing on Flow Intensities", *Networks and Spatial Economics* (Forthcoming)

• O. Yilmaz, B.Y. Kara, U. Yetis, "Hazardous waste management system design under population and environmental impact considerations", *J of Environmental Management* (Forthcoming)

• B. Kepir, C. Koocyigit, I. Koyuncu, M.B. Ozer, B.Y. Kara, M.A. Gürbüz, "Flight-Scheduling Optimization and Automation for AnadoluJet", *Interfaces*, 46, 315-325 (2016)

• H. Sahin, B.Y. Kara, O.E. Karasan, "Debris Removal during disaster response - A Case for Turkey", *Socio Economic Planning Sciences*, 53, 49-59 (2016)

• I. Mahmutogullari, B.Y. Kara, "Hub Location under Competition", *European J of Operational Research*, 250, 214-225 (2016)

• M. Peker, B.Y. Kara, J.F. Campbell, S. Alumur, "Spatial Analysis of Single Allocation Hub Location Problems", *Networks and Spatial Economics*, 16, 1075-1101 (2016)

• N. Bektas, B.Y. Kara, O.E. Karasan, "Solution methodologies for debris removal in disaster response", *Euro J on Computational Optimization*, 4, 403-445 (2016)

• F. Kilici, B.Y. Kara, B. Bozkaya, "Locating temporary shelter areas after an Earthquake- Case for Turkey", *European J of Operational Research*, 243, 323-332 (2015)

• F. Sahinyazan, B.Y. Kara, M.R. Taner, "Selective Vehicle Routing for a Mobile Blood Donation System", *European J of Operational Research*, 246, 22-34 (2015)

• I. Mahmutogullari, B.Y. Kara, "Hub Location Problem with Allowed Routing between non-hub nodes", *Geographical Analysis*, 47, 410-430 (2015)

• M. Peker, B.Y. Kara, "The P-Hub maximal covering problem and extensions for gradual decay functions", *Omega - Int J of Management Science*, 54, 158-172 (2015)

• S.A. Alumur, B.Y. Kara, T. Melo, "*Location and Logistics*", Location Science, G. Laporte, F. Saldana da Gama (Eds.), pp. 419-442, Springer (2014)

• B. Yildiz, O.E. Karasan, "Regenerator location problem in flexible optical networks", *Operations Research* (Forthcoming)

• B. Yazar, O. Arslan, O.E. Karasan, B.Y. Kara, "Fiber Optical Network Design Problems - A Case for Turkey", *Omega - Int J of Management Science*, 63, 23-40 (2016)

• B. Yildiz, O. Arslan, O.E. Karasan, "A branch and price approach for routing and refueling station location", *European J of Operational Research*, 248, 815-826 (2016)

• F. Bellini, O.E. Karasan, M.C. Pinar, "Joint mixability of some integer matrices", *Discrete Optimization*, 20, 90-104 (2016)

• G.D. Batur, S. Erol, O.E. Karasan, "Robot move sequence determining and multiple part-type scheduling in hybrid flexible flow shop robotic cells", *Computers and Industrial Engineering*, 100, 72-87 (2016)

• O. Arslan, O.E. Karasan, "A Benders decomposition approach for the charging station location problem with plug-in hybrid electric vehicles", *Transportation Research B,* 93, 670-695 (2016)

• B. Yildiz, O.E. Karasan, "Regenerator Location Problem and survivable extensions- A hub covering location perspective", *Transportation Research B*, 71, 32-55 (2015)

• O. Arslan, B. Yildiz, O.E. Karasan, "Minimum cost path problem for Plug-in Hybrid Electric Vehicles", *Transportation Research E*, 80, 123-141 (2015)

• O.E. Karasan, A.R. Mahjoub, O. Ozkok, H. Yaman, "Survivability in Hierarchical Telecommunications Networks under Dual Homing", *Informs Journal of Computing*, 26, 1-15 (2014)

• O. Arslan, B. Yildiz, O.E. Karasan, "Impacts of battery characteristics, driver preferences and road network features on travel costs of a plug-in hybrid electric vehicle (PEHV) for long-distance trips", *Energy Policy*, 74, 168-178 (2014)

• S.N.B. Oliaei, Y. Karpat, "Investigating the influence of friction conditions on finite element simulation of microscale machining with the presence of built-up edge", *Int J of Advanced Manufacturing Technology* (Forthcoming)

• S. Oliaei, Y. Karpat, "Influence of Tool Wear on Machining Forces and Tool Deflections during Micro Milling", *Int J of Advanced Manufacturing Technology*, 84, 1963-1980 (2016)

• S.N.B. Oliaei, Y. Karpat, "Investigating the influence of built-up edge on forces and surface roughness in micro scale orthogonal machining of titanium alloy Ti6Al4V", *J of Materials Processing Technology*, 235, 28-40 (2016)

• S. Zeinali, B. Cetin, S.N.B. Oliaei, Y. Karpat, "Fabrication of microfluidics device with 3D electrode structures for high throughput DEP applications using high precision machining", *Electrophoresis*, 36, 1431-1442 (2015)

• Y. Karpat, B. Deger, O. Bahtiyar, "Experimental Evaluation of Polycrystalline Diamond Tool Geometries while Drilling Carbon Fiber Reinforced Plastics", *Int J of Advanced Manufacturing Technology*, 71, 1295-1307 (2014)

• Y. Karpat, B. Deger, O. Bahtiyar, B. Kaftanoglu, "A Mechanistic Approach to Investigate Drilling of UD-CFRP Laminates with PCD Drills", *CIRP Annals - Manufacturing Technology*, 63, 81-84 (2014)

• O. Karsu, "Approaches for inequity-averse sorting", *Computers and Operations Research*, 66, 67-80 (2016)

• O. Karsu, A. Morton, "Inequity averse optimization in operational research", *European J of Operational Research*, 245, 343-359 (2015)

• O. Karsu, M. Azizoglu, "Bi-criteria multi-resource generalized assignment problem", *Naval Research Logistics*, 61, 621-638 (2014)

• A.S. Kocaman, C. Abad, T.J. Troy, W.T. Huh, V. Modi, "A stochastic model for a macroscale hybrid renewable energy system", *Renewable and Sustainable Energy Reviews*, 54, 688-703 (2016)

• E. Nadar, M. Akan, A. Scheller-Wolf, "Experimental Rssults Indicating Lattice-Dependent Policies May Be Optimal for General Assemble-To-Order Systems", *Production and Operations Management*, 25, 647-661 (2016)

• E. Nadar, M. Akan, A. Scheller-Wolf, "Optimal Structural Results for Assemble-to-Order Generalized M-Systmes", *Operations Research*, 62, 571-579 (2014)

• M.C. Pinar, C. Kizilkale, "Robust screening under ambiguity", *Mathematical Programming* (Forthcoming)

• S. Biagini, M.C. Pinar, "The robust Merton problem of an ambiguity averse investor", *Mathematics and Financial Economics* (Forthcoming)

• M.C. Pinar, "On robust mean-variance portfolios", *Optimization*, 65, 1039-1048 (2016)

• H.I. Bayrak, M.C. Pinar, "Generalized second price auction is optimal for discrete types", *Economics Letters*, 141, 35-38 (2016)

• R.S. Burachik, C.Y. Kaya, M.C. Pinar, "Non-linear continuous optimization", *Euro J on Computational Optimization*, 4, 1-2 (2016)

• M.C. Pinar, "Non-linear Pricing by Convex Duality", *Automatica*, 53, 369-375 (2015)

• M.C. Pinar, "Lower hedging of American contingent claims with minimal surplus risk in finite-state financial markets by mixed-integer linear programming", *Discrete Applied Mathematics*, 164, 304-312 (2014)

• M.C. Pinar, "Equilibrium in an Ambiquity-Averse Mean-Variance Investors Market", *European J of Operational Research*, 237, 957-965 (2014)

• M.C. Pinar, "Sur l'allocation dynamique de portefeuille robuste contre l'incertitude des rendements moyens", *INFOR*, 52, 14-19 (2014)

• M.C. Pinar, A.B. Pac, "Mean semi-deviation from a target and robust portfolio choice under distribution and mean return ambiquity", *J of Computational and Applied Mathematics*, 259, 394-405 (2014)

• A. Fabretti, S. Herzel, M.C. Pinar, "Delegated Portfolio Management under Ambiquity Aversion", *Operations Research Letters*, 42, 190-195 (2014)

• A.B. Pac, M.C. Pinar, "Robust Portfolio Choice with CVaR and VaR under Distribution and Mean Return Ambiquity", *Top*, 22, 875-891 (2014)

• Y.E. Arisoy, A. Altay-Salih, M.C. Pinar, "Optimal multi-period consumption and investment with short-sale constraints", *Finance Research Letters*, 11, 16-24 (2014)

• M. Giandomenico, M.C. Pinar, "Pricing Multiple Exercise American Options by Linear Programming ", "*Optimal Financial Decision Making under Uncertainty pp. 137-150* Springer (2016)

• F. Arslan, N. Sahin, "A fast algorithm for constructing Arf closure and a conjecture", *J of Algebra*, 417, 148-160 (2014)

• K. Guler, E.Korpeoglu, A. Sen, "Design and Analysis of Mechanisms for Decentralized Joint Replenishment", *European J of Operational Research* (Forthcoming)

• A. Sen, "Competitive Markdown Timing for Perishable and Sustitutable Products", *Omega - Int J of Management Science*, 64, 24-41 (2016)

• G. Hancerliogulları, A. Sen, E. Agca, "Demand Uncertainty and Inventory Turnover Performance - An Empirical Analysis of the US Retail Industry", *Int J of Physical Distribution & Logistics Managmenet*, 46, 681-708 (2016)

• U. Koc, A. Toptal, I. Sabuncuoglu, "Coordination of Inbound and Outbound Transportation Schedules with the Production Schedule", *Computers and Industrial Engineering* (Forthcoming)

• A. Toptal, B. Cetinkaya, "How Supply Chain Coordination Affects the Environment- A Carbon Footprint Perspective", *Annals of Operations Research* (Forthcoming)

• A. Toptal, S. Cetinkaya, "The Impact of Price Skimming on Supply and Exit Decisions", *Applied Stochastic Models in Business and Industry*, 31, 551-574 (2015)

• A. Toptal, H. Ozlu, D. Konur, "Joint Decisions on Inventory Replenishment and Emission Reduction Investment under Different Emission Regulations", *Int J of Production Research*, 52, 243-269 (2014)

• A. Toptal, U. Koc, I. Sabuncuoglu, "A Joint Production and Transportation Planning Problem with Heterogeneous Vehicles", *J of Operational Research Society*, 65, 180-196 (2014)

• B. Rudloff, F. Ulus, R. Vanderbei, "A parametric simplex algorithm for linear vector optimization problems", *Mathematical Programming* (Forthcoming)

• G. Ozbaygin, H. Yaman, O.E. Karasan, "Time constrained maximal covering salesman problem with weighted demands and partial coverage", *Computers and Operations Research*, 76, 226-237 (2016)

• I. Rodríguez-Martín, J.J. Salazar-González, H. Yaman, "The ring/K-rings network design problem- Model and branch-and-cut algorithm", *Networks*, 68, 130-140 (2016)

• I.R. Martin, J.J.S. Gonzalez, H. Yaman, "A Branch-and-cut Algorithm for Two-Level Survivable Network Design Problems", *Computers and Operations Research*, 67, 102-112 (2016)

• L.A. Wolsey, H. Yaman, "Continuous Knapsack Sets with Divisible Capacities", *Mathematical Programming*, 156, 1-20 (2016)

• M. Merakli, H. Yaman, "Robust intermodal hub location under polyhedral demand uncertainty", *Transportation Research B*, 86, 66-85 (2016)

• E. Koca, H. Yaman, M.S. Akturk, "Stochastic Lot Sizing Problem with Controllable Processing Times", Omega - *Int J of Management Science*, 53, 1-10 (2015)

• V. Bayram, B.C. Tansel, H. Yaman, "Compromising system and user interests in shelter location and evacuation planning", *Transportation Research B*, 72, 146-163 (2015)

• A. Sen, H. Yaman, K. Guler, E. Korpeoglu, "Multi-period supplier selection under price uncertainty", *J of Operational Research Society*, 65, 1636-1648 (2014)

• E. Koca, H. Yaman, M.S. Akturk, "Lot Sizing with Piecewise Concave Production Costs", *Informs Journal of Computing*, 26, 767-779 (2014)

• E.D. Gunes, H. Yaman, B. Cekyay, V. Verter, "Matching patient and physician preferences in designing a primary care facility network", *J of Operational Research Society*, 65, 483-496 (2014)

• I.R. Martin, J.J.S. Gonzalez, H. Yaman, "A Branch-and-cut Algorithm for the Hub Location and Routing Problem", *Computers and Operations Research*, 50, 161-174 (2014)

• M.V. Vyve, L.A. Wolsey, H. Yaman, "Relaxations for two-level multi-item lot-sizing problems", *Mathematical Programming*, 146, 495-523 (2014)

• H. Calik, M. Labbe, H. Yaman, "p-Center Problems", Location Science, G. Laporte, S. Nickel, S. da Gama (Eds.), pp. 79-92, Springer (2015)

Contact:
Dr. M. Selim Aktürk
(Department Chair)
Phone : +90 312 290 1262
Fax : +90 312 266 4054
akturk@bilkent.edu.tr
ie.bilkent.edu.tr

## Faculty Profile: Dr. Savaş Dayanık, Associate Professor, Department of Industrial Engineering

Savaş Dayanık received a B.S. (1994) and an M.S. (1996) in industrial engineering from Bilkent University and a Ph.D. (2002) in applied probability from Columbia University. After serving on the faculty of Princeton University from 2002 to 2009, he joined Bilkent University. He was a visiting scholar at Carnegie Mellon University in 2015-2016. His research interests are in applied probability, stochastic modeling, and statistical learning.

His work on optimal stopping and change detection were recognized with George Nicholson Student and Junior Faculty Interest Group Paper Awards by the Institute for Operations Research and the Management Sciences and with the Tweedie New Researcher Award by the Institute of Mathematical Statistics. His research has been supported by grants from the NSF, AFOSR, and TÜBİTAK. His papers have appeared in *Mathematics of Operations Research, Annals of Operations Research, Stochastic Processes and Their Applications, Annals of Applied Probability,* and *IEEE Transactions on Information Theory*.

## Faculty Profile: Dr. Mustafa Ç. Pınar, Professor, Department of Industrial Engineering

Mustafa Ç. Pınar graduated from Boğaziçi University in 1987 with a B.Sc. degree in industrial engineering. He obtained M.Sc. and Ph.D. degrees from the University of Pennsylvania in 1989 and 1992, both in systems engineering. After working as a postdoctoral fellow at the Institute of Numerical Analysis at the Technical University of Denmark from 1992 to 1994, he joined Bilkent University in 1994. He has held visiting positions at the Université Libre de Bruxelles and Université Catholique de Louvain in Belgium, Princeton University, Université Paul Sabatier, Toulouse, France, University of l'Aquila, and University of Milano, Italy.

He is associate editor for the EURO Journal on computational optimization and topical editor in financial engineering of the *Wiley Encyclopedia of Management Science* and *Operations Research*. He is the recipient of 1997 TÜBİTAK Incentive Award in Engineering and a Fulbright Senior Scholarship in 2007. His research interests are in methodology of numerical and robust optimization with applications.

# MECHANICAL ENGINEERING

The Department of Mechanical Engineering has strong research expertise in the areas of design, manufacturing, dynamics and control, computational mechanics, tribology, microfluidics, micro/nano robotics, nanotechnology, acoustics and noise control and their applications to the automotive, aerospace and other industrial sectors. Most research projects are conducted in collaboration with institutions in the US and Europe. The Department has introduced several research areas consistent with the strengths of Bilkent University, with a view to developing new and important technologies in Turkey. These include microsystems and their design and manufacturing and novel computational methods that can address the multiscale nature of the related technological challenges. Additionally, plans are underway to develop bioinspired sensors and actuators through learning from those that have evolved in nature. Nanotechnology research focusing on the development of nanometer-scale electromechanical systems and advanced scanning probe microscopy (SPM) methods are also being pursued.

## FACULTY

**ADNAN AKAY**, Professor. Provost and Department Chair. Ph.D., Mechanical Engineering, North Carolina State University, 1976. *Applied mechanics, vibrations and acoustics, noise control, friction-induced sounds.*

**MEHMET Z. BAYKARA**, Assistant Professor. Ph.D., Mechanical Engineering and Materials Science, Yale University, 2012. *Atomic force microscopy and spectroscopy, scanning tunneling microscopy, nanotribology, surface science.*

**LUCA BIANCOFIORE**, Assistant Professor. Ph.D., Fluid Mechanics, University of Nice - Sophia Antipolis, 2011. *Hydrodynamic stability analysis, computational fluid dynamics, numerical modelling, phase-changing flows, complex fluids.*

**MELİH ÇAKMAKCI**, Assistant Professor. Ph.D., Mechanical Engineering, University of Michigan, 2009. *Dynamic systems and control theory, design and development of vehicle control systems and smart mechatronic components.*

**BARBAROS ÇETİN**, Assistant Professor. Ph.D., Mechanical Engineering, Vanderbilt University, 2009. *Microfluidics, Lab-on-a-chip technology, electrokinetic transport, microscale heat transfer, partical flow modeling.*

**E. YEGÂN ERDEM**, Assistant Professor. Ph.D., Mechanical Engineering, University of California at Berkeley, 2013. *Microfluidics, droplet-based systems, microreactors, nanomaterial synthesis, nanoimprinting.*

**M. SELİM HANAY**, Assistant Professor. Ph.D., Physics, California Institute of Technology (Caltech), 2011. *Nanoelectromechanical systems, mass sensing, biosensors, microwave sensors.*

**ALİ JAVILI**, Assistant Professor. Ph.D., Mechanical Engineering, University of Erlangen–Nuremberg, 2012. *Computational continuum mechanics, interfaces and interphases, multi-scale multi-physics, bio-mechanics, applied mathematics.*

**YİĞİT KARPAT**, Associate Professor. Ph.D., Industrial and Systems Engineering, Rutgers University, 2007. *Manufacturing systems and processes.*

**ONUR ÖZCAN**, Assistant Professor. Ph.D., Mechanical Engineering, Carnegie Mellon University, 2012. *Miniature robotics, bio-inspiration, micro/nano systems and fabrication, printed-circuit MEMS manufacturing, novel actuators, sensors, and mechanisms.*

**İLKER TEMİZER**, Associate Professor. Ph.D., Mechanical Engineering, University of California, Berkeley, 2005. *Computational mechanics, thermodynamics of homogenization, contact mechanics, multiscale modeling.*

**YILDIRAY YILDIZ**, Assistant Professor. Ph.D., Mechanical Engineering, Massachusetts Institute of Technology, 2009. *Prediction and control of complex systems with multiple human-automation interactions. Control theory, game theory and machine learning and their applications in aerospace, automotive and robotics fields.*

## MASTER OF SCIENCE IN MECHANICAL ENGINEERING

**Admission:** Applicants are required to have a B.S. degree in mechanical engineering or a related field of science or engineering. Students with a B.S. degree in an area other than mechanical engineering may be required to take certain undergraduate courses in order to acquire the necessary background in the field. Evaluation of applicants is based on their ALES (*Akademik Personel ve Lisansüstü Eğitimi Giriş Sınavı*/Academic Personnel and Postgraduate Education Entrance Examination) scores, past academic records, reference letters, and an interview. Applicants who are not Turkish citizens and Turkish citizen applicants who are residents of another country may take the GRE (Graduate Record Examination) instead of the ALES. All nonnative speakers of English are required to submit proof of satisfactory knowledge of English.

**Degree Requirements:** In addition to completing at least 21 credit units of course work, the M.S. degree candidate must prepare and successfully defend a thesis. The expected duration of study for the M.S. degree is 4 semesters; the maximum duration is 6 semesters.

# DOCTOR OF PHILOSOPHY IN MECHANICAL ENGINEERING

**Admission:** All applicants are required to have a B.S. degree in mechanical engineering or a related field of science or engineering. Evaluation of applicants is based on their ALES (*Akademik Personel ve Lisansüstü Eğitimi Giriş Sınavı*/ Academic Personnel and Postgraduate Education Entrance Examination) scores, past academic records, reference letters, and an interview. Applicants who are not Turkish citizens and Turkish citizen applicants who are residents of another country may take the GRE (Graduate Record Examination) instead of the ALES. All nonnative speakers of English are required to submit proof of satisfactory knowledge of English.

**Degree Requirements:** The completion of 21 credit units of course work beyond the M.S. level is required. Ph.D. candidates must pass a qualifying exam, typically in their fourth semester, and then must prepare a dissertation proposal. Preparation and defense of a dissertation based on original research is the centerpiece of the program. The standard duration of study for the Ph.D. degree is 8 semesters for students who enter the program with an M.S. degree; the maximum duration is 12 semesters.

## COURSE DESCRIPTIONS

**ME 500 Integrated Product Development**
The process of new product development from an interdisciplinary standpoint. A one-semester project course involving the collaborative team effort from engineering design to business plan.

