Calculus II

Course Code:

MATH 132

Course Period:

Spring

Course Type:

Core

Credits:

4

Theoric:

3

Practice:

2

Laboratory Hour:

0

ECTS:

6

Prerequisite Courses:

Calculus I [1]
Course Language:

English

Course Objectives:

The aim of this course is to provide students with an understanding of sequences, series, analytic geometry in 3-space, limits and partial derivatives of functions of several variables, multiple integrals, line integrals of vector fields and their calculations.

Course Content:

Applications of integrals; volumes of solids of revolution, arc length, areas of surfaces of revolution. Convergence of sequences. Convergence tests for series. Power, Taylor and Maclaurin series. Analytic geometry in 3-space. Functions of several variables, partial derivatives, extreme values. Double integrals

Course Methodology:

1: Lecture, 2: Problem Solving

Course Evaluation Methods:

A: Written examination

Learning Outcomes	**Teaching Methods**	**Assessment Methods**
1) Knows the concepts of convergence of sequences and series and performs related calculations.	1,2	A
2) Knows the concepts of vectors, lines, planes and quadric surfaces in 3-space and performs related calculations.	1,2	A
3) Knows the concept of double integrals and some of its applications and performs related calculations.	1,2	A

Week	**Topics**	**Study Materials**
1	Volumes by slicing - Solids of revolution,	(From Textbook) 7.1,7.2
2	Arc Length and surface area,	7.3
3	Sequences and Convergence, Infinite Series,	9.1,9.2
4	Convergence Tests for Positive Series,	9.3
5	Absolute and Conditional Convergence, Power Series,	9.4,9.5
6	Taylor and Maclaurin Series, Applications of Taylor and Maclaurin Series,	9.6,9.7
7	Analytic Geometry in Three Dimensions, Vectors,	10.1,10.2
8	The Cross Product in 3-Space, Planes and Lines,	10.3,10.4
9	Quadric Surfaces, Functions of Several Variables, Limits and Continuity	10.5,12.1,12.2
10	Partial Derivatives, Higher-Order Derivatives, The Chain Rule	12.3,12.4,12.5

11	Linear Approximations, Differentials, Gradients and Directional Derivatives, Implicit Functions	12.6,12.7,12.8
12	Extreme Values, Extreme Values of Functions Defined on Restricted Domains, Lagrange Multipliers	13.1,13.2,13.3
13	Double Integrals, Iteration of Double Integrals in Cartesian Coordinates	14.1,14.2
14	Double Integrals in Polar Coordinates, Change of variables in double Integrals	14.4

Textbook	R. A. Adams and C. Essex, Calculus, 7th Ed., Pearson (2010)
Additional Resources	

IN-TERM STUDIES	**NUMBER**	**PERCENTAGE**
Mid-terms	2	100
Quizzes	0	0
Assignments	0	0
Total		**100**
CONTRIBUTION OF FINAL EXAMINATION TO OVERALL GRADE	1	40
CONTRIBUTION OF IN-TERM STUDIES TO OVERALL GRADE		60
Total		**100**

No	**Program Learning Outcomes**	**Contribution**				
		1	**2**	**3**	**4**	**5**
1	The ability to make computation on the basic topics of mathematics such as limit, derivative, integral, logic, linear algebra and discrete mathematics which provide a basis for the fundamenral research fields in mathematics (i.e., analysis, algebra, differential equations and geometry)					**X**
2	Acquiring fundamental knowledge on fundamental research fields in mathematics					**X**
3	Ability form and interpret the relations between research topics in mathematics			**X**		
4	Ability to define, formulate and solve mathmatical problems					**X**

5	Consciousness of professional ethics and responsibilty	**X**				
6	Ability to communicate actively					
7	Ability of self-development in fields of interest					**X**
8	Ability to learn, choose and use necessary information technologies					
9	Lifelong education					

Activities	**Quantity**	**Duration (Hour)**	**Total Workload (Hour)**
Course Duration (14x Total course hours)	14	5	70
Hours for off-the-classroom study (Pre-study, practice)	14	3	42
Mid-terms (Including self study)	2	8	16
Quizzes			
Assignments			
Final examination (Including self study)	1	12	12
Total Work Load			140
Total Work Load / 25 (h)			5.6
ECTS Credit of the Course			6