GAZI UNIVERSITY

FACULTY OF TECHNOLOGY

DEPARTMENT OF ENERGY SYSTEMS ENGINEERING

PROGRAMME INFORMATION

2020

OBJECTIVE OF THE DEPARTMENT

Energy Systems Engineering Department is a discipline that plans, designs, implements and develops strategies for the production of all kinds of energy in an adequate, high quality, continuous, low-cost and environmentally friendly manner, presenting them to consumers and using them economically. Engineers who are educated at Department of Energy Systems Engineering, design and manufacture any kind of energy systems regarding the design of a system, making the necessary calculations, establishment of appropriate systems and maintenance and renewal of its production taking into account the basic principles of energy technologies, learning and teaching techniques.

Department of Energy Systems Engineering aims at training leader Energy Systems Engineers having advanced scientific research skills, using information technologies effectively, adopting total quality as a lifestyle, capable of working in international related organizations, with a broad vision, equipped with a high academic level. For these purposes, 7 professors, 5 associate professors and 12 research assistants carry out the research and teaching activities at this department.

DIFFERENCE IN EDUCATION

Faculty of Technology was established with the decision of the Council of Ministers published in the Official Gazette dated 13.11.2009 and numbered 27405. In Engineering programs within Faculty of Technology, students will be trained in **Workplace Training** in order to improve their practical skills in the 7th or 8th semester. For this reason, students are educated in 7 semesters of the 8-semester education period at the faculty. Then, for the rest 1 semester, they are trained at a work place. In addition to this, they have to complete at least 40 work days for internship training in the summer. This system (the training carried out at a work place) enables the students have more business knowledge and practical skills regarding a real occupational field

Some companies that have been made an agreement for training are as follows:

- Aselsan Inc.
- Akbaş Holding Hydroelectric Power Plant Irmak Energy Industry
- Aygaz Inc.
- Bosch Thermotechnical Ind.Trade.Inc.

- Genpower Generator
- Enerjisa
- Selnikel Energy Heating and Air Techniques Inc.
- Daıkın Heating and Cooling System

WORKING AREAS AND JOB OPPORTUNITIES

Engineers graduated from Department of Energy Systems Engineering can find many jobs such as a designer or implementer in the fields of energy production, transmission, distribution and use.

Some institutions where graduates can work:

Energy Institutions and Organizations in the public sector

- Energy Market Regulatory Authority
- Ministry of Energy and Natural Resources,
- Directorate General of Petroleum Affairs
- Directorate General of Mineral Research and Exploration
- National Boron Research Institute
- Directorate General of Renewable Energy
- Turkish Electricity Transmission Inc.
- Directorate General for State Hydraulic Works
- Turkish Coal Enterprises Institution
- Turkish Petroleum Corporation
- Turkish Atomic Energy Authority
- Directorate General of State Railways

In addition to the places presented above:

o All areas related to energy systems and technologies in the private sector (Nuclear Energy, Renewable energies RES GES HEPP, Energy Efficiency etc.),

o Sanitary Areas (Heating, Cooling, Heating-Ventilation and Air Conditioning)

They will also have the opportunity to work as an authorized Energy Systems Engineer in their occupational fields.

In addition these mentioned above, our graduates may be entitled to receive an Energy Specialist certificate by receiving the Energy Specialist training of the Ministry of Energy and can work as an Energy Specialist for buildings, facilities and industry. Many private sector organizations invest in bio-energy, geothermal, wind and hydraulic power plants to close the energy gap that our country needs more. In the coming years, it is expected that other energy sources/carrieers such as boron, uranium and thorium, which have not been used to date more, will be put into operation with the construction of nuclear power plants. Engineers trained in energy technologies at all levels will be needed, starting from the R&D level to the most economical distribution of energy in all these areas. In our country, which is an energy bridge between three continents, It is thought that Energy Systems Engineers will be an important part in national and international projects.

