İstanbul Technical University
Faculty of Aeronautics and Astronautics

AERONUATICAL ENGINEERING

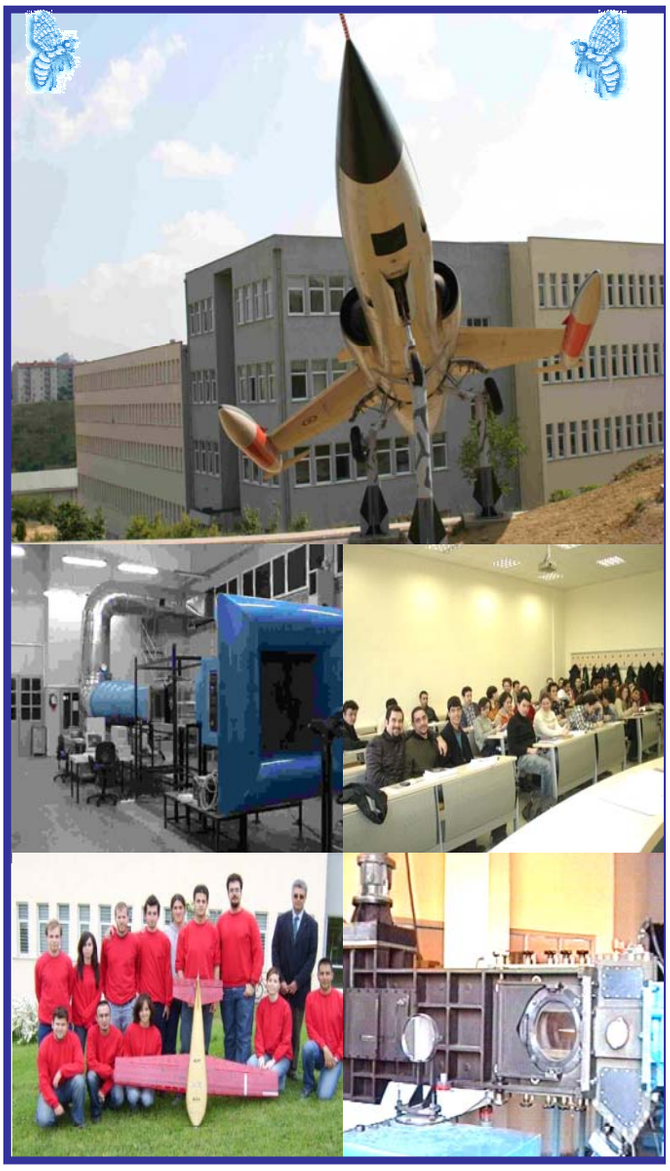
Aeronautical engineering is a branch of engineering which deals with design and development of flying vehicles in the air such as aircraft, helicopter, rocket, missiles etc. In this engineering field, necessary background is also gained for maintenance, repair, and operation of those vehicles. Aeronautical engineering, in addition to air vehicles, makes valuable contributions into the other industrial fields such as ground vehicles in the form of research-development and design. Thus, aeronautical engineers have varies opportunities to find a job in from defense and aircraft industry to automotive industry.

The Aeronautical Engineering education, which was started in 1940 as a branch of ITU Mechanical Engineering Department, is still being continued under the Faculty of Aeronautics and Astronautics that was established in 1983. In the department, 7 professors, 2 associate professors, 4 assistant professor and 2 foreign professors have been working. Up to now 1334 students had been graduated from the department and still 342 undergraduate students have been studying in the department.

The undergraduate program provides students with a basic understanding of the fundamentals of Aeronautical Engineering as a broad background in related areas. The program, with %30 of courses in English, provides the essential educational infrastructure required for continuing on for advanced degrees in a number of aeronautical-related fields. Among 67 courses offered in the program, there are 41 compulsory and 26 elective courses. Students are required to complete a total 153 credit hours including about 30 hours of humanities and social sciences courses, for graduation.

The Aeronautical Engineering Program is accredited with six year certification by the Accreditation Board for Engineering and Technology (ABET) in 2004. Accreditation is based not just on what we teach, but how we decide on our educational objectives and outcomes, the way we evaluate how well they are being met, and how we use those evaluations to tune our program. This feedback loop helps us continuously improve our program efficiently and with relevance.

