

MATHEMATICS BACHELOR DEGREE PROGRAM INFORMATION

General Information	<p>The Department of Mathematics of TOBB ETÜ was founded in 2004.</p> <p>Department of Mathematics offers a four-year undergraduate education program which meets the international standards at a very high level and The language of instruction is weighted in %70 Turkish and %30 English. Besides the courses offered for our undergraduate program, our department offers math courses for various departments of faculties of engineering, administrative sciences, and arts and sciences as well.</p> <p>Our department offers an MSc. and a Ph.D. programs with and without thesis.</p> <p>Undergraduate program also offers minor and double major programs for successful students from other department of the university.</p> <p>For all up-to-date information about the department please visit the webpage: https://www.etu.edu.tr/en/bolum/mathematics</p> <p>In the TOBB ETU, for all undergraduate departments, each education year is divided into three equal parts: Fall, Spring and Summer. 3 Term Education Program is not practiced in any other university in Turkey. The purpose of this program is to improve our students' work experience before they get their license degree. All students join the cooperative education (co-op) program three times before graduation and graduate with nearly 1 year of work experience. At TOBB ETU, our students use 4 years of learning time efficiently, work harder. Please see for details about co-op education: https://www.etu.edu.tr/en/ortak-egitim</p>
Program Purpose	<p>The primary goal of the Department of Mathematics is to train young, qualified and research scientists into the academic world. The Department of Mathematics aims to raise students, who have graduated from undergraduate and graduate programs, in such a way that they have a potential to work with interdisciplinary background at selected universities and institutions.</p>
Degree Earned	<p>Students who complete the department are entitled to receive a bachelor degree in Mathematics.</p>
Level of Degree Earned	<p>Bachelor degree (NQF- HETR 6. Level)</p>
Requirements and Rules of the Degree Earned	<p>To get an undergraduate degree in Mathematics, it is required to complete 128 credits, 269 ECTS, 3 co-op education semesters, and to have at least 2,00 CPGA (Cumulative Point Grade Average) out of 4,00. See the TOBB ETU Regulations on Undergraduate Education and Examination: https://www.etu.edu.tr/tr/sayfa/mevzuat for details.</p>
Registration Admission Requirements	<p>We accept students to our undergraduate program according to a nation-wide university examination. See https://www.etu.edu.tr/tr/sayfa/mevzuat for the TOBB ETU Regulations on Undergraduate Education and Examination; and http://www.osym.gov.tr for the detailed information on nation-wide university exam.</p>
Recognition of Prior Learning	<p>By completing secondary education (high school), the national center placement examination will be required to get enough points in the appropriate score category. Exemptions from the courses which are included in transfer and student exchange programs, minor and double major programs are regulated by the related articles in TOBB ETU Regulations on Undergraduate Education and Examination. See for details: https://www.etu.edu.tr/tr/sayfa/mevzuat</p>
Examinations, Assessment and Grading	<p>Examinations are graded on 100 points. The grade weights of quizzes, homework, midterms and the final exam may vary according to the structure of the course. Evaluation of exams and letter grades are done according to TOBB ETU Regulations on Undergraduate Education and Examination: https://www.etu.edu.tr/tr/sayfa/mevzuat</p>
Teaching Style	<p>Full time education. The undergraduate program of the department of mathematics consists of 3 co-op education semesters and 8 university education semesters. There are totally 46 courses in the undergraduate program. 22 of them are departmental required courses, 4 of them are departmental elective courses, 6 of them are the university elective courses, 4 of them are the second foreign language courses, and 10 of them are the university common courses. The number of total credit is 128, and the ECTS is 269.</p>
Graduation Requirements	<p>To get an undergraduate degree in Mathematics, it is required to complete 128 credits, 269 ECTS, 3 co-op education semesters, and to have at least 2,00 CPGA (Cumulative Point Grade Average) out of 4,00. See the TOBB ETU Regulations on Undergraduate Education and Examination: https://www.etu.edu.tr/tr/sayfa/mevzuat for details.</p>
Occupational Profiles of Graduated-Employment Opportunities	<p>Students who have successfully completed undergraduate and graduate programs will have work skills as teaching staff at distinguished universities in the country and abroad. In addition, thanks to the co-op education system and minor/double major programs, our graduates from the undergraduate program enjoy extensive work opportunities in the public and private sectors. They can work as a teacher in MEB; a software development specialist in the information technology; a stockbroker, broker and account specialist in banking and finance sectors; or a specialist and expert assistant staff in the appropriate public sectors.</p>
Transition to a Upper Degree	<p>Students who successfully complete undergraduate education can continue their graduate, doctorate or integrated doctorate programs if they have enough grades from the ALES exam and if they have achieved sufficient success on the foreign language, and also if they are successful in the interview exams. Please visit TOBB ETU Institute of Science website for all information about application conditions and current announcements to graduate programs: https://www.etu.edu.tr/en/enstitu/fen-bilimleri-enstitusu</p>

