TOROS ÜNİVERSİTESİ

Faculty Of Engıneerıng
Industrıal Engıneerıng (Englısh)

Course Information

CALCULUS II					
Code	**Semester**	**Theoretical**	**Practice**	**National Credit**	**ECTS Credit**
		Hour / Week			
MAT106	Spring	3	2	4	6

Prerequisites and co-requisites	
Language of instruction	English
Type	Required
Level of Course	Bachelor's
Lecturer	Asst. Prof. Dr. Türker Ertem
Mode of Delivery	Face to Face
Suggested Subject	None
Professional practise (internship)	None
Objectives of the Course	The sequence MAT105-106 is the standard complete introduction to the concepts and methods of calculus. It is taken by all engineering students. The emphasis is on concepts, solving problems, theory, and proofs. All sections are given a uniform midterm and a final exam. Students will develop their reading, writing, and questioning skills in mathematics.
Contents of the Course	Sequences and infinite series. Power series. Taylor series. Vectors and analytic geometry in 3-space. Functions of several variables: limits, continuity, partial derivatives. Chain rule. Directional derivatives. Tangent planes and linear approximations. Extreme values. Lagrange multipliers. Double integrals. Double integrals in polar coordinates. General change of variables in double integrals. Surface parametrization and surface area in double integrals. Triple integrals in Cartesian, cylindrical and spherical coordinates. Parametrization of space curves. Line integrals. Path independence. Green s theorem in the plane.

Learning Outcomes of Course

#	Learning Outcomes
1	To effectively write mathematical solutions in a clear and concise manner.
2	To graphically and analytically synthesize and to apply multivariable and vector-valued functions and their derivatives, using correct notation and mathematical precision.
3	To use double, triple and line integrals in applications, including Green's Theorem.
4	To synthesize the key concepts of differential, integral and multivariate calculus.

Course Syllabus

#	Subjects	Teaching Methods and Technics
1	Ch. 9: Sequences, Series, and Power Series 9.1 Sequences and Convergence 9.2 Infinite Series 9.3 Convergence Tests for Positive Series	lecturing, discussing, problem solving
2	9.3 Convergence Tests for Positive Series 9.4 Absolute and Conditional Convergence	lecturing, discussing, problem solving
3	9.5 Power Series 9.6 Taylor and Maclaurin Series	lecturing, discussing, problem solving
4	9.7 Applications of Taylor and Maclaurin Series Ch. 10: Vectors and Coordinate Geometry in 3-Space 10.1 Analytic Geometry in Three Dimensions 10.2 Vectors	lecturing, discussing, problem solving

5	10.3 The Cross Product in 3-Space 10.4 Planes and Lines 10.5 Quadric Surfaces Ch. 12: Partial Differentiation 12.1 Functions of Several Variables	lecturing, discussing, problem solving
6	12.2 Limits and Continuity 12.3 Partial Derivatives 12.4 Higher-Order Derivatives 12.5 The Chain Rule	lecturing, discussing, problem solving
7	12.6 Linear Approximations, Differentiability, and Differentials 12.7 Gradients and Directional Derivatives	lecturing, discussing, problem solving
8	12.8 Implicit Functions Ch. 13: Applications of Partial Derivatives 13.1 Extreme Values 13.2 Extreme Values of Functions Defined on Restricted Domains	lecturing, discussing, problem solving
9	13.3 Lagrange Multipliers Ch. 14: Multiple Integration 14.1 Double Integrals 14.2 Iteration of Double Integrals in Cartesian Coordinates	lecturing, discussing, problem solving
10	14.4 Double Integrals in Polar 14.5 Triple Integrals 14.6 Change of Variables in Triple Integrals	lecturing, discussing, problem solving
11	14.7 Applications of Multiple Integrals (The Surface Area of a Graph) Ch. 11: Vector Functions and Curves 11.1 Vector Functions of One Variable 11.3 Curves and Parametrizations	lecturing, discussing, problem solving
12	Ch. 15: Vector Fields 15.3 Line Integrals 15.1 Vector and Scalar Fields	lecturing, discussing, problem solving
13	16.1 Gradient, Divergence, and Curl 15.2 Conservative Fields 15.4 Line Integrals of Vector Fields	lecturing, discussing, problem solving
14	15.4 Line Integrals of Vector Fields Ch. 16: Vector Calculus 16.3 Green’s Theorem in the Plane	lecturing, discussing, problem solving
15		
16	Final Exam	

Course Syllabus

#	Material / Resources	Information About Resources	Reference / Recommended Resources
1	Robert A. Adams, Christopher Essex, Calculus: A Complete Course	Pearson Education	
2	James Stewart, Calculus	Brooks/Cole	
3	George B. Thomas Jr., Maurice D. Weir, Joel R. Hass, Thomas’ Calculus	Pearson Education	

Method of Assessment

#	Weight	Work Type	Work Title
1	20%	Mid-Term Exam	Mid-Term Exam
2	80%	Final Exam	Final Exam

Relationship between Learning Outcomes of Course and Program Outcomes

#	Learning Outcomes	Program Outcomes	Method of Assessment
1	To effectively write mathematical solutions in a clear and concise manner.	1,7	1,2
2	To graphically and analytically synthesize and to apply multivariable and vector-valued functions and their derivatives, using correct notation and mathematical precision.	1,7	1,2
3	To use double, triple and line integrals in applications, including Green's Theorem.	1,7	1,2
4	To synthesize the key concepts of differential, integral and multivariate calculus.	1,7	1,2

PS. The numbers, which are shown in the column Method of Assessment, presents the methods shown in the previous table, titled as Method of Assessment.

Work Load Details

#	Type of Work	Quantity	Time (Hour)	Work Load

1	Course Duration	14	5	70
2	Course Duration Except Class (Preliminary Study, Enhancement)	14	6	84
3	Presentation and Seminar Preparation	0	0	0
4	Web Research, Library and Archival Work	0	0	0
5	Document/Information Listing	0	0	0
6	Workshop	0	0	0
7	Preparation for Midterm Exam	1	10	10
8	Midterm Exam	1	2	2
9	Quiz	0	0	0
10	Homework	0	0	0
11	Midterm Project	0	0	0
12	Midterm Exercise	0	0	0
13	Final Project	0	0	0
14	Final Exercise	0	0	0
15	Preparation for Final Exam	1	12	12
16	Final Exam	1	2	2
				180