TISHK INTERNATIONAL UNIVERSITY
FACULTY OF ENGINEERING
Department of MECHATRONICS ENGINEERING,
2021-2022 Spring
Course Information for ME 212 ADVANCED MATHEMATICS II

Course Name:	ADVANCED MATHEMATICS II				
Code	**Regular Semester**	**Theoretical**	**Practical**	**Credits**	**ECTS**
ME 212	4	3	-	3	3

Name of Lecturer(s):	Tariq Kakahama
Teaching Assistant:	non
Course Language:	-
Course Type:	Main
Office Hours	Wednesday
Contact Email:	tariq.kakahama@tiu.edu.iq Tel:07500000
Teacher's academic profile:	PhD
Course Objectives:	Provide students with mathematical principles that they will use in the technical courses of the upper levels. The main goal of this course is introduce students how to formulate models from physical problem arising from engineering problems. Students will also introduce to function of several variables and vectors in the plain and space. Furthermore, introduce the students to the concepts of Laplace equation and Laplace transformation and fourier transform
Course Description (Course overview):	Laplace Transform, Review, applications. The Fourier Integral and Transforms, Fourier Cosine and Sine Integrals . Delta Function the Fourier Transform. Matrices. Complex Numbers and Functions. The Cauchy-Riemann Equations, The Exponential and Trigonometric Functions. Partial differential Equations, The Wave Equation, Wave Equation, Wave Motion on an Interval , Heat equation.

COURSE CONTENT

Week	Hour	Date	Topic
1	3	6-10/2/2022	Course introduction and Syllabus explanation chapter one : Sequence
2	3	13-17/2/2022	Series and Tests
3	3	20-24/2/2022	Geometric series
4	3	27/2-3/3/2022	Vector in the plain, Define vectors, operations of the vectors and give some examples about it
5	3	6-10/3/2022	Vectors in the space, examples and some theorems of vectors in the plain, Line in the space, cross products of the vectors
6	3	27-31/3/2022	Functions of several variable
7	3	3-7/4/2022	Domain range of the functions of several variable
8	3	10-14/4/2022	Midterm Exam
9	3	17-21/4/2022	derivative 1
10	3	24-28/4/2022	derivative 2
11	3	8-12/5/2022	Derivative
12	3	15-19/5/2022	Partial derivatives ,Higher order Partial derivatives
13	3	22-26/5/2022	Implicit differential, Direction derivatives and gradients
14	3	29/5-2/6/2022	Cylinder coordinate

| 15 | 3 | 5-9/6/2022 | Final Exam |
| 16 | 3 | 12-16/6/2022 | Final Exam |

COURSE/STUDENT LEARNING OUTCOMES

1	Sequences and Series
2	Functions of several variables
3	Vector in the plain and space
4	Limits and continuity in higher dimensions
5	Partial derivatives ,Higher order Partial derivatives, Implicit differential, Direction derivatives and gradients

COURSE'S CONTRIBUTION TO PROGRAM OUTCOMES
(Blank : no contribution, I: Introduction, P: Profecient, A: Advanced)

	Program Learning Outcomes	Cont.
1	Apply the knowledge as well as the ability to implement mathematics, science, and engineering fundamentals and construct solution of complex engineering problems.	A
2	analyze and synthesize systems and/or sub-systems that can function in coherence with a variety of initial states and boundary conditions.	P
3	analyze data produced by acquisition systems for both localized and/or remote applications.	A
4	apply the knowledge about environmental issues which they are capable of embracing in their solution constructs coupled with public health and safety requirements.	I
5	identify various parameters of physical quantities such as: temperature, pressure and displacement, through the use of appropriate sensors, transducers and actuators to different processors and provide suitable control for that.	
6	apply the knowledge about the energy demand and the sustainability requirements which can be addressed in any proposed engineering project to achieve and optimized solution.	I
7	communicate effectively and work collaboratively with other engineers and technical personnel.	
8	apply the traits of good leadership, responsibility, passion and active engagement in both professional and community assignments.	I
9	apply personal and industrial safety at work standards.	I
10	draw all necessary plans and procedures to meet good satisfaction based on customer feedback.	
11	apply competency based marketing within the corporate domain that matches standards beyond local arena.	
12	apply the basic organizational and project knowledge skills; and effectively manage resources, tasks and time.	

Prerequisites (Course Reading List and References):	* Thomas, G.B.(7th edition). Calculus and analytic geometry.
Student's obligation (Special Requirements):	Attendance, reading assignments, write homework, quizzes, midterm and final exams
Course Book/Textbook:	Thomas' Calculus" 11th edition
Other Course Materials/References:	Calculus Early Transcendental Functions" by Ron Larson and Bruce Edwards
Teaching Methods (Forms of Teaching):	Lectures, Exercises, Assignments, , ,

COURSE EVALUATION CRITERIA

Method	Quantity	Percentage (%)
Attendance	1	5
Quiz	2	5
Homework	2	5
Project	1	5
Midterm Exam(s)	1	30
Final Exam	1	40
Total		**100**

Examinations: Essay Questions, Multiple Choices, Short Answers, , ,

Extra Notes:

ECTS (ALLOCATED BASED ON STUDENT) WORKLOAD

Activities	Quantity	Workload Hours for 1 quantity*	Total Workload
Theoretical Hours	16	3	48
Practical Hours	16	0	0
Final Exam	1	40	40
Attendance	1	5	5
Quiz	2	5	10
Homework	2		0
Project	1		0
Midterm Exam(s)	1		0
Total Workload			**103**
ECTS Credit (Total workload/25)			**4**

Peer review

Signature: Signature: Signature:

Name: Name: Name:

Lecturer   Head of Department   Dean