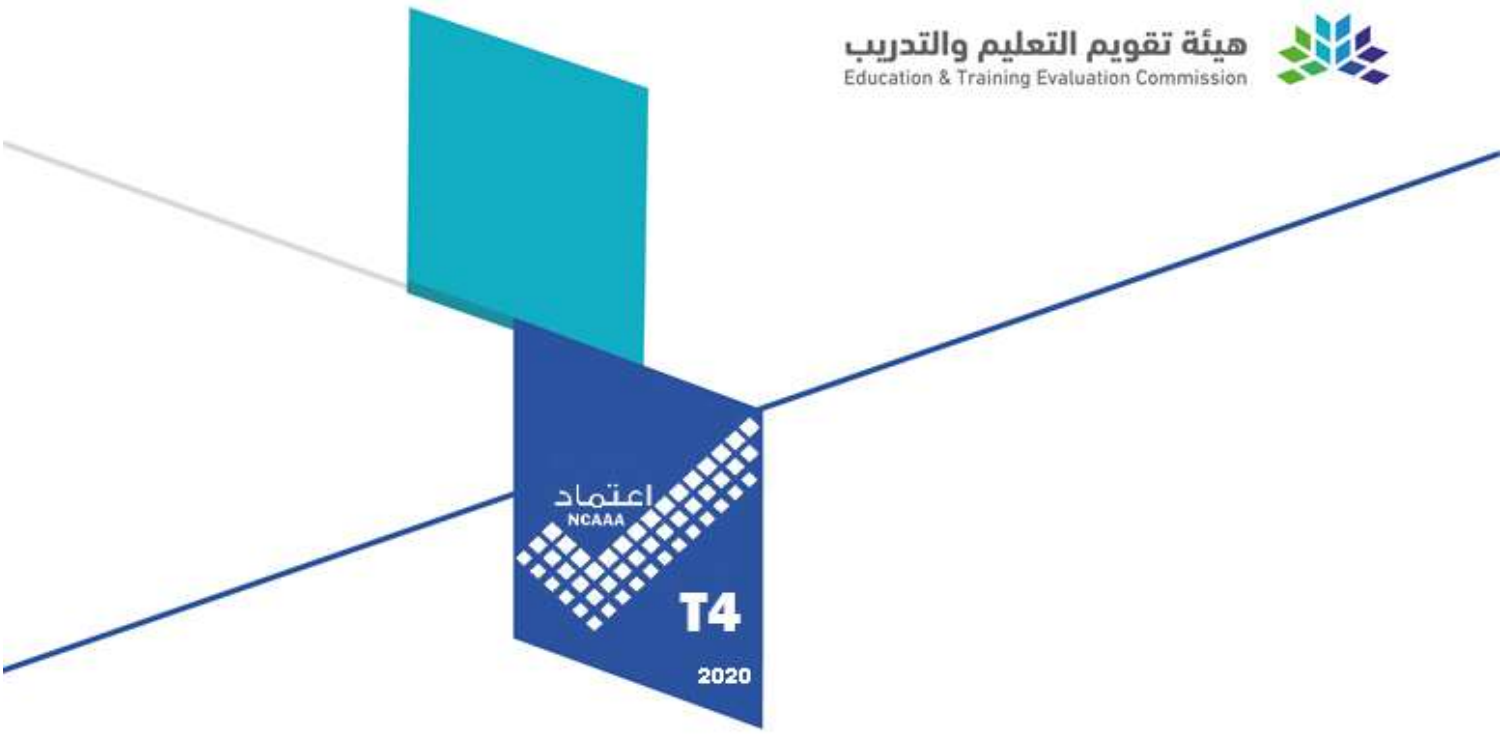
هيئة تقويم التعليم والتدريب
Education & Training Evaluation Commission



Course Specifications

Course Title:	Partial Differential Equations
Course Code:	Math 406
Program:	Bachelor of Science in Mathematics
Department:	Mathematics
College:	Science
Institution:	University of Tabuk

Table of Contents

A. Course Identification

1. Credit hours: 03 Hours/Week
2. Course type **a.** University ☐ College ☐ Department ☑ Others ☐ **b.** Required ☑ Elective ☐
3. Level/year at which this course is offered: L6/Y3
4. Pre-requisites for this course (if any)**: Math 305**
5. Co-requisites for this course (if any)**:** None

6. Mode of Instruction (mark all that apply)

No	Mode of Instruction	Contact Hours	Percentage
1	**Traditional classroom**	45	100%
2	**Blended**		
3	**E-learning**		
4	**Distance learning**		
5	**Other**		

7. Contact Hours (based on academic semester)

No	Activity	Contact Hours
1	**Lecture**	45
2	**Laboratory/Studio**	
3	**Tutorial**	
4	**Others** (specify)	
	Total	45

B. Course Objectives and Learning Outcomes

1. Course Description :

The main purpose of this course is to provide students with the basic concept of Partial Differential Equations (PDE's) ،general integral and singular integral for first-order Partial Differential Equations (PDE's) ،complementary functions for both Homogeneous and Non Homogeneous partial differential equations of the second and higher order with constant coefficient ،the applications of Partial Differential Equations (PDE's) ،the Fourier expansion and Fourier complex for many functions.