DEPARTMENT CURRICULUM

In order to graduate from our department, **at least 240 ECTS** courses must be successfully achieved. Of these,

Energy Systems Engineering Engineering Program Basic Science And Engineering Field Coures

I.SEMESTER

Name	Hour
Foreign Language 1	4
Computer Aided Technical Drawing	4
Introduction to Energy Engineering	2
Manufacturing Technologies	5
Physics- I	4
Physics Laboratory	2
Mathematics- I	4
Atatürk's Principles and Revolution History-I	2
Turkish Language-I	2

II. SEMESTER

Foreign Language 2	4
Introduction to Programming in Engineering	4
Physics II	4
Chemistry	4
Chemistry lab	2
Mathematics-II	4
Atatürk's Principles and Revolution History-II	2

IV. SEMESTER

Name	Hour
Foreign Language 4	4
Fuels And Combustion	2
Thermodynamics II	3
Heat and Mass Transfer	4
Measuring Technique	3
Dynamic	3
Resistance	3
Numerical Analysis	3

V. SEMESTER

Engineering Economy	2
Foreign Language 5	4
Energy Applications Lab. I	3
Fluid Mechanics-I	3
Machine Elements	3
Electromechanical Energy Conversion	3
Energy Systems Design	3
Technical Elective Group I	3
Technical Elective Group II	3

VII. SEMESTER

Name	Hour
Workplace Training	5
Internship	2

VIII. SEMESTER

Foreign Language 7	6
Entrepreneurship	4
Graduation Project	3
Automatic control	3
Energy Lax	2
Environmental Effects of Energy Systems	2
Heating, Cooling and Ventilation Systems	3
Technical Elective Group V	3
Technical Elective Group VI	3

III.SEMESTER

Foreign Language	4
Static	3
Thermodynamics-I	3
Introduction to Electrical and Electronics Engineering	2
Statistics	3
Differential equations	4
Material science	4

VI. SEMESTER

Foreign Language 6	6
Energy Applications Lab. II	3
Fluid Mechanics-II	3
Electric Power Transmission and Distribution	3
Renewable Energy Techonologies	2
Projecting Energy Systems	3
Occupational Health And Safety-II	2
Technical Elective Group III	3
Technical Elective Group IV	3
Other Programme Elective Group	2

Technical Elective Group I	
Solar Energy And Systems	Biomass And Wave Energy And Systems
Wind Energy And Systems	Hydroelectric Energy Systems
Geothermal Energy And Systems	Coal Technologies
Nuclear Energy And Technologies	Petroleum and Natural Gas Technologies
Hydrogen Energy and Systems	Ventilation-Air Conditioning Systems
Technical Elective Group II	
Electric Machines	Circuit Analysis
Electronic	Power systems
Artificial Intelligence Techniques	Microprocessors
Technical Elective Group III	
Digital Heat And Flow	Engines
Radiative Heat Transfer	Cogeneration And Trigeneration
Heat And Sound Insulation	Gas Systems Design
Heating Systems	Thermal Turbo Machines
Boilers And Combustion Technologies	
Technical Elective Group IV	
Power Electronics	Lighting Technique And Electric Plant Projects
Modeling and Simulation of Power Systems	Power Plants And Engineering

Technical Elective Group V	
Energetic Materials	Energy efficiency
Exergy And Applications	Hydraulic-Pneumatic Systems
Project of Plumbing Systems	Wind Turbine Design
Projecting of Heating Systems	Energy Feasibilities
Projecting of Ventilation and Air Conditioning Systems	Pv System Design
Cooling Systems	
Technical Elective Group VI	
Engineering Measuring Devices	Decision Making Techniques
Modeling and Simulation in Energy Systems	Hybrid And Electric Vehicle Technologies
Engineering Software	Drying Techniques
Energy Quality And Harmonics	Insulation Techniques
Energy Storage Systems	Energy Market Models
Smart Grids	Business Management and Organization

DOUBLE MAJOR AND SIDE BRANCH OPPORTUNITIES OF OUR DEPARTMENT

In accordance with **Gazi University Double Major Second Undergraduate and Minor Program Regulations**, our students can do double major in the departments presented below:

- Automotive Eng.
- Manufacturing Eng.
- Civil Eng.
- Electrical-Electronics Eng.
- Metallurgical and Materials Eng.

can do minor in the departments presented below:

- Automotive Eng.
- Manufacturing Eng.
- Electrical-Electronics Eng.

ERASMUS +

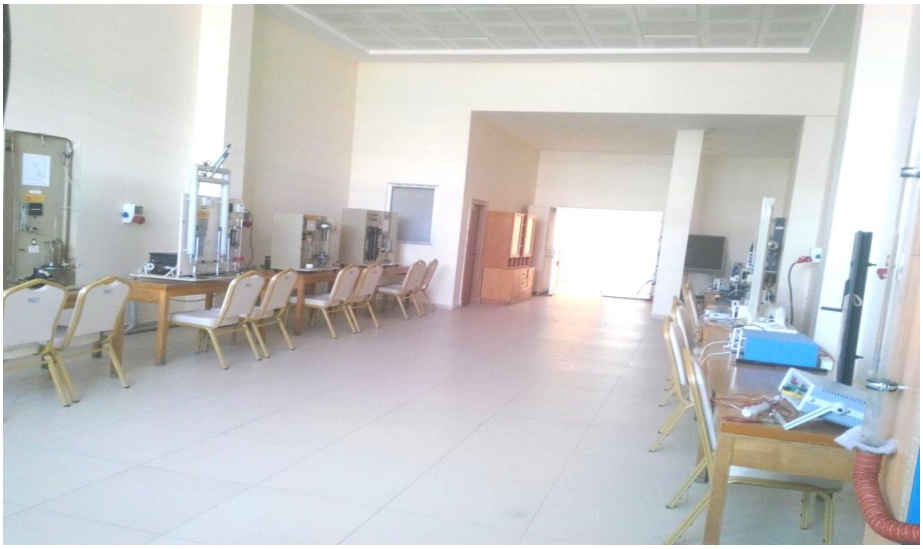
Our university runs the Erasmus + Program within the framework of the rules set by the Turkish National Agency. Erasmus + covers education, education and youth as well as sports. In student mobility for education; 3 to 12 months, in student mobility for internship; It takes 2 to 12 months. Participants are given per diem, travel expenses, special needs support. Cooperation with universities that have been made an agreement with our department is perfomed by the Department's Erasmus coordinator.

STUDENT COMMUNITIES

ENERGY COMMUNITY has carried on the activity in our department since 2010. In addition to this, there is an another student community named as TECHNOLOGY GROUP at Faculty of Technology. Our student communities organize technical trips to many companies during the education period in order to improve theoretical and practical knowledge of our undergraduate students.

LABORATORIES

Heat TransferLab.



Fluid MechanicsLab.

Electric Electronic Lab.

Thermodynamics & Energy Efficiency Lab.

HVAC Lab.

<u>Refrigeration Lab.</u>

Welding Lab.

Solar Energy Lab.

SOME RESEARCH FIELDS CONDUCTED IN OUR DEPARTMENT

- New and renewable fuels
- Advanced combustion technologies
- Energy efficiency applications
- Fuel cell technologies
- Hydrogen energy
- Nano-fluids and its heat transfer applications
- Nuclear Technologies
- Heating, cooling, air conditioning applications
- Solar energy and its applications

SOME UNIVERSITIES WITH INTERNATIONAL COOPERATION

- Imperial College London, London, England-United Kingdom
- University of Maryland, College Park, USA
- Aalborg University, Aalborg, Denmark
- National Cheng Kung University, Tainan, Taiwan
- National Formosa University, Huwei District, Yunlin County, Taiwan
- Cardiff University, Cardiff, Wales- United Kingdom
- University of Manchester, Manchester, England-United Kingdom
- University of Padova, Padua, Italy