## OSTIM TECHNICAL UNIVERSITY INSTITUTE OF SCIENCES ELECTRICAL AND ELECTRONICS ENGINEERING

## COURSE SCHEDULE FORM 2023-2024 FALL/SPRING

Course CODE Course NAME								
Course Unit Name	Course Unit Code	Semester	Lecture Hr	Practice Hr	Lab Hr	Credit	ECTS	
Engineering Mathematics I	Math 101	Fall	4	1	0	4	6	

Course Details	
Language of Instruction	English
Level of Course Unit	Bachelor's Degree
Program	Aerospace Engineering Computer Engineering Electrical and Electronics Engineering Industrial Engineering Material Science and Engineering Mechanical Engineering Software Engineering
Mode of Delivery	Face to Face
Type of Course Unit	Compulsory
Objectives of the Course	The basic objective of Calculus is to relate small-scale (differential) quantities to large-scale (integrated) quantities. This is accomplished by means of the Fundamental Theorem of Calculus. Students should demonstrate an understanding of the integral as a cumulative sum, of the derivative as a rate of change, and of the inverse relationship between integration and differentiation.
Course Content	Functions, Limit and Continuity, Derivatives, Applications of Derivatives, Integrals, Applications of Integrals, Transcendental Functions
Course Method and Techniques	<ol> <li>Primarily to give the basic idea of topics and help the students to see the big picture.</li> <li>To support the issues with a variety of examples.</li> <li>Reinforcing learning through regular homework research and team activities.</li> <li>Holding midterm exam and final exam.</li> </ol>
Prerequisites and Corequisities	The prerequisites are high school algebra and trigonometry
Course Coordinator	
Name of Lecturer(s)	
Assistants	

Work Placement(s)	

## Recommended or Required Reading

Resources: Textbook(s): 1- *G.B Thomas, J. Hass, M.D.Weir, C. Heil, Thomas' Calculus,* 14th Edition, Pearson

2- R.A. Adams, Calculus: A complete course 8-th revised ed., Prentice Hall, 2013.

3- J. Stewart, Calculus, Metric Version, Eighth Edition, 2016, Cengage Learning

## **Course Category**

Mathematics and Basic Science	es : % 100	Education	: %
Engineering	: %0	Science	: %
Engineering Design	: %0	Health	: %
Social Sciences	: %	Profession	: %

Weekly Detailed Course Contents						
Week No	Topics	Pre-study & Materials				
1	Functions of a Single Variable					
2	Limit and Continuity					
3	Limit and Continuity					
4	Derivatives					
5	Derivatives					
6	Derivatives and Applications					
7	Midterm Exam					
8	Derivatives and Applications					
9	Integration					
10	Integration					
11	Integration and Applications					
12	Integration and Applications					
13	Transcendental Functions					
14	Transcendental Functions					
15	L'Hopital's Rule					
16	Final Exam					

Course	Learning Outcomes
No	Learning Outcomes
C1	Using both the definition of derivative as a limit and the rules of differentiation to differentiate
CI	functions.
C2	Sketching the graph of a function using asymptotes, critical points, and the derivative test for
	increasing/decreasing and concavity properties.
C3	Setting up max/min problems and using differentiation to solve them.
C4	Evaluating integrals by using the Fundamental Theorem of Calculus.
C5	Using both the definition of derivative as a limit and the rules of differentiation to differentiate
	functions and using L'Hôpital's rule.
C6	Applying integration to compute areas and volumes by slicing, volumes of revolution,
	arclength, and surface areas of revolution.

	Finding inverse functions and their derivatives, using calculus to obtain rigorous and precise
C7	definitions and properties of the exponential and logaritmic functions.

Progra	mme Outcomes
No	Outcomes
P01	Reaches the knowledge broadly and in depth by doing scientific research in the field, evaluates, interprets and applies the knowledge.
P02	Has comprehensive knowledge about current techniques and methods applied in engineering and their constraints.
P03	Complements and applies knowledge with scientific methods, using uncertain, limited or incomplete data; can use information from different disciplines together.
P04	He is aware of the new and developing applications of his profession, examines and learns them when needed.
P05	Defines and formulates problems related to the field, develops methods to solve and applies innovative methods in solutions.
P06	Develops new and/or original ideas and methods; designs complex systems or processes and develops innovative/alternative solutions in their designs.
P07	Designs and implements theoretical, experimental and modeling research; examines and solves complex problems encountered in this process.
P08	Can work effectively in disciplinary and multi-disciplinary teams, lead such teams and develop solutions in complex situations; can work independently and take responsibility.
P09	Communicates verbally and in writing by using a foreign language at least at the B2 General Level of the European Language Portfolio.
P10	He/she conveys results of his/her studies systematically and clearly in written or verbal form in national and international environments in that field or outside the field.
P11	Knows the social, environmental, health, safety, legal aspects of engineering applications, project management and business life applications and is aware of the constraints they impose on engineering applications.
P12	Observes social, scientific and ethical values in the stages of data collection, interpretation, announcement and in all professional activities.

Assessment Methods and Criteria		
In-term studies	Quantity	Percentage
Attendance		
Lab		
Practice		
Fieldwork		
Course-specific internship (if any)		
Quiz/Studio/Criticize	1	%10
Homework		
Presentation		
Project		
Report		
Seminar		
Midterm Exam	1	%30
Final Exam	1	%60
	Total	%100
Contribution of Midterm Studies to Success Grade		

Contribution of End of Semester Studies to Success Grade		
	Total	% 100

ECTS Allocated Based on Student Workload						
Activities	Quantity	Duration (Hr)	Total Work Load			
Weekly Theoretical Course Hrs (Including the exam week: 16 x total course hours)	16	4	64			
Lab						
Practice	16	2	32			
Course-specific internship (if any)						
Fieldwork						
Out-of-class study time	1	16	16			
Presentation/Seminar Preperation						
Project						
Report						
Homework						
Quiz/Studio/Criticize	1	5	5			
Midterm Exam and Preperation for Midterm	1	15	15			
Final Exam and Preperation for Final Exam	1 20		20			
Total Workload			152			
ECTS Credit	(152	2 / 25 ) =	6,08			

Contribution of Course Learning Outcomes to Programme Outcomes									
Contribu	tion: 1: V	ery Slight	2:Slight 3	B:Moderat	e 4:Signif	icant 5:Ve	ery Signifi	cant	
P01 P02 P03 P04 P05 P06									
C1	4	4	3		4	4			
C2	4	4	3		4	4			
С3	4	4	3		4	4			
C4	4	4	3		4	4			
C5	4	4	3		4	4			
C6	4	4	3		4	4			
C7	4	4	3		4	4			