What does an Electrical and Electronics Engineer Do?

- By using system analysis and synthesis methods which are mainly built on mathematics and physics basis, Electrical and Electronics Engineers:
  - determine,
  - solve,
  - develop prototype systems,
  - realize production.

of current problems which can push further the boundaries of technology.
Energy

Smart Grids

Solid-State Lighting

Fuel Cell

Renewable Energy
Health

Bio-sensors

Da Vinci Robot Operator

Imaging

Tele-health
Transportation

Embedded Systems

Hybrid Cars

Smart Transportation Systems
Telecommunications - IT

Smart Phones

TURKISH SCIENTIST SIGNATURE on 5G STANDARD

Polar Codes developed by Bilkent Faculty Member Prof. Dr. Erdal Arıkan have been selected to be a part of the 5G standards. Prof. Arıkan has received the 2010 IEEE Information Theory Society Best Paper Award, the 2013 IEEE W.R.G. Baker Award, the 2018 IEEE Richard W. Hamming Medal and the 2019 Claude E. Shannon Award for his contributions to information and communications theory.
Education Degrees

Bachelor’s Degree
- It includes 4 years of fundamental engineering education.
- Students are equipped with abilities to work on production and test applications.

Master’s Degree
- It is a 2 or 3 years of education and research period after the undergraduate education.
- Students prepare a thesis study in their area of interest.
- They can work on industry including research and development (R&D) applications.

PhD Degree
- It is a 4 or 5 years of education after master’s degree and comprehensive research period.
- Students prepare a thesis study in their area of interest which contains scientific contribution at the international level.
- They take part in advanced level of R&D applications and development process of competent products in industry. They conduct advanced level of research studies as an academic member in universities and contribute to the education of creative and equipped young engineers.
Primary Sectors which Employ Electrical and Electronics Engineer

- Telecommunication
- Semi-conductors
  - nanotechnology
- Biomedical
- Defense
- Aerospace
- Automotive and Transportation
- Production
- Computer
- Energy and Electric Power
- Education and Research
Department Graduates

- TURKEY 68.44%
- U.S. 20.37%
- GERMANY 1.82%
- NETHERLANDS 1.51%
- U.K. 1.15%
- SWITZERLAND 0.75%
- SWEDEN 0.67%
- CANADA 0.49%
- BELGIUM 0.22%
- UNITED ARAB EMIRATES 0.31%
- OTHER 1.42%

18 July 2019
Department Graduates

- Industry: 66%
- Student: 18%
- Academy: 12%
- Other: 4%
Department Graduates

- **Engineer**: 35%
- **Manager**: 14%
- **Student**: 18%
- **Academy**: 12%
- **Industry**: 4%
- **Researcher**: 8%
- **Consultant**: 2%
- **Co-founder**: 2%
- **Top-Level Manager**: 3%
- **Other**: 2%

18 July 2019
Situation in Industry in Turkey

Primary EE Engineer Employers:

- Aselsan, Havelsan, Roketsan, TAI
- Türk Telekom, Türkcell, Ericsson, Vodafone
- Karel, Netaş, Alcatel-Lucent
- Siemens, Meteksan, Koç Sistem
- Arçelik, Vestel
- ...

![Company Logos]
Bilkent, in THE Asia University Rankings

- Bilkent University has been ranked 54th in the Times Higher Education Asia University Rankings. The rankings compile a listing of the top 300 universities in Asia.

- Employing 13 separate performance indicators, The Asia University Rankings judge world-class universities on the continent across all of their core missions such as teaching, research, knowledge transfer and international outlook.
In Bilkent University, there are 11,279 undergraduate students and 1226 graduate students.

Teaching staff consists of 1000 faculty members with 270 from 32 different countries.

For the last 5 years, average annual exogenous research project’s budget is more than 24 million US Dollar.

- Major part of the exogenous funds arise from the projects conducted by EEE faculty members and researchers.

It has student exchange program agreement with 306 universities from 44 different countries around the world.
2018-2019 Spring Semester Students

- Undergraduate Program Student Number: 786
  - Freshman year: 223
  - Sophomore year: 166
  - Junior year: 155
  - Senior year: 242
  - Preparatory class: 29

- Graduate Program Student Number: 148
  - Master’s Degree (MS): 76
  - PhD Degree (PhD): 72
Student Profile

- Electrical and Electronics Engineering Department is the department which requires the highest grade in Undergraduate Placement Exam in Bilkent University.

