

Meteorological Engineering

Introduction:

The Department of Meteorological Engineering at Istanbul Technical University is one of the academical unit in Turkey giving educational training since 1953 at degrees of undergraduate and graduate levels. The Meteorological Engineering Program offers two graduate degrees; Master of Sciences as well as Philosophy of Doctorate in Meteorological Engineering. The Department is a highly dynamic and exciting education and research center, attracting qualified students and academics from Turkey, Balkans, North African and Middle Eastern countries. Meteorology is an interdisciplinary subject which heavily relies on basic sciences like physics, mathematics, chemistry, statistics, fluid dynamics, etc. as well as other physical sciences including hydrology, ocean sciences, agriculture and forestry, space sciences studying the highly complex phenomena taking place within the Earth's atmosphere.

The Department of Meteorological Engineering provides each graduate with a foundation of knowledge and experience upon which to build successful careers in meteorology and atmospheric sciences where a strong background is required or desirable.

The vision of the Department of Meteorological Engineering (ME) is to be highly competitive program on a worldwide basis and to be recognized internationally through a curriculum and research based on a continuous improvement approach.

The mission of the Department of ME is to educate individuals in both undergraduate and graduate levels for careers in the field of meteorology and atmospheric science applications; to equip graduates with contemporary knowledge and abilities; to conduct basic and applied research projects to contribute to the body of scientific knowledge; and to support the educational objectives of the department with an ultimate goal of serving for the well-being of the natural environments and mankind.

The educational objectives of the Meteorological Engineering undergraduate program are to achieve the following career and professional accomplishments in meteorological engineering and atmospheric sciences following the strategic goals-2007 of the American Meteorological Society (AMS).



1. To build on solid quantitative background in basic science and engineering fundamentals with capability to employ analytical tools and techniques for professional practice or post-baccalaureate studies as their aptitudes and career goals may dictate.
2. To conceptualize, design, model, and analyze meteorological systems, with a broad understanding of atmospheric phenomena by illustrating meteorological applications to real life problems.

3. To exercise leadership in interdisciplinary environments to develop algorithms and to use atmospheric models in order to create new knowledge and to find solutions in atmospheric science problems.
4. To inspire graduates who will have the curiosity and desire of learning for earth- atmospheric sciences and to instill in them the ability, professional and ethical responsibility, self-confidence, and lifelong learning to be a part of the rapid and major changes so that they can effectively adapt to changing demands throughout their careers.

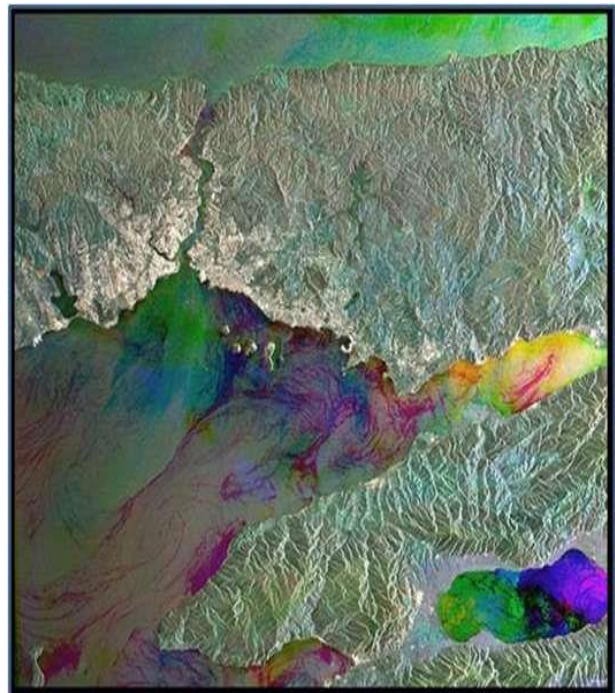
Meteorological Engineering Department has a strong commitment for carrying out fundamental research and taking an active role in the related national and international scientific administrations. The members of the department in addition to teaching at undergraduate and graduate programs are involved in research activities and realization of industrial projects.

Head of Department: Prof. Ahmet Duran ŞAHİN
Prof. Dr. Hüseyin TOROS
Vice Heads: Asst. Prof. Ahmet ÖZTOPAL
Asst. Prof. Barış ÇALDAĞ

e-mail: metmuh-uubf@itu.edu.tr
Phones: +90 212 285 3129 and +90 212 285 3442
Fax: +90 212 285 2926
Address: Istanbul Technical University Faculty of Aeronautics and Astronautics
Department of Meteorology 34469 Maslak-Istanbul TURKEY

Job Opportunities:

- Meteorology, Atmospheric Sciences and Environmental Sciences Departments
- Turkish State Meteorological Service
- State Hydraulic Works
- Ministry of Environment and Forestry
- Environmental Offices of the Municipality
- Electrical Power Resources Survey
- Turkish Airlines
- Turkish Armed Forces
- Oceanography
- Media
- Wind and Sun Energy Companies
- Hydrological Companies
- Disaster Management Institutes
- Research and Development Centers



International Relations

Erasmus Exchange Program offers an outstanding learning experience currently in Germany; Hannover University, Hamburg University, Albert-Ludwigs University Freiburg, Rheinische Friedrich-Wilhelms University Bonn, in Finland; University of Helsinki, in the Netherlands; Wageningen University, in Italy University of Bologna.

