ELECTRICAL & ELECTRONICS ENGINEERING Ph.D. PROGRAM

Doktora programına, Elektrik-Elektronik Mühendisliği ve buna yakın diğer programlardan mezun olanların başvuruları kabul edilmektedir.

Tezli yüksek lisans derecesi ile kabul edilecek öğrenciler için,

Alınması gereken toplam kredi: 21 dir.

Alınması gereken toplam AKTS kredisi: en az 240 dır

Program içeriği,

- bir eğitim-öğretim yılı 60 AKTS'den az olmamak koşuluyla en az yedi adet kredili ders
- bir seminer dersi,
- yeterlik sınavı,
- tez önerisi,
- tez çalışmasından oluşmaktadır.

Lisans derecesi ile kabul edilecek öğrenciler için,

Alınması gereken toplam kredi: 42 dir.

Alınması gereken toplam AKTS kredisi: en az 300 dır.

Program içeriği,

- en az on dört adet kredili ders,
- bir seminer dersi,
- bir tez konusunda özel çalışmalar dersi,
- yeterlik sınavı,
- tez önerisi,
- tez çalışmasından oluşmaktadır.

Öğrenciler, danışman onayı ile, Enstitü yönergelerindeki hususlar dikkate alınarak diğer doktora programlarından da seçmeli ders alabilirler. Programda Atılım Üniversitesi Fen Bilimleri Enstitüsü Lisansüstü Eğitim-Öğretim ve Sınav Yönetmeliği'nde belirtilen şartlar geçerlidir.

Doktora Programı Müfredatı (Tezli Yüksek Lisans Derecesi ile Kabul Edilecek Öğrenciler için)				
Course Code	Title	Must /	Credit	ECTS

		Elective		
MDES600	Research Methodology and Communication Skills	Must	(3-0)3	5
EE 6XX/5XX	Elective Courses Group	Elective	(3-0)3	5
EE 6XX/5XX	Elective Courses Group	Elective	(3-0)3	5
EE 6XX/5XX	Elective Courses Group	Elective	(3-0)3	5
EE 6XX/5XX	Elective Courses Group	Elective	(3-0)3	5
EE 6XX/5XX	Elective Courses Group	Elective	(3-0)3	5
EE 6XX/5XX	Elective Courses Group	Elective	(3-0)3	5
EE 682	Seminar	Must	NC	5
EE 689	Qualification Exam	Must	NC	30
EE 691	Thesis Proposal	Must	NC	20
EE 697	Thesis	Must	NC	150

NC: Kredisiz

Doktora Programı Müfredatı (Lisans Derecesi ile Kabul Edilecek Öğrenciler için)				
Course Code	Title	Must / Elective	Credit	ECTS
MDES600	Research Methodology and Communication Skills	Must	(3-0)3	5
EE 6XX/5XX	Elective Courses Group	Elective	(3-0)3	5
EE 6XX/5XX	Elective Courses Group	Elective	(3-0)3	5
EE 6XX/5XX	Elective Courses Group	Elective	(3-0)3	5
EE 6XX/5XX	Elective Courses Group	Elective	(3-0)3	5
EE 6XX/5XX	Elective Courses Group	Elective	(3-0)3	5
EE 6XX/5XX	Elective Courses Group	Elective	(3-0)3	5
EE 6XX/5XX	Elective Courses Group	Elective	(3-0)3	5
EE 6XX/5XX	Elective Courses Group	Elective	(3-0)3	5
EE 6XX/5XX	Elective Courses Group	Elective	(3-0)3	5
EE 6XX/5XX	Elective Courses Group	Elective	(3-0)3	5
EE 6XX/5XX	Elective Courses Group	Elective	(3-0)3	5
EE 6XX/5XX	Elective Courses Group	Elective	(3-0)3	5

EE 6XX/5XX	Elective Courses Group	Elective	(3-0)3	5
EE 682	Seminar	Must	NC	5
EE 696	Special Studies on Thesis Subject	Must	NC	25
EE 689	Qualification Exam	Must	NC	30
EE 691	Thesis Proposal	Must	NC	20
EE 697	Thesis	Must	NC	150

NC: Kredisiz

Zorunlu (Must) Ders (bu dersi daha önce almış olanlar yerine seçmeli ders alacaktır)

MDES 600 Research Methodology and Communication Skills (3-0)3
The objective of this course is to improve the research and communication skills of students early in their graduate program to help them better plan, conduct and present their research and thesis work.

