GAU, Faculty of Engineering

Course Unit Title	Engineering Mathematics
Course Unit Code	MT212
Type of Course Unit	Compulsory, All engineering students
Level of Course Unit	2nd Year BSc
National Credits	3
Number of ECTS Credits Allocated	6 ECTS
Theoretical (hour/week)	2
Practice (hour/week)	1
Laboratory (hour/week)	-
Year of Study	2
Semester when the course unit is delivered	2
Mode of Delivery	Face to Face,
Language of Instruction	English
Prerequisities and co-requisities	MT211
Recommended Optional Programme Components	Basic bacground for high school algebra and trigonometry.

Objectives of the Course:

- Designed for students working on a degree in science, mathematics, computer science, and those planning on certain types of graduate work.
- Students should also be able to solve inequalities and equations involving exponential, logarithmic and trigonometric functions
- Improve their ability to think critically, to analyze a problem and solve it using a wide array of tools

Learning Outcomes

When this course has been completed the student should be able to		Assesment.
1	Understand and apply two and three dimensional Cartesian coordinate system;	1,2
2	Recognize and classify the equations and shapes of quadratic surfaces;	1,2
3	recognize and construct the equations of lines and planes;	1,2
4	Evaluate doubleand triple integrals in Cartesian and polar coordinates and triple integrals in Cartesian and cylindrical coordinates;	1,2
5	find line integrals and flux using Green's Theorem and find circulation of a vector field using Stoke's theorem;use Divergence Theorem to find the flux of a vector field.	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	4
2	Ability to design and conduct experiments as well as to analyze and interpret	3
3	Ability to work in multidisciplinary teams while exhibiting professional responsibility and ethical conduct	1
4	Ability to apply systems thinking in problem solving	4
5	Knowledge of contemporary issues while continuing to engage in lifelong learning	3
6	Ability to use the techniques, skills and modern engineering tools necessary for engineering practice	3
7	Ability to express their ideas and findings, in written and oral form	4
8	Ability to design and integrate systems, components or processes to meet desired needs within realistic constraints	2
9	Ability to approach engineering problems and effects of their possible solutions within a well structured, ethically responsible and professional manner	3

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

Course Contents

Week			Exams
1		Introduction	
2		Multiple Integrals : Double Integrals	
3		Double integrals in polar coordinates	
4		Triple Integrals	
5		Change of variables in triple integrals	
6		Vector fields	
7		Vector and scalar fields	
8			Midterm
9		Conservative Fields	
10		Line integrals	
11		Line integrals of vector fieds	
12		Gradient, Divergence and Curl	
13		Green's Theorem in the plane, Divergence theorem	
14		Stoke's Theorem	
15			Final

Recommended Sources

Textbook: "Calculus a Complete Course", Robert A. Adams, Pearson 6th Edn 2006

Supplementary Material (s):
1)"Calculus Early Transcendental Functions", Robert T.Simith & Roland B. Minton 4th Edition,2012
2) "Calculus Early Transcendental" Briggs Cochran ,William Briggs, Lyle Cochran, Bernard Gıllett

Assessment

Attendance& Assignment & 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	2	30
Tutorials	15	1	15
Assignments	5	3	15
Project/Presentation/Report Writing	-	-	-
E-learning Activities	-	-	-
Quizzes	3	8	24
Midterm Examination	1	15	15
Final Examination	1	20	20
Self Study	15	3	45
Total Workload			164
Total Workload/30 (h)			5.5
ECTS Credit of the Course			6