- It is a department in which students with a special curiosity about mathematics and physics who want to make technological innovations are found.
Minor Programs

The Departments which Are Being Enrolled to Their Minor Programs by Our Department Students in 2018-2019 Academic Year:

- Psychology (3)
- Philosophy (2)
- Political Science and Public Administration (1)
- Mathematics (1)
- Economics (1)

- To be eligible to apply for admission to a minor program, the cumulative GPA (CGPA) of a student has to be 3.0 or greater.

- To qualify for a minor program certificate, a student must complete all courses for the minor program with a C or higher grade and have a minor program CGPA of at least 2.5.

- A minor program certificate is not equivalent to a diploma.

- Note: Student numbers show numbers of the students who are currently enrolled in minor programs.
Exchange Programs (2018-2019)

• Outgoing Students
  – Universities from Asia, USA and Canada
    • Northern Arizona University (USA) (1)
    • City Unv. of Hong Kong (China) (3)
    • Ecole Polytechnique Fédérale de Lausanne (Switzerland) (3)
    • Sungkyunkwan University (Korea) (1)
    • Nanyang Technological University (Singapore) (2)
    • National University of Singapore (Singapore) (2)
    • National Tiawan University (Taiwan) (2)
  – European Universities (Erasmus Program)
    • University of Erlangen (Germany) (1)
    • Aston University (United Kingdom) (1)
    • AGH University of Science and Technology (Poland) (1)
    • TelecomSudParis (France) (1)
    • University of Twente (Netherland) (1)

• Incoming Student
  – Dongguk University (Korea) (1)
  – DHA Suffa University (Pakistan) (1)
  – Princess Sumaya University (Jordan) (2)
Industrial Design Projects

- Senior year students form a project team of 5 or 6 person and develop a prototype system with the leading companies in Turkey during two semesters.

Project Team

- Companies provide financial support to the projects and the company mentor keeps track of the project development.

- Faculty members from our department contributes to the development of each project as an academic advisor.

- Students can use the laboratory which contains a personal desk for each student all the time.
Industrial Design Projects

- In five years, 449 student successfully terminated 79 different projects.
- These projects are conducted with 20 different leading companies of Turkey and Europe.
- Our students published 8 national and international paper related with the project outcomes.
- Among 57 project applications, 55 of them deserved to have a TÜBİTAK fund.
- Our students had the chance to exhibit their projects in various fairs and contests.

Companies that Performed Joint Projects with Our Students
Industrial Design Projects

Photos from Our Project Fair
Graduate Student Achievements

• Prof. Mert Pilancı
  – BS, Bilkent (2008)
  – MS, Bilkent (2010)
  – PhD, University of California, Berkeley (2016)
  – Faculty Member, Stanford University

• Alper Turgut
  – BS, Bilkent (1993)
  – MS, Northeastern University, Boston (1995)
  – MBA, MIT Sloan School of Management (1997)
  – Vercata Inc., CEO
  – Head of Google Cloud Video Engineering, Anvato

Google bought Anvato

Google bought software company Anvato which was found by Alper Turgut in 2007 at Silicon Valley. Anvato continues to its R&D studies as a part of the Google Cloud Platform team.

Graduate Student Achievements

Büşra Nurdan Kılınçoğlu  
(lisans 2015)  
*Strategy Analyst*  
*Accenture Consultancy*

