



# ESOGÜ Electrical-Electronics Engineering Department

COURSE CODE: 151221202 - 151241202

COURSE TITLE: Calculus I

Semester	Weekly Hours		COURSE			
	Theoretical	Practical	Credits	ECTS	Type	Language
1	4	0	4	5	Compulsory (x) Elective ( )	Turkish ( ) English (x)
Write the credit (for non-credit courses weekly hours) below (If necessary distribute the credits.).						
Math and Basic Science		Electrical Engineering [mark (√) if there is high design content]		General Education	Humanities	
4		0 ( )		0	0	
Assessment		THEORETICAL-PRACTICAL COURSES			LABORATORY COURSES	
Midterm	Type	Number	%	Activity Type	Number	%
	Midterm	1	30	Quiz		
	Quiz	2	10	Lab performance		
	Homework	4	10	Report		
	Project			Oral exam		
Other (.....)			Other (.....)			
Final			50			
Makeup exam (Oral/Written)						
Prerequisites						
Brief content of the course		Functions. Limits and continuity. Differentiation. Applications of derivatives. Integration. Sequences and series.				
Objectives of the course		Main objective of this course is to teach students basic concepts, theorems of calculus and provide them the ability to solve mathematical problems.				
Contribution of the course towards professional education		By taking this course, the students gain necessary mathematical background for engineering courses and their professional lives.				
Outcomes of the course		1. Solving limit problems. 2. Defining differentiation. 3. Applying derivatives to certain problems. 4. Defining integration. 5. Solving definite integrals. 6. Analyzing sequences and series.				
Textbook of the course		George B. Thomas Jr., Thomas' Calculus, 12th edition, Pearson Publications, 2009.				
Other reference books		- Abdülkadir Özdeğer ve Nursun Özdeğer, Çözümlü Analiz Problemleri Cilt I, İTÜ Fen Fakültesi Yayınları, 1996. - Ahmet A. Karadeniz, Yüksek Matematik Cilt: 1, 14. Baskı, Çağlayan Kitabevi, 2011. - Ahmet A. Karadeniz, Yüksek Matematik Cilt: 2, 9. Baskı, Çağlayan Kitabevi, 2007.				
Required material for the course						

WEEKLY PLAN OF THE COURSE	
Week	Topics
1	Functions and their graphs. Shifting and scaling.
2	Trigonometric functions. Exponential functions. Inverse functions. Natural logarithm.
3	Limits. Types of limits.
4	Types of limits. Continuity of a function.
5	Differentiation. Tangents and derivative at a point. Differentiation rules.
6	Derivatives of certain functions. Chain rule. Implicit differentiation.
7	Extreme values of a function. Mean value theorem.
8	Midterm
9	Midterm
10	Integration. Definite integrals.
11	Fundamental theorem of integral calculus. Indefinite integrals. Integration by parts.
12	Trigonometric substitutions. Volumes.
13	Sequences and infinite series. Convergence. Comparison tests. Ratio and root tests.
14	Alternating series. Absolute convergence. Power series. Taylor and Maclaurin series.
15,16	Final

NO	OUTCOMES OF THE PROGRAMME	4	3	2	1
1	Adequate knowledge of mathematics, science and Electrical and Electronic Engineering; ability to practice theoretical and practical knowledge of these areas into modeling and solving complex problems of Electrical and Electronic Engineering	X			
2	Ability to identify complex engineering problems in Electrical and Electronic Engineering and related fields, for this purpose having skills to formulate, select and apply appropriate methods.				X
3	Having skills to apply modern design methods to design a complex system, process, equipment or product that should work under realistic conditions and constraints and satisfy specific requirements concerning the Electrical and Electronic Engineering.				X
4	Having skills to develop, select and apply modern techniques and tools needed to analyze and solve complex applications in Electrical and Electronic Engineering, skills to use information technology effectively.				X
5	Skills to design and conduct tests, collect data, analyze results, and interpret data for the experimental investigation of complex problems in Electrical and Electronic Engineering				X
6	Ability to function effectively as an individual and as a member of teams within the discipline and in multidiscipline areas.				X
7	Communicating effectively in oral and written form both in Turkish and English. Effective report writing and understanding written reports, preparing design and manufacturing reports, making effective presentations, skills to give and receive clear and concise instructions.				X
8	Awareness of the necessity of lifelong learning, access to information, monitoring developments in science and technology and the ability to self-renewing				X
9	Understanding of professional and ethical responsibility				X
10	Information on project management, change management and risk management practices, awareness on entrepreneurship and innovation, knowledge on sustainable development.				X
11	Information about universal and societal effects of engineering applications on health, safety and environment; awareness of the legal consequences of engineering solutions.				X

**Scale for assessing the contribution of the course to the program outcomes:**

**4: High                      3: Medium                      2: Low                      1:None**

**Name of Instructor(s):** Asst. Prof. Dr. Özge YANAZ ÇINAR

**Signature(s):**

**Date:**