Student Admission:

Admission to the department is controlled by the Student Selection and Placement Center (ÖSYM), which is affiliated to the Higher Education Council (YÖK).

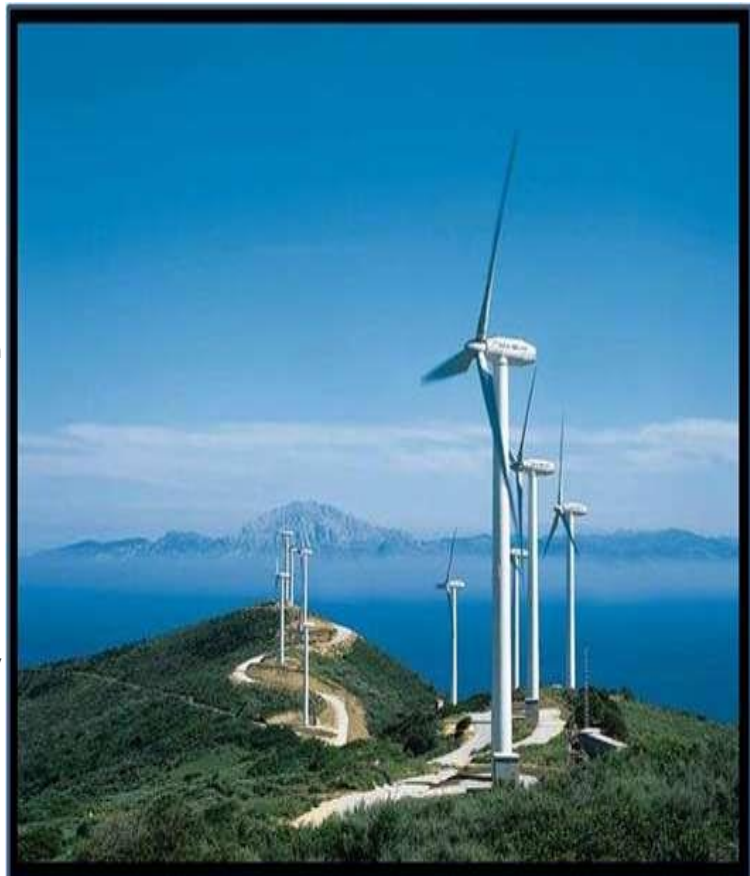
Students accepted to the program can be divided into five categories:

- 1) Regular high school or technical and vocationally oriented high school graduates.
- 2) The first ranking graduates of high schools.
- 3) Foreign students.
- 4) Transfer students from different engineering programs at ITU and other domestic and foreign universities.
- 5) Students of other engineering programs at ITU pursuing double major in Aeronautical Engineering.

Regular high school or technical and vocationally oriented high school graduates are accepted to the program through a nationwide University Entrance Examination (ÖSS), which is performed in two successive stages every year in March and June. The examination aims to measure the verbal and the quantitative abilities of the candidates and is administered by the Student Selection and Placement Center (ÖSYM), which is affiliated with the Higher Education Council (YÖK).

Candidates are essentially evaluated on basis of their performance in the examinations together with their academic achievement (grade-point averages) in high school. The effective scores of the candidates reflect not only their selection examination scores but also their grade point averages at high school graduation. The candidates are placed in the higher education programs that are the highest on their list of preferences, if compatible with their scores.

The department has a limited number of quota for foreign students which is announced by the Student Selection and Placement Center (ÖSYM). The foreign students who wish to enroll in the program should have to meet the criteria outlined by the Higher Education Council of Turkey at: <http://www.yok.gov.tr/web/guest/yurt-disindan-kabul-edilecek-ogrenci-kontenjanlari> and Application Conditions to Undergraduate Level Programs at <http://www.sis.itu.edu.tr/eng/foreign/> .