**ME 501 Mathematical Techniques in Mechanical Engineering**
Ordinary differential equations and introduction to partial differential equations, series solutions, Fourier, Bessel and Legendre functions, boundary value problems and eigenfunction expansions; calculus of variations. Classical partial differential equations related to mathematical physics, including Laplace transformation and the method of separation of variables.

**ME 503 Numerical Methods in Mechanical Engineering**
This course emphasizes numerical methods to solve differential equations that are important in Mechanical Engineering. Procedures will be presented for solving systems of ordinary differential equations and boundary value problems in partial differential equations. Students will be required to develop computer algorithms and employ them in a variety of engineering applications.

**ME 511 Fluid Mechanics**
Development and application of control volume forms of mass, momentum and energy conservation laws, differential forms of these laws in Eulerian and Lagrangian coordinates, and Navier-Stokes equations. Applications to problems in incompressible and compressible laminar flows, boundary layers, hydrodynamic lubrication, transient and periodic flows, thermal boundary layers, convective heat transfer, and aerodynamic heating.

**ME 516 Tribology Friction, Lubrication and Wear**
Introduction to the field of tribology. Fundamental principles of friction, lubrication, and wear from a mechanical engineering point of view. Surface roughness, contact between surfaces, adhesion, macroscopic laws of friction, fluid film lubrication, boundary lubrication, wear mechanisms, nanotribology.

**ME 523 Molecular Simulation of Materials**
Review of continuum field theories, atomistic potentials, molecular statics, discrete-to-continuum transition, finite element implementation, calculation of various material properties.

**ME 525 Introduction to Nanomechanics**
Linear atomic chains, lattice vibrations in 2D and 3D. Properties of phonon gas. Elasticity relations. Piezoelectricity. Static and dynamic deformations of solids. Accelerometers, gyroscopes and resonant mechanical sensors. Nanomechanical measurement techniques, dissipation and nonlinearity in nanomechanics.

**ME 543 Sound and Vibration**
Forced and free oscillations, frequency and impulse response of mechanical systems. Wave propagation in solids and fluids. Interaction of waves with boundaries, transmission, reflection, and absorption. Radiation and scattering of sound and interference. Waveguides and cavities. Wave propagation in periodic structures.

**ME 550 Continuum Mechanics**
Introduction to the fundamental concepts and tools for mechanics. Overview of tensor calculus, the kinematics of deformation, concepts of stress, strain, linearization, objectivity and the balance laws for mass, momentum and energy. Materials modeling aspects such as constitutive laws and material symmetry applications to solid and fluid mechanics.

**ME 552 The Finite Element Method**
Numerical solution of partial differential equations describing engineering problems. Fundamentals of the finite element methods including the weighted residual method, shape functions, numerical integration, assembly and error analysis by solving 1D linear second order elliptic equations technique and extension to 2D and 3D elliptic problems. Fourth order equations, time-dependent parabolic and hyperbolic partial differential equations and non-linear problems. Applications problems in applied mechanics, elasticity, vibrations, heat conduction, and others. Background required in calculus, linear algebra and differential equations.

**ME 555 Cellular Biomechanics**
This course discusses how mechanical quantities and processes such as force, motion, and deformation influence cell behavior and function, with a focus on the connection between mechanics and biochemistry. Specific topics include: (1) the role of stresses in the cytoskeleton dynamics as related to cell growth, spreading, motility, and adhesion; (2) the generation of force and motion by moot molecules; (3) stretch-activated ion channels; (4) protein and DNA deformation; (5) mechanochemical coupling in signal transduction. If time permits, we will also cover protein trafficking and secretion and the effects of mechanical forces on gene expression. Emphasis is placed on the biomechanics issues at the cellular and molecular levels; their clinical and engineering implications are elucidated.

**ME 557 Metal Cutting Principles**
The basic principles of metal cutting. The mechanics of metal cutting, heat generation during metal cutting, modern cutting materials, tool life and tool wear, cutting fluids, surface roughness generated by cutting actions, chip control, economics of cutting, chatter vibration, abrasive machining and non-conventional machining processes.

**ME 565 Dynamics**
Kinematics of particles and rigid bodies; dynamics of a particle, systems of particles and rigid bodies; central force fields, orbits and trajectories variable mass systems; Lagrange's equations of motion; Hamilton's Principle; variational methods; and applications to dynamics problems and the fundamentals of gyroscopes.

**ME 571 Advanced System Modeling**
Modeling of linear and nonlinear dynamical systems that have components from mechanical, electrical, chemical, thermal and fluidic domains. State space models, interaction between domains, time and frequency domain analysis. Control system design using root locus and bode plots.

**ME 575 Micro/Nano Robotics**
This course focuses on the design, modeling, fabrication, and control of miniature mobile robot and micro/nano-manipulation systems for graduate and upper level undergraduate students. It provides an overview of the state-of-the-art micro- and nanoscale sensors, actuators, manipulators, energy sources, robot design, and control methods. It requires active student participation, interaction, and in-class discussions. In addition to the basic background, it includes many case studies of current miniature robots and micro/nano-systems, challenges and future trends, and potential applications. The course requires a final project involving novel theoretical and/or experimental ideas for micro/nano-robotic systems with a team of students. Depending on the equipment availability, these projects can also involve hands-on experience and experimental demonstrations.

**ME 576 Linear Control System Design**
Frequency response and root locus analysis and design; engineering applications. Static error coefficients, log-magnitude diagrams, polar plots and Nyquist diagram, Nyquist stability criterion, relative stabililty analysis, closed-loop frequency response specifications, constant M and N circles and Nichols charts. Design and compensation techniques.

**ME 578 Vehicle Control Systems**
Design and analysis of vehicle control systems such as cruise control, traction control, active suspensions and advanced vehicle control systems for Intelligent Vehicle-Highway Systems (IVHS). Human factor considerations such as driver interfaces. Fuel Cell and Hybrid Electric Vehicle Control Systems.

**ME 579 Adaptive Control Systems**
Control systems with undetermined or time-varying parameters, theory and application of self-tuning and model reference adaptive control for continuous and discrete-time deterministic systems, methods for estimation and control, stability of nonlinear systems, adaptation laws, and design and application of adaptive control systems.

**ME 580 Introduction to MEMS and Micro Systems**
Analysis of microelectromechanical systems (MEMS), design of microsystems, components of MEMS devices such as beams, folded suspensions and their analysis ~~ design metrics, beams as micromechanical springs, clean room fabrication techniques, MEMS sensors, accelerometers, gyroscopes, resonant mass/force sensors, MEMS actuation methods, measurement and noise analysis of MEMS devices.

**ME 582 Fundamentals of Design for Reliability**
Comprehensive definition of reliability. Introduction to reliability engineering, its basic definitions, applications and benefits. Confidence intervals and levels. Concept of target reliability. Case histories from aerospace, military, process control and power systems applications. Basic statistical and analytical functions and distribution types used by reliability engineers. Reliability analysis during the design phase. Qualification tests for components and assemblies. Interfaces of reliability, maintainability and risk engineering. Design guidelines for reliability, maintainability and quality. Statistical reliability testing. Reliability during the production phase. Standards about aerospace, defense and nuclear engineering. System reviews and related checklists. Construction of fault trees and fault tree analysis. Design of reliability testing. Failure causes and types. Effects of environmental conditions, age, mission time and stress. Mission profile and requirements. Failure modes, effects and criticality analysis and two different methods supported by examples. Ageing testing methods. Role of reliability departments in engineering organizations and systems projects.

**ME 590 Mechanical Engineering Seminar**
Participation in university-wide departmental research seminars. Discussion of scientific and technological aspects with supervising faculty.

**ME 599 Master's Thesis**

**ME 615 Microfluidics**
The fluid dynamical phenomena underlying key components of "lab on a chip" devices. Practical aspects of microfluidic device operation through hands-on laboratory experience, computer simulations of microscale flows, and reviews of recent literature in the field. Ways of optimizing device performance based on knowledge of the fundamental fluid mechanics. Selected topics will be covered in more detail through a semester project. Pressure-driven and electrokinetically-driven flows in microchannels, surface effects, micro-fabrication methods, micro/nanoparticles for biotechnology, biochemical reactions and assays, mixing and separation, two-phase flows, and integration and design of microfluidic chips.

**ME 631 Conductive Heat Transfer**
Focuses on exact (separation of variables, integral transform techniques and Green's function method) and approximate analytical methods (integral method and variational formulation) to solve problems of conduction heat transfer. Covered topics include heat conduction in Cartesian, cylindrical and spherical coordinates at steady state as well as the transient processes, steady periodic problems, Duhamel's theorem, heat conduction through composite medium, heat conduction with a moving heat source.

**ME 657 Nano/Micro Manufacturing**
Lithography, laser processes, mechanical micro-manufacturing, measurement techniques, ultrasonic micromachining, micro-electrodischarge machining, micro-electrochemical machining, e-beam and ion-beam machining, and micro-stereolithography techniques are surveyed. The physical principles; material capability, geometric capability, and other advantages/disadvantages of these techniques. Students are required to complete a final project.

**ME 690 Mechanical Engineering Seminar**
Participation in university-wide departmental research seminars. Discussion of scientific and technological aspects with supervising faculty.

**ME 699 Ph.D. Dissertation**

## SAMPLE OF RECENT PUBLICATIONS


• A. Carcaterra, A. Akay, "Fluctuation-dissipation and energy properties of a finite bath", *Physical Review E*, 93, 032142-1--10 (2016)

• N. Roveri, A. Carcaterra, A. Akay, "Frequency intermittency and energy pumping by linear attachments", *J of Sound and Vibration*, 333, 4281-4294 (2014)

• M.Z. Baykara, H. Mönig, T.C. Schwendemann, Ö. Ünverdi, E.I. Altman, U.D. Schwarz, "Three-dimensional interaction force and tunneling current spectroscopy of point defects on rutile TiO2(110)", *Applied Physics Letters*, 108, 071601-1--5 (2016)

• M.Z. Baykara, U.D Schwarz, "Noncontact atomic force microscopy III", *Beilstein Journal of Nanotechnology*, 7, 946-947 (2016)

• E. Cihan, S. İpek, E. Durgun, M.Z. Baykara, "Structural lubricity under ambient conditions", *Nature Communications*, 7, 12055-1--6 (2016)

• T. Demirbaş, M.Z. Baykara, "Nanoscale tribology of graphene grown by chemical vapor deposition and transferred onto silicon oxide substrates", *J of Materials Research*, 31, 1914-1923 (2016)

• M.Z. Baykara, M. Todorovic, H. Mönig, T.C. Schwendemann, L. Rodrigo, E.I. Altman, R. Perez, U.D. Schwarz, "Simultaneous Measurement of Multiple Independent Atomic-Scale Interactions Using Scanning Probe Microscopy: Data

Interpretation and the Effect of Cross-Talk", *J of Physical Chemistry C*, 119, 6670-6677 (2015)

• B. Uluutku, M.Z. Baykara, "Artifacts Related to Tip Asymmetry in High-Resolution Atomic Force Microscopy and Scanning Tunneling Microscopy Measurements of Graphitic Surfaces", *J of Vacuum Science and Technology B*, 33, 031802-1--6 (2015)

• E. Cihan, A. Ozogul, M.Z. Baykara, "Structure and nanotribology of thermally deposited gold nanoparticles on graphite", *Applied Surface Science*, 354, 429-436 (2015)

• E.I. Altman, M.Z. Baykara, U.D. Schwarz, "Noncontact Atomic Force Microscopy: An Emerging Tool for Fundamental Catalysis Research", *Accounts of Chemical Research*, 48, 2640-2648 (2015)

• M.Z. Baykara, U.D. Schwarz, "Noncontact atomic force microscopy II", *Beilstein Journal of Nanotechnology*, 5, 289-290 (2014)

• A. Ucar, M. Copuroglu, M.Z. Baykara, O. Arikan, S. Suzer, "Tribological interaction between polytetrafluoroethylene and silicon oxide surfaces", *J of Chemical Physics*, 141, 164702-1--6 (2014)

• P. Karayaylali, M.Z. Baykara, "Analysis of amplitude modulation atomic force microscopy in aqueous salt solutions", *Applied Surface Science*, 318, 137-141 (2014)

• M.Z. Baykara, "Noncontact Atomic Force Microscopy for Atomic-Scale Characterization of Material Surfaces", *Surface Science Tools for Nanomaterials Characterization*, C.S.S.R. Kumar (Eds.), pp. 273-316, Berlin, Springer (2015)

• M.Z. Baykara, U.D. Schwarz, "3D Force Field Spectroscopy", *Noncontact Atomic Force Microscopy*, S. Morita, F.J. Giessibl, E. Meyer, R. Wiesendanger (Eds.), pp. 9-28, Berlin, Springer (2015)

• H.I. Dokuyucu, M. Cakmakci, "Concurrent Design of Energy Management and Vehicle Traction Supervisory Control Algorithms for Parallel Hybrid Electric Vehicles", *IEEE Trans on Vehicular Technology*, 65, 555-565 (2016)

• N. Gencer-Ulu, E. Ulu, M. Cakmakci, "Design and Analysis of a Modular Learning Based Cross-Coupled Control Algorithm for Multi-Axis Precision Positioning Systems", *Int J of Control, Automation Systems*, 14, 272-281 (2016)

• E. Ulu, N. Gecer-Ulu, M. Cakmakci, "Development and Validation of an Adaptive Method to Generate High-Resolution Quadrature Encoder Signals", J of Dynamic Systems, Measurement and Control, *Trans of ASME*, 136, 034503 (2014)

• A.G. Ulsoy, H. Peng, M. Cakmakci, *Automotive Control Systems*, Cambridge University Press, (2014)

• B. Cetin, M.B. Ozer, E. Cagatay, S. Buyukkocak, "An integrated acoustic and dielectrophoretic particle manipulation in a microfluidic device for particle wash and separation fabricated by mechanical machining", *Biomicrofluidics*, 10, 014112-1--17 (2016)

• C. Kerse, H. Kalaycioglu, P. Elahi, B.Cetin, D.K. Kesim, O. Akcaalan, S. Yavas, M.D. Asik, B. Oktem, H. Hoogland, R. Holzwarth, F.O. Ilday, "Ablation-cooled material removal with ultrafast bursts of pulses", *Nature*, 537, 84-88 (2016)

• C. Yavuz, S.N.B. Oliaei, B. Cetin, O. Yesil-Celiktas, "Sterilization of PMMA microfluidic chips by various techniques and investigation of material characteristics", *J of Supercritical Fluids*, 107, 114-121 (2016)

• B. Cetin, A.K. Koska, M. Erdal, "Warpage Characterization of Microchannels Fabricated by Injection Molding", *J of Micro- and Nano- Manufacturing*, 3, 021005-1--7 (2015)

• M. Barisik, A.G. Yazicioglu, B. Cetin, S. Kakac, "Analytical solution of thermally developing microtube heat transfer including axial conduction, viscous dissipation and rarefaction effects", *Int. Commun. Heat. Mass*, 67, 81-88 (2015)

• S. Zeinali, B. Cetin, S.N.B. Oliaei, Y. Karpat, "Fabrication of microfluidics device with 3D electrode structures for high throughput DEP applications using high precision machining", *Electrophoresis*, 36, 1431-1442 (2015)

• Z. Karakaya, B. Baranoglu, B. Cetin, A. Yazıcı, "A-Parallel boundary element formulation for tracking multiple particle trajectories in Stoke's flow for microfluidic applications", *Computer Modeling in Engineering & Sciences*, 104, 227-249 (2015)

• B. Cetin, M.B. Ozer, M. Solmaz, "Microfluidic bio-particle manipulation for biotechnology", *Biochemical Engineering Journal*, 92, 63-82 (2014)

• B. Cetin, S. Zeinali, "Anlaysis of heat transfer and entropy generation for a low-Peclet-number microtube flow using a second-order slip model: an extended-Graetz problem", *J of Eng Math*, 89, 13-25 (2014)

• K. Cole, B. Cetin, L. Brettmann, "Microchannel heat transfer with slip flow and wall effects", *J of Thermophysics and Heat Transfer*, 28, 455-462 (2014)

• S. Buyukkocak, M.B. Ozer, B. Cetin, "Numerical modeling of acoustophoretic particle separation for microfluidics", *Microfluid Nanofluid*, 17, 1025-1037 (2014)

• B. Cetin, B. Baranoglu, "Boundary-Element Method in Microfluidics", *Encyclopedia of Microfluidics and Nanofluidics*, D. Li (Eds.), pp. 202-213, Springer (2015)

• B. Cetin, D. Li, "Temperature Generation and Control", *Encyclopedia of Microfluidics and Nanofluidics*, D. Li (Eds.), pp. 3225-3227, Springer (2015)

• B. Cetin, R. Salemmilani, D. Li, "Microfluidic Rotary Pump", *Encyclopedia of Microfluidics and Nanofluidics*, D. Li (Eds.), pp. 2000-2004, Springer (2015)

• B. Cetin, R. Salemmilani, D. Li, "Ultrasonic pumps", *Encyclopedia of Microfluidics and Nanofluidics*, D. Li (Eds.), pp. 3394-3397, Springer (2015)

• B. Cetin, S. Taze, D. Li, "Methods for Pressure Measurements", *Encyclopedia of Microfluidics and Nanofluidics*, D. Li (Eds.), pp. 2828-2834, Springer (2015)

• B. Cetin, S. Zeinali, D. Li, "Magnetic Pumps", *Encyclopedia of Microfluidics and Nanofluidics*, D. Li (Eds.), pp. 1690-1695, Springer (2015)

• B. Cetin, S. Zeinali, D. Li, "Microfluidic Optical Devices", *Encyclopedia of Microfluidics and Nanofluidics*, D. Li (Eds.), pp. 1980-1984, Springer (2015)

• S. Buyukkocak, M.B. Ozer, B. Cetin, "Microscale Acoustofluidics", *Encyclopedia of Microfluidics and Nanofluidics*, D. Li (Eds.), pp. 2149-2158, Springer (2015)

• A. Ozcan, E.Y. Erdem, "Numerical analysis of mixing performance in sinusoidal microchannels based on particle motion in droplets", *Microfluid Nanofluid*, 19, 1101-1108 (2015)

• E.Y. Erdem, J.C. Cheng, F.M. Doyle, A.P. Pisano, "Multi-Temperature Zone, Droplet-based Microreactor for Increased Temperature Control in Nanoparticle Synthesis", *Small*, 10, 1076-1080 (2014)

• M.S. Hanay, S.I. Kelber, C.D. O'Connell, P. Mulvaney, J.E. Sader, M.L. Roukes, "Inertial imaging with nanomechanical systems", *Nature Nanotechnology*, 10, 339-344 (2015)

• C. Nyffeler, M.S. Hanay, D. Sacchetto, Y. Leblebici, "Graphene field effect devices operating in differential circuit configuration", *Microelectronic Engineering*, 145, 149-152 (2015)

• E. Sage, A. Brenac, T. Alava, R. Morel, C. Dupre, M.S. Hanay, M.L. Roukes, L. Duraffourg, C. Masselon, S. Hentz, "Neutral particle mass spectrometry with nanomechanical systems", *Nature Communications*, 6, 6482 (2015)

• A. Javili, S. Saeb, P. Steinmann, "Aspects of implementing constant traction boundary conditions in computational homogenization via semi-Dirichlet boundary conditions", *Computational Mechanics* (Forthcoming)

• A. Esmaeili, P. Steinmann, A. Javili, "Coupled thermally general imperfect and mechanically coherent energetic interfaces subject to in-plane degradation", *J of Mechanics of Materials and Structures* (Forthcoming)

• A. Esmaeili, P. Steinmann, A. Javili, "Non-coherent energetic interfaces accounting for degradation", *Computational Mechanics* (Forthcoming)

• A. Javili, P. Steinamnn, J. Mosler, "Micro-to-macro transition accounting for general imperfect interfaces", *Computer Methods in Applied Mechanics and Engineering*, 317, 274-317 (2017)

• A. Esmaeili, A. Javili, P. Steinmann, "Coherent energetic interfaces accounting for in-plane degradation", *Int J of Fracture*, 202, 135-165 (2016)

• S. Saeb, P. Steinmann, A. Javili, "Aspects of Computational Homogenization at Finite Deformations: A Unifying Review From Reuss' to Voigt's Bound", *Applied Mechanics Reviews*, 68, 050801-1--33 (2016)

• S.N.B. Oliaei, Y. Karpat, "Investigating the influence of friction conditions on finite element simulation of microscale machining with the presence of built-up edge", *Int J of Advanced Manufacturing Technology* (Forthcoming)

• S. Oliaei, Y. Karpat, "Influence of Tool Wear on Machining Forces and Tool Deflections during Micro Milling", *Int J of Advanced Manufacturing Technology*, 84, 1963-1980 (2016)

• S.N.B. Oliaei, Y. Karpat, "Investigating the influence of built-up edge on forces and surface roughness in micro scale orthogonal machining of titanium alloy Ti6Al4V", *J of Materials Processing Technology*, 235, 28-40 (2016)

