هيئة تقويم التعليم والتدريب
Education & Training Evaluation Commission

T-104
2022

Course Specification

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Course Title:	**Partial Differential Equations**
Course Code:	**343Math -3**
Program:	**B.Sc. of Mathematics**
Department:	**Mathematics**
College:	**Arts and Sciences**
Institution:	**Najran University**
Version:	**1**
Last Revision Date:	**07-05-2023**

Table of Contents:

A. General information about the course:

Course Identification					
1. Credit hours:	3				
2. Course type					
a.	University ☐	College ☐	Department☒	Track☐	Others☐
b.	Required ☒	Elective☐			
3. Level/year at which this course is offered:	5/3				
4. Course general Description This course introduces the solutions of different classes of the first and the second order partial differential equations.					
5. Pre-requirements for this course (if any): Differential Equations (1) (240Math -3)					
6. Co- requirements for this course (if any): None					
7. Course Main Objective(s) The main objectives of the course is to familiarize the students with the essential concepts and the solutions of partial differential equations.					

1. Teaching mode (mark all that apply)

No	Mode of Instruction	Contact Hours	Percentage
1.	Traditional classroom	3	100%
2.	E-learning		
3.	Hybrid • Traditional classroom • E-learning		
4.	Distance learning		

2. Contact Hours (based on the academic semester)

No	Activity	Contact Hours
1.	Lectures	45
2.	Laboratory/Studio	---
3.	Field	---
4.	Tutorial	
5.	Others (specify)	
	Total	45

B. Course Learning Outcomes (CLOs), Teaching Strategies and Assessment Methods

Code	Course Learning Outcomes	Code of CLOs aligned with program	Teaching Strategies	Assessment Methods
1.0	Knowledge and understanding **By the end of the semester, the students will be able to**			
1.1	Define the basic concepts of partial differential equations	K1	Lecture Cooperative learning Problem solving Brain storming Self-Learning	Assignments Midterm Final Exam
2.0	Skills **By the end of the semester, the students will be able to**			
2.1	Solve the first and the second order partial differential equations.	S1	Lecture Cooperative learning Problem solving Brain storming Self-Learning	Assignments Midterm Final Exam
2.2	Prove some methods for solving partial differential equations.	S2		
2.3	Establish some formulas which is related to Laplace and Fourier transforms.	S3		
2.4	Present mathematical ideas through oral, written, and demonstrate and describe mathematical notations and structures.	S4		
3.0	Values, autonomy, and responsibility **By the end of the semester, the students will be able to**			
3.1	Work independently and self-learning	V2	Class discussions	Observation form

C. Course Content

No	List of Topics	Contact Hours
1.	Introduction: Basic Concepts and Definitions, Mathematical Problems, Linear Operators, Superposition Principle, Initial and boundary conditions.	**6**
2.	Method of Characteristics: First-Order (Linear- Quasi-Linear – Nonlinear) with constant and variable coefficients. Second-Order (Linear)	**10**
3.	Inverse Operators: Linear equations with constant coefficients.	**7**
4.	Method of Separation of Variables: Hyperbolic Equation, Parabolic Equation, Elliptic Equation	**10**
5.	Integral Transforms: Laplace Transform, Fourier Transform. Green's Functions.	**12**
Total		45

D. Students Assessment Activities

No	Assessment Activities *	Assessment timing (in week no)	Percentage of Total Assessment Score
1.	Midterm Exam	6-8 11-13	20 20
2.	Assignments & Quizzes	During classes	10
3.	Final Exam	16-18	50

*Assessment Activities (i.e., Written test, oral test, oral presentation, group project, essay, etc.)

E. Learning Resources and Facilities

1. References and Learning Resources

Essential References	- Linear Partial Differential Equations for Scientists and Engineers, Tyn Myint U and Lokenath Debnath.
Supportive References	- المعادلات التفاضلية الجزئية ، أس فارلو ، ترجمة مها عواد الكبيسي، جامعة عمر المختار ، البيضاء، 2005.
Electronic Materials	https://www.youtube.com/watch?v=s37vC88ot1Y&list=PLpSIRgI7BcxMmDsoplBm5SGnmzJpYHBrg
Other Learning Materials	

2. Required Facilities and equipment

Items	Resources
facilities (Classrooms, laboratories, exhibition rooms, simulation rooms, etc.)	Classroom with 30 seats.
Technology equipment (projector, smart board, software)	- Blackboard Platform - Mathematica Program - Projector
Other equipment (depending on the nature of the specialty)	**N/A**

F. Assessment of Course Quality

Assessment Areas/Issues	Assessor	Assessment Methods
Effectiveness of teaching	Student	Student Questionnaire (Indirect)
Effectiveness of students assessment	Peer Reviewer	Rubrics (Indirect)
Quality of learning resources		
The extent to which CLOs have been achieved	Faculty	Direct
Other		

Assessor (Students, Faculty, Program Leaders, Peer Reviewer, Others (specify)

Assessment Methods (Direct, Indirect)

G. Specification Approval Data

COUNCIL /COMMITTEE	Council of Mathematics Department
REFERENCE NO.	14441017-0208-00014
DATE	17-10-1444H