

Istanbul Technical University - Faculty of Science and Letters

The Faculty of Science and Letters consists of Mathematics, Physics, Chemistry, Molecular Biology and Genetics and Humanities and Social Sciences Departments and, as is the case in all major technical universities, has the important task of providing training in elementary basic science education to non-majors in their first and second years at the university. It also provides Humanities and Social Sciences courses for the whole university.

The faculty's courses and general contributions to the university's other faculties can be summed up in three main groups. The first group consists of foundational science courses taken by freshmen and sophomore students from almost all departments. These courses are offered by the Departments of Mathematics, Physics, and Chemistry. While providing a scientific foundation to engineering students, they also support the further development of problem solving skills and analytical thinking. The second group of courses aims to support other departments with elective courses or classes designed for specific departments. Finally, there are elective courses offered by the Humanities and Social Sciences Department. The annual number of students registered for the above courses surpasses 25,000 students.

In the first group, the Mathematics Department offers three different mathematics courses.

There are two sequential calculus courses, namely
MAT101-102 (course language Turkish) or MAT101E-102E (course language English) – 5 credits and
MAT103-104 (course language Turkish) or MAT103E-104E (course language English) – 4 credits.

Each year, over 8,300 freshmen attend these courses. Calculus I courses MAT101 and MAT103 cover calculus of single variable functions, differential and integral calculus with applications. Calculus II courses MAT102 and MAT104 cover infinite series, calculus of vectors, multivariable functions and multiple integrals. The two-semester long Calculus sequence is mandatory throughout the university with the exception of the Faculty of Architecture, which requires only the single variable Calculus I. The Calculus sequence is usually completed in the first year and, for many departments, is a prerequisite for other courses.

Starting Fall term 2017, there will be some changes to the Calculus sequence (see Improvements section below).

The Differential Equations course MAT201 (course language Turkish) or MAT201E (course language English) is a required course in the curriculum of all the engineering departments and is offered to sophomores in both Fall and Spring terms although most departments prefer to take this course in the Fall term to meet their departmental prerequisites. Each year, over 2,700 sophomores attend this course which covers ordinary differential equations including series methods.

The Linear Algebra course MAT261 (course language Turkish) or MAT261E (course language English) is a required course in the curriculum of some of the engineering departments and is offered to both freshmen and sophomores. Each year, over 2,200 students attend this course which covers matrices and systems of linear equations, vector spaces, linear transformations and their matrix representations. Some departments offer additional MAT coded courses that are not within the scope of Mathematics Department's responsibility.

Starting Fall term 2017, there will be some changes to Differential Equations and Linear Algebra courses (see Improvements section below).

The Chemistry Department offers the General Chemistry I course KIM101 (course language Turkish) or KIM101E (course language English), a required course in the curriculum of all the engineering departments, to freshmen in both Fall and Spring terms. Each year, over 3,500 freshmen attend these courses which cover the principles of chemistry.

Within the first group, the Physics Department offers three courses.

Physics I course FIZ101 (course language Turkish) or FIZ101E (course language English) is a required course in the curriculum of all the engineering departments and is offered to freshmen in both Fall and Spring terms. Each year, over 3,000 freshmen attend these courses which cover mechanics.

Physics II is a required course in the curriculum of all the engineering departments and is offered to freshmen in both Fall and Spring terms. Depending on the preferences of their home departments, over 3,000 freshmen each year take either the course FIZ102E (course language English) which covers electricity and magnetism, or the course FIZ106 (course language Turkish) or FIZ106E (course language English) which covers the physics of continuous media.

Starting Fall term 2017, there will be some changes to the Physics II course (see Improvements section below).

Since 2003, the Faculty of Science and Letters has given the above courses with parallel sections; i.e. students are free to register for any section of their required course regardless of their department and program. All students registered in the same course, regardless of the course language, take the same exams (be it midterm or final exams) on the same day, and are considered in the same grading distribution. Following the examination, solutions are posted online and lecturers and teaching assistants (supervised by the lecturers) begin to grade the examination papers. The grades are then recorded and posted online.

Each semester, a course coordinator is appointed to each course. The course coordinator is responsible for planning and coordinating the delivery of the course and for ensuring its appropriate assessment together with the relevant Head of Department, who has the final responsibility. The coordinator is also responsible for organizing the grading of examination papers.

Lecturers are available in their offices for a minimum of two hours per week to address student questions.

Each semester, an exam committee is appointed for each course. Each committee consist of faculty members that are not assigned to that particular course. The committee assists with determining exam's content, writing new exam questions, and editing exam questions to maintain a high standard of exam quality.

The second group consists of 17 courses offered by the Physics, Chemistry, and Molecular Biology and Genetics Departments. Each year, over 2,100 students attend these courses.

The third group consists of elective courses offered to all undergraduate students by the Humanities and Social Sciences Department with the code ITB. Each term, the department offers about 60 courses, including different sections of the same course. These courses aim at enhancing general knowledge and learning capacity of students.

All ITB courses are offered as social science and humanities electives for undergraduate students. There is no department restriction on these courses; i.e. students from all departments are free to choose any ITB course they wish. The number of ITB courses required of each student varies according to the graduation scheme of each department.

Including different sections of the same course, the department offers more than 60 courses per semester which serve approximately 1,600 students. All ITB courses are offered in both English and Turkish. Courses taught by core members of the department accept around 40 students. Those taught by guests and visiting scholars do not exceed 30 students.

Improvements

Going into effect in Fall term 2017, math courses will be changed in line with curricular improvements throughout the university:

The Calculus sequence and Physics II are now standardized across departments. This will help with the adaptation of courses in the case of transfers between departments.

The Differential Equations and Linear Algebra courses have been combined into one course, called Engineering Mathematics, in an approach closer to that which has been gaining popularity globally. As a result, students will be better able to observe the interaction between these two subjects.

The process of entering exam grades of all the above courses in the first group has been automated. Exam papers are standardized so that grades may be entered using an optic reader. This speeds up the process and lessens error.

An anticipated change is to digitize graded exams using an optic reader during the grade entry process. This will make archiving and responding to exam appeals easier.

All three departments strive to use the Internet more effectively to maintain communication with students, share information, and to increase coordination and information sharing amongst lecturers teaching the same courses. Through the departments' websites, students can access course materials, homeworks, exam locations, past terms' exam questions and solutions as well as their exam grades while lecturers can send announcements and documents to students.

In the past year, the Mathematics Department has begun to develop an online system and incorporated this into its website. Currently, exam locations and grades are posted on the website. Lecturers can access information about their students and statistics about their courses through the site. Additionally, lecturers can see students who have appealed grades, along with their grades, and make merited changes online during the appropriate period. Students are then able to access the results of their grade appeals online.