• Y. Karpat, B. Deger, O. Bahtiyar, "Experimental Evaluation of Polycrystalline Diamond Tool Geometries while Drilling Carbon Fiber Reinforced Plastics", *Int J of Advanced Manufacturing Technology*, 71, 1295-1307 (2014)

• Y. Karpat, B. Deger, O. Bahtiyar, B. Kaftanoglu, "A Mechanistic Approach to Investigate Drilling of UD-CFRP Laminates with PCD Drills", *CIRP Annals - Manufacturing Technology*, 63, 81-84 (2014)

• I. Temizer, "Sliding friction across the scales: Thermomechanical interactions and dissipation partitioning", *J of the Mechanics and Physics of Solids*, 89, 126-148 (2016)

• I. Temizer, C. Hesch, "Hierarchical NURBS in Frictionless Contact", *Computer Methods in Applied Mechanics and Engineering*, 299, 161-186 (2016)

• I. Temizer, S. Stupkiewicz, "Formulation of the Reynolds equation on a time-dependent lubrication surface", *Proceedings of Royal Society A*, 472, 20160032-1--16 (2016)

• A. Waseem, I. Temizer, J. Kato, K. Terada, "Homogenization-based design of surface textures in hydrodynamic lubrication", *Int J for Numerical Methods in Engineering*, 108, 1427-1450 (2016)

• C. Hesch, M. Franke, M. Dittmann, I. Temizer, "Hierarchical NURBS and a higher-order phase-field approach to fracture for finite-deformation contact problems", *Computer Methods in Applied Mechanics and Engineering*, 301, 242-258 (2016)

• K.I. Kilic, I. Temizer, "Tuning macroscopic sliding friction at soft contact interfaces: Interaction of bulk and surface heterogeneities", *Tribology International*, 104, 83-97 (2016)

• G. Kabacaoglu, I. Temizer, "Homogenization of soft interfaces in time-dependent hydrodynamic lubrication", *Computational Mechanics*, 56, 421-441 (2015)

• I. Temizer, "Computational Homogenization of Soft Matter Friction: Isogeometric Framework and Elastic Boundary Layers", *Int J for Numerical Methods in Engineering*, 100, 953-981 (2014)

• I. Temizer, "Multiscale thermomechanical contact: Computational homogenization with isogeometric analysis", *Int J for Numerical Methods in Engineering*, 97, 582-607 (2014)

• I. Temizer, M.M. Abdalla, Z. Gurdal, "An interior point method for isogeometric contact", *Comput. Methods Appl. Mech. Eng.*, 276, 589-611(2014)

• M. Dittmann, M. Franke, I. Temizer, C. Hesch, "Isogeometric Analysis and thermomechanical Mortar contact problems", *Comput. Methods Appl. Mech. Eng.*, 274, 192-212 (2014)

• T. Wu, I. Temizer, P. Wriggers, "Multiscale hydro-thermo-chemo-mechanical coupling: Application to alkali-silica reaction", *Computational Materials Science*, 84, 381-395 (2014)

• K. Abidi, Y. Yildiz, A. Annaswamy, "Control of Uncertain Sampled-Data Systems: An Adaptive Posicast Control Approach", *IEEE Trans on Automatic Control* (Forthcoming)

• N. Musavi, D. Onural, K. Gunes, Y. Yildiz, "Unmanned Aircraft Systems Airspace Integration: A Game Theoretical Framework for Concept Evaluations", *AIAA Journal of Guidance, Control and Dynamics*, vol.40, no.1, pp. 96-109 (2017)

• K. Abidi, Y. Yildiz, B.E. Korpe, "Explicit time-delay compensation in teleoperation: An adaptive control approach", *Int J of Robust and Nonlinear Control*, 26, 3388-3403 (2016)

• D.M. Acosta, Y. Yildiz, R.W. Craun, S.D. Beard, M.W. Leonard, G.H. Hardy, M. Weinstein, "Piloted Evaluation of a Control Allocation Technique to Recover from Pilot-Induced Oscillations", *J of Aircraft*, 52, 130-141(2015)

• Y. Yildiz, A. Agogino, G. Brat, "Predicting Pilot Behavior in Medium-Scale Scenarios Using Game Theory and Reinforcement Learning", *J of Guidance, Control and Dynamics*, 37, 1335-1342 (2014)

Contact:
Dr. Adnan Akay
(Department Chair)
Phone : +90 312 290 1045
Fax : +90 312 266 4126
akay@bilkent.edu.tr
me.bilkent.edu.tr

## Faculty Profile: Dr. E. Yegân Erdem, Assistant Professor, Department of Mechanical Engineering

E. Yegân Erdem received a B.Sc. in mechatronics engineering from Sabancı University in 2006. In 2008, she obtained an M.S. degree in mechanical engineering from the University of Washington, where she worked in Karl Böringer's research group on developing textured surfaces for droplet transport and characterization of a walking microrobot. She received a Ph.D. from the Department of Mechanical Engineering at the University of California, Berkeley, in May 2013 with minors in materials science and electrical engineering. During her doctoral studies, she worked on the development of microfluidic systems for controlled synthesis of nanoparticles in Albert Pisano's and Fiona Doyle's research laboratories. Dr. Erdem joined Bilkent University in 2013. Her research interests include microfluidics, MEMS, nanomaterials, and nanosensors. She has published in journals such as *IEEE MEMS, Advanced Materials, Small, Applied Physics Letters*, and *Lab on a Chip*. She was a recipient of the Jane Lewis and Berkeley Mechanical Engineering Fellowships.

## Faculty Profile: Dr. İlker Temizer, Associate Professor, Department of Mechanical Engineering

İlker Temizer received a B.S. degree (2001) from Boğaziçi University and M.S. (2003) and Ph.D. (2005) degrees from the University of California, Berkeley, in mechanical engineering. Subsequently, he joined the Institute of Continuum Mechanics of Leibniz University at Hannover as a postdoctoral researcher. He has been a faculty member at Bilkent University since 2010.

Dr. Temizer leads the Computational Multiscale Mechanics Laboratory (CMML), in which research efforts are focused on the theoretical and numerical aspects of computational mechanics associated with multiscale–multiphysics modeling strategies for heterogeneous materials and interfaces. Funded by Turkish and German research foundations as well as by the European Union, his research has led to numerous publications in collaboration with researchers from the US, Europe, and Japan. Dr. Temizer is a recipient of the European Commission's Marie Curie career grant and young investigator awards from the Science Academy (BAGEP) and the Mustafa Parlar Foundation.

# EDUCATION


The Graduate School of Education offers four graduate programs which are tailored to meet the needs of those who wish to become classroom teachers and also thoose who are already practitioners in educational institutions. Three of these programs are in the area of Curriculum and Instruction. A brief description of all four programs follows:

The M.A. in Curriculum and Instruction is designed for practicing teachers who are in positions of middle management in schools, or intending to move to such positions in the near future and thus become educational leaders. It enables participants to develop the knowledge and skills to improve their own practice and assist in the professional development of colleagues in their area.

The M.A. in Curriculum and Instruction with Teaching Certificate program is a two-year full-time master's degree program. It awards a master's degree together with a teaching certificate that qualifies graduates to teach in high schools. It also awards an International Baccalaureate Certificate in Teaching and Learning. The program includes: courses required by the Turkish Council of Higher Education (YÖK) for qualified teacher status; additional education courses; and a thesis. Students with degrees in the following subject areas are accepted into the program: Turkish language and literature, English, biology, mathematics, and physics.

The Ph.D. in Curriculum and Instruction is a doctoral program for practicing teachers and other educators with at least three years of teaching experience. Participants gain in knowledge and skills, and are expected to contribute to the advancement of knowledge through independent and original research.

The M.A. in Teaching English as a Foreign Language (TEFL) is a one-year full-time intensive master's program aimed at those already teaching English in Turkish universities.

## FACULTY

**H. NECMİ AKŞİT**, Assistant Professor. Ph.D., Educational Sciences, Middle East Technical University, 1998. *Educational administration, teacher education, curriculum and instruction.*

**TİJEN AKŞİT**, Assistant Professor and Acting Director of the School of English Language. Ph.D., Educational Sciences, Middle East Technical University, 2006. *Educational management, language teacher education, curriculum and instruction.*

**ARMAĞAN ATEŞKAN**, Assistant Professor. Ph.D., Computer Education and Instructional Technologies, Middle East Technical University, 2008. *Science and biology education, environmental issues.*

**ALİPAŞA AYAS**, Visiting Professor and Director of the Graduate School of Education, Ph.D., Educational Sciences, University of Southampton, 1993. *Curriculum development, teacher education, concept development, assessment and evaluation.*

**JULIE MATHEWS AYDINLI**, Assistant Professor. Ph.D., Second Language Education, McGill University, 2003. *Literacy development, culture and identity in second language reading and writing, literature in the language classroom, curriculum development.*

**ERDAT ÇATALOĞLU**, Visiting Associate Professor. Ph.D., Curriculum and Instruction (science education), Pennsylvania State University, 2002. *Computer instruction, science and physics education, assessment and evaluation.*

**İLKER KALENDER**, Assistant Professor. Ph.D., Secondary Science and Mathematics Education, Middle East Technical University, 2011. *Computerized adaptive testing procedures, detection of creating/aberrant response patterns through software, educational technology.*

**JENNIE FARBER LANE**, Assistant Professor. Ph.D., Curriculum and Instruction, University of Wisconsin – Madison, 2006. *Biology education, education for sustainability, curriculum development.*

**AIKATERINI MICHOU**, Assistant Professor. Ph.D., Educational Sciences, University of Athens, 2005. *Educational psychology; motivation in education.*

**JOHN O'DWYER**, Assistant Professor. Ph.D., Language Testing and Evaluation, English Language Teaching, Surrey University, 2005. *School and project management, people management, organizational learning, curriculum development, implementation and evaluation.*

**DENİZ ORTAÇTEPE**, Assistant Professor. Ph.D., Curriculum and Instruction, State University of New York, 2011. *Second language socialization, professional development of teachers, social identity in ESL/EFL.*

**RASİM ÖZYÜREK**, Assistant Professor. Ph.D., Turkish Language Teaching, Baku State University, 1998. *Turkish language teaching methods.*

**MARGARET SANDS**, Visiting Professor. Ph.D., Science Education, Nottingham University, 1983. *Science education, teacher training, school partnerships, examinations and assessment, curriculum development and evaluation, project management, quality assurance and standards.*

## MASTER OF ARTS IN CURRICULUM AND INSTRUCTION

The program consists of eight core courses (24 credits), which together cover the educational foundations of a school community, and the learning and teaching that go on there. Theory and practice are interlinked. Students look at their own experience and expertise in the context of educational theory, which itself will inform their practice in the future. Work in the classroom or in other school contexts is an essential feature of the program.

**Program Goals:**
- To enable participants to meet the needs of the educational institutions in which they work, and to allow them to make effective and up-to-date contributions to quality education in Turkey at the primary and secondary levels
- To encourage school-based research
- To permit participants to continue working in their institutions while working toward an advanced degree

**Admission:**
- Qualified teacher status
- At least two years of teaching experience in an elementary, middle or high school
- Official transcript from the institution that awarded the applicant's undergraduate degree
- Minimum 2.5 cumulative GPA during undergraduate studies
- ALES (*Akademik Personel ve Lisansüstü Eğitimi Giriş Sınavı*/Academic Personnel and Postgraduate Education Entrance Examination) or GRE (Graduate Record Examination): minimum ALES score of 60; GRE combined score of at least 295 and 3.5 in analytical writing
- One of the following English proficiency scores:
  - TOEFL (iBT): 87
  - IELTS: 6.5 (minimum 5.5 on each section)
  - Bilkent PAE: C
- Two reference letters: one from the applicant's school director, stating approval to attend the program; and one from a person familiar with the applicant's academic ability.

## MASTER OF ARTS IN CURRICULUM AND INSTRUCTION WITH TEACHING CERTIFICATE

The two-year program in teacher education awards a master's degree in Curriculum and Instruction, together with a teaching certificate that qualifies graduates to teach in high schools. It also awards an International Baccalaureate Certificate in Teaching and Learning.

The program's teacher education courses cover the required pedagogical knowledge and skills. Subject area and liberal arts courses broaden and extend students' understanding of their own subject area as well as educational philosophy. Emphasis is placed on international dimensions, including the International Baccalaureate and IGCSE curricula. A central feature of the program is students' experience in schools. Each semester, students have an internship in a leading high school in Ankara, Istanbul, or Izmir, observing classes and teaching. The program also includes an internship consisting of five weeks at the University of Cambridge Faculty of Education and schools in Cambridge or nearby. Here, student teachers experience a different system of education and teacher training, and gain a wider perspective on teaching, classroom interactions, and life in another country.

**Admission:**
- Minimum score of 60 on the verbal section of the ALES (Akademik Personel ve Lisansüstü Eğitimi Giriş Sınavı/ Academic Personnel and Postgraduate Education Entrance Examination)
- One of the following English proficiency scores (except english teacher education track):
  - TOEFL (iBT): 70
  - IELTS: 5.5
  - Bilkent PAE: C
- Minimum 2.5 cumulative GPA in one of the following four-year undergraduate degrees:
  - Turkish Language and Literature (Turkish Language and Literature, Contemporary Turkish Dialects and Literatures)
  - English (English Language and Literature, American Culture and Literature, Translation and Interpretation, English Linguistics)
  - Biology (Biology, Molecular Biology and Genetics)
  - Mathematics (Mathematics, Mathematics-Computer Sciense
  - Physics (Physics, Physics Engineering)

Applicants will be evaluated on the basis of their academic records, ALES scores, proficiency in English, letters of recommendation, and an interview.

**Degree Requirements:** Students must complete the required curriculum with a minimum GPA of 3.00 overall, as well as satisfactorily completing the school experience and teaching practice at partner schools.

## MASTER OF ARTS IN TEACHING ENGLISH AS A FOREIGN LANGUAGE (MA TEFL)

The Master of Arts Program in Teaching English as a Foreign Language at Bilkent University was established in 1988 to enhance the quality of English language instruction in Turkey. Bilkent University, the Turkish Fulbright Commission and the United States Embassy cooperated to establish the program.

**Program Goals:** Graduates of the Program benefit in many ways. In addition to the opportunity to study at an English-medium university and thereby improve their English, the program strives to provide graduates with the following:

- Improvement of classroom teaching and testing based on a thorough understanding of linguistic theory and language learning;
- Enhanced understanding of general educational principles;
- Improved familiarity with current developments in educational technology;
- Development of research skills for the systematic analysis of issues related to language teaching; and
- Opportunity to develop professional contacts within the Turkish and international TEFL communities.

**Admission:** Admission to the Bilkent MA TEFL Program is competitive. The program is demanding in its academic requirements. Applicants accepted to the program are expected to maintain their personal commitment to academic and professional advancement throughout the heavy load of courses, assignments, and a thesis compressed into eleven months. Applicants must meet the following criteria:

- Have at least two years of full-time EFL/ESL teaching experience
- Proof of a relevant undergraduate degree
- Language proficiency: TOEFL (iBT) 87 or IELTS (academic module) 6.5 (minimum 5.5 in each section), or Bilkent PAE:C
- A minimum ALES (*Akademik Personel ve Lisansüstü Eğitimi Giriş Sınavı*/Academic Personnel and Postgraduate Education Entrance Examination) score of 60 (verbal), or minimum combined GRE (Graduate Record Examination) score of 295 and 3.5 in analytical writing
- Two signed and sealed letters of recommendation
- Academic transcripts (min. CGPA 2.75/4)
- A personal statement (about 1000 words)

The application process also includes an English proficiency test and a personal interview. Candidates are expected to make appropriate arrangements with their home institutions for leave. It is the candidate's responsibility to be sure his or her institution will grant a release with support for the year's program.

**Degree Requirements:** The Bilkent MA TEFL Program includes successful completion of the required courses and a thesis, to be completed in one academic year and the following summer. The curriculum is based on the theoretical and practical concerns of teaching English as a foreign language in Turkey and other foreign language settings.

## DOCTOR OF PHILOSOPHY IN CURRICULUM AND INSTRUCTION

The Ph.D. in Curriculum and Instruction is tailored to meet the needs of professional practitioners in education, including classroom teachers, who wish to continue their own education while still working as educators. It is designed for practicing educators with at least two years of teaching experience.

Applicants should demonstrate clear goals, evidence of interest in research, evidence of background and experience in the area of curriculum and instruction, and strong writing skills.

**Admission:**
- Qualified teacher status with a minimum two years of teaching experience
- Master's degree (with thesis) from an accredited program, with a minimum GPA of 3.0/4.0
- ALES (Akademik Personel ve Lisansüstü Eğitimi Giriş Sınavı/Academic Personnel and Postgraduate Education Entrance Examination) or GRE (Graduate Record Examination): minimum ALES score (equally weighted) of 60; GRE score of at least 305 (or 1100 verbal and quantitative combined) and 4 in analytical writing
- YDS: min 55
- One of the following English proficiency scores:
  - IELTS (academic module) 6.5 (minimum 5.5 in each section)
  - TOEFL (iBT) 87,
  - Bilkent PAE: C
- Two signed and sealed letters of recommendation (from individuals able to address the applicant's academic abilities and potential for doctoral study)
- Personal statement (1,000-1,250 words), to include purpose and objectives for undertaking graduate study, and description of prior research experience, research interests, and career goals
- Applicants may be asked to come for an interview

**Degree Requirements:** Students accepted into the program must complete at least 12 credit hours of academic preparation and 24 credit hours of doctoral course work. A cumulative GPA of at least 3.0 must be maintained for Ph.D. courses. Upon successful completion of the course work, a Ph.D. student will take written and oral qualifying exams. The student will then submit a research proposal to be evaluated by the Dissertation Monitoring Committee. Upon a favorable evaluation, the student may begin work on the Ph.D. dissertation, which must be the result of original research by the candidate and should represent a substantial contribution to the field of study. The candidate must then defend the dissertation before a jury. A candidate must also publish a paper in a journal acceptable to the university.

## COURSE DESCRIPTIONS

**CI 501 Learning, Development, and the Cultural Context for teaching**
The course will focus on the holistic development of school students in their current cultural context. Topics for study include the development of cognitive abilities, critical, creative, and imaginative thinking, Gardner's multiple intelligences, and cognitive and affective taxonomies. The sociology of educability will be considered: the effect of the family and home environment on a child's development and ability to learn and achieve, as well as the impact of other social factors on development.

**CI 502 Managing the Classroom**
The course will give a general overview of the social and psychological factors which determine or affect student behavior in educational settings. It includes systems for classroom management to maximize student learning outcomes, and techniques for meeting the varied needs of learners in a classroom, with a view to increasing motivation, managing groups, orienting students, and allowing the quality use of time in the classroom.

**CI 503 Educational Leadership and School Development**
The course considers leadership skills for those who may take on administrative roles in a school. It includes skills required for effective staff motivation and the creation of a leadership team, problem analysis and decision-making, good communication, strategic planning, implementing change, utilizing a team process, and managing crises in school. In addition, leadership styles, principles of adult learning and adult motivation theory, self and peer assessment, plus coaching teachers toward increased effectiveness will be included.

**CI 504 Contemporary Issues in Curriculum Development and Evaluation**
The course will examine curriculum theory for elementary and high school courses of study. It will consider current trends and issues in curriculum development, the determinants of the curriculum, and conditions for curriculum change. The evaluation of the implementation of new curricula will be included. The role of the teacher, the school, other members of the school community, and the values and attitudes of society, in curriculum implementation will be studied.

**CI 506 IB and IGCSE Curricula**
International education programs. The nature of the International Baccalaureate Diploma Program. Student requirements for obtaining the IB Diploma. Planning and teaching IB Diploma courses. The nature of the International General Certificate of Secondary Education. Student requirements for obtaining IGCSE certificates. Planning and teaching IGCSE courses. Critical thinking and Theory of Knowledge. Community Service. School structure and authorization for offering IB and IGCSE programs.

**CI 507 Educational Research**
The course is designed to introduce key concepts in quantitative and qualitative research in general. It will explore the different research methods used in educational research. Topics will include formulating research questions, reviewing the literature, synthesizing sources, selecting appropriate research designs, sampling, designing valid and reliable instruments for data gathering, and analyzing data. Action research as a qualitative approach to research will be given particular emphasis.

**CI 508 Assessing Student Learning and Progress**
The course will focus on formative and summative evaluation at elementary and high school levels. It will review fundamental concepts, principles and uses of testing and assessment for monitoring the progress and achievement of school students of all ages. Participants will gain experience of devising effective means of formative assessment and recording progress, and in writing specific learning outcomes. They will compose tests, writing items to measure objective and complex outcomes, and analyzing items and examinations to guide student learning and to inform practice.

**CI 509 Thesis Seminar**
The thesis seminar is intended to guide the Masters students in their thesis work. Research methods, literature reviews, elaboration of topics, organization of material in relation to each student's research will be discussed, leading to a thorough consideration of, and guidance in, the preparation of the thesis. Students will make presentations of their research to date in order to share their progress and learn from each other.

**CI 511 Curriculum in an international Context**
The course examines education, specifically education in schools and the school curriculum, in several countries. In particular, course participants study and compare the International Baccalaureate (IB) system of curricula and assessment from primary to high school, and the nature and role of international education. Such study includes the nature of the IB diploma program; planning, teaching and assessing IB courses; together with critical thinking and the theory of knowledge. The International General Certificate in Secondary Education (IGCSE) is also considered. International large scale comparative studies are included, particularly the findings from the Programme for International Student Assessment (PISA).

**CI 512 Written Academic Discourse**
The course focuses on developing essential research and language skills. It provides opportunities for participants to learn the APA system of referencing, analyze research articles, and start preparing the introduction and literature review sections of their thesis.

**CI 513 Statistics**
Descriptive statistics; measures of central tendency, measures of variability, measures of relative standing (percentile, z-scores), graphing data, sampling, point and interval estimation, sampling distributions, hypothesis testing, one and two sample tests of hypothesis for means (t-tests), introduction to analysis of variance, statistical software applications.

**CI 514 Curriculum Development and Evaluation**
This course is designed to examine approaches to curriculum development and evaluation. It considers curriculum theorizing, curriculum models and curriculum planning at different levels. The course also provides evaluation models and techniques to analyze curriculum and its components. Procedures and issues for curriculum development and evaluation, factors that impact curriculum, and curriculum decision making are also studied.

**CI 515 Trends and Issues in Instruction and Assessment**
This course will provide participants with an understanding of current trends and issues in instruction and assessment. It will explore procedures for instructional design, delivery, and evaluation. The course will also survey current methods and techniques used to assess student performance. Participants will critically reflect on, and evaluate, current practices and future directions.

**CI 516 - Child and Adolescent Psychology**
The course provides an introduction to the milestones of development from childhood through adolescence to adulthood. It covers developmental research methods, the biological and social contextual contributions to individual development, and the fundamental theories of cognitive and psychological development (such as those of Piaget and Erickson). These theories are integrated into a consideration of physical, cognitive, social and emotional development in childhood and adolescence. Aspects of developmental research which focus on the implications for parenting and education are discussed.

**CI 517 - Learning Theories and Practice**
The course focuses on theories of human learning and their implications for education, how we develop and acquire knowledge and skills. It will present behaviorist, social, cognitive and constructivist learning theories, and consider their contribution to teaching practices and to the understanding of students' learning processes.

**CI 518 - Science of Learning**
The science of learning involves examining how data is learned, remembered, processed, interpreted and applied. The course will also show connections between the functions of the brain and effective learning/teaching strategies. The course begins with a study of the brain itself, including its anatomy, physiology and health, and how its structure and working relate to learning. Awareness and the biology of conscious thought will be explored through research related to brain development, information processing, memory and retention, transferring learning, and critical thinking. Participants will review this research, and examine how it applies to effective learning and teaching in their subject areas. A related aim of the course is for trainee-teachers to identify teaching methodologies, strategies and activities that best assist learning.

**CI 532 - Written Academic Discourse**
This course focuses on developing essential skills for effective presentation of academic language in written discussion. Students learn the APA system for referencing, and prepare their proposals including the introduction, literature review and methodology of their thesis.

**CI 601 Instruction: Perspectives and Practice**
The course focuses on contemporary instructional theories and design models. Participants will also examine instructional strategies and effective delivery methods. Topics will include information processing, learning contracts, simulations, inquiry, learner-based instruction, and digital literacy.

**CI 602 Curriculum: Perspectives and Practice**
The course examines major themes and concepts relevant to curriculum theory and research. Participants will critically analyze models of curriculum theory through philosophical, psychological, sociological and historical perspectives.

**CI 603 Practicum in Curriculum Development and Evaluation**
The course provides experience in developing and evaluating curricula. It introduces technical and non-technical approaches to development and evaluation. Participants will be expected to pursue a field study in their own schools.

**CI 604 Educational Statistics**
This course introduces descriptive and inferential statistical concepts needed to conduct quantitative inquiry in educational statistics. Participants will be expected to analyze cases, and determine and apply appropriate statistical procedures, using the Statistical Package for Social Sciences (SPSS). They will also interpret and report the results.

**CI 605 Educational Research Methods**
The course gives an introduction to the logic of social scientific inquiry and exposure to the methodology, techniques and ethics of research. Participants will focus on how to formulate research problems, collect and analyze data, and present findings, considering various research designs. The use of a theoretical framework in conducting research in educational settings will be emphasized.

**CI 606 Qualitative Research Methods**
This course is intended to provide participants with the basic skills needed to conduct qualitative research. It will focus on methods of qualitative data collection and analysis. Participants will be expected to develop and implement data collection and analysis tools to explore and address educational issues.

**CI 608 Current Trends and Issues in Educational Technology**
The aim of this course is to explore current trends and

related issues in educational technology. The overall theme of the course considers the many different ways educational technology is used in education; types of available technology, teachers' and students' use of technology, and challenges for the education community at large will be included. Applications, such as Web 2.0, multimedia, and simulations will be considered in detail. Case studies of good practice and critical evaluation utilizing related scientific research pertaining to the effectiveness of educational technology in teaching and learning will be studied. Sessions will include practical applications in the computer laboratory and students will also be expected to pursue applications relating to their field of expertise at their own time.

**CI 611 Issues and Trends in Education**
The course focuses on educational issues and trends at the national and global level. Participants will explore and discuss implications of policies affecting educational goals, processes and outcomes. The course involves an analysis of the micro- and macro-level issues nationally and internationally, including those concerned with structural and organizational issues, teacher-training, elementary education, secondary education, higher education, and the transitional problems between these levels.

**CI 690 Dissertation Seminar**
The seminar is intended to guide doctoral students as they prepare their research proposal, which requires approval by the Dissertation Monitoring Committee. The seminar follows the qualifying exam and instructs the students in the preparation of the first three chapters of the dissertation. Participants are expected to formally present their work to the group and share their experiences.

**TE 509 Developmental Psychology**
Basic concepts and principles of development. Theories of development. Stages of development. Physical, cognitive, personal and moral development during childhood and adolescence. Problems during puberty and coping strategies.

**TE 510 Curriculum and Instruction**
Basic concepts. Theoretical foundations of curriculum development in education (historical, philosophical, psychological and social foundations). Curriculum design in education and models. The process of curriculum development (planning, preparing a proposal, piloting and evaluating, ensuring continuity) Instructional principles. Importance and benefits of studying regularly and methodically. Planning instruction (unit by unit yearly plans, sample daily plans and activities). Instructional methods and techniques, and their delivery. New trends in education and instruction (for example, effective learning, multiple intelligences, constructivism, lifelong learning, creative thinking). Duties and responsibilities of teachers in improving the quality of teaching.

**TE 518 Measurement and Evaluation**
Role and significance of measurement and evaluation in education, fundamental concepts of measurement and evaluation, desirable qualities of measurement tools (reliability, validity, practicality), measurement tools used in education and their characteristics. Traditional tools (written examinations, short-answer tests, true-false tests, multiple choice tests, matching, oral examinations, assignments). Tools which assess multiple facets of student performance (observation, interview, performance-based assessment, portfolios, research papers, research projects, peer assessment, self-assessment, attitude scales). Use of basic statistical tools to process the results of assessment, evaluating learner outcomes, grading, development of subject area specific assessment tools.

**TE 519 Classroom Management**
Fundamental concepts of classroom management, classroom communication and interaction, definition of classroom management, various aspects of classroom management other than discipline, external and internal factors affecting classroom climate, models of classroom management, development and implementation of classroom rules, physical arrangement of the classroom, managing undesirable behavior, time management, class organization, developing a class environment conducive to learning (cases and suggestions).

**TE 520 Instructional Technology and Materials Design**
Concepts of instructional technology, characteristics of various instructional technology. Role and use of instructional technology in the process of teaching, identification of technology needs in the classroom/school, appropriate planning and management of technology use, using technology to develop 2-D and 3-D materials, developing teaching tools (worksheets, activity design, OHP transparencies, slides, visual media tools such as DVD, VCD and computer based tools). Analyzing educational software, evaluating teaching tools of varying quality, internet and distance education, principles of visual design, research pertaining to the effectiveness of teaching materials, the state of instructional technology for teaching in Turkey and the wider world.

**TE 524 Guidance**
Fundamental concepts, student support services, the role of guidance and counseling in student support services, principles of guidance, principles and development of guidance, types of guidance and counseling, services, techniques, organization and personnel, recent developments in the field, techniques for getting to know students, counselor-teacher cooperation, guidance duties of the teacher.

**TE 528 Introduction to Educational Science**
Basic concepts in education. Relationship of education to other disciplines (the philosophical, social, legal, psychological, economic and political foundations of education). History of educational science. Major trends in educational science in the 21st century; Research methods in educational science. Structure and characteristics of the Turkish Education System. Role of teachers in education. Characteristics of the teaching profession. Developments and practices in teacher education.

**TE 529 Turkish Language and Literature Curriculum Review I**
This course provides students with knowledge and experience to assist them to become effective Turkish Language and Literature (TLL) teachers. The major areas of TLL taught in school will be reviewed in detail and related to high school curriculum and demands made on high school teachers and students. The skills covered include knowledge of the appropriate level of subject area content and relevancy, together with a working knowledge of school TLL text books, and the application of these skills in the classroom. National, IB and IGCSE curricula will be discussed.

**TE 531 English Teaching Methods I**
The course explores, with practical examples, and with reference to current research, the teaching of English at high school level. It considers all relevant teaching methods, and their application to a range of teaching/learning contexts. Students will engage in extensive reflection on the methods and applications considered.

**TE 532 Biology Teaching Methods I**
The course explores, with practical examples, and with reference to current research, the teaching of biology at high school level. It considers all relevant teaching methods, and their application to a range of teaching/learning contexts. Students will engage in extensive reflection on the methods and applications considered.

**TE 533 Turkish Language Teaching Methods**
The course explores, with practical examples, and with reference to current research, the teaching of Turkish language at high school level. It considers all relevant teaching methods, and their application to a range of teaching/learning contexts. Students will engage in extensive reflection on the methods and applications considered.

**TE 535 Mathematics Teaching Methods I**
The course explores, with practical examples, and with reference to current research, the teaching of mathematics at high school level. It considers all relevant teaching methods and their application to a range of teaching/learning contexts. Students will engage in extensive reflection on the methods and applications considered.

**TE 537 Physics Teaching Methods I**
The course provides an introduction to the teaching of physics, and to the classroom techniques which may be used in the teaching of it. Specific teaching methods and strategies will be explored, together with their application to a range of teaching/learning contexts. Practical applications of the methods will be experienced through a number of activities including microteaching, project work and simulation situations. Students will be asked to engage in extensive reflection on the methods and applications considered.

**TE 540 Curriculum Development in Education**
This course is designed to examine approaches to curriculum development. It considers curriculum theorizing, curriculum models and curriculum planning at different levels. Procedures and issues for curriculum development and evaluation, factors that impact curriculum, and curriculum decision making are also studied.

**TE 541 English Teaching Methods II**
This course is a continuation of TE 531. It continues the developmental work of TE 531 in the teaching of English. Students gain further understanding of the teaching and learning methods which may be used with different groups of students, and of the context in which learning is set. There will be further practical applications and classroom experience.

**TE 542 Biology Teaching Methods II**
This course is a continuation of TE 532. It continues the developmental work of TE 532 in the teaching of biology. Students gain further understanding of the teaching and learning methods which may be used with different groups of students, and of the context in which learning is set. There will be further practical applications and classroom experience.

**TE 543 Turkish Literature Teaching Methods**
This course is a continuation of TE 533. It continues the developmental work of TE 533 in the teaching of Turkish language and literature. Students gain further understanding of the teaching and learning methods which may be used with different groups of students, and of the context in which learning is set. There will be further practical applications and classroom experience.

**TE 545 Mathematics Teaching Methods II**
This course is a continuation of TE 535. It continues the developmental work of TE 535 in the teaching of mathematics. Students gain further understanding of the teaching and learning methods which may be used with different groups of students, and of the context in which learning is set. There will be further practical applications and classroom experience.

**TE 547 Physics Teaching Methods II**
This course is a continuation of TE 537. The course provides an introduction to the teaching of physics, and to the classroom techniques which may be used in teaching. Specific teaching methods and strategies will be explored, together with their application to a range of teaching/learning contexts. Practical applications of the methods will be experienced through a number of activities including microteaching, project work, and simulation situations. Students will be asked to engage in extensive reflection on the methods and applications considered.

**TE 550 Educational Psychology**
The relationship between education and psychology, definition and functions of educational psychology. Basic concepts of learning and development. Physical, mental, emotional, social and ethical development. Theories of learning, a consideration of learning theories in relation to the teaching process. Effective learning. Factors affecting learning: motivation, individual characteristics, group dynamics; their effects on in-class teaching.

**TE 551 School Experience I in English**
**TE 552 School Experience I in Biology**
**TE 553 School Experience I in Turkish Language and Literature**
**TE 555 School Experience I in Mathematics**
**TE 557 School Experience I in Physics**
One day a week in a high school under the daily supervision of an experienced school teacher who acts as mentor. Students use structured activities which involve lesson observation and interviews to understand the organization and daily work of the school. They analyze particular teaching skills, and consider whole school issues. There is a one-hour seminar which consolidates the work done in school.

**TE 560 Physics Curriculum Review**
The course provides students with knowledge and experience to assist them to become effective physics teachers. The major areas of the physics curriculum taught in high schools will be reviewed in detail and related to the demands made on high school teachers and students. The topics covered include curriculum objectives, content and implementation, assessment, the school-based physics curriculum, textbooks used in schools, the national curriculum, the IGCSE curriculum, and IB curricula.

**TE 561 School Experience II in English**
**TE 562 School Experience II in Biology**
**TE 563 School Experience II in Turkish Language and Literature**
**TE 565 School Experience II in Mathematics**
**TE 567 School Experience II in Physics**
Students spend one day a week in a school, under the daily supervision of their mentor. They teach classes, as well as working on structured activities related to teaching and the school environment. There is a one-hour seminar which consolidates the work done in school.

**TE 571 Teaching Practice in English**
**TE 572 Teaching Practice in Biology**
**TE 573 Teaching Practice in Turkish Language and Literature**
**TE 575 Teaching Practice in Mathematics**
**TE 577 Teaching Practice in Physics**
Students spend an extended period in a school, under the supervision of their school mentor and faculty supervisor. Students become members of the school for this period. They work with teachers, they attend meetings and extra-curricular activities, they observe lessons, and teach full lessons in the English department. The course includes tutorials and seminars which assist students in the planning and evaluation of their school work and allows them to share experience.

**TE 581 Principles and Methods of Instruction**
The basic concepts of instruction. The principles of teaching and learning. The importance and benefits of instructional planning. The planning of instruction (yearly plans containing units, daily plans and sample activities). Teaching and learning strategies. Instructional methods and techniques, and their relation to practice. Instructional materials. The teacher's roles and responsibilities in improving the quality of instruction. Teacher competencies.

**TE 590 Advanced Teaching Practice**
Students participate in teaching/learning activities in schools in England over a period of five weeks. They extend their pre-service teacher education studies at Cambridge University, and experience other approaches to high school student learning in an independent school in England.

**BTE 501 Biology Curriculum Review I**
The major areas of biology will be reviewed in detail for plant physiology, genetics, biotechnology and evolution. They will be related closely to the high school curriculum and the demands made on high school teachers and students. Both the Ministry of Education and IGCSE syllabuses will be covered. Students will be required to extend and update their subject knowledge by consideration of the school biology curriculum, advanced level school test questions, and textbooks both in Turkish and English.

**ETE 503 English Curriculum Review**
The course provides students with knowledge and experience to assist them to become effective English teachers. The major areas of the English curriculum taught in schools, especially in high schools, will be reviewed in detail and related to the demands made on high school teachers and students. The topics covered include curriculum objectives, content and implementation, assessment, the school-based language curriculum, textbooks used in schools, the IGCSE curriculum, and IB language curricula.

**MTE 501 Mathematics Curriculum Review I**
This course is a continuation of MTE 501. The major areas of mathematics taught in school will be reviewed in detail and related to the high school curriculum, focusing on grade 10 and later. Students gain further understanding of mathematics content, relevancy, and the application of these skills in the classroom. Discussion of national standards in mathematics will continue.

**MTE 503 Computer Technology in Mathematics Education**
The course will equip student-teachers with the skills to use computer technology to teach secondary mathematics. These skills will be used to create lesson plans, classroom demonstrations and teaching/learning materials that clarify topics in the mathematics curriculum. The topics covered will include algebra, geometry, trigonometry, calculus, probability, discrete math and other areas.

**TEFL 501 Second Language Acquisition**
Theories of second language acquisition. Students analyze both qualitative and quantitative research studies conducted in the past 30 years.

**TEFL 503 Linguistics: The Nature of Language**
Foundations in linguistics with an emphasis on basic terminology, concepts, and analysis. Main topics include phonetics, phonology, morphology, syntax, semantics, and pragmatics. Discussion focuses on their relevance and application to second language acquisition and foreign language teaching, in particular, teaching English in Turkey.

**TEFL 506 Sociolinguistics**
Examination of linguistic variation in English among social groups due to region, socio-economic status, gender, ethnicity, and age, especially as this variation relates to language learning. Linguistic registers, standard and non-standard dialects, language attitudes, and attitudes toward language learning are also treated.

**TEFL 510 Language Testing**
Theoretical and practical considerations in the construction, use, and critical evaluation of both classroom and standardized tests of language proficiency. Students are acquainted with basic concepts of validity and reliability, as well as a variety of different kinds of tests and testing techniques.

**TEFL 521 EFL Methodology**
Discussion of the major foreign language teaching methods in their historical contexts, as well as individual language skills and integrated skills. Current areas of concern in ESL/EFL are also examined, and key EFL/ESL terminology is reviewed.

**TEFL 528 Curriculum Development and Evaluation**
Principles of course design, implementation, and evaluation. The role of the teacher in the curriculum process is central to the course. Small projects and papers relating to students' experiences will provide skills in developing and evaluating curricula.

**TEFL 530 Materials Development**
Selection, adaptation, development, evaluation, and implementation of lesson plans, textbooks, and other materials for different teaching situations. Students become familiar with a variety of materials. Opportunities are provided for critiquing, developing, and adapting materials for a wide range of contexts and target groups.

**TEFL 531 Research Methods I in Linguistics**
Introduction to skills in library research and applied linguistics research methodology including the collection, analysis, and processing of data. Issues of research methodology are examined for their applicability to critiquing published research and to conducting original research in language-learning environments. Quantitative, qualitative, and mixed-methods research traditions are examined.

**TEFL 532 Research Methods II in Linguistics**
This course is a continuation of Research Methods in Linguistics I, and includes further detailed examination of theoretical and methodological topics in the contemporary literature on qualitative, quantitative, and mixed-methods research designs. It also explores topics in the ongoing development of applied linguistics research methodology in particular, and provides students with additional practice in the critical reading, understanding, and assessing of published research.

**TEFL 554 Thesis Writing**
Focus on presenting aspects of research findings in an organized and coherent manner. Students receive critical feedback from peers and their instructor on their thesis. The emphasis is on improvement of academic discourse appropriate to complete the program thesis successfully.

**TEFL 555 Writing Academic Discourse**
Focus on developing essential skills for effective writing. Meta-discussion of readings and exercises will help develop students' own abilities to teach academic writing.

**TEFL 556 Seminar in TEFL**
In-depth exploration of and innovative approaches to topics of importance in the field of TEFL. The course may be divided into two eight-week seminars to allow expanded coverage of the issues. Specific topics to be determined by the instructor(s).

## SAMPLE OF RECENT PUBLICATIONS


• A. Ateskan, "Pre-Service Teacher's Cultural and Teaching Experiences Abroad", *J of Education for Teaching*, 42, 135-148 (2016)

• A. Ateskan, J.F. Lane, "Promoting Field Trip Confidence: Teachers Providing Insights for Pre-Service Education", *European J of Teacher Education*, 39, 190-201 (2016)

• S. Sagun, A. Ateskan, J. Onur, "Developing Students for University through an International High School Program in Turkey", *Educational Sciences - Theory & Practice*, 16, 439-457 (2016)

• H. Demircioglu, A. Ayas, G. Demircioglu, H. Ozmen, "Effects of storylines embedded within the context-based approach on pre-service primary school teachers' conceptions of matter and its states", *Asia Pacific Forum on Science* Learning *and Teaching*., 1-30 (2016)

• A. Yazici, A. Ayas, "Challenges and barriers in implementing lifelong learning in developing countries", *Int J of New Trends in Education and Their Implications*, 6, 1-9 (2015)

• F. Yaman, A. Ayas, "Assessing changes in high school students' conceptual understanding through concept mapsbefore and after the computer-based predict-observe-explain (CB-POE) tasks on acid-base chemistry at the secondary level", *Chemistry Education Research and Practice*, 16, 843-855 (2015)

• I. Kalender, G. Berberoglu, "Can computerized adaptive testing work in students' admission to higher education programs in turkey", *Educational Sciences - Theory & Practice* (Forthcoming)

• I. Kalender, "Measurement Invariance of Student Evaluation of Teaching across Groups defined by Course-Related Variables", *Int Online J of Educational Sciences*, 7, 69-79 (2015)

• I. Kalender, "Reliability-Related Issues in the Context of Student Evaluations of Teaching in Higher Education", Int J of Higher Education, 4, 1-13 (2015)

• M. Basaran, G. Ozalp, I. Kalender, C. Alacaci, "Mathematical Knowledge and Skills Expected by Higher Education in Engineering and the Social Sciences: Implications for High School Mathematics Curriculum", *Eurasia J of Mathematics, Science and Technology Education*, 11, 405-420 (2015)

• I. Kalender, "Profiling Instructional Effectiveness to Reveal Its Relationship", *Asia-Pacific Education Researcher*, 23, 717-726 (2014)

• A. Ozdemir, J.F. Lane, A. Michou, "Autonomous and controlling reasons underlying achievement goals during task engagement: Their relation to intrinsic motivation and cheating", *Educational Psychology: An Int J of Experimental Educ. Psych*, 36, 1160-1172 (2016)

• O.K. Can, J.F. Lane, A. Ateskan, "Facilitating place-based environmental education through bird studies: an action research investigation", *Environmental Education Research*., 1-15 (2016)

• J.F. Lane, A. Baker, S. Kerlin, S. Schuller, "Designing Resilient Energy Education Programs for a Sustainable Future", *J of Sustainability Education*, 8 (2015)

• J.F. Lane, K. Floress, M. Rickert, "Development of school energy policy and energy education plans: A comparative case study in three Wisconsin school communities", *Energy Policy*, 65, 323-331 (2014)

• U. Ozdag, J.F. Lane, "A Study of the Writing Strategies of Renowned Conservationists: Implications for Place-Based Education in Turkey", *Hacettepe University Journal of Education*, 29, 189-204 (2014)

• R.A. Martin, C. Alacaci, "Positive youth development in Turkey: a critical review of research on the social and emotional learning needs of Turkish adolescents, 2000-2012", *Research Papers in Education*, 30, 327-346 (2015)

• A. Mouratidis, A. Michou, A. Vassiou, "Adolescents' autonomous functioning and implicit theories of ability as predictors of their school achievement and week-to-week study regulation and well-being", *Contemporary Educational Psychology* (Forthcoming)

• A. Michou, A. Mouratidis, E. Ersoy, H. Uğur, "Social achievement goals, needs satisfaction, and coping among adolescents", *Personality and Individual Differences*, 99, 260-265 (2016)

• A. Michou, L. Matos, R. Gargurevich, B. Gumus, D. Herrera, "Building on the Enriched Hierarchical Model of Achievement Motivation: Autonomous and Controlling Reasons Underlying Mastery Goals", *Psychologica Belgica*, 56, 269-287 (2016)

• A. Michou, E. Matsagouras, W. Lens, "Dispositional achievement motives matter for autonomous versus controlled motivation and behavioral or affective educational outcomes", *Personality and Individual Differences,* 69, 205-211 (2014)

• A. Michou, M. Vansteenkiste, A. Mouratidis, W. Lens, "Enriching the Hierarchical Model of Achievement Motivation: Autonomous and Controlling Reasons Underlying Achievement Goals", *British J of Education Psychology*, 84, 650-666 (2014)

• E. Burhan-Horasanli, D. Ortactepe, "Reflective practice-oriented online discussions: A study on EFL teachers' reflection-on, in and for-action", *Teaching and Teacher Education*, 59, 372-382 (2016)

• K. Pfeiffer, D. Ortactepe, S. Corlu, "The effect of L1 on the production of L2 formulaic expressions", *J of Language Teaching and Learning*, 6, 35-48 (2016)

• S. Mutlu, D. Ortactepe, "The identity (re)construction of nonnative English teachers stepping into native Turkish teachers' shoes", *Language and Intercultural Communication*, 16, 552-569 (2016)

• D. Ortactepe, "'EFL teachers' identity (re)construction as teachers of intercultural competence: A language socialization approach", *J of Language, Identity and Education*, 14, 96-112 (2015)

• D. Ortactepe, A. Akyel, "The effects of a professional development program on English as a foreign language teachers' efficacy and classroom practice", *Tesol Journal*, 6, 680-706 (2015)

• G.I. Bayram, M.S. Corlu, E. Aydin, D. Ortactepe, B. Alapala, "An exploratory study of visually impaired students' perceptions of inclusive mathematics education", *British J of Visual Impairment*, 33, 1-7 (2015)

• D. Ortactepe, "Common ground as a resource for positioning: A discourse analysis", *Hacettepe University Journal of Education*, 29, 160-174 (2014)

• A. Engin, D. Ortactepe, "Gender differences in item format and skill area: Some evidence from an EFL Acheievement Test", *J of Language Teaching and Learning*, 4, 48-62 (2014)

• E. Kaypak, D. Ortactepe, "Language learner beliefs and study abroad: A study on English as a lingua franca (ELF)", *System*, 42, 1-13 (2014)

• D. Ortactepe, *The Development of Conceptual Socialization in International Students*, Cambridge Scholars Publishing, (2012)

• P. Kocabas, D. Ortactepe, "Teacher identity (re) construction within professional learning communities: The role of emotions and tensions", *Facilitating In-Service Teacher Training for Professional Development*, K. Dikilitas & I. H. Erten (Eds.), pp. 1-12, IGI Global (2016)

Contact:
Dr. Alipaşa Ayas
(Director of the Graduate School of Education)
Phone : +90 312 290 2950 - 51
Fax : +90 312 266 4065
teached@bilkent.edu.tr
gse.bilkent.edu.tr

## Faculty Profile: Dr. Jennie Farber Lane, Assistant Professor, Faculty of Education

Jennie Farber Lane received a B.S. in biology from Florida Southern College and master's degrees from Columbia Teachers College and the University of Wisconsin (UW)–Stevens Point. She earned a PhD in curriculum and instruction from UW–Madison. Prior to coming to Bilkent in 2012, she was director of the Wisconsin K-12 Energy Education Program (KEEP) for 17 years. She worked through KEEP from the time of its inception in 1995 to network with energy resource providers and to develop resources and services (including online courses) that motivate teachers to integrate energy concepts into their classroom lessons. Her other work experience includes teaching public school in the US, and instructing pre-service teachers in Thailand and at the University of Wisconsin–Stevens Point.

While in Wisconsin, Dr. Lane also served on the board of directors of the Midwest Renewable Energy Association and on the research committee for the Wisconsin Environmental Education Board. She has received a number of awards, including the University of Wisconsin–Stevens Point Academic Staff Excellence Award (2003) and the Aldo Leopold Award for Excellence in Environmental Education (2006). She coauthored the *Project WET Curriculum and Activity Guide*, which is used throughout the world, and has published papers in journals including the *Journal of Environmental Education, Energy Policy*, and *Environmental Education Research*. Her research areas include environmental, place-based, and sustainability education.

## Faculty Profile: Dr. Aikaterini Michou, Assistant Professor, Faculty of Education

Aikaterini Michou obtained a master's degree from the University of Geneva and a Ph.D. in educational sciences from the National and Kapodistrian University of Athens. She started her career in education as an elementary teacher, moving to research positions after completing her Ph.D. She worked as a research associate at the Education Research Center of Greece and as a health education coordinator. She also taught educational psychology and pedagogy in the Early Childhood Teachers Training School in Athens and graduate teacher programs.

Dr. Michou's main research interest pertains to the contextual and personal factors that facilitate learning and development in educational settings. More specifically, her research focuses on the learner's quality of motivation and self-regulation and their contextual and personal correlates. She has collaborated in theory-based empirical research projects with advanced quantitative methodology and has also carried out qualitative research that amalgamates the school-based and theory-based approaches. Her research projects have led to publications in journals such as the *Journal of Educational Psychology*, the *British Journal of Educational Psychology*, and *Contemporary Educational Psychology*. In collaboration with two other investigators, she received a 1001 TÜBİTAK grant to study longitudinally the academic success and well-being of adolescents. As a research associate at the Education Research Center of Greece, she was principal investigator for the funded project "The Development of Students' Self-Knowledge and Creativity: A Collaborative Action Research Project" (EPEAEK).

# CAMPUS INFORMATION

Bilkent University is located about 12 kilometers from the center of Ankara and is connected to downtown by a free hourly bus service. The Bilkent campus occupies more than 500 hectares of land. There are three campus areas: the Main, Middle, and East Campuses, which are connected by a regularly scheduled, free shuttle bus service.

**Housing**
Accommodation for graduate students is available on campus either in dormitories or in shared apartments. All housing facilities are furnished, and bedding is provided. Most of the units are equipped with basic necessities including major appliances and kitchenware. Free high-speed Internet service is available in all units.

**Health Services**
There are two health centers, one each on Main Campus and East Campus, providing health care to all students, faculty, and administrative staff. Membership in group health insurance plans is available at reasonable rates for ongoing graduate students. The health centers are equipped with in-house laboratories as well as x-ray and ultrasound machines. Physicians and nurses are available 24 hours a day for emergency care. In addition to the full-time healthcare staff, there are also specialists available for consultation by appointment, including a dentist, a dermatologist, gynecologists, an ophthalmologist, an orthopedist, an otorhinolaryngologist, and a psychiatrist.

**Dining Facilities**
There are a number of restaurants, cafeterias, and coffee shops at the university, which serve a variety of foods and beverages throughout the day. Listed below, they offer healthy food choices and in addition provide an environment where students may socialize. (Bilkent Station and Ankuva Shopping Center, located a short walk from the campus, also feature a variety of restaurants.)

• **Cafe In:** Located near the Table d'Hôte Cafeteria on the Main Campus. An option for sandwiches, fast food, and pastries.

• **Coffee Break:** Four locations: along the pedestrian walkway on the north side of the Faculty of Economics, Administrative, and Social Sciences Building; near the School

of Applied Technology and Management; in the Main Campus Library; and in the School of Applied Languages. Good for a quick bite, pastries, and coffee.

• **Express Café:** Located near the Faculty of Art, Design, and Architecture Building. Serves hot meals.

• **Fameo:** Located in the Faculty of Engineering Building. Offers coffee, drinks and appetizers.

• **Fiero Café:** Located in the Faculty of Economics, Administrative, and Social Sciences Building. An option for a quick bite, pastries, and coffee.

• **Kıraç:** Located near the Sports Center and the Bookstore. Serves mainly Turkish cuisine.

• **Mozart Café:** Three locations: in the Faculty of Music and Performing Arts Building; in B Building; and in the EE Building. An option for sandwiches, salads, and pastries.

• **Sofa Cafe and Restaurant:** Located in Dorms 69 and 70. Offers various food and beverage choices.

• **Sözeri Pide Hut:** Located near the dorms. Serves Turkish pide and kebabs.

• **Speed:** Located near the Sports Center and the Bookstore. Offers a salad bar, hot meals, and fast food.

• **Starbucks Coffee:** Located in the Faculty of Business Administration Building and Faculty of Art, Design and Architecture Building. Offers a wide selection of gourmet coffee drinks and appetizers.

• **Table d'Hôte Cafeteria:** Offers mainly set menus at three locations: across from the Faculty of Engineering Building; in the Faculty of Music and Performing Arts Building; and near the School of English Language.

**Bookstore**
The University Bookstore offers a wide selection of textbooks, stationery items, greeting cards, CDs, DVDs, and national and international newspapers.

**Banking and Shopping Facilities**
Yapı Kredi Bank, on the Main Campus, is open during working hours, including the lunch hour. There are also a number of automated teller machines in various locations around the campuses. On the Main Campus, a grocery store sells local and imported products seven days a week. Ankuva Shopping Center, with a variety of shops and services, is within walking distance.

**Sports Facilities and Programs**
The university's sports facilities, programs, and activities are expanding constantly to keep pace with the needs of a large student body and an increasingly fitness-conscious population. The facilities include three gymnasiums, a semi-Olympic swimming pool, three outdoor tennis courts, two indoor tennis courts, four mini-football fields, outdoor volleyball and basketball courts, aerobics studios, fitness conditioning rooms, multipurpose rooms, and a regulation-size grass football field. In addition, a multipurpose sports complex, which houses a large, state-of-the-art fitness center, basketball and volleyball courts, three squash courts, group exercise studios, and an indoor track, is located on the Main Campus. Courses offered include aerobics/step, aikido, archery, badminton, ballroom dancing, fencing, fit boxing, fitness/conditioning, group exercises (such as Pilates, yoga, and Zumba), horseback riding, judo, karate, kendo, squash, table tennis, taekwondo, tennis, and wing-tsun. Students who enjoy competitive sports may participate in intramural tournaments and play on the various Bilkent University teams.

**International Center**
The International Center serves as an advising and organizing unit for all international faculty members at Bilkent. The main purpose of the center is to provide ongoing assistance and guidance to international faculty by preparing guidebooks for them, informing them about services available on campus, and organizing orientation programs and social events to ease their transition to the university.

**Schools and Kindergartens**
Innovative preschool, primary, and secondary education programs are available to serve the needs of the university community. Bilkent Laboratory and International School (BLIS) is an English-medium school with grades from prekindergarten to 12, providing International Baccalaureate (IB), IB PYP, and IGCSE programs. The Bilkent Private Lycée is a bilingual school that follows the Turkish Ministry of Education curriculum; its primary school provides education in Turkish, with some English language classes. There is also a preschool on campus that offers Turkish-medium instruction.

**Social and Cultural Activities**
Bilkent University offers a lively cultural and social milieu. Student clubs organize frequent film screenings, concerts, and seminars, and young actors studying in the Department of Performing Arts give numerous performances each semester. The annual Spring Festival is a time for fun and friendship.

The university also sponsors art exhibitions and literary evenings, and is a leader in music and the performing arts in Turkey. The Bilkent Symphony Orchestra, Turkey's first private, international, academic music ensemble, performs regularly at the Bilkent Concert Hall, and tours in Turkey and abroad.


# THE BİLKENT ENVIRONS AND ANKARA

The campus offers easy access to Ankara's cultural activities, museums, and entertainment venues. In addition, Bilkent's location in central Anatolia is convenient for travel to other cities, traditional villages, seaside and ski resorts, historic sites, and places of stunning natural beauty or great cultural interest throughout the country.

The Bilkent campuses are situated in a recently developed, safe suburban area. A shopping mall with many good stores and eateries is located within walking distance. Located a short walk off campus are diversions and amenities such as a multiplex cinema showing international films, a bowling alley, boutiques, and salons, along with Bilkent Station, a lively complex where students can try various pubs and restaurants, and occasionally enjoy live music. Also within walking distance is Sports International, a club with state-of-the-art gymnasium facilities as well as indoor and outdoor swimming pools, tennis and squash courts, and a bar and restaurants.

The Bilkent Hotel and Conference Center, at the edge of East Campus, offers all the facilities of a five-star hotel, including an outdoor swimming pool and outdoor cinema during the summer months.

Ankara, in the heart of the Anatolian region, has been the crossroads of many civilizations dating back to the Bronze Age. The city owes its existence to its location at the intersection of trade routes running north-south and east-west across the Anatolian plateau. The Bronze Age Hattians and Hittites and the Iron Age Phrygians were the earliest identifiable inhabitants. The town prospered under the Romans; its Temple of Augustus, with an important Greek and Latin inscription recording the deeds of the Emperor Augustus carved on its outer walls, still stands. The Byzantines were responsible for the fortifications that can be seen guarding the citadel. The Seljuk Turks, who took the city after 1071, built the Arslanhane Mosque, which is located just outside the citadel walls. Eventually, the Ottomans assumed control, and Ankara remained Ottoman until the end of the Empire.

In 1923, Ankara was named the capital of the Turkish Republic by the latter's founder, Mustafa Kemal Atatürk. Today, Ankara has two centers. Ulus and the adjacent citadel mark the site of the ancient and medieval town, and retain a traditional Turkish atmosphere, with old houses and shops selling traditional crafts. The Museum of Anatolian Civilizations is also located in this area. Atatürk Boulevard, Ankara's main thoroughfare, links Ulus with Kızılay, the heart of the modern city. The boulevard continues south to Çankaya, a district that is dominated by the old Presidential Palace and home to most of the embassies to Turkey.

Ankara is a modern, well-planned city, with wide boulevards, parks, restaurants, and museums, along with several universities in addition to Bilkent, ensuring the presence of a large student and professional population. The city has much to offer in terms of cultural activities, including opera, concerts, theatrical performances, lectures, and events organized by foreign embassies.

Ankara has an efficient intracity bus and underground rail system. In addition, its location in the center of Turkey makes it a convenient hub for intercity travel by means of an extensive network of private, long-distance bus companies. Many cities are also connected to Ankara by a modern rail system. Esenboğa Airport, located about 30 km northeast of the city, offers numerous regularly scheduled flights to international as well as domestic destinations.

**Climate**
Ankara is subject to the weather patterns of central Anatolia. While the spring and autumn seasons are generally moderate, with temperatures ranging from around 10°C (50°F) to 20°C (68°F), the winter and summer seasons can be subject to extremes.

From June to September, the weather is often hot and dry, with daytime high temperatures around 32°C (90°F). The winter season, between November and March, can be changeable, with temperatures as low as -10°C (14°F) and as high as 10°C (50°F). Snow or rain alternates with periods of clear, bright weather. It is recommended that students bring attire appropriate for all seasons.

# CLASSICAL MUSIC AT BİLKENT UNIVERSITY

**Bilkent Symphony Orchestra**
**2016-2017**

**Season Opening Concert: From Dark to Dawn**
**Saturday, 8 October 2016**
Avi Ostrowsky, conductor
Mojca Erdmann, soprano
W.A. Mozart | Idomeneo, KV.366 "Quando avran fine omai"
W.A. Mozart | Cosi Fan Tutte, KV.588 "Come scoglio"
W.A. Mozart | Cosi Fan Tutte Overture, KV.588
R. Strauss | "Ich wollt ein Strausslein binden", Op. 68
R. Strauss | "Allerseelen", Op.10
R. Strauss | "Standchen", Op.17
D. Shostakovich | Symphony No.10 in E minor, Op.93

**Journey of Dreams**
**Saturday, 15 October 2016**
Maurice Steger, conductor & recorder
Jadran Duncumb, lute
G.P. Telemann | Klingende Geographie
C.I. Monza | Sinfonia detta,"La Tempesta di Mare"
D.N. Sarro | Concerto for Flute in D minor
A. Montanari | Concerto for Piccolo Flute in B flat major
A. Vivaldi | Concerto for Lute in D major, RV.93
G.A. Brescianello | Chaconne in A major
G. Sammartini | Concerto for Flute in F major

**The Spirit of Festivity**
**Saturday, 29 October 2016**
James Feddeck, conductor
Aga Mikolaj, soprano
R. Wagner | The Flying Dutchman Overture
R. Wagner | Wesendonck Lieder
P. Hindemith | Mathis der Maler: Symphony

**İstanbul Concert**
**Sunday, 6 November 2016 | CRR Concert Hall, İstanbul**
Gabor Takacs Nagy, conductor
S. Kaleli | [No.13] for Orchestra, World premiere, MIAM Composition Prize
J. Haydn | Symphony No.92 in G major "Oxford"
R. Schumann | Symphony No.4 in D minor, Op.120

**In Memory of Atatürk**
**Saturday, 12 November 2016**
Julien Masmondet, conductor
Jean Guihen Queyras, violoncello
F. Köksal | In par_en_thesis, World premiere, BSO commission
H. Dutilleux | Tout un monde lointain
A. Roussel | Bacchus et Ariane, Op.43 Suite No.2

**Boğaziçi Jazz Choir**
**Saturday, Sunday, 19, 20 November 2016**
Boğaziçi Jazz Choir
Masis Aram Gözbek, choirmaster

**Aksak Rythms**
**Saturday, 26 November 2016**
Toshiyuki Shimada, conductor
Christoph Sietzen, percussion
A. Dorman | Frozen in Time
I. Stravinsky | Petrushka

**Happy Birthday İdil Biret**
**Saturday, 3 December 2016**
Rengim Gökmen, conductor
İdil Biret, piano
S. Rachmaninov | Rhapsody on a Theme of Paganini, Op.43
İ. Usmanbaş | Music for Orchestra – 07, World premiere
F. Liszt | Les Préludes

**Magic Flutes**
**Saturday, 10 December 2016**
Ferenc Gabor, conductor
Sharon Bezaly, flute
Albena Sezer, flute
F. Doppler | Concerto for 2 Flutes
W.A. Mozart | Concerto for Flute No.1 in G major, KV.313
L. van Beethoven | Symphony No.7 in A major, Op.92

**Happy New Year for Children**
**Tuesday, 20 December 2016**
Mozart Group & Krosny

**Brahms The Viking**
**Friday, 23 December 2016**
Dorian Wilson, conductor
Vikingur Olafsson, piano
J. Brahms | Concerto for Piano No.1 in D minor, Op.15
P.I. Tchaikovsky | Francesca da Rimini, Op.32

**New Year's Concerts**
**Wednesday, Thursday, 28, 29 December 2016**
Dorian Wilson, conductor
Aydar Gaynullin, bandoneon
Waltzes, Polkas

**Varicolored**
**Saturday, 28 January 2017**
Julien Masmondet, conductor
Laurent Korcia, violin
D. Kabalevsky | Colas Breugnon Overture, Op.24
M. Bruch | Concerto for Violin No.1 in G minor, Op.26
E. Satie | Gymnopédies Nos.1 & 3 Orchestrated by Debussy
M. Ravel | Rapsodie Espagnole

**Spanish Fever**
**Friday, 10 February 2017**
Victor Aviat, conductor
Leticia Moreno, violin
E. Lalo | Symphonie Espagnole, Op.21
W.A. Mozart | Symphony No.41 in C major, KV.551 "Jupiter"

**Valentine's Day Concerts: Music and Puppets**
**Monday, Tuesday, 13, 14 February 2017**
Per Poc Puppet Company
Işın Metin, conductor
Selçuk Yöntem, narrator
S. Prokofiev | Romeo & Juliet

**The Legend at Bilkent**
**Saturday, 18 February 2017**
Avi Ostrowsky, conductor
Ivo Pogorelich, piano
R. Schumann | Concerto for Piano in A minor, Op.54
J. Brahms | Symphony No.4 in E minor, Op.98

**In Memory of İhsan Doğramacı**
**Saturday, 25 February 2017**
Gürer Aykal, conductor
Stanislav Ioudenitch, piano
P.I. Tchaikovsky | Concerto for Piano No.1 in B flat minor, Op.23
P.I. Tchaikovsky | Symphony No.5 in E minor, Op.64

**The Classics from the Hungarians**
**Saturday, 4 March 2017**
Zsolt Hamar, conductor
Kristof Barati, violin
J. Haydn | Symphony No.100 in G major "Military"
W.A. Mozart | Concerto for Violin No.2 in D major, KV.211
W.A. Mozart | Symphony No.40 in G minor, KV.550

**Paris, Mon Amour**
**Saturday, 11 March 2017**
Christoph Mathias Mueller, conductor
David Kadouch, piano
Saygun Philharmonic Chorus
Çiğdem Aytepe, chorusmaster
M. Ravel | Piano Concerto for left Hand in D major
M. Ravel | Piano Concerto in G major
C. Debussy | Nocturnes

**Spring in Vienna**
**Saturday, 18 March 2017**
Mathieu Herzog, conductor
Elena Bashkirova, piano
L. van Beethoven | Concerto for Piano No.3 in C minor, Op.37
J. Brahms | Symphony No.3 in F major, Op.90

**Spring Dreams**
**Saturday, 25 March 2017**
BSO String Ensemble
Konzertmeister: Irina Nikotina
Cem Babacan, piano
Mevlan Mecid, violin
Murat Cangal, viola
Ece Akyol, viola
Serdar Rasul, violoncello
Burak Noyan, double bass
F. Mendelssohn Piano Sextet in D major, Op.110
P.I. Tchaikovsky Serenade in C major, Op.48

**İhsan Doğramacı Special Concert**
**Monday, 3 April 2017**
Gürer Aykal, conductor
Gülsin Onay, piano
L. van Beethoven | Concerto for Piano No.4 in G major, Op.58
B. Tarcan | Suite for Orchestra No.3
A. Borodin | Symphony No.3 in A minor

**Life in Paradise**
**Saturday, 8 April 2017**
Gürer Aykal, conductor
Seda Ayazlı, soprano
G. Mahler | Symphony No.4 in G major

**From Classic to Romantic**
**Saturday, 15 April 2017**
Kazem Abdullah, conductor
Martin Stadtfeld, piano
L. van Beethoven | Concerto for Piano No.2 in
B flat major, Op.19
S. Rachmaninov | Symphony No.3 in A minor, Op.44

**Children's Holiday Concert**
**Friday, 21 April 2017**
Dağhan Doğu, conductor
Çetin Özen, marimba
Bade Daştan, violin
Children's Choir of Early Music Training Program
A. Vivaldi | Concerto for Violin in E major,
RV.267 (Arrangement for Marimba)
F. Mendelssohn | Concerto for Violin in E minor, Op.64
Songs from Disney Movies

**Children's Holiday Concert**
**Saturday, 22 April 2017**
Dağhan Doğu, conductor
Ada Dinçer, flute
İdil Bursa, violoncello
Children's Choir of Early Music Training Program
C. Stamitz | Concerto for Flute in G major, Op.29
J. Haydn | Concerto for Violoncello No.1 in C major
Songs from Disney Movies

**Erzurum Concert**
**Thursday, 27 April 2017 | Bilkent Erzurum Concert Hall**
BSO String Ensemble
Konzertmeister: Irina Nikotina
Özberk Miraç Sarıgül, guitar
A. Vivaldi | Concerto for Guitar in D major, RV.93
R. Dyens | Tango en Skai
K. Karayev | Three Dances
P.I. Tchaikovsky | Serenade in C major, Op.48

**The Master and the Future Star**
**Saturday, 6 May 2017**
Jean-François Heisser, conductor & piano
Eren Süalp, guitar
C.M. von Weber | Konzertstück in F minor, Op.79
M.C. Tedesco | Concerto for Guitar No.1 in D major
A. Dvorak | Symphony No.8 in G major, Op.88

**Forever Young**
**Saturday, 20 May 2017**
Rengim Gökmen, conductor
Elif Ece Cansever, violin
J. Sibelius| Concerto for Violin in D minor, Op.47
L. Bernstein | On the Waterfront
J. Adams | Short ride in a fast machine

**Italian Film Music Concert**
**Saturday, 3 June 2017, 20.30 | Bilkent Odeon**
Ender Sakpınar, conductor
Tülay Uyar, soprano

**Fazıl Say at Odeon**
**Sunday, 18 June 2017, 20.30 | Bilkent Odeon**
Rengim Gökmen, conductor
Fazıl Say, piano
L. van Beethoven | Concerto for Piano No.5 in
E at major, Op.73 "Emperor"
F. Say | Mesopotamia Symphony, Op.38

# CURRENT POSITIONS OF RECENT Ph.D. GRADUATES

| NAME | CURRENT INSTITUTION OF EMPLOYMENT | POSITION |
|---|---|---|
| Didem Ünal Abaday | City University of New York, Department of Sociology | Postdoctoral Researcher |
| Enika Abazi | European University of Tirana, Faculty of Social Sciences and Education | Associate Professor |
| Burak Acar | Boğaziçi University, Department of Electrical-Electronics Engineering | Associate Professor |
| Handan Acar | University of Chicago, Institute for Molecular Engineering | Postdoctoral Researcher |
| Tolga Acun | Bülent Ecevit University, Department of Molecular Biology and Genetics | Assistant Professor |
| Volkan Açıkel | Aselsan | Design Engineer |
| Yasemin Afacan | Bilkent University, Department of Interior Architecture and Environmental Design | Assistant Professor |
| Murat Ak | Akdeniz University, Department of Computer Engineering | Assistant Professor |
| Gözde Bozdağı Akar | Middle East Technical University, Department of Electrical-Electronics Engineering | Professor |
| Nail Akar | Bilkent University, Department of Electrical and Electronics Engineering | Professor |
| Yıldırım Akbal | TED University, Basic Sciences Unit | Part-Time Lecturer |
| Kadir Akbudak | King Abdullah Univ. of Science & Tech., Extreme Computing Research Center | Postdoctoral Researcher |
| Dilek Akbulut | Gazi University, Department of Industrial Design | Associate Professor |
| Deniz Yetkin Aker | Namık Kemal University, Department of Political Science and Public Administration | Assistant Professor |
| Alphan Y. Akgül | İstanbul 29 Mayıs University, Department of Turkish Language and Literature | Assistant Professor |
| Murat Akgül | TÜBİTAK UEKAE İLTAREN | Chief Researcher |
| Çağla Özgit Akgün | Aselsan | Expert Engineer |
| İbrahim Akgün | Abdullah Gül University, Department of Industrial Engineering | Associate Professor, Chair |
| Pelin Telkoparan Akıllılar | Yüksek İhtisas University, Faculty of Medicine | Assistant Professor |
| Güliz Muğan Akıncı | Okan University, Department of Interior Architecture | Associate Professor |
| Yıldız Akkaya | Sveriges Riksbank | Economist |
| Rizwan Akram | Qassim University, Department of Electrical Engineering | Associate Professor |
| Süreyya Elif Aksoy | Doğuş University, Division of Humanities and Social Sciences | Assistant Professor |
| Fatma Altunbulak Aksu | Çankaya University, Department of Mathematics and Computer Science | Assistant Professor |
| Hidayet Aksu | Florida International University, Department of Electrical & Computer Engineering | Postdoctoral Associate |
| H. Cemal Akyel | Plenus Business Consultancy Services | Founding Partner |
| Ayşegül Özgüner Akyol | Abdullah Gül University, Department of Civil Engineering | Assistant Professor |
| Esra Demirci Akyol | Republic of Turkey, Ministry of Family and Social Policies | Expert |
| Selin Akyüz | Bilkent University, Department of Political Science and Public Administration | Part-Time Instructor |
| A. Aydın Alatan | Middle East Technical University, Department of Electrical-Electronics Engineering | Professor |
| Cemal Albayrak | Eindhoven University of Technology, Department of Applied Physics | Postdoctoral Researcher |
| Esra Pakin Albayrakoğlu | İstanbul Gelişim University, Department of Political Science and Int. Relations | Associate Professor |
| Sibel Alumur Alev | University of Waterloo, Management Sciences | Assistant Professor |
| Reda Alhajj | University of Calgary, Department of Computer Science | Professor |
| Kamil Boratay Alıcı | TÜBİTAK, Space Technologies Research Institute | Chief Scientist |
| Burak Alişan | Aselsan | Microwave Design Engineer |
| Hani Alotaibi | Dokuz Eylül University, Department of Medical Biology | Assistant Professor |
| Ruken Alp | Sabancı University, School of Languages | Instructor |
| Yaşar Kemal Alp | Aselsan | Design Engineer |
| Burçak Altay | Bilkent University, Department of Interior Architecture and Env. Design | Assistant Professor of Practice |
| Can Altay | İstanbul Bilgi University, Faculty of Architecture | Assistant Professor |
| Nihan Altınbaş | The Grand National Assembly of Turkey | Coordinator |
| İsmail Şengör Altıngövde | Middle East Technical University, Department of Computer Engineering | Associate Professor |
| Kerem Altun | Işık University, Department of Mechanical Engineering | Assistant Professor |
| Murat Altunbulak | Dokuz Eylül University, Department of Mathematics | Assistant Professor |
| Gülbanu Altunok | Middle East Technical University, Dept. of Political Science and Public Administration | Instructor |
| Eylem Altunya | Republic of Turkey, Ministry of Foreign Affairs | Counselor |
| Orhan Anafarta | Atrafana School | Guitar Teacher |
| Bülent Arı | Council of Higher Education, Turkey | Supervisory Board Member |
| Çağlar Arı | Koç University, Department of Electrical and Electronics Engineering | Postdoctoral Fellow |
| Yakup Eser Arısoy | Paris Dauphine University, Department of Finance | Associate Professor |
| Yalçın Armağan | İstanbul Şehir University, Department of Turkish Language and Literature | Instructor |
| Ahmet Arslan | Konya Food and Agriculture University, Department of Computer Engineering | Professor |
| Bora Arslan | BGL GROUP | Customer Analytics Director |
| Sefa Feza Arslan | Mimar Sinan Fine Arts University, Department of Mathematics | Professor |
| Lütfiye Durak Ata | İstanbul Technical University, Dept. of Electronics and Communications Engineering | Professor |
| Naim Atabağsoy | Çankaya University, Turkish Language Unit | Instructor |
| Mehrdad Atabak | Scienta Omicron | R&D Project Manager |
| Can Ataca | Brown University, Department of Chemistry | Senior Research Associate |
| Cemile Akça Ataç | Çankaya University, Department of Political Science and International Relations | Associate Professor |
| Oğuzhan Atak | Aselsan | Senior Design Engineer |
| Ergin Atalar | Bilkent University, Department of Electrical and Electronics Engineering | Professor |
| Arzu Atalay | Ankara University, Institute of Biotechnology | Assistant Professor |
| Pelin Kale Attar | Republic of Turkey, Ministry of Development | Coordinator |
| Ayşegül Avcı | Bilkent University, Turkish Language Unit | Instructor |
| Ender Avcı | Dokuz Eylül University, İzmir International Biomedicine & Genome Institute | Specialist |
| Feridun Ay | Anadolu University, Department of Electrical and Electronics Engineering | Associate Professor |
| Sencer Ayas | Stanford University, School of Medicine | Postdoctoral Researcher |
| Nermin Aydemir | International Antalya University, Dept. of Political Science and International Relations | Assistant Professor |
| Ertan Aydın | The Grand National Assembly of Turkey | Deputy |
| Koray Aydın | Northwestern University, Department of Electrical Engineering and Computer Science | Assistant Professor |
| Merve Aydın | Mikrogen | Specialist |
| Tolga Aydın | Atatürk University, Department of Computer Engineering | Assistant Professor |
| Canan Aydoğdu | İzmir Institute of Technology, Department of Electrical-Electronics Engineering | Assistant Professor |
| Elif Aydoğdu | Aselsan | Systems Engineer |
| Tayfun Aytaç | TÜBİTAK BİLGEM İLTAREN | Chief Research Scientist |
| Beyhan Uygun Aytemiz | İstanbul Arel University, Department of Translation and Interpreting | Assistant Professor |
| Pelin Aytemiz | Başkent University, Faculty of Communication | Assistant Professor |
| Özgün Babur | Oregon Health & Science University | Research Assistant Professor |
| Müjdat Balantekin | İzmir Institute of Technology, Department of Electrical-Electronics Engineering | Assistant Professor |
| Savaş Şafak Barkçın | Presidency of the Republic of Turkey | Chief Adviser |
| Erdem Başçı | Permanent Delegation of Turkey to the OECD | Ambassador |
| Sıdıka Başçı | Ankara Yıldırım Beyazıt University, Department of Economics | Assistant Professor |
| Fulya Ertem Başkaya | İzmir University of Economics, Department of Visual Communication Design | Assistant Professor |
| Muhammet Baştan | Nanyang Technological University, Center for Infocomm Technology | Research Fellow |
| Defne Bayık | National Cancer Institute | Postdoctoral Fellow |
| Serkan Bayraktar | EXA GMBH | Senior Software Developer |
| Fatih Bayram | İstanbul Medeniyet University, Department of International Relations | Assistant Professor |
| Suat Bayram | Suat Bayram Engineering | Entrepreneur |
| Vedat Bayram | TED University, Department of Industrial Engineering | Assistant Professor |
| Sermetcan Baysal | Quantcast | Software Engineer |
| Edip Asaf Bekaroğlu | İstanbul University, Department of Political Science and International Relations | Assistant Professor |
| Tolga Bektaş | University of Southampton, Faculty of Business, Law, and Art | Professor |

| | | |
|---|---|---|
| Necmi Bıyıklı | Utah State University, Department of Electrical and Computer Engineering | Research Fellow |
| Gonca Biltekin | Bilkent University, Department of International Relations | Part-Time Instructor |
| Verda Ceylan Bitirim | Ankara University, Faculty of Medicine | Postdoctoral Researcher |
| Hüseyin Boyacı | Bilkent University, Department of Psychology | Associate Professor |
| Elif Boyacıoğlu | Başkent University, Faculty of Communication | Instructor |
| Cemaliye Akyerli Boylu | Acıbadem University, Department of Medical Biology | Assistant Professor |
| Ali Bozbey | TOBB ETÜ, Department of Electrical and Electronics Engineering | Associate Professor |
| Önder Bozdoğan | Ankara Numune Education and Research Hospital, Clinic of Pathology | Professor |
| Ayhan Bozkurt | Sabancı University, Faculty of Engineering and Natural Sciences | Associate Professor |
| Hülya Budunoğlu | Aselsan | Senior Engineer |
| İbrahim Levent Budunoğlu | Meteksan Savunma | Electrooptics Systems Engineer |
| Alper Buldum | The University of Akron, Department of Physics | Professor |
| Yeliz Bulgurcu | Republic of Turkey, Ministry of Development | Independent Assessor |
| İrfan Bulu | Schlumberger | Senior Scientist |
| Önder Bulut | Yaşar University, Department of Industrial Engineering | Assistant Professor |
| M. Abdullah Bülbül | Ankara Yıldırım Beyazıt University, Department of Computer Engineering | Assistant Professor |
| Bayram Bütün | Bilkent University, Nanotechnology Research Center | Researcher |
| Serkan Bütün | Northwestern University, Department of Electrical Engineering and Computer Science | Postdoctoral Scholar |
| Onur Büyükçakır | Ulsan National Institute of Science and Technology | Research Fellow |
| Berkant Barla Cambazoğlu | Juggler and Plumber | Scientist |
| Ahmet Camcı | Yaşar University, Department of Business Administration | Assistant Professor |
| Merve Taner Camcı | CNRS, ICS | Postdoctoral Associate |
| Fırat Caner | Karadeniz Technical University, Department of Turkish Language and Literature | Assistant Professor |
| Murat Cankara | Ankara Social Sciences University, Department of Turkish Language and Literature | Assistant Professor |
| Filiz Başkan Canyaş | İzmir University of Economics, Department of Political Science and Int. Relations | Professor, Chair |
| Günil Ö. Ayaydın Cebe | Nevşehir Hacı Bektaş Veli University, Faculty of Science and Letters | Assistant Professor |
| Feyda Sayan Cengiz | İstanbul Bilgi University, Department of Media | Assistant Professor, Chair |
| Ceyhan Ceran | Bome Ltd. | R&D Director |
| Hakan Ceylan | Max Planck Institute for Intelligent Systems | Postdoctoral Researcher |
| Nazlı İkizler Cinbiş | Hacettepe University, Department of Computer Engineering | Assistant Professor |
| Neval Ayşegül Cinel | Bilkent University, Nanotechnology Research Center | Researcher |
| Simten Coşar | Hacettepe University, Department of Radio, Television, and Cinema | Professor, Chair |
| Olcay Coşkun | Boğaziçi University, Department of Mathematics | Associate Professor |
| Selim Coşkun | Selçuk University, Department of International Relations | Associate Professor |
| Pelin Pasin Cowley | İzmir Katip Çelebi University, Department of Economics | Assistant Professor |
| Tolga Çağatay | UT Southwestern Medical Center, Department of Pharmacology | Instructor |
| Barış Çağlar | MEF University Department of Political Science and International Relations | Assistant Professor |
| Ömer Çaha | Yıldız Technical University, Department of Political Science and Public Administration | Professor |
| Deniz Çakır | North Dakota State University, Department of Physics & Astrophysics | Assistant Professor |
| Özgür Çakır | İzmir Institute of Technology, Department of Physics | Associate Professor |
| Atilla Özgür Çakmak | Pennsylvania State University, Department of Electrical Engineering | Postdoctoral Researcher |
| Sündüs Erbaş Çakmak | Konya Food and Agriculture University, Faculty of Agriculture and Natural Sciences | Assistant Professor |
| Yusuf Çakmak | Konya Food and Agriculture University, Faculty of Engineering | Assistant Professor |
| Semih Çakmakyapan | UCLA, Terahertz Electronics Laboratory | Postdoctoral Researcher |
| Hatice Çalık | Université libre de Bruxelles, Graphs and Mathematical Optimization Lab | Postdoctoral Fellow |
| Ümit V. Çatalyürek | Georgia Institute of Technology, School of Computational Science and Engineering | Professor |
| İlknur Çayırtepe | TÜBİTAK | Specialist |
| Özlem Çaykent | İstanbul 29 Mayıs University, Department of History | Assistant Professor |
| Şahver Ömeraki Çekirdekçi | Doğuş University, Department of Business Administration | Assistant Professor |
| Aslı Çelebioğlu | University of Cambridge, Department of Chemistry | Postdoctoral Researcher |
| Ayşe Aslıhan Çelenk | Erciyes University, Department of International Relations | Associate Professor |
| Haydar Çelik | National Institutes of Health | Scientist |
| Mustafa Çelik | Extreme DA Corp. | CEO |
| Mitat Çelikpala | Kadir Has University, Graduate School of Social Sciences | Professor, Dean |
| Murat Çemrek | Necmettin Erbakan University, Department of International Relations | Professor |
| Yusuf Turan Çetiner | Republic of Turkey, Ministry of Foreign Affairs | Department Head |
| Menderes Çınar | Başkent University, Department of Political Science and International Relations | Professor |
| İlyas Evrim Çolak | Ankara University, Department of Electrical-Electronics Engineering | Associate Professor |
| Yılmaz Çolak | Turkish National Police Academy | Professor, President |
| Sefa Dağ | Global Foundries | Principle Engineer |
| Münir Dede | NanoMagnetic Instruments Ltd. | Deputy General Manager |
| Bala Gür Dedeoğlu | Ankara University, Biotechnology Institute | Assistant Professor |
| Emek Demir | Oregon Health & Science University, Department of Molecular and Medical Genetics | Assistant Professor |
| Engin Demir | Çankaya University, Department of Computer Engineering | Assistant Professor |
| Muhittin Hakan Demir | İzmir University of Economics, Faculty of Business | Associate Professor, Chair |
| Sultan Erdoğan Demir | İstanbul Technical University, Department of Mathematics Engineering | Instructor |
| Nahide Işık Demirakın | Bilkent University, Department of History | Part-Time Instructor |
| Güler Ufuk Demirbaş | Çankaya University, Department of Interior Architecture | Assistant Professor |
| Özgen Osman Demirbaş | İzmir University of Economics, Dept. of Interior Architecture and Env. Design | Associate Professor |
| Oya Demirbilek | University of New South Wales, Faculty of Built Environment | Associate Professor |
| Ece Z. Demirci | TU Eindhoven, Department of Industrial Engineering and Innovation Sciences | Postdoctoral Researcher |
| Tanel Demirel | Çankaya University, Department of Political Science and International Relations | Professor, Chair |
| Neslihan Demirkol | Ankara Social Sciences University, Department of Turkish Language and Literature | Assistant Professor |
| Özhan Demirkol | Karabük University, Safranbolu Vocational School | Assistant Professor |
| Zeynel Deprem | Türk Telekom | Budget Ctrl. & Planning Mgr. |
| Ayşe Mutlu Derya | TED University, Basic Sciences Unit | Assistant Professor |
| Erhan Dikel | National Research Council Canada | Research Officer |
| Fahri Dikkaya | TED University, Basic Sciences Unit | Part-Time Lecturer |
| A. Nihat Dilek | Enerjisa | Renewable Projects Manager |
| Nazire Nergiz Dinçer | TED University, Department of Economics | Professor |
| Tuba Dinçer | Karadeniz Technical University, Faculty of Medicine | Assistant Professor |
| Erkan Doğan | Hasan Kalyoncu University, Department of International Relations | Assistant Professor |
| Figen Güneş Doğan | TOBB ETÜ, Department of Management | Assistant Professor |
| Seda Meyveci Doğanay | Republic of Turkey Ministry of Economy | Asst. Foreign Trade Expert |
| Gökçe Küçükayan Doğu | Intel | Engineer |
| Mehmet Emin Dönderler | Turkcell Technology | Software Dev. Manager |
| Özkan Duman | Republic of Turkey, Ministry of Foreign Affairs | Chief of Policy Planning Sec. |
| Burhanettin Duran | Ankara Social Sciences University, Dept. of Political Science and Int. Relations | Professor |
| Engin Durgun | Bilkent University, Institute of Materials Science and Nanotechnology | Assistant Professor |
| Fatih Durgun | İstanbul Medeniyet University, Department of History | Assistant Professor |
| Leyla Özcivelek Durlu | Le Gusto Kasaba | Owner |
| İrem Durmaz | Lund University, Division of Oncology and Pathology | Postdoctoral Fellow |
| Tuba Işınsu İsen Durmuş | TOBB ETÜ, Department of Turkish Language and Literature | Associate Professor, Chair |
| Funda Durupınar | Oregon Health & Science University | Research Software Engineer |
| Leyla Burcu Dündar | Başkent University, Department of Turkish Language and Literature | Assistant Professor |
| Sıtkı Egeli | İzmir University of Economics, Department of Political Science and Int. Relations | Part-Time Lecturer |
| Dritan Egro | University of New York Tirana, Department of Social Science and Humanities | Associate Professor |
| Ahmet Suat Ekinci | Aselsan | Lead Design Engineer |
| Fatma Didem Ekinci | Çankaya University, Department of Political Science and International Relations | Associate Professor |
| Okan Öner Ekiz | Nanodev Scientific | Founder & CEO |