Seçmeli (Elective) Dersler

EE 610 Complex and Functional Analysis (3-0)3
Complex number system and its operations, limits and sequences, continuous functions and their properties, derivatives, conformal representation, curvilinear and complex integration, Cauchy integral theorems, power series and singularities. An introduction to metric spaces, normed spaces, Banach spaces, inner product spaces, Hilbert spaces, and bounded linear operators.

EE 611 Random Processes (3-0)3
Random Processes is a graduate course on random (stochastic) processes and builds on an undergraduate course on probability theory. In this course, basic concepts of probability theory, random variables and random vectors are reviewed first. Then Poisson and Gaussian processes, Brownian motion/Wiener process, Markov process, spectral estimation, linear systems driven by stochastic inputs and elementary queuing theory are covered. Finally, the applications of random processes to communications, signal processing, control systems and computer science are discussed.

EE 621 Computational Electromagnetics (3-0)3
Finite difference time domain (FDTD), Finite Element (FE), geometric theory of diffraction (GTD) and method of moments (MoM) applied to antennas and scattering.

EE 622 Nonlinear Systems (3-0)3
Nonlinear models and nonlinear phenomena, qualitative behaviour of second order systems, Lyapunov stability, passivity, Poincare and Bendixon theorems, frequency response of nonlinear systems and describing functions, applications of Lyapunov theory, advanced nonlinear phenomena such as bifurcations.

EE 623 Electrical Power System Dynamics (3-0)3
Power System Modeling, Synchronous Generator Modeling,Modeling of the main components of the classical power plants, Wind Power Generation, Solar Power Generation, Short-circuit

calculation, Power System Control, Active power and frequency control, Voltage and reactive power control, Power System Stability, Small-disturbance angle stability and electromechanical oscillation damping, Transient stability, Voltage Stability, Computer Simulation of Scale-Bridging Transients in Power Systems.

EE 624 FPGA Based Software Defined Radio Laboratory (2-2)3
Development of software-defined elements of the radio system from algorithm to hardware using FPGA platforms. The course has both lecture and laboratory components. The lectures review telecommunication concepts and systems, waveform generation, and analog and digital modulation schemes in a practical way. The labs include exercises such as sampling, convolution, spectral analysis, digital filtering, equalization, and baseband processing. Detailed projects on wireless and digital communications will be completed by students.

EE 625 Remote Sensing (3-0)3
Fundamentals of remote sensing (light, reflectance, digital data), principles and techniques of acquisition, enhancement, and analysis of remote sensing imagery, visual and computer based image interpretation, aerial images, satellite remote sensing (multispectral and hperspectral), active remote sensing (radar, lidar), thermal remote sensing.

EE 626 Applied Optics and Photonics (3-0)3
Applied optics and photonics course is a graduate course. It consists of interdisciplinary topics such as optical science and engineering, optical and opto-electronic materials and device technology, communication and computer engineering as well as photonic systems engineering. In this course basic concepts are ultrafast optical processes, multidimensional optoelectronic I/O devices, optical image science, optoelectronic and micromechanical device and packaging, optical image science.

EE 651 Information System Analysis and Design (3-0)3
The objective of this course is to give understanding of the basics of information systems development.

EE 655 Advanced Topics in Digital Image Processing(3-0)3
Students will learn and have an understanding of the mathematical tools for modeling and analysis of image acquisition and processing systems. Students will also master basic techniques of image processing applications.

EE 657 Advanced Artificial Intelligence(3-0)3
To introduce advanced concepts and different approaches to Artificial Intelligence (AI) (including symbolic and non-symbolic ones), in order to extent the engineering vision of the student.

EE 659 Linear Optimization(3-0)3
This course aims to give to Ph.D. students from different engineering backgrounds the skills of real life problem formulation with linear optimization along with the use of basic computer packages to solve the problems.

EE 660 Nonlinear Optimization (3-0)3
This course aims to give to Ph.D. students from different engineering backgrounds the theory of nonlinear optimization along with possible application areas.