ESOGU METALLURGY AND MATERIALS ENGINEERING DEPARTMENT

COURSE INFORMATION FORM

Course Name	Course Code
Calculus I	151911200

Semester	Weekly Course Period		Credit	ECTS
	Theory	Practice		
1	4	0	4	5

Course Catagory (credit distribution)				
Maths and Basic Sciences	Engineering Sciences	Engineering Design	General Education	Social Sciences
✓				

Course Language	Course Level	Course Type
Turkish	Undergraduate	Compulsory

Prerequieite(s)	
Course Objectives	To introduce the concepts of function, limit, continuity, derivative and integral, which are the basic knowledge of mathematics, and to develop their skills in using them when necessary.
Course Description	Functions, Limits and Continuity, Derivation and Applications of differentiation, Definite and indefinite integrals, Applications of integration, improper integrals, polar coordinates

Course Outcomes	Contributed program outcomes	Education Methods*	Assessment Methods **
1 Define the function and reverse function	1a	1, 6	A
2 Explains limit and continuity.	1a	1, 6	A
3 Explain coordinate systems.	1a	1, 6	A
4 Grasp the meaning of derivatives and take derivative	1a	1, 6	A
5 Grasp the meaning of integral and take integral	1a	1, 6	A
6			
7			
8			
9			
10			

*Educaiton Methods 1:Lecture, 2:Discussion, 3:Experiment, 4:Analogy, 5:Question-Answer, 6:Practice, 7:Observation, 8:Case Study, 9:Technical Tour, 10:Problem/Problem Solving , 11:Individual Work, 12:Team/Group Work, 13:Brainstorming, 14:Project Design / Management, 15:Report Preparation and/or Presentation
**Assessment Methods A:Exam, B:Quiz, C:Oral Exam, D:Homework, E:Report, F:Article Review, G:Presentation, I:Experimentation Skills, J:Project Follow up, K:Class Attendance; L:Jury Exam

Textbook	Balcı, M.,2008, Genel Matematik 1, Balcı Yayınları, Ankara
Supporting Resources	Koçak, M, Genel Matematik, "Diferansiyel ve İntegral Hesap". Balcı, M.,2007, Genel Matematik Problemleri 1, Balcı Yayınları, Ankara
Tools and Equipment Required for the Course	Lectures and applications

COURSE SYLLABUS	
1	Function concept and properties
2	Essential functions and their graphs
3	Trigonometric, exponential, logarithmic and hyperbolic functions
4	Limit
5	Continuity
6	Derivatives and derivation rules
7	Derivatives of Trigonometric, Exponential, Logarithmic and Hyperbolic functions
8	**MIDTERM**
9	L'Hospital's rule, geometric meaning of derivative
10	Maximum-minimum problems
11	Drawing curve, indefinite integrals
12	Integration formulas, definite integrals
13	Applications of integration
14	Improper integrals, polar coordinates
15	Practice
16,17	**FINAL EXAM**

Calculation of Course Workload			
Activities	**Number**	**Duration (hr)**	**Total Workload (hr)**
Course Duration (total weekly course hours)	14	4	56
Class Study time (revision, reinforcement, pre-study,….)	10	4	40
Homework			
Quiz			
Quiz preparation			
Oral Exam			
Oral Exam prep			
Report (including preparation and presentation time)			
Project (including preparation and presentation time)			
Presentation (including preparation time)			
Midterm	1	2	2
Midterm Exam preparation	7	2	14
Semester final exam	1	2	2
Final exam preparation	10	2	20
		Total workload	**134**
		Total workload / 30	**4.5**
		Course ECTS Credits	**5**

Assessment	
Semester activities	**%**
Midterm	40
Semester final exam	60
Total	100

RELATIONSHIP BETWEEN THE COURSE LEARNING OUTCOMES AND THE PROGRAM OUTCOMES (PO) (5: Very high, 4: High, 3: Middle, 2: Low, 1: Very low)		
NO	**PROGRAM OUTCOME**	**Contribution**
1	To possess sufficient knowledge in mathematics, science, and engineering subjects related to Metallurgical and Materials Engineering; the ability to apply theoretical and practical knowledge in these areas to model and solve engineering problems.	5
2	The ability to identify, define, formulate, and solve complex engineering problems by selecting and applying appropriate analysis and modeling methods.	2
3	The ability to design a complex system, process, device, or product under realistic constraints and conditions to meet specific requirements by applying modern design methods.	2
4	The ability to develop, select, and use modern techniques and tools necessary for engineering applications encountered as a Metallurgical and Materials Engineer; the ability to effectively use information technology.	3
5	The ability to design experiments, conduct experiments, collect data, analyze results, and interpret findings for the investigation of engineering problems.	2
6	The ability to work effectively individually, as well as within disciplinary and interdisciplinary teams.	2
7	The ability to communicate effectively in Turkish, both verbally and in writing; knowledge of at least one foreign language.	2
8	The awareness of the necessity for lifelong learning; the ability to access information, follow developments in science and technology, and continuously renew oneself.	2
9	Awareness of professional and ethical responsibility.	2
10	Knowledge about business practices such as project management, risk management, and change management; awareness of entrepreneurship, innovation, and sustainable development.	2
11	Knowledge about the universal and societal impacts of engineering applications on health, environment, and safety; awareness of the legal consequences of engineering solutions.	3
12	Awareness of quality consciousness and sustainability in material selection, product development, and production processes in engineering applications; awareness of quality control.	3
13	The ability to confidently approach problems encountered in engineering applications.	2

INSTRUCTOR(S)			
Instructor(s)			
Signature			

17/7/2024

*Educaiton Methods 1:Lecture, **2:**Discussion, **3:**Experiment, **4:**Analogy, **5:**Question-Answer, **6:**Practice, **7:**Observation, **8:**Case Study, **9:**Technical Tour, **10:**Problem/Problem Solving , **11:**Individual Work, **12:**Team/Group Work, **13:**Brainstorming, **14:**Project Design / Management, **15:**Report Preparation and/or Presentation
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