Research Interests:

The Department has a strong commitment to fundamental research and active role in national and international scientific administration. All of the staff members in addition to teaching at under-graduate and graduate programs, are involved in research activities and realization of industrial projects. Some of these activities are:

- Modelling of atmospheric events.
- Calculation of surface heat flux based on surface measurement.
- Development of automatic diagnostic methods for meteorological data of Turkey.
- Surface ozone studies.
- Effect of air pollution on surface water resources.
- Urban air pollution and regional air pollution.
- Climate change.
- Investigation of atmospheric structure parameters by means of acoustic radars.
- Solar energy determination.
- Wind energy potential determination.
- Hydrometeorological assessment of surface water resources around Istanbul.
- Artificial rainfall enhancement.
- Cloud seeding.
- Determination of water level fluctuation relationships to climatic changes.
- Effect of atmospheric parameters on corn and soy bean plants.
- Meteorological analysis and prediction of avalanches.
- Acid rain.
- Solar Wind-Magnetosphere-Ionosphere coupling.

Focal Points of Research:

Strengthening and developing the technological expertise in a diverse field of fundamental sciences oriented Atmospheric Sciences and Meteorological Engineering applications.

Understanding the mechanisms of desertification and natural disasters, including their links with climatic change so as to improve risk and impact assessment and forecasting, and decision support methodologies.

Strengthening the capacity to understand, detect and predict greenhouse gases and pollutant emissions in regional scales and urban areas as well as developing strategies for prevention, mitigation and adaption for reducing.

Focusing on improving buildings heating/cooling efficiency and promotion changes in energy demand patterns and consumption behaviour for reducing greenhouse gas emissions and pollutant emissions in urban areas.

In order to establish "sustainable communities", developing renewable energy sources such as wind and solar energy, and integrating to the regional energy system. Assessing the potential effect of climate change on residential energy demand, agricultural production and water resources especially for the semi-arid, developing and non-oil producing countries. Simulating and understanding regional climate response of the climate to human induced changes and determining the climate sensitivity in the regional scale.

Selected International Projects (Completed in five years):

- ITU-Pensylvania State University-NATO
- CRG Collaborative Research Universitaet für Bodenkultur-Austria
- ITU-University of Athens, ESA ENVISAT Project-Greece
- Solar Wind - Magnetosphere - Ionosphere Coupling, NSF-USA
- Global Magnetic Geometry of the Open Magnetosphere for General IMF Orientations, NSF-USA
- Space Weather: Scale Lenth of Solar Parameters effecting Magnetosphere, NSF-USA

Selected ongoing International Projects:

- Spatial and temporal variations of ozone over Southeastern Europe, ENVISAT-AO Project-
- Effect of upper atmosphere on terrestrial and Earth-space communications, COST 271
- Hazardous weather and cyclones in the Mediterranean, NSF-USA
- GEM: Magnetosheath Model Verification, NSF-USA
- Using JERS Radar Satellite data for the product type and soil humidity research, TUBITAK
- Air Pollution Modeling Project, COST 728

Laboratories and Equipment

The department has particular strength in weather analysis and prediction, physical meteorology, including instrumentation, air pollution, renewable energy and remote sensing. The department has therefore various facilities for numerical modeling, meteorological observations and analysis.

- Computer laboratory for numerical studies (Modeling and Analysis)
- Automatic weather station
- Satellite data receiver
- Acoustic Radar systems

Faculty :

Professors:

SAHIN, Ahmet Duran (Chair)

PhD, Istanbul Technical University

KADIOGLU, Mikdat

PhD, University of Missouri

KAYMAZ, Zerefsan

PhD, University of California, Los Angeles

KOCAK, Kasım

PhD, Istanbul Technical University

ŞAYLAN, Levent

PhD, Universitaet Wien

MENTEŞ, Şükran Sibel

PhD, Istanbul Technical University

ŞEN, Orhan

PhD, Istanbul Technical University

TOPÇU, Hatice Sema

PhD, Istanbul Technical University

ÜNAL, Yurdanur S.

PhD, University of California, Los Angeles

TOROS, Hüseyin

PhD, Istanbul Technical University

Associate Professors:

DENİZ, Ali

PhD, Istanbul Technical University

ASİLHAN, Sevinç

PhD, Istanbul Technical University

ÖNOL, Barış

PhD, Istanbul Technical University

DEMİRHAN BARI, Deniz

PhD, Istanbul Technical University

Assistant Professors:

ÖZTOPAL, Ahmet

PhD, Istanbul Technical University

ÇALDAĞ, Barış

PhD, Istanbul Technical University

KAHYA, Ceyhan

PhD, Istanbul Technical University

Instructors:

TAN, Elçin

PhD, University of California, Davis

Teaching Assistants

TÜRK KATIRCIOĞLU, Filiz

PhD, Istanbul Technical University

Research Assistants

EFE, Bahtiyar

AKATAŞ, Nilcan

DİREN, Deniz Hazel

DOĞAN, Nida

Visiting Research Assistants

AKBAYIR, İbrahim

ASLAN, Toprak

ÖZGÜR, Evren

YERLİ DURNA, Bihter

Emeritus

BORHAN, Yunus

PhD, Istanbul Technical University

İNCECIK, Selahattin

PhD, Istanbul Technical University