

Course Description Form

1. Course Name:	
Partial differential equation	
2. Course Code:	
MS 208	
3. Semester / Year:	
2 nd /2024	
4. Description Preparation Date:	
25/3/2024	
5. Available Attendance Forms:	
Theory and Lecture.	
6. Number of Credit Hours (Total) / Number of Units (Total)	
60 Hours/ 4 Units	
7. Course administrator's name (mention all, if more than one name):	
Name: Dr.Esraa Habeeb Khaleel Email: esraa.h.khaleel@tu.edu.iq	
8. Course Objectives	
<p>Course Objectives</p>	<ul style="list-style-type: none"> • To familiarize the student with the definition and concept of partial differential equations and their formation. • That the student recognizes the classification of the partial differential in terms of degree and rank. • Identify the applications of partial differential equations in various fields. • Knowledge and understanding. • Learn the methods and rules for finding solutions to different partial differential equations with initial and limit values. • The student is acquainted with the legal formulas for partial equations (hyperbolic, ellipse, parabola). • The student was introduced to the integral transformation: Laplace transform, Fourier transform, and some of its applications.

9. Teaching and Learning Strategies

Strategy	The main strategy to be adopted in this unit is to encourage students to participate in the exercises, while at the same time improving and expanding their thinking skills. This will be achieved through assignments and how to solve them.
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10. Course Structure

Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
1	4	Second order partial differential equations	Classification of equations: second-order partial differential equations	Lectures	Discussion and tests
2	4	Second order partial differential equations	Partial differential equations of order n	Lectures	Discussion and tests
3	4	Second order partial differential equations	Fourier series	Lectures	Discussion and tests
4	4	Types of second-order partial differential equations with variable coefficients and methods for solving them	Study different types of equations with variable coefficients	Lectures	Discussion and tests
5	4	Types of second-order partial differential equations with variable coefficients and methods for solving them	Different types of equations with variable coefficients and different ways to solve them	Lectures	Discussion and tests
6	4	Types of second-order partial differential equations with variable coefficients and methods for solving them	Laplace transform to solve this type of partial equations	Lectures	Discussion and tests
7	4	Thermal diffusion equation	Heat diffusion equation in an isolated metal arm and homogeneous boundary conditions	Lectures	Discussion and tests
8	4	Thermal diffusion equation	Heat diffusion equation in an isolated metal arm and inhomogeneous boundary conditions	Lectures	Discussion and tests
9	4	Thermal diffusion equation	Heat diffusion equation in a metal arm with insulated ends	Lectures	Discussion and tests

10	4	Wave equation in one and two dimensions	Construct the wave equation	Lectures	Discussion and tests
11	4	Wave equation in one and two dimensions	The wave equation and methods for solving it in one or two dimensions	Lectures	Discussion and tests
12	4	Wave equation in one and two dimensions	Applied problems on the wave equation	Lectures	Discussion and tests
13	4	Laplace equation	Solve Laplace's equation in two dimensions	Lectures	Discussion and tests
14	4	Laplace equation	Solve the Laplace equation in two dimensions by separating variables	Lectures	Discussion and tests
15	4	Laplace equation	Laplace's equation with polar coordinates and its solution	Lectures	Discussion and tests