NQF-HETR PROGRAM QUALIFICATION MATRIX				PROGRAM QUALIFICATIONS																		
Program : Mathematics																						
Related NQF-HETR Core Field: Mathematics and Statistics (Academic) - Bachelor Degree				1	2	3	4	5	6	7	8	9	10	11	12	13	14	15				
CORE AREA QUALIFICATIONS	INFORMATION	Theoretical - Factual	Has advanced theoretical and applied knowledge in the foreground, with a scientific approach supported by textbooks, application tools and other resources with current information in the field.	X	X	X	X		X		X			X	X			X				
			Adapts and passes on the information given in the field to secondary education.					X	X					X								
	SKILLS	Cognitive - Applied	Uses advanced theoretical and practical knowledge in the field.	X	X	X	X	X	X		X											
			Updates information depending on the conditions of the day.					X	X				X							X		
			Uses the advanced knowledge and skills gained in his / her field to interpret and evaluate the data, defines and analyzes problems parallel to current technological developments, develops solutions based on research and evidence.	X	X		X		X												X	
			Has the ability to conceptualize events and phenomena related to their field; researches scientific methods and techniques.	X	X	X	X					X				X					X	
			Designs and conducts experiments for analyzing problems, collect data, analyzes and interprets the results.	X				X	X													
			COMPETENCIES	Ability to work independently and to take responsibility	Independently conducts an advanced study of the field.	X					X	X					X	X				
	Takes responsibility as individual and team members to solve complex and unforeseen problems encountered in field related applications.							X	X		X						X					
	Plans and manages the activities for the development of the project team members under their responsibility.							X	X								X					
	Plays a role in the decision-making process in problems related to different disciplinary fields.										X							X				
	Uses time effectively in the process of drawing conclusions with analytical thinking ability.	X							X													
	Learning Competence			Evaluates advanced knowledge and skills in the field with a critical approach.	X					X		X										
				Determines learning needs and guide learning.					X					X				X				
				Develops a positive attitude towards life-long learning.					X					X								
				Is aware of the necessity of lifelong learning and constantly improve their professional knowledge and skills.					X	X		X										
	Communication and Social Competence			Informs the related institutions about the field; expresses his / her thoughts and suggestions for solution of problems in written and oral form.					X	X	X											
				Shares ideas with his / her expert and non-experts by supporting quantitative and qualitative solutions to suggestions for solutions to problems and issues in his / her field.					X	X	X		X					X				
				Organizes and implements projects and activities for social responsibility awareness and social environment.					X	X		X						X				
				Uses a foreign language at least at the European Language Portfolio B1 General Level, monitors the information in the field and communicates with colleagues.															X	X		
				Uses computer and communication technology at least in the European Computer Use License Advanced level required by his / her field.																		X
				Uses the knowledge of human health and environment awareness that they have about their field in the benefit of society.					X						X							
	Field Specific Competence			Acts in accordance with the social, scientific, cultural and ethical values in the stages of collecting, interpreting, applying and reporting the results related to the field.										X								
				Has sufficient consensus in the areas of environmental protection, occupational health and safety, as well as the universality of social rights, social justice, quality management and compliance with processes (instead of quality cultures) and protection of cultural values.											X				X			

Mathematics Program Qualifications

1	Knows and understands the basic concepts and notations of mathematics, and be able to analyze the mathematical results.
2	Makes modeling problems with reasoning, tries to solve them with skills of analyzing, finds approximate solutions with numerical methods in case of the absence of exact solutions.
3	Uses various logical methods in proving mathematical results, such as, reductio ad absurdum, induction, and deduction
4	Knows mainly which method is used for the exact or approximate solutions of the systems of linear and nonlinear equations, and uses various methods in solving the differential and partial differential equations.
5	Prepares creative projects, gives efficient presentations, and develops himself/herself continuously.
6	Develops his/her analytic and abstract thinking skills with help of theoretical and applicable courses in the program and uses it in interdisciplinary problems.
7	Has skills entrepreneurship and leadership and develops his/her skills of acting independently and taking initiative.
8	Has satisfactory information and background to apply for graduate programs in his/her own field.
9	Be aware of the professional responsibility and ethical values and obeys these values, and knows the importance of lifelong learning, has a sense of social, cultural and environmental responsibilities.
10	Transplants and applies the theoretical and applicable knowledge gained in their field to the secondary education by using suitable tools and devices.
11	Knows the number systems, the structures of group, ring and field, and the set theory, the concepts of Limit, Continuity, Derivative, Integral, Metric, Norm, and Vector Space.
12	Knows how to search the literature in Mathematics and reaches printed and online sources.
13	Participates and directs teamwork actively and has a rapport with his/her colleagues.
14	Has proficiency in English language to communicate with colleagues and to follow the innovations in mathematics and related fields.
15	Acquires basic software knowledge necessary to work in the computer science related fields and together with the skills to use information technologies effectively.

