Course Description Form

1. Course Name:
Partial Differential Equations
2. Course Code:
MATH 410
3. Semester / Year:
First Semester / Fourth Class
4. Description Preparation Date:
1/10/2023
5. Available Attendance Forms:
6. Number of Credit Hours (Total) / Number of Units (Total):
60 Hours/ 3Unit
7. Course administrator's name (mention all, if more than one name)
Name: Dr. Ahmed Ayyoub Yousif Email: ahmed.ayyoub@nahrainuniv.edu.iq
8. Course Objectives

Course Objectives	• **The student knows how to solve a differential equation of the first and second order.** • **The student knows how to make a system of differential equations of the first order.** • **The student knows how to use transformations of integration in place of partial differential equations.**

9. Teaching and Learning Strategies

Strategy	1- Daily Post. 2- Daily Exams. 3- The Monthly Exam. 4- Home Works.

10. Course Structure

Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
1st & 2nd	8	Introduction to partial differential equations and the separation of variables.		Give Lectures	Daily Exams and H.W.
3rd & 4th	8	Transforming nonhomogeneous Bcs to homogeneous ones and solving more complicated problems.		Give Lectures	Daily Exams and H.W.
5th & 6th	8	Transforming hard equations into easier ones and solving nonhomogeneous PDE using eigenvector expansion method.		Give Lectures	Daily Exams and H.W.

7th & 8th	8	Integral transform (sine and cosine transform.		Give Lectures	Daily Exams and H.W.
9th & 10th	8	The Fourier series and transforms and its application to PDEs		Give Lectures	Daily Exams and H.W.
11th & 12th	8	The Laplace transform and its application to PDEs		Give Lectures	Daily Exams and H.W.
13th & 14th	8	The one dimensional wave equation (hyperbolic equation)		Give Lectures	Daily Exams and H.W.
15th	4	The D'alembert solution of the wave equation and the finite vibrating string (standing waves) and Elliptic type problems (the Laplacian)		Give Lectures	Daily Exams and H.W.

11. Course Evaluation

Distributing the score out of 100 according to the tasks assigned to the student such as daily preparation, daily oral, monthly, or written exams, reports .... etc

12. Learning and Teaching Resources

Required textbooks (curricular books, if any)	Partial differential equations for scientists a engineers By Stanley J. Farlow
Main references (sources)	
Recommended books and references (scientific journals, reports…)	
Electronic References, Websites	