GAU, Faculty of Engineering

Course Unit Title	Calculus II
Course Unit Code	MT112
Type of Course Unit	Compulsory
Level of Course Unit	1st Year BSc
National Credits	4
Number of ECTS Credits Allocated	6 ECTS
Theoretical (hour/week)	3
Practice (hour/week)	2
Laboratory (hour/week)	-
Year of Study	1
Semester when the course unit is delivered	2
Mode of Delivery	Face to Face, E-learning activities
Language of Instruction	English
Prerequisities and co-requisities	Knowledge of Calculus 1 is necessary
Recommended Optional Programme Components	-

Objectives of the Course:

Main objectives of this course are to enable students to understand major background of integration and its applications.

Learning Outcomes

When this course has been completed the student should be able to		Assesment.
1	Become familiar about how to use integration and its applications to solve engineering problems	1,2
2	Understand the concepts of definite and indefinite integral	1,2
3	Learn finding areas between curves	1,2
4	Learn techniques of integration	1,2
5	Learn volumes of solids	1,2
6	Learn arclengts and surface areas	1,2
7	Learn improper integrals	1,2

Assesment Methods: 1. Written Exam, 2. Assignment 3. Project/Report, 4.Presentation, 5 Lab. Work

Course's Contribution to Program

		CL
1	Ability to understand and apply knowledge of mathematics, science, and engineering	5
2	Ability to design and conduct experiments as well as to analyze and interpret data	-
3	Ability to work in multidisciplinary teams while exhibiting professional responsibility and ethical conduct	-
4	Ability to apply systems thinking in problem solving and system design	2
5	Knowledge of contemporary issues while continuing to engage in lifelong learning	1
6	Ability to use the techniques, skills and modern engineering tools necessary for engineering practice	-
7	Ability to express their ideas and findings, in written and oral form	-
8	Ability to design and integrate systems, components or processes to meet desired needs within realistic constraints	-
9	Ability to approach engineering problems and effects of their possible solutions within a well structured, ethically responsible and professional manner	1

CL: Contribution Level (1: Very Low, 2: Low, 3: Moderate 4: High, 5:Very High)

Course Contents

Week		Exams
1	Review of Calculus 1	
2	Integration: Sums and Sigma Notation	
3	Areas as limits of sums	
4	The definite integral and the indefinite integral	
5	Techniques of integration: Substitution	
6	Integration by parts	
7	Integrals of trigonometric functions	
8		Midterm
9	Integration by parts	
10	Partial fraction decomposition and integrals of rational functions	
11	Application of Integrals: Areas	
12	Volumes of solids of revolution	
13	Arclength and Surface integral	
14	Inroduction to Differential Equations	
15		Final

Recommended Sources

Textbook: Calculus a Complete Course; Robert A. Adams; Pearson, 6th Edition, 2006.
Supplementary Material (s): Thomas Calculus, Early Transcendentals; George B. Thomas; Pearson, 11th Edition, 2005.

Assessment

Attendance & E-learning & Quiz	20%	
Midterm Exam (Written)	35%	
Final Exam (Written)	45%	
Total	100%	

ECTS Allocated Based on the Student Workload

Activities	Number	Duration (hour)	Total Workload(hour)
Course duration in class (including the Exam week)	15	3	45
Labs and Tutorials	13	2	26
Assignments	5	2	10
Project/Presentation/Report Writing	-	-	-
E-learning Activities	-	-	-
Quizzes	1	6	6
Midterm Examination	1	20	20
Final Examination	1	30	30
Self Study	14	2	28
Total Workload			165
Total Workload/30 (h)			5.5
ECTS Credit of the Course			6