

مختصر توصيف المقرر

(Course Information)

معلومات المقرر*

المعادلات التفاضلية الجزئية	اسم المقرر:
فيز 2062	رقم المقرر:
المعادلات التفاضلية في الفيزياء	اسم ورقم المتطلب السابق:
--	اسم ورقم المتطلب المرافق:
الرابع	مستوى المقرر:
(0+0+3)3	الساