TISHK INTERNATIONAL UNIVERSITY
FACULTY OF ENGINEERING
Department of CIVIL ENGINEERING,
2020-2021 Spring
Course Information for CE 218 ENGENEERING MATHEMATICS

Course Name:	ENGENEERING MATHEMATICS

Code	Regular Semester	Theoretical	Practical	Credits	ECTS
CE 218	4	3	-	3	

Name of Lecturer(s)-Academic Title:	Saad Khalis -
Teaching Assistant:	-
Course Language:	English
Course Type:	Main
Office Hours	3
Contact Email:	saad.essa@tiu.edu.iq Tel:07504823149
Teacher's academic profile:	Dr. Saad Essa
Course Objectives:	To introduce the basic concepts of numeric methods required to understand and solve equations by iterative methods To teach methods to solve differential equations of various types numerically. To give an ability to apply knowledge of mathematics on engineering problems. To provide vast knowledge in Matrices and their use in linear algebra. To give the ability to model periodic function To understand and solve using Fourier series
Course Description (Course overview):	Introduction, Functions of several variables, Limits and continuity in higher dimension, Partial derivatives , Three - dimensional Laplace equation, Two - dimensional Laplace equation, One –dimensional Wave equation, The chain Rule for function of two independent variables, Gradient vectors, Tangent planes, Total differential, High and low points on the surface

COURSE CONTENT

Week	Hour	Date	Topic
1	3	31/1-4/2/2021	Syllabus presentation, references, reading assignments, and scope of the course
2	3	7-11/2/2021	Use the parallelogram law to add geometric vectors.
3	3	14-18/2/2021	Use parametric equations for plane curves and space curves
4	3	21-25/2/2021	Compute velocity, unit tangent and acceleration vectors along a parametric curve; resolveacceleration into tangential and normal components and compute curvature.
5	3	28/2-4/3/2021	Use the cross product; interpret the cross product geometrically and as area of a parallelogram;interpret the vector triple product as volume of a parallelopiped.
6	3	7-11/3/2021	Recognize cylinders and quadric surfaces from their Cartesian equations.
7	3	28/3-1/4/2021	Represent a function of two variables as the graph of a surface; sketch level curves.
8	3	4-8/4/2021	Calculate partial derivatives and the gradient.
9	3	11-15/4/2021	Midterm Exam
10	3	18-22/4/2021	Midterm Exam
11	3	25-29/4/2021	State the definition of the integral of a function over a rectangle.
12	3	2-6/5/2021	Build on elementary integration techniques to evaluate multiple integrals efficiently.
13	3	9-13/5/2021	Recognize conservative vector fields, and apply the fundamental theorem for line integrals ofconservative vector fields.

14	3	16-20/5/2021	Set up and evaluate integrals over parametric surfaces.
15	3	23-27/5/2021	State and apply the Divergence Theorem.
16	3	30/5-3/6/2021	State and apply Stokes' Theorem.
17	3	6-10/6/2021	Final Exam
18	3	13-17/6/2021	Final Exam

COURSE/STUDENT LEARNING OUTCOMES

1	ability to use numeric methods in solving equations
2	ability to solve differential equations numerically
3	an ability to apply knowledge of mathematics on engineering problems
4	ability in using Matrices in solving problems of linear algebra.
5	ability to understand and solve using Fourier series

COURSE'S CONTRIBUTION TO PROGRAM OUTCOMES

(Blank : no contribution, I: Introduction, P: Profecient, A: Advanced)

	Program Learning Outcomes	**Cont.**
1	Apply principles of mathematics, science, and engineering	P
2	Design and conduct experiments, as well as analyze and interpret data accurately.	I
3	Design an engineering system, component, or process to meet desired industrial needs.	
4	Identify, formulate and solve complex engineering problems	P
5	Apply, in design and construction, the most modern design codes, standards and specifications such as; AISC, ACI, ASCE 7, IBC, etc.	P
6	Use the techniques, skills, and modern engineering tools, such as surveying instruments, and designing software that are necessary for engineering practices.	
7	Apply knowledge and skills in construction project management and recognition of international standards and methodologies	
8	Manage to work with multi-disciplinary teams and communicate effectively.	
9	Identify the moral values that ought to guide the Civil Engineering profession and resolve the moral issues in the profession.	I
10	Apply the principles of sustainable development in their professional duties which go in line with the paramount safety, health and welfare of the public.	
11	Analyze the impact of engineering solutions in a global and social context	P
12	Identify the need and have the ability to engage in lifelong learning and knowledge of contemporary issues.	

Prerequisites (Course Reading List and References):	Calculus I, Calculus II, differential equations
Student's obligation (Special Requirements):	Attend classes, performing class and home works, perform quizzes, participate in class discussions
Course Book/Textbook:	Advanced Engineering Mathematics by Kreyszig
Other Course Materials/References:	Advanced Engineering Mathematics by Wiley Advanced Engineering Mathematics by Zill
Teaching Methods (Forms of Teaching):	Lectures, Excersises, Presentation, Assignments

COURSE EVALUATION CRITERIA

Method	**Quantity**	**Percentage (%)**
Attendance	1	5
Participation	1	10
Quiz	1	10
Homework	1	5
Midterm Exam(s)	1	30
Final Exam	1	40
Total		**100**

Examinations: Essay Questions, True-False, Multiple Choices, Short Answers

Extra Notes:

ECTS (ALLOCATED BASED ON STUDENT) WORKLOAD

Activities	Quantity	Workload Hours for 1 quantity*	Total Workload
Theoretical Hours	18	3	54
Practical Hours	18	0	0
Final Exam	1	35	35
Attendance	1	5	5
Participation	1	5	5
Quiz	1	5	5
Homework	1	10	10
Midterm Exam(s)	1	20	20
Total Workload			**134**
ECTS Credit (Total workload/25)			**5.36**

Peer review

Signature:	Signature:	Signature:
Name:	Name:	Name:
Lecturer	Head of Department	Dean