| | | |
|---|---|---|
| Mohammed El-Badry | Ministry of Foreign Affairs, Egypt | Ambassador |
| Gönenç Ercan | Hacettepe University, Department of Computer Engineering | Assistant Professor |
| Şerife Esra Erdal | Dokuz Eylül University, Faculty of Medicine | Professor |
| Talha Erdem | University of Cambridge, Optoelectronics Group | Newton International Fellow |
| Fatih Erden | Seagate | Research Principal Engineer |
| Güneş Erdoğan | University of Bath, School of Management | Associate Professor |
| Mutlu Erdoğan | Max Planck Institute of Neurobiology | Postdoctoral Researcher |
| Mehmet Selim Ergül | Mardin Artuklu University, Department of Turkish Language and Literature | Assistant Professor |
| Özgür Salih Ergül | Middle East Technical University, Dept. of Electrical and Electronics Engineering | Associate Professor |
| Arif Sanlı Ergün | TOBB ETÜ, Department of Electrical and Electronics Engineering | Associate Professor |
| Burak Alparslan Eroğlu | İstanbul Bilgi University, Department of Economics | Assistant Professor |
| Rıfat Hakan Ertep | Yaşar University, Department of Visual Communication Design | Professor, Chair |
| Zeynep Koçer Erverdi | T.C. İstanbul Kültür University, Department of Communication Design | Assistant Professor |
| Yiğitcan Eryaman | University of Minnesota, Center for Magnetic Resonance Research | Research Associate |
| Engin Erzin | Koç University, Department of Electrical and Electronics Engineering | Associate Professor |
| Gökhan Bora Esmer | Marmara University, Department of Electrical and Electronics Engineering | Associate Professor |
| Guita Farivarsadri | Eastern Mediterranean University, Department of Industrial Design | Assistant Professor |
| Burcu Afyonoğlu Fazlıoğlu | TOBB ETÜ, Department of International Entrepreneurship | Assistant Professor |
| Hakan Fidan | National Intelligence Organization, Turkey | Undersecretary |
| Ziya Gürkan Figen | TÜBİTAK BİLGEM İLTAREN | Chief Researcher |
| Ruslan Garifullin | Bilkent University, Institute of Materials Science and Nanotechnology | Postdoctoral Researcher |
| M. Zafer Gedik | Sabancı University, Faculty of Engineering and Natural Sciences | Associate Professor, Director |
| M. Fatih Genişel | Dicle University, Department of Chemistry | Assistant Professor |
| Ömer Nezih Gerek | Anadolu University, Department of Electrical and Electronics Engineering | Professor |
| Seçil Gergün | Dokuz Eylül University, Department of Mathematics | Assistant Professor |
| Şebnem Yardımcı Geyikçi | TED University, Department of Political Science and International Relations | Assistant Professor |
| Eylem Akdeniz Göker | İstanbul Kemerburgaz Univ., Dept. of Political Science and Public Administration | Assistant Professor |
| M. Sinan Gönül | Middle East Technical University, Department of Business Administration | Associate Professor |
| Selçuk Gören | Abdullah Gül University, Department of Industrial Engineering | Assistant Professor |
| Oleg Gusak | FITBIT | Principle Performance Engineer |
| Uğur Güdükbay | Bilkent University, Department of Computer Engineering | Professor |
| Arzu Güler | Adnan Menderes University, Department of International Relations | Assistant Professor |
| Güldal Güleryüz | Hacettepe University, Department of Industrial Engineering | Assistant Professor |
| Oğuz Gülseren | Bilkent University, Department of Physics | Professor, Chair |
| Hilal Ünal Gülsüner | University of Washington, Department of Medical Genetics | Postdoctoral Researcher |
| Süleyman İ. Gülsüner | University of Washington, Department of Medical Genetics | Assistant Professor |
| Hakan Gültekin | TOBB ETÜ, Department of Industrial Engineering | Associate Professor |
| Hasan Gümral | Yeditepe University, Department of Mathematics | Professor |
| Tarık Tolga Gümüş | Mersin University, Department of History | Associate Professor |
| Osman Günay | Aselsan | Systems Engineer |
| Ayşegül Utku Günaydın | Tudem Publishing | Editor |
| Yasemin Bal Gündüz | IMF | Senior Economist |
| Hasan Güner | Ertunç Özcan Group | Senior Engineer |
| Aylin Güney | Yaşar University, Faculty of Human and Social Sciences | Professor, Acting Dean |
| Uğur Güngör | Başkent University, Faculty of Communication | Associate Professor |
| Metin Gürcan | Sabancı University, İstanbul Policy Center | Researcher |
| Metin Nafi Gürcan | Ohio State University, College of Medicine | Associate Professor |
| Tuğba Gürçel | Atılım University, Department of Political Science and Public Administration | Instructor |
| Burak Gürel | Boğaziçi University, Department of Mathematics | Associate Professor |
| Sinan Gürel | Middle East Technical University, Department of Industrial Engineering | Associate Professor |
| Necip Gürler | Mesan Electronics Industry Trade Co. Inc. | R&D Engineer |
| Bahar Gürsel | Middle East Technical University, Department of History | Assistant Professor |
| Derya Gürses Tarbuck | Bahçeşehir University, Department of Sociology | Assistant Professor |
| Güner Gürsoy | Okan University, Faculty of Business and Administrative Sciences | Professor, Dean |
| Aylin Gürzel | Eastern Mediterranean University, Department of Political Science and Int. Relations | Assistant Professor |
| Ebru Bilget Güven | Kadir Has University, Department of Bioinformatics and Genetics | Instructor |
| Kaan Güven | Koç University, Department of Physics | Assistant Professor |
| Ece Akhan Güzelcan | Middle East Technical University, Graduate School of Informatics | Postdoctoral Fellow |
| Burak Güzeltürk | Stanford University, Slac National Accelerator Laboratory | Postdoctoral Fellow |
| Burak Toygar Halistoprak | International Antalya University, Department of Economics | Assistant Professor |
| Enver Hasani | University of Prishtina, Faculty of Law | Professor |
| Yasushi Hazama | IDE-JETRO | Director |
| Öncü Hazır | TED University, Department of Business Administration | Associate Professor |
| Fatma Fulya Hisarlıoğlu | Doğuş University, Department of International Relations | Assistant Professor |
| Ayça Özçelikkale Hünerli | Chalmers University of Technology, Department of Signals and Systems | Postdoctoral Researcher |
| Aslı Güçlükan İlhan | Gebze Technical University, Department of Mathematics | Assistant Professor |
| Deniz Hasırcı İnceoğlu | İzmir University of Economics, Dept. of Interior Architecture and Env. Design | Associate Professor, Chair |
| Güven İncirlioğlu | İzmir University of Economics, Department of Visual Communication and Design | Associate Professor |
| Volkan İpek | Yeditepe University, Department of Political Science and International Relations | Instructor |
| Celal Nazim İrem | İstanbul Aydın University, Faculty of Economics and Administrative Sciences | Professor And Dean |
| Selcen İslamoğlu | Bilkent University, Department of Physics | Postdoctoral Researcher |
| Veysi İşler | Middle East Technical University, Department of Computer Engineering | Professor |
| Seymur Jahangirov | Bilkent University, Institute of Materials Science and Nanotechnology | Research Assistant Professor |
| Mohamed Mehdi Jelassi | IHEC, Department of Quantitative Methods | Assistant Professor |
| Özge Ejder Johnson | Mimar Sinan Fine Arts University, Department of Philosophy | Assistant Professor |
| Fahd Jrad | Çankaya University, Department of Mathematics | Associate Professor, Chair |
| Keziban Ünsal Kaçmaz | Pfizer Oncology | Senior Principal Scientist |
| Hasan Bülent Kahraman | Kadir Has University | Vice Rector |
| Tamer Kahraman | Exodiag Ltd. | Managing Director |
| Alper Kaliber | İstanbul Kemerburgaz University, Department of International Relations | Associate Professor |
| Levent Kandiller | Yaşar University | Vice Rector |
| Mehmet Kanık | Massachusetts Institute of Technology, Simons Center for the Social Brain | Postdoctoral Researcher |
| Zeynep Kantur | Bilkent University, Department of Economics | Part-Time Instructor |
| Gülbanu Kaptan | University of Leeds, Business School | Lecturer |
| Göktuğ Kara | European Commission | Coordinator |
| Orhun Kara | TÜBİTAK | Chief Senior Scientist |
| Eminegül Karababa | Middle East Technical University, Department of Business Administration | Associate Professor |
| Ertuğrul Karademir | Trinity College Dublin, Crann | Postdoctoral Fellow |
| Gurbet Karahan | McGill University, Health Centre | Postdoctoral Fellow |
| Ahmet Fatih Karakaya | TOBB ETÜ, Department of Interior Architecture and Environmental Design | Assistant Professor |
| Kasım Murat Karakaya | Atılım University, Department of Computer Engineering | Assistant Professor |
| Mehmet Karakaya | İzmir Katip Çelebi University, Department of Economics | Assistant Professor |
| Kani İrfan Karakoç | Çanakkale Onsekiz Mart University, Department of Turkish Language and Literature | Assistant Professor |
| Mustafa Karaman | İstanbul Technical University, Dept. of Electronics and Communication Engineering | Professor |
| Seçil Yıldırım Karaman | İstanbul Kemerburgaz University, Department of Economics | Assistant Professor |
| Sema Genel Karaosmanoğlu | Support to Life Agency | Executive Director |
| Hasan Ali Karasar | Atılım University, Department of International Relations | Professor |
| Petek Karatekelioğlu | Republic of Turkey, Ministry for EU Affairs | Coordinator |
| Tolga Kartaloğlu | Bilkent University, Nanotechnology Research Center | Researcher |
| Berna Tarı Kasnakoğlu | TOBB ETÜ, Department of Business Administration | Associate Professor |

| | | |
|---|---|---|
| Dilek Kaya | Yaşar University, Department of Radio, Cinema, and Television | Associate Professor |
| İsmet İnönü Kaya | Sabancı University, Faculty of Engineering and Natural Sciences | Associate Professor |
| Kamer Kaya | Sabancı University, Faculty of Engineering and Natural Sciences | Assistant Professor |
| Koray Doğan Kaya | National Institutes of Health, National Eye Institute | Research Fellow |
| Enver Kayaaslan | Inria | Postdoctoral Researcher |
| Özlem Kaygusuz | Ankara University, Department of International Relations | Associate Professor |
| Ayşegül Altın Kayhan | TOBB ETÜ, Department of Industrial Engineering | Assistant Professor |
| Öncü Keçeli | Republic of Turkey, Ministry of Foreign Affairs | Department Head |
| Ümit Keleş | Bilkent University, National Magnetic Resonance Research Center | Postdoctoral Researcher |
| Daniel John Keller | Gems American Academy, Abu Dhabi | CEO |
| Aysu Sagun Kentel | Middle East Technical University, Northern Cyprus Campus | Instructor |
| Mehmet Can Kerse | University of Toronto, Department of Physics | Postdoctoral Fellow |
| Kerim Keskin | ADA University, School of Business | Assistant Professor |
| Zeynep Tokcaer Keskin | Acıbadem University, Department of Molecular Biology and Genetics | Assistant Professor |
| Tural Khudiyev | MIT, Research Laboratory of Electronics | Postdoctoral Researcher |
| Bilal Kılıç | Turkish Airlines | Pilot |
| Çetin Kılıç | Gebze Institute of Technology, Department of Physics | Professor |
| Gülşah Merve Dal Kılınç | Middle East Technical University, Department of Biology | Postdoctoral Researcher |
| Müge Kınacıoğlu | Hacettepe University, Department of International Relations | Associate Professor |
| Mehmet Kırdar | Namık Kemal University, Department of Mathematics | Associate Professor |
| Meryem Hakim Kırımlı | Konya Necmettin Erbakan University, Department of International Relations | Assistant Professor |
| Nureddin Kırkavak | Çankaya University, Department of Industrial Engineering | Assistant Professor |
| Ramez Kian | University of Southampton, Business School | Research Fellow |
| Ayşegül Kibaroğlu | MEF University, Department of Political Science and International Relations | Professor |
| Mustafa Kibaroğlu | MEF University, Department of Political Science and International Relations | Professor, Chair |
| İbrahim Kimukin | Carnegie Mellon University, Department of Electrical and Computer Engineering | Research Associate |
| Arzdar Kiracı | Siirt University, Department of Economics | Associate Professor |
| İsa Kiyat | TÜBİTAK | Senior Scientist |
| Esra Koca | Sabancı University, Faculty of Engineering and Natural Sciences | Assistant Professor |
| Aşkin Kocabaş | Koç University, Department of Physics | Assistant Professor |
| Metin Koç | Central Bank of the Republic of Turkey | IT Specialist |
| Utku Koç | MEF University, Faculty of Engineering | Assistant Professor |
| Gürcan Koçan | İstanbul Technical University, Department of Humanities and Social Sciences | Professor |
| Seyit Koçberber | Bilkent University, Computer Center | Director |
| Emre Kopanoğlu | Aselsan | Senior Research Scientist |
| Andreas Kotelis | Clark Center for Global Engagement | Scholar In Residence |
| Safacan Kölemen | UC Berkeley, Department of Chemistry | Postdoctoral Researcher |
| Hakan Köni | İstanbul Rumeli University, Department of Political Science and Public Administration | Assistant Professor |
| Gizem Tinçer König | Center for Regenerative Therapies Dresden | Postdoctoral Researcher |
| Kahraman Güçlü Köprülü | Aselsan | Lead Design Engineer |
| İbrahim Köremezli | Eskişehir Osmangazi University, Department of International Relations | Assistant Professor |
| Hakan Köroğlu | Chalmers University of Technology, Mechatronics Research Group | Postdoctoral Researcher |
| Evren Körpeoğlu | WalmartLabs | Senior Data Scientist |
| Kıvanç Köse | Memorial Sloan-Kettering Cancer Center | Research Fellow |
| Mehmet Köseoğlu | Hacettepe University, Department of Computer Engineering | Assistant Professor |
| Seda Köymen | The Grand National Assembly of Turkey | Consultant |
| Nermin Kura | Roger Williams University, School of Architecture Art and Historic Preservation | Professor |
| Tahsin M. Kurç | Stony Brook University, Department of Biomedical Informatics | Associate Professor |
| Canan Kurşungöz | Interlab | Product Specialist |
| Aren Emre Kurtgözü | MEF University, Faculty of Arts, Design, and Architecture | Assistant Professor |
| Alev P. Kuruoğlu | University of Southern Denmark, Department of Marketing and Management | Postdoctoral Researcher |
| Mehmet Alper Kutay | Bilkent University, Department of Electrical and Electronics Engineering | Senior Lecturer |
| Esra Uslu Kutlukaya | Banking Regulation and Supervision Agency of Turkey | Specialist |
| Elif Gözdaşoğlu Küçükalioğlu | Ufuk University, Department of Political Science and Int. Relations | Assistant Professor |
| Tayfun Küçükyılmaz | TED University, Department of Computer Engineering | Assistant Professor |
| Banu Bayramoğlu Lise | Middle East Technical University, Graduate School of Social Sciences | Assistant Professor |
| Berrin Koyuncu Lorasdağı | Hacettepe University, Dept. of Political Science and Public Administration | Professor |
| Uğur Madran | İzmir University of Economics, Department of Mathematics | Associate Professor |
| Shihabuddin Mahmud | University of Dammam, College of Architecture and Planning | Assistant Professor |
| Saed Fathalla Mallak Palestine | Technical University, Department of Mathematics | Associate Professor |
| Rohat Melik | TOBB ETÜ, Department of Electrical Engineering | Assistant Professor |
| İpek Sancaktar Memikoğlu | Çankaya University, Department of Interior Architecture | Assistant Professor, Chair |
| Neslihan Demirtaş Milz | İzmir University of Economics, Department of Sociology | Associate Professor |
| Valeriy Morkva | Eskişehir Osmangazi University, Department of International Relations | Assistant Professor |
| Rizwan Akram Muhammad | Qassim University, Department of Electrical Engineering | Associate Professor |
| Pelin Ayan Musil | Anglo-American University, School of International Relations and Diplomacy | Senior Lecturer |
| Evren Mutlugün | Abdullah Gül University, Department of Electrical-Electronics Engineering | Assistant Professor |
| Çiğdem Özbilgin Müderris | U.S. Consulate, Adana, Turkey | Education and Exchanges Coordinator |
| Özgür Esat Müstecaplıoğlu | Koç University, Department of Physics | Professor |
| Ramzi Nekhili | Applied Science University, College of Administrative Science | Associate Professor |
| Sedat Nizamoğlu | Koç University, Department of Electrical and Electronics Engineering | Assistant Professor |
| Ersan Ocak | Bilkent University, Department of Communication and Design | Assistant Professor |
| Ogan Ocalı | Ocalı Software | Founder & CEO |
| Seden Odabaşıoğlu | Marmara University, Department of Interior Design | Instructor |
| Ceyda Oğuz | Koç University, Department of Industrial Engineering | Professor |
| Hüseyin Kağan Oğuz | Siemens Healthineers | Senior Engineer |
| Taner Oğuzer | Dokuz Eylül University, Department of Electrical-Electronics Engineering | Professor |
| H. Tarık Oğuzlu | Antalya International University, Department of Political Science and Int. Relations | Professor |
| Chong Jin Oh | Hankuk University of Foreign Studies, Department of Turkish and Azerbaijani | Professor |
| Emel Gülden Oktay | Hacettepe University, Department of International Relations | Associate Professor |
| Erhan Okuyan | Turkish Aerospace Industries, Inc. | Avionic Software Engineer |
| Gökçe Akın Olçum | Environmental Defense Fund | Research Economist |
| Selim Olçum | MIT, Koch Institute of Integrative Cancer Research | Research Scientist |
| Nilgün Olguntürk | Bilkent University, Department of Interior Architecture and Env. Design | Associate Professor, Acting Chair |
| Ahmet Oral | Middle East Technical University, Department of Physics | Professor |
| Mehmet Orhan | International Burch University, Department of Management | Professor |
| Gülsen Kaya Osmanbaşoğlu | Ankara Social Sciences University, Faculty of Political Studies | Instructor |
| Rasim Volga Ovalı | Recep Tayyip Erdoğan University, Faculty of Engineering | Assistant Professor |
| Şebnem Timur Öğüt | İstanbul Technical University, Department of Industrial Product Design | Associate Professor |
| Bülent Öktem | Aselsan | Senior Engineer |
| Saygun Önay | Arke Telekom | Managing Partner |
| A. Özlem Başçı Önder | Ege University, Department of Economics | Professor |
| Tuğba Ayas Önol | Sakarya University, Department of Interior Architecture | Assistant Professor |
| Ozan Örmeci | Beykent University, Department of of Political Science and Public Administration | Assistant Professor |
| Erdem Öz | Max Planck Institute for Physics | Physicist |
| Hakan Özaktaş | Çankaya University, Department of Industrial Engineering | Assistant Professor |
| Yeliz Özay | Gazi University, Department of Turkish Folklore | Assistant Professor |
| Ferruh Özbudak | Middle East Technical University, Department of Mathematics | Professor |
| Burcu Şenyapılı Özcan | Bilkent University, Department of Architecture | Associate Professor |