Program Qualifications Course Matrix of Mathematics		Program Qualifications														
Code	Course Name	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
MAT 101	Mathematics I	5	4	2	3		3		4	3	3	3		2	2	3
MAT 111	Mathematical Logic	5	2	5	3	2	5	1	3	2		3	1	1	2	1
FİZ 101	Physics I		2		1											2
FİZ 101L	Physics Laboratory I		2		1											2
BİL 101	Computer Programming I					4				2				1		5
TÜR 101	Turkish Language I					2		2		3				2		
İNG 001	English I					2				1				1		5
MAT 102	Mathematics II	5	4	2	3		3		4	3	3	3		2	2	3
FİZ 102	Physics II		2		1											2
FİZ 102L	Physics Laboratory II		2		1											2
BİL 102	Computer Programming II					4				2				1		5
TÜR 102	Turkish Language II					2		2		3				2		
İNG 002	English II					2				1				1		5
OEG 101	Introduction to Cooperative Education					1		3		1						
MAT 201	Linear Algebra	5	2	3	5	1	3	1	5	3	4	5	3	4	2	4
MAT 209	Advanced Analysis I	4	2	4	1		2		5	2		3	1	2	1	
END 213	Probability and Statistics I	2			1		1		1						1	3
ÂİT 201	Atatürk's Principles and History of the Reforms I							1		3						
İNG 003	Professional Writing Skills					2				1				1		5
MAT 202	Differential Equations	4	3	3	4		1		5	3		2	2	2	1	
MAT 210	Advanced Analysis II	4	2	4	1		2		2	2		3	1	2	1	
MAT 212	Linear Algebra II	5	2	5	5	4	5	3	5	4	4	5	4	4	3	5
ÂİT 202	Atatürk's Principles and History of the Reforms II							1		3						
İNG 004	Professional Presentation Skills					2				1				1		5
MAT 309	Algebra	5	2	5	2	3	3		4	3	5	4	3	2	2	2
MAT 311	Complex Functions Theory	5	2	3	1		3		5	1	2	4	3		2	3
MAT 395	Numerical Analysis	5	4	3	4	1	3		5	3		3	2	3	4	4
İŞL 315	Entrepreneurship and Leadership					1		5		4				2		
MAT 312	Functional Analysis	5	2	4	1	1	2		4	2		4	2		2	1
MAT 396	Partial Differential Equations	5	4	3	5	1	3		5	3		4	3	2	4	2
MAT 495	Project Course I	3	3	3	3	5	2	1	2	3	1	3	5	3	4	5
MAT 496	Project Course II	3	3	3	3	5	2	1	2	3	1	3	5	3	4	5
MAT 205	Mathematics III	5	3	4			4		4	2	1	4	2	2	1	
MAT 310	Differential Geometry	3	2	4	1		3		4	1	1	4	2		2	2
MAT 411	Measure Theory	5	3	4	1	1	3	1	5	3	1	3	2		2	1
MAT 412	Transformations in Complex Analysis	4	1	3	1		2		5	1	1	3	2		2	3
MAT 413	Mathematical Analysis	5	3	5	1		5		5	1	2	3	3		2	3
MAT 414	Approximation Theory	5	4	4	3		4		5	1	1	4	3		2	3
MAT 415	History of Mathematics	1				5			4				5	5		
MAT 421	Introduction to Cryptography	2	3	2	1	5	4	3	4	3	3	2	5	4	4	5
MAT 422	Introduction to Coding Theory	2	3	2	3	5	4	3	4	3	3	3	5	4	4	5
MAT 423	Introduction to Finite Fields	3	2	4	2	3	3		4	3	3	3	5	4	4	2
MAT 424	Reduced Sequences and Combinatorial Properties	2	3	3	4	3	3	3	4	3	3	4	5	3	3	5
MAT 425	Number Theory	4	3	5	3	4	3		4	3	5	4	5	3	3	2
MAT 432	Topology	5	3	4	1		3		4	2	1	2	1		1	
MAT 441	Ordinary Differential Equations Theory	5	5	4	5	2	4		4			5	4	3		
MAT 442	Numerical Solutions of Differential Equations	4	3	3	3		3		3	2		3	2	2	1	4
MAT 443	Mathematical Modeling	4	5	1	4		4		3	2		2	2	2	1	1
MAT 444	Financial Mathematics	4	4	2	4		4		4	2		1	2	2	1	1
MAT 445	Applied Mathematics	5	5	3	5	2	4		4			4	4	3		
MAT 446	Mathematical Biology	4	4	2	4		4		4	2		1	2	2	1	1
MAT 447	Dynamical Systems	5	4	2	4		4		4	2		2	2	2	1	1
MAT 448	Special Functions in Applied Functions	5	5	3	5	2	4		4			3	4	3		
MAT 449	Introduction to Difference Equations	5	5	3	5	2	3		4			2	4	3		
MAT 450	Introduction to Control Theory	5	5	3	5	2	4		4				4	3		
MAT 452	Fuzzy Logic and Set Theory	5	2	5	2	2	5		4			2	4	3		
MAT 499	Independent Study Course	3	3	3	3	5	2		2	3	1	3	5	2	4	4
BİL 133	Combinatorics and Graph Theory		1	3			2								1	3
ELE 371	Signals and Systems		1		1		1								1	3
ELE 375	Numerical Methods for Electrical Engineering		4		1		1		1						1	3
MAK 310	Numerical Methods		4		1		1		1						1	3
END 214	Probability and Statistics II	2			1		1		1						1	3