Erdem Bıyık  
(lisans 2017)  
*Graduate Student, Stanford University*

Ayça Takmaz  
(lisans 2018)  
*Graduate Student, ETH Zurich*
Academic Staff

**Professors**

N. AKAR (1994, Bilkent)
E. ARIKAN (1985, MIT)
O. ARIKAN (1990, UIUC)
A. ATALAR (1978, Stanford)
E. ATALAR (1991, Bilkent)
O. AYTÜR (1991, Northwestern)
B. BARSHAN (1991, Yale)
E. ÇETİN (1987, Univ. Pennsylvania)
H. V. DEMİR (2004, Stanford) *
T. M. DUMAN (1998, Northeastern)
V. B. ERTÜRK (2000, Ohio State)
S. GEZİCİ (2006, Princeton)
Y. Z. İDER (1979, Northwestern)
E. KARAŞAN (1995, Rutgers)
S. S. KOZAT (2004, UIUC)
H. KÖYMEN (1979, Univ. Birmingham)
Ö. MORGÜL (1989, UC Berkeley)
L. ONURAL (1985, SUNY)
H. ÖZAKTAŞ (1991, Stanford)
E. ÖZBAY(1992, Stanford) *
H. ÖZBAY (1989, Univ. Minnesota)
A. B. ÖZGÜLER (1982, Univ. Florida)

**Associate Professors**

T. ÇUKUR (2009, Stanford)
F. Ö. İLDAY (2003, Cornell) *

**Assistant Professors**

E. Ü. SARITAŞ (2009, Stanford)
C. TEKİN (2013, Univ. Michigan)
E. TATAR (2016, Carnegie Mellon)

**Instructors**

Dr. M. ALPER KUTAY (1999, Bilkent)

* Joint appointment with Physics Department
Scientific Research Areas

- Biomedical
- Computer Networks
- Electromagnetics
- Electronics
- Nanotechnology
- Optics and Photonics
- Robotics
- Signal Processing
- Systems and Control
- Telecommunications
Research Centers

- NANOTAM (Nanotechnology Research Center) (E. Özbay)
- BASTA (Bilkent Acoustics and Underwater Technologies Research Center) (H. Köymen)
- İSYAM (Communications and Spectrum Management Research Center) (A. Altıntaş)
- UMRAM (National Magnetic Resonance Research Center) (E. Atalar)
Academic Awards of Our Faculty Members

2018 IEEE Hamming Medal
Erdal Arıkan

2013 IEEE BAKER PRIZE
Paper Award
Erdal Arıkan

IEEE Fellows
Erdal Arıkan
Abdullah Atalar
Enis Çetin
Tolga M. Duman
Levent Onural
Haldun Özaktaş
Hitay Özbay

EU Descartes Award
Ekmel Özbay (2005)

2019 Claude E. Shannon Award
Erdal Arıkan

TÜBİTAK Science Awards
Ergin Atalar (2006)
Ekmel Özbay (2006)
Haldun Özaktaş (1999)
Abdullah Atalar (1994)

TÜBA Members
Abdullah Atalar
Haldun Özaktaş
Ekmel Özbay

ISMRM Fellow
Ergin Atalar (2011)
Academic Awards of Our Faculty Members

IEEE 3. Millennium Medal
Ayhan Altıntaş
Levent Onural
Tolga M. Duman

TÜBİTAK Encouragement Awards
Özay Oral (1978)
Abdullah Atalar (1982)
Erol Sezer (1985)
Bülent Özgüler (1987)
Enis Çetin (1993)
Levent Onural (1995)
Ayhan Altıntaş (1996)
Ömer Morgül (1997)
Ekmel Özbay (1997)
Billur Barshan (1998)
Orhan Aytür (1999)
Orhan Arıkan (2002)
Levent Gürel (2003) (emekli)
H. Volkan Demir (2009)

TÜBA-GEBİP Awards
Tolga Çukur (2015)
Emine Ü. Sarıtaş (2015)
Sinan Gezici (2013)
S. Serdar Kozat (2010)

2010 IEEE Information Theory Paper Award
Erdal Arıkan
Our Undergraduate Students and Research

• Some of our students take part in the research projects from the sophomore year in accordance with their interests and abilities.
  – In this year’s Graduate Research Conference (GRC), one of our senior class students won an award in the best poster presentation category.
  – Some of our senior class students are among the authors of national/international papers.

• Apart from a mandatory project course in senior year, another senior project can be performed as an elective course under the supervision of a faculty member.
Last Words

• Electrical and Electronics Engineering is an occupation in which students that are:
  • Creative
  • Interrogator
  • Talented about mathematics and physics can have a very successful career.

• We provide our students with a superior level of education and enable them to carry their abilities to the uppermost level.

• Our graduate students can make successful careers in international level and they can be the source of pride for all of us.