Course Unit Title	Calculus I
Course Unit Code	MAT 101
Type of Course Unit	Compulsory
Level of Course Unit	1st year BSc program
National Credits	4
Number of ECTS Credits Allocated	6
Theoretical (hour/week)	4
Practice (hour/week)	-
Laboratory (hour/week)	-
Year of Study	1
Semester when the course unit is delivered	1
Course Coordinator	Assist. Prof. Dr. Ali Denker
Name of Lecturer (s)	Assist. Prof. Dr. Ali Denker
Name of Assistant (s)	-
Mode of Delivery	Face to Face,
Language of Instruction	English
Prerequisites	-
Recommended Optional Programme Components	

Course description:

Limits and continuity. Derivatives. Rules of differentiation. Higher order derivatives. Chain rule. Related rates. Rolle's and the mean value theorem. Critical Points. Asymptotes. Curve sketching. Integrals. Fundamental Theorem. Techniques of integration. Definite integrals. Application to geometry and science. Indeterminate forms. L'Hospital's Rule**.**

Learning Outcomes

At the end of the course the student should be able to		Assessment
1	Recognize properties of functions and their inverses.	1
2	Recall and use properties of polynomials, rational functions, exponential, logarithmic, trigonometric and inverse-trigonometric	1
3	Understand the terms domain and range	1, 2
4	Sketch graphs, using function, its first derivative, and the second derivative	1, 2
5	Use the algebra of limits, and l'Hôspital's rule to determine limits of simple expressions	1, 2
6	Apply the procedures of differentiation accurately, including implicit and logarithmic differentiation and apply the differentiation procedures to solve related rates and extreme value problems	1,2
7	Obtain the linear approximations of functions and to approximate the values of functions	1,2
8	Perform accurately definite and indefinite integration, using integration by parts, substitution, inverse substitution	1,2
9	Understand and apply the procedures for integrating rational functions	1,2
Assessment Methods: 1. Written Exam, 2. Assignment		

Course's Contribution to Program

		CL

1	Apply knowledge of mathematics, natural science with relevant to life science and multidisciplinary context of engineering science	5
2	Analyze, design and cınduct experiments, as well as to analyzeand interpret data.	4
3	Design a system, component or process to meet desired needs within realistic constraints such as economic, environmental, social, political, ethical, health and safety, manufacturability and sustainability.	3
4	Function on multidisciplinary teams.	2
5	Control of design work, by using simulation, modeling and tests and integration in a problem solving oriented way.	1
6	Display an understanding of professional and ethical responsibility.	1
7	Communicate effectively aware of the non-technical effects of engineering.	1
8	Search technical literature and other information sources.	1
9	Recognize of the need for, and an ability to engage in life-long learning.	1
10	Exhibit knowledge of contemporary issues.	3
11	Use the techniques, skills and modern engineering tools necessary for engineering practice to develop marketable products for the global market.	1
CL: Contribution Level (1: Very Low, 2: Low, 3: Moderate, 4: High, 5: Very High)		

Course Contents

Week	Chapter	Topics	Exam
1	1	Preparation for Calculus	
2,3	2	Limits and Their Properties , Continuity	Quiz
4,5	3	Dıfferentiation: The Derivative and the Tangent Line Problem Basic Differentiation Rules and Rate of Change	
6	3	The chain rule, The derivative Of Trigonometric Functions. Hıgher Order Derivative , Derivative of İnverse Function, Implicit Differentiation ,Related Rates	Quiz
7			Midterm
8,9	4	APPLICATIONS OF DIFFERENTIATION: Extrema on an Interval Rolle's Theorem and the Mean Value Theorem Increasing and Decreasing Functions and The First Derivative Test	
10		Concavity and The Second Derivative Test, Limits at İnfinity, Curve Sketching, Optimization Problems	
11	5	INTEGRATION: Antiderivatives and Indefinite Integration, Areas Riemann Sum and Definite Integral, The Fundamental Theorem of Calculus	
12	5	Integration by Substitution, Numerical Integration, The Natural Logarithm as an Integral. Inverse Trigonometric Functions: Integration	Quiz
13	7	Applications of Integration: Area of a Region Between Two curves, Volume: The Disk Method	
14	8	INTEGRATION TECHNIQUES, L'HOPITAL'S RULE: Basic Integration Rules, Integration by Parts, Trigonometric Integrals	Quiz

		Trigonometric Substitution	
15	8	Partial Fractions, Indeterminate forms and L'Hopital's Rule	
16			Final

Recommended Sources

Textbook:
CALCULUS, Early Transcendental Functions Ron Larsaon, Bruce Edwards 5rd.edition, 2011

Supplementary Course Material

1- Early Transcendental Functions Robert Smith, Roland Minton 3rd.edition,2007
2- CALCULUS 7th edition Robert A.ADAMS , Christopher Essex 2010

Assessment		
Attendance & Assignment	15%	
Midterm Exam	30%	Written Exam
Quizzes	10%	
Final Exam	45%	Written Exam
Total	100%	

Assessment Criteria

Final grades are determined according to the Near East University Academic Regulations for Undergraduate Studies

Course Policies

1. Attendance to the course is mandatory.
2. Late assignments will not be accepted unless an agreement is reached with the lecturer.
3. Cheating and plagiarism will not be tolerated. Cheating will be penalized according to the Near East University General Student Discipline Regulations

ECTS allocated based on Student Workload

Activities	Number	Duration (hour)	Total Workload(hour)
Course duration in class (including Exam weeks)	16	4	64
Labs and Tutorials	-	-	-
Assignment	2	2	4
Project/Presentation/Report	-	-	-
E-learning activities	-	-	-
Quizzes	4	4	16
Midterm Examination	1	15	15

Final Examination	1	15	15
Self Study	14	5	70
Total Workload			184
Total Workload/30(h)			6.1
ECTS Credit of the Course			6