| | | |
|---|---|---|
| Nazlı Şenses Özcan | Başkent University, Department of Political Science and International Relations | Assistant Professor |
| Veli Ongun Özçelik | Princeton University, Department of Civil and Environmental Engineering | Research Associate |
| Hilal Özdağ | Ankara University, Biotechnology Institute | Professor |
| Ahmet Kemal Özdemir | Schlumberger | Research Scientist |
| Selma Ayşe Özel | Çukurova University, Department of Computer Engineering | Associate Professor |
| İbrahim Özen | Marmara University, Department of Mathematics | Assistant Professor |
| Hakan Özgür Özer | İstanbul Technical University, Department of Physics Engineering | Associate Professor |
| Mehmet Özer | Capital Markets Board of Turkey | Expert |
| Necip Özfidan | Çankaya University, Department of Mathematics | Instructor |
| Kıvanç Özgören | FibLas Ltd. | General Manager |
| Ege Özgün | Bilkent University, Institute of Materials Science and Nanotechnology | Postdoctoral Researcher |
| Özlem Özkal | Özyeğin University, Department of Communication Design | Assistant Professor |
| Hüseyin Özkan | MIT, Department of Brain and Cognitive Sciences | Research Associate |
| Kaya Özkaraçalar | Bahçeşehir University, Department of Film and Television | Associate Professor |
| Banu Yüksel Özkaya | Hacettepe University, Department of Industrial Engineering | Assistant Professor |
| Onur Özkök | Amazon | Senior Research Scientist |
| Eray Özkural | Gök Us Cybernetics | Founder |
| Aylin Özman | TED University, Department of Political Science and International Relations | Professor |
| Burak Bilgehan Özpek | TOBB ETÜ, Department of Political Science and International Relations | Associate Professor |
| Neşe Öztimur | Ken Social Sciences and Art Academy | General Manager |
| Barış Öztop | JP Morgan Chase & Co. | Quantitative Analyst |
| Duygu Öztürk | İstanbul Medipol University, Department of Political Science | Assistant Professor |
| Hümeyra Çağlayan Öztürk | Abdullah Gül University, Department of Electrical-Electronics Engineering | Assistant Professor |
| Nuri Öztürk | Gebze Technical University, Department of Molecular Biology and Genetics | Associate Professor |
| Süheyla Özyıldırım | Bilkent University, Faculty of Business Administration | Associate Professor |
| Selen Pehlivan | TED University, Department of Computer Engineering | Assistant Professor |
| Aslı Pekcan | Hacettepe University, Department of Mathematics | Associate Professor |
| Şule Taşlı Pektaş | Bilkent University, Department of Architecture | Assistant Professor |
| Emrah Pelvanoğlu | Yeditepe University, Department of Turkish Language and Literature Teaching | Assistant Professor |
| Nilay Özer Pelvanoğlu | Işık University, Department of Humanities and Social Sciences | Instructor |
| Gülşen Fatma Çulhaoğlu | Pirencek Çankaya University, Turkish Language Unit | Assistant Professor |
| Emre Ozan Polat | ICFO, Quantum Nano-Optoelectronics Lab. | Postdoctoral Researcher |
| Faruk Polat | Middle East Technical University, Department of Computer Engineering | Professor |
| L. Hakan Polatoğlu | ETİ | CEO |
| Albert Rakipi | Albanian Institute for International Studies | Chairman |
| Başak Renklioğlu | Bilkent University, Department of Physics | Postdoctoral Researcher |
| Bahar Bayraktar Sağlam | Hacettepe University, Department of Economics | Associate Professor |
| Segah Sak | Bilkent University, Department of Architecture | Instructor |
| Ayman Hashem Sakka | Islamic University of Gaza, Department of Mathematics | Professor |
| Yahya Saleh | An-Najah National University, Department of Industrial Engineering | Assistant Professor |
| Emre Sarı | İzmir Institute of Technology, Department of Photonics | Assistant Professor |
| Çetin Sarıkartal | Kadir Has University, Department of Theater | Professor, Chair |
| Kerim Savran | Esen System Integration | Senior Staff Engineer |
| Bilge Say | Middle East Technical University, Graduate School of Informatics | Assistant Professor |
| Zafer Say | Turkish Standards Institution | Advisor |
| A. Emre Sayan | University of Southampton, Medical School | Lecturer |
| Berna Sayan | University of Manchester, Institute of Cancer Sciences | Lecturer |
| Yücel Saygın | Sabancı University, Faculty of Engineering and Natural Sciences | Professor |
| Ömer Selvi | Selvi Engineering | Founder |
| Reha Oğuz Selvitopi | Bilkent University, Department of Computer Engineering | Postdoctoral Researcher |
| Tuğrul Senger | İzmir Institute of Technology, Department of Physics | Professor |
| Ali Serdar | Özyeğin University, Turkish Language Unit | Instructor |
| Ceyhan Ceran Serdar | Bome | R&D Manager |
| Reyhan Tutumlu Serdar | Sabancı University, School of Languages | Instructor |
| Emre Sermutlu | Çankaya University, Department of Computer Engineering | Assistant Professor |
| H. Hale Sert | İstanbul Şehir University, Department of Turkish Language and Literature | Assistant Professor |
| Sıla Severim | Bilkent Laboratory and International School | Instructor |
| Cem Sevik | Anadolu University, Department of Mechanical Engineering | Associate Professor |
| Haldun Sevinçli | İzmir Institute of Technology, Department of Materials Science and Engineering | Assistant Professor |
| Sevilay Sevinçli | İzmir Institute of Technology, Department of Photonics | Assistant Professor |
| Hikmet Sezen | ELETTRA-Sincrotrone Trieste, Beamlines Microscopy/Diffraction Group | Postdoctoral Researcher |
| Talal Shahwan | Birzeit University, Faculty of Graduate Studies | Professor and Dean |
| R. Aslıhan Aksoy Sheridan | Bilkent University, Turkish Language Unit | Part-Time Instructor |
| Etrit Shkreli | Sabancı University, Foundations Development Directorate | Teaching Assistant |
| Hamza Soğancı | TÜBİTAK - SAGE | Senior Research Engineer |
| Ercan Solak | Işık University, Department of Computer Engineering | Professor, Chair |
| Ali Bayram Soner | Turkish National Police Academy | Institute Deputy Manager |
| Muhsin Soyudoğan | Gaziantep University, Department of Sociology | Assistant Professor |
| Ahmet Levent Subaşı | İstanbul Technical University, Department of Physics Engineering | Associate Professor |
| Ceren Sucularlı | Hacettepe University, Graduate School of Health Sciences | Assistant Professor |
| Alexander Suhre | Valeo | Systems Engineer |
| Güliz Sütçü | TÜBİTAK | Scientific Programmes Expert |
| Canay Şahin | Yıldız University, Department of Economics | Assistant Professor |
| Erdem Şahin | Tampere University of Technology, Signal Processing Unit | Marie Curie Researcher |
| Hasan Şahin | University of Antwerp, Department of Physics | Postdoctoral Researcher |
| Hülya Dündar Şahin | Acıbadem University, Turkish Language Unit | Assistant Professor |
| Mesut Şahin | Hacettepe University, Department of Mathematics | Associate Professor |
| Elif Yaman Şaşmaz | Leica Biosystems | Product Manager |
| Bahar Emgin Şavk | Yaşar University, Department of Visual Communication Design | Assistant Professor |
| Ediz Şaykol | Beykent University, Department of Computer Engineering | Assistant Professor, Chair |
| Hüseyin Şener Şen | ETSF, Nano-Bio Spectroscopy Group | Postdoctoral Researcher |
| Seher Şen | İzmir University of Economics, Department of Sociology | Assistant Professor |
| Muhammed Niyazi Şenlik | Aselsan | Senior Expert Engineer |
| Neslihan Şenocak | Columbia University, Department of History | Associate Professor |
| Başak Şenova | Ankara Social Sciences University, Department of Communication Design | Lecturer |
| Ahmet Şensoy | Borsa İstanbul | Senior Expert |
| Nalan Soyarık Şentürk | Başkent University, Department of Political Science and International Relations | Instructor |
| Şerif Şentürk | Dokuz Eylül University, İzmir International Biomedicine and Genome Institute | Assistant Professor |
| Benal Tanrısever Şimşek | BT Music and Drama School | Owner |
| Özlem Madi Şişman | University of Houston-CL, Department of Political Science | Adjunct Lecturer |
| Umut Şumnu | Başkent University, Department of Interior Architecture and Env. Design | Assistant Professor |
| Ertuğrul Kartal Tabak | Havelsan | Simulation Group Lead |
| Manouchehr Takrimi | Islamic Azad University of Urmia | Assistant Professor |
| Ahmet Serdar Tan | Gradus Technologies | Founder |
| Hüseyin Özgür Tan | İşCepte.net | Founding Partner |
| Seda Uyanık Tanrıverdi | Bilkent University, Turkish Unit | Coordinator |
| Vahdettin Taş | RFTR | Technical Lead |
| Mehmet Emre Taşgın | Hacettepe University, Institute of Nuclear Sciences | Associate Professor |
| Serhan Tatar | Turkish Air Force, CIS Division | Team Leader |
| Ayhan Tek | Muş Alparslan University, Kurdish Language and Literature | Assistant Professor |

| | | |
|---|---|---|
| Süleyman Tek | University of the Incarnate Word, Department of Mathematics | Associate Professor |
| Metin Tekkalmaz | Aselsan | Senior Software Engineer |
| Erkan Tekman | Linuxera | Founder |
| Elif Bayraktar Tellan | İstanbul Medeniyet University, Faculty of Tourism | Assistant Professor |
| Burak Temelkuran | Imperial College London, Hamlyn Centre | Research Associate |
| Selim Tezcan | Ankara Social Sciences University, Department of History | Assistant Professor |
| Elçin Tezel | Bahçeşehir University, Department of Industrial Product Design | Associate Professor, Chair |
| Erkan Tın | Ekinoks Software Ltd. | CEO |
| Şule Toktaş | Kadir Has University, Department of Political Science and Int. Relations | Professor, Chair |
| Hasan Ertuğ Tombuş | The New School for Social Research, Department of Sociology | Adjunct Professor |
| Mehmet Topsakal | Brookhaven National Laboratory, Center for Functional Nanomaterials | Research Associate |
| Emre Toros | Atılım University, Department of Political Science and Public Administration | Associate Professor, Chair |
| Akif Burak Tosun | University of Pittsburgh, School of Medicine | Postdoctoral Associate |
| A. Özgür Toy | İstanbul Bilgi University, Department of Industrial Engineering | Associate Professor, Chair |
| Hünkar Toyoğlu | Sabre Airline Solutions | Director |
| Behçet Uğur Töreyin | İstanbul Technical University, Dept. of Electronics and Communication Engineering | Associate Professor |
| Gökçe Altay Töröner | Saint Francis Health System, Genetics Laboratory | Director |
| Hakan Tuna | Meteksan Savunma | Embedded Software Engineer |
| Funda Şenova Tunalı | Bilkent University, Department of Communication and Design | Lecturer |
| Celal Alp Tunç | Mega Özel Sağlık Hizmetleri | CEO |
| İlknur Tunç | University of Turkish Aeronautical Association, Dept. of Mechanical Engineering | Associate Professor |
| Agah Reha Turan | Republic of Turkey, Ministry of Economy | Expert |
| Hamide Karahan Turan | Republic of Turkey, Ministry of Economy | Planning Expert |
| İlke Şimşek Turan | Hayat Kimya | R&D Specialist |
| Turgut Tut | Gebze Technical University, Institute of Nanotechnology | Assistant Professor |
| İpek Tuvay | Mimar Sinan Fine Arts University, Department of Mathematics | Assistant Professor |
| Dilek Z. Hakkani Tür | Google | Research Scientist |
| Gökhan Tür | Google | Research Scientist |
| Meltem Türe | Skema Business School, Department of Marketing | Assistant Professor |
| Ata Türk | Boston University, Department of Electrical and Computer Engineering | Research Scientist |
| Esra Abacı Türk | Boston Children's Hospital | Research Fellow |
| Ayten Türkcan | New York City Fire Department | Research Scientist |
| Yurdanur Türker | Elantas Europe Srl. | Experienced Researcher |
| Elif Erdemir Türkkan | Bilkent University, Department of Interior Architecture and Environmental Design | Instructor |
| İnan Utku Türkmen | TED University, Basic Sciences Unit | Assistant Professor |
| Bora Uçar | CNRS, LIP | Researcher |
| Şebnem Udum | Hacettepe University, Department of International Relations | Assistant Professor |
| Salih Uğur | Meteksan Savunma | Director |
| Alper Rıfat Uluçınar | SAP Development Center | Senior Software Engineer |
| Begüm Ulusoy | Atılım University, Department of Interior Architecture and Environmental Design | Assistant Professor |
| Erdem Ulusoy | Koç University, Optical Microsystems Laboratory | Research Assistant Professor |
| Rifat Onur Umucalılar | Koç University, Department of Physics | Research Fellow |
| Mehmet Umutlu | Yaşar University, Department of International Trade and Finance | Associate Professor, Chair |
| Ayşe Ece Ungan | TED University, Department of Business Administration | Part-Time Instructor |
| Can Uran | Vestel | Senior Design Engineer |
| Vuslat Us | Central Bank of the Republic of Turkey | Economist |
| Mehmet Fatih Uslu | İstanbul Şehir University, Department of Turkish Language and Literature | Assistant Professor |
| Ali Resul Usul | İstanbul Medipol University, Faculty of Humanities and Social Sciences | Dean |
| Veli Şafak Uysal | İstanbul Bilgi University, Department of Interior Design | Assistant Professor |
| Elif Uz | Uludağ University, Department of Molecular Biology and Genetics | Assistant Professor |
| Gözde Uzunallı | Purdue University, College of Engineering | Postdoctoral Researcher |
| Melike Tokay Ünal | Bilkent University, Department of Amerikan Culture and Literature | Part-Time Instructor |
| Adem Ersin Üreyen | Anadolu University, Department of Mathematics | Assistant Professor |
| Güzden Varinlioğlu | İzmir University of Economics, Faculty of Art, Design, and Architecture | Assistant Professor |
| Vedat Verter | McGill University, Faculty of Management | Professor |
| Ebru Voyvoda | Middle East Technical University, Department of Economics | Associate Professor |
| F. Michael Wuthrich | University of Kansas, Department of Political Science | Instructor |
| Burcu Silindir Yantır | Dokuz Eylül University, Department of Mathematics | Associate Professor |
| Göksenin Yaralıoğlu | Özyeğin University, Department of Electrical-Electronics Engineering | Associate Professor |
| Ergün Yaraneri | İstanbul Technical University, Department of Mathematics Engineering | Associate Professor |
| Fahri Yaraş | Magic Leap Inc. | Senior Optical Enginer |
| Sezen Yaraş | Bilkent University, Department of Political Science and Public Administration | Part-Time Instructor |
| Burze Yaşar | TED University, Department of Business Administration | Assistant Professor |
| Seydi Yavaş | Lumos Laser Ltd. | Co-Founder |
| Mehmet Akif Yazıcı | İstanbul Technical University, Informatics Institute | Assistant Professor |
| M. Burcu Irmak Yazıcıoğlu | Haliç University, Department of Molecular Biology and Genetics | Associate Professor, Chair |
| Mehmet Yegin | USAK | President |
| Harun Yeni | TOBB ETÜ, Department of History | Lecturer |
| Seda Erkoç Yeni | Ankara Social Sciences University, Faculty of Social and Human Sciences | Assistant Professor |
| Mehmet Baskın Yenicioğlu | İstanbul Bilgi University, Department of Business Administration | Assistant Professor |
| Emre Yetginer | TÜBİTAK | Chief Research Scientist |
| Bahar Kara Yetiş | Bilkent University, Department of Industrial Engineering | Professor |
| Adem Yıldırım | University of Colorado Boulder, Goodwin Research Group | Research Associate |
| Rıza Yıldırım | TOBB ETÜ, Department of History | Associate Professor |
| Uğur Ziya Yıldırım | NATO | Operations Research Analist |
| Barış Yıldız | Koç University, College of Engineering | Assistant Professor |
| Cevdet Yılmaz | Republic of Turkey, Ministry of Development | Minister |
| Eda Yılmaz | Bilkent University, Institute of Materials Science and Nanotechnology | Visiting Research Assistant Professor |
| Işıl Sevilay Yılmaz | TED University, Department of Business Administration | Faculty Member |
| Mehmet Şakir Yılmaz | İstanbul 29 Mayıs University, Faculty of Arts and Literature | Assistant Professor |
| Tuba Demirci Yılmaz | Kemerburgaz University, Department of Sociology | Assistant Professor |
| Türker Yılmaz | STM | Cyber Security Manager |
| Ahu Yiğit | The International Foundation for Electoral Systems | Consultant |
| Ali Özgür Yöntem | University of Cambridge, Department of Electrical Engineering | Research Associate |
| Mustafa Eray Yücel | Özyeğin University, Department of Economics | Adjunct Lecturer |
| Zeynep Yücel | Advanced Telecommunications Research Institute International | JSPS-RPD Fellow |
| Aslı Bayar Yüksel | Bahçeşehir University, Department of Business Administration | Professor |
| Ebru Yüksel | TOBB ETÜ, Department of Management | Assistant Professor |
| Mustafa Kerem Yüksel | University of Turkish Aeronautical Association, Dept. of Aviation Management | Assistant Professor |
| Murat Ali Yülek | İstanbul Ticaret University, Department of Economics | Professor |
| İlkay Şendeniz Yüncü | Middle East Technical University, Department of Business Administration | Assistant Professor |
| Haluk Yüzügüllü | Harvard Catalyst, Department Biological Chemistry & Molecular Pharmacology | Research Scientist |
| Ş. Özge Gürsoy Yüzügüllü | Harvard Catalyst, Department of Radiation Oncology | Instructor |
| Zharmukhamed Zardykhan | KIMEP, Department of International Relations and Regional Studies | Assistant Professor |
| Kostyantin Zheltukhin | Middle East Technical University, Department of Mathematics | Assistant Professor |
| Natalya Zheltukhina | Bilkent University, Department of Mathematics | Instructor |


**Online applications are accepted via:** http://stars.bilkent.edu.tr/gradapp

**Further information:** http://bilkent.edu.tr/bilkent/academic/graduate



Bilkent University, Graduate Studies Catalog, Volume 13, April 2017

Produced by: Publications Office, Bilkent University, 2017
Publisher Certificate Number: 27028

Printed by: A4 Ofset Matbaacılık San. ve Tic. Ltd. Şti. Yeşilce Mah., Donanma Sok. No: 16 34418 Seyrantepe / İstanbul Tel : +90 212 281 64 48
Printing House Certificate Number: 12168

For free distribution only.
According to the second paragraph of Article 5 of the Regulation on Banderole Application Procedures and Principles, the use of banderole for this publication is not compulsory.

Bilkent University
TR-06800 Bilkent, Ankara
Turkey

Phone : +90-312-290-1240
Fax : +90-312-266-4787
e-mail : bilinfo@bilkent.edu.tr

bilkent.edu.tr

/BilkentUniversitesi
/BilkentUniv
/BilkentUniv

ISBN: 978-605-9788-11-3