2. Course Main Objective:

- Student will be able to recall the concept of Partial Differential Equations (PDE's), and find general integral and singular integral for a first order Partial Differential Equations (PDE's).
- Student will be able to apply Partial Differential Equations (PDE's) to solve real-world problems.

3. Course Learning Outcomes

CLOs		Aligned PLOs
1	**Knowledge and Understanding**	
1.1	Students will be able to define the fundamentals of Partial Differential Equations.	K1
1.2	Students will be able to demonstrate in-depth knowledge of procedures used in PDEs.	K2
2	**Skills :**	
2.1	Students will be able to solve complex problems using the analytical procedures of PDEs.	S1
2.2	Students will be able to apply PDEs techniques to solve problems.	S3
2.3	Demonstrate Proficiency in communicating concepts and theories of integral equations	S4
3	**Values:**	
3.1	Students will be able to work in groups while observing ethics.	V1
3.2	Students will be able to manage duties and time.	V2

C. Course Content

No	List of Topics	Contact Hours
1	Introduction to Partial Differential Equations (PDE's)	3 Hrs
2,3	First order linear partial differential equation	6 Hrs
4	Solution using Lagrange's method	3 Hrs
5	Cauchy problem	3 Hrs
6	**Mid-Exam#1**	
6,7	Homogeneous and Non-Homogeneous PDE's of the second and higher order with constant coefficients.	6 Hrs
8,9	Physical applications using separation of variables	6 Hrs
10	Classification of PDE's	3 Hrs
11	**Mid-Exam#2**	
11,12	Fourier Series	6 Hrs
13	Fourier Transforms	3 Hrs
14,15	**Revision & Final Exam**	6 Hrs
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 and Understanding**		
1.1	Students will be able to define the fundamentals of Partial Differential Equations.	Introducing new ideas through case study Lectures Class Discussions	Quizzes I II Midterm Exams Final Exams homework assignments.
1.2	Students will be able to demonstrate in-depth knowledge of procedures used in PDEs.		
2.0	**Skills**		

Code	Course Learning Outcomes	Teaching Strategies	Assessment Methods
2.1	Students will be able to solve complex problems using the analytical procedures of PDEs.	- Lectures Group work - Case Study - Brainstorming	- Quizzes -Assignments -Midterm exams - Final exam
2.2	Students will be able to apply PDEs techniques to solve problems.		
2.3	Demonstrate Proficiency in communicating concepts and theories of integral equations		
3.0	**Values**		
3.1	Students will be able to work in groups while observing ethics.	Cooperative learning and Teamwork	- Quizzes -Assignments -Class participation
3.2	Students will be able to manage duties and time.		

2. Assessment Tasks for Students

#	Assessment task*	Week Due	Percentage of Total Assessment Score
1	Activities	Weekly basis	5%
2	Homework	Weekly basis	5%
3	Quizzes	Weekly basis	10%
4	Mid Exam1	6th week	20%
5	Mid Exam2	11th week	20%
6	Final Exam	At end of the Semester	40%

***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 :
Six office hours per week in the lecturer schedule.

F. Learning Resources and Facilities

1.Learning Resources

Required Textbooks	1. F. John. Partial differential equations, Springer- Verlag, New York, 1982.
Essential References Materials	Griffiths, David F., John W. Dold, and David J. Silvester. Essential partial differential equations. Springer, Heidelberg, Germany, 2015.
Electronic Materials	None
Other Learning Materials	None

2. Facilities Required

Item	Resources
Accommodation (Classrooms, laboratories, demonstration rooms/labs, etc.)	1.Lecture Room with max capacity of 30 students and equipped with White Board, Overhead projector and internet connection.

Item	Resources
	2.Library
Technology Resources (AV, data show, Smart Board, software, etc.)	Projectors
Other Resources (Specify, e.g. if specific laboratory equipment is required, list requirements or attach a list)	None

G. Course Quality Evaluation

Evaluation Areas/Issues	Evaluators	Evaluation Methods
Effectiveness of teaching and assessment	Students	Direct and Indirect
Extent of achievement of course learning outcomes	Teachers	Direct
Quality of learning resources	Students	Indirect

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	The Curriculum committee
Reference No.	
Date	25/08/2021