هيئة تقويم التعليم والتدريب
Education & Training Evaluation Commission

اعتماد
NCAAA

T4

2020

Course Specifications

Course Title:	Partial Differential Equation
Course Code:	MTH 323
Program:	BS-Mathematics
Department:	Mathematics
College:	College of Sciences, AlZulfi
Institution:	Majmaah University, Saudi Arabia

VISION 2030
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Table of Contents

A. Course Identification

1. Credit hours: 4(3+1)	

2. Course type

a.	University ☐	College ☐	Department ☑		Others ☐		
b.	Required ☑		Elective ☐				

3. Level/year at which this course is offered: 1ˢᵗ Semester /1ˢᵗ year

4. Pre-requisites for this course (if any)**:** MTH 202

5. Co-requisites for this course (if any)**:**

6. Mode of Instruction (mark all that apply)

No	Mode of Instruction	Contact Hours	Percentage
1	Traditional classroom	20	45 %
2	Blended	18	40 %
3	E-learning	7	15 %
4	Correspondence		
5	Other		

7. Contact Hours (based on academic semester)

No	Activity	Contact Hours
1	Lecture	45
2	Laboratory/Studio	0
3	Tutorial	10
4	Others (specify)	5
	Total	60

B. Course Objectives and Learning Outcomes

1. Course Description

This course covers the fundamental concepts of partial differentiation and the formation and classification of theses equations by degree and order and linearity, then solution of these equations by means of direct integration or some transformations like Laplace.

2. Course Main Objective

This course aims to give an introduction to partial differential equations. The student enrolled in this course should have a back-ground in Calculus Theory.
1-deduce the differential equations for a family of curves or surfaces
2- solve first-order quasi-linear partial differential equations
3- recognize characteristic curves and canonical forms for second-order partial differential equations
4- apply the Fourier transform to solve boundary value problems

3. Course Learning Outcomes

	CLOs		Aligned PLOs
1	**Knowledge:**		
1.3	The students should be able to Acquire and outline mathematical knowledge and skills in fundamental concepts of sets and relations on them and their properties, and the basic terminology of Boolean algebra and some manipulation operations on it.		K3
2	**Skills :**		
2.2	The students should be able to Demonstrate the work independently and within a team via finding and designing, Euler circuits for example.		S2
3	**Competence:**		
3.3	The students should be able to Critically interpret numerical and graphical data in graph theory.		C3

C. Course Content

No	List of Topics	Contact Hours
1	Partial derivation rules Resolution of partial differential equations using direct integration Resolution of partial differential equations by separation of variables	**9**
2	Formation of partial differential equations from an algebraic equation	**9**
3	First-order quasi-linear partial differential equations	**9**
4	Second-order partial differential equations	**9**
5	Application of the Fourier transform in solving boundary value problems	**9**
Total		**45**

D. Teaching and Assessment

1. Alignment of Course Learning Outcomes with Teaching Strategies and Assessment Methods

Code	Course Learning Outcomes	Teaching Strategies	Assessment Methods
1.0	**Knowledge**		
1.3	The students should be able to Acquire and outline mathematical knowledge and skills in fundamental concepts of sets and relations on them and their properties, and the basic terminology of Boolean algebra and some manipulation operations on it.	**Direct teaching:** Inquiry-based instruction PowerPoints and discussions **Aimed teaching:** Discovery and oral questions **Indirect teaching:** Peer Learning.	• Homework • Quiz • Midterms • Final Exams • E-exam • Oral Exam
2.0	**Skills**		
2.2	The students should be able to Demonstrate the work independently	**Direct teaching:** Lectures **Aimed teaching:**	• Homework • Quiz • Midterms

Code	Course Learning Outcomes	Teaching Strategies	Assessment Methods
	and within a team via finding and designing, Euler circuits for example.	Discovery and oral questions **Indirect teaching**: Peer Learning	• Final Exams • E-exam • Oral Exam
3.0	**Competence**		
3.3	The students should be able to Critically interpret numerical and graphical data in graph theory.	**Direct teaching**: Lectures **Aimed teaching**: Discovery and oral questions **Indirect teaching**: Cooperative Learning	• Homework • Quiz • Midterms • Final Exams
3.2			

2. Assessment Tasks for Students

#	Assessment task*	Week Due	Percentage of Total Assessment Score
1	Quiz 1	4th Week	2.5%
2	Assignment/Home Work 1	5th Week	2.5%
3	Mid Term 1	7th Week	20%
4	Quiz 2	9th Week	2.5%
5	Assignment /Home Work 2	10th Week	2.5%
6	Class Activities/Discussions	10th Week	5%
7	Mid Term 2	12th Week	20%
8	Electronic Test	13th Week	5%
9	Final Exam	---	40%
	Total		100%

*Assessment task (i.e., written test, oral test, oral presentation, group project, essay, etc.)

E. Student Academic Counseling and Support

Arrangements for availability of faculty and teaching staff for individual student consultations and academic advice:

1- 4-office hours per week in the lecturer schedule.

- Sunday 10-12.

- Wednesday 10-12.

2- The contact with students by e-mail and website.
3- activation of the virtual classrooms and academic guidance via Black Board **LMS**.

F. Learning Resources and Facilities

1.Learning Resources

Required Textbooks	• **1. E.C. Zachmanoglou and D.W. Thoe, "Introduction to Partial Differential Equations with Applications", Dover Publication, 1986.**
Essential References Materials	1. . G.F. Carrier and C.E. Pearson, Partial Differential Equations: Theory and Technique, Academic Press, 1976.
Through of semester Electronic Materials	• http://www.wolfram.com/ • http://www.mathworks.com/
Other Learning Materials	

2. Facilities Required

Item	Resources
Accommodation (Classrooms, laboratories, demonstration rooms/labs, etc.)	- Classroom with capacity of 30-students. - Computer Lab of Mathematics Department
Technology Resources (AV, data show, Smart Board, software, etc.)	Mathematical software packages like MATHEMATICA
Other Resources (Specify, e.g. if specific laboratory equipment is required, list requirements or attach a list)	http://mathworld.wolfram.com/classroom/classes/CalculusII.html

G. Course Quality Evaluation

Evaluation Areas/Issues	Evaluators	Evaluation Methods
Effectiveness of teaching and assessment	Students/ internal committee	Direct (Students evaluation electronically organized by Deanship of registration and admission)/ Verification of students' papers
Extent of achievement of course learning outcomes	Staff members (Peer Reviewer)	Indirect (Frequent meetings consultation among the teaching staffs)
Quality of learning resources.	Staff members (course coordinators)	Direct (Meeting between course coordinators and the tutors)

Evaluation areas (e.g., Effectiveness of teaching and assessment, Extent of achievement of course learning outcomes, Quality of learning resources, etc.)
Evaluators (Students, Faculty, Program Leaders, Peer Reviewer, Others (specify)

Assessment Methods (Direct, Indirect)

H. Specification Approval Data

Council / Committee	Mathematics Department
Reference No.	27
Date	8/8/1442 H-21/3/2021 G

Head of Department

Dr. Muqrin Almuqrin