The missions of the department are i) ducate individuals for careers in the aircraft industry at internationally recognized standard and to provide the basis for advanced study, ii) attract and retain high quality students, iii) conduct basic and applied research in the aircraft field that will contribute to the body of scientific knowledge and support the department's education programs, iv) develop and maintain a capability of transforming findings of the research carried out at the department into economical progress and benefit of the society.



Chair: Prof. Dr. Mehmet Şerif Kavsaoğlu

ITU Faculty of Aeronautics and Astronautics,
Aeronautical Engineering Department,
Ayazağa Campus, 34469
Maslak-İstanbul, Turkey

e-mail: ucakmuh@uubf.itu.edu.tr
Web: http://www.uubf.itu.edu.tr
tel : (+90) 212 2853144
fax: (+90) 212 2852926

RESEARCH

Faculty staff have been working in the following research projects and industrial cooperation areas with respect to graduate studies.

• Aviation research, development and implementation.
• Measurement, control and determination of temperature in high-speed phenomena.
• Rocket nozzle construction with ceramic and composite materials.
• Active cooling of rotor blades
• Light aircraft design
• Theoretical and experimental investigation of interacting traces.
• Design of unmanned air vehicle
• Wind turbine rotor design .
• Design and Calibration of wind tunnels. Hypervelocity impact analysis.
• Vibration analysis of T-41D aircrafts wing.
• 3-D viscous flow simulation around the arbitrary bodies.
• Light commercial helicopter design and construction.

LABORATORY FACILITIES

The department is highly dynamic and exciting education and research centers, which attract highly qualified students and top-class academics. Facilities consisting of 4 wind tunnels for subsonic research, 2 wind tunnels for supersonic research, force, velocity and pressure measurement systems (hot-wire, LDA, PIV), flow visualization systems (oil and smoke, Schlieren method), structural dynamics test systems, several workstations and personal computers for numerical studies are used for research work of special interest in the fields of applied mechanics, experimental fluid mechanics, industrial aerodynamics, analysis and design of aerospace propulsion systems, dynamics of combustion processes.

STUDENT ACTIVITIES

Aeronautical Engineering students participate in various student team projects and Aeronautical Engineering Faculty members serve as advisors. Some of these student projects are also supported in part by graduation projects and theses.
Students are participating to “Design/Build/Fly Competition” organised by AIAA and sponsored by Cessna and ONR (Office of Naval Research) which provides a real-world aircraft design experience for engineering students by giving them the opportunity to validate their analytic studies. Student teams supervised by academic staff, design, fabricate, and demonstrate the flight capabilities of an unmanned, electric powered, radio controlled aircraft which can best meet the specified mission profile. In 2005-2006 ATA7, which was designed and manufactured by ITU students, took the 5th position within 49 teams.

Students are attending to Autonomous Unmanned Air Vehicle competition organised by AUVSI (The Association for Unmanned Vehicle Systems International) with models designed and fabricated by them.

Students member of the solar-powered car racing team of Istanbul Technical University designs one-person vehicles.

GRADUATE STUDY

Students who have completed an undergraduate course in an engineering or science discipline or in an applied science are eligible to apply for admission to work toward advanced degrees in aeronautics or aerospace. Faculty of Aeronautics and Astronautics offers graduate programs:

• Aeronautical and astronautical graduate program (Multidisciplinary),
• Aeronautical - astronautical graduate program (Advanced Technologies in Engineering)

These programs are designed to provide intense education in the foundations of mechanics in relation to aeronautical and aerospace sciences, with emphasis on basic research, analysis, and experimental methods.

COOPERATED SUBJECTS

Department cooperates with the national and international universities and research institution academically in several related subjects.

• Certifications of systems, hardware and equipment of air vehicles
• Control of motors and motor components
• Design of thermodynamic systems
• Evaluation and control of exhaust and noise emission
• Aerodynamic and structural analysis of external forces in aircraft
• Calibration of trisonic tunnel
• Design of supersonic wind tunnel
• Temperature measurement with liquid-crystal

COOPERATING INSTITUTIONS

• Aerospace Institute of Turkish Air Force, Yeşilyurt, İstanbul, Turkey.
• Imperial College of Science and Technology, Aeronautics Department, London, UK
• Yokohama National University, Mechanical Engineering Department, Yokohama, Japan
• Lehigh University, Mechanical Engineering and Mechanics Department, Bethlehem, PA, USA
• Georgia Institute of Technology, Aerospace Engineering Department, Atalanta, USA.

OUTCOMES

During 2005 academic year, 9 projects were cooperated by department staff and moreover, 12 scientific papers were published in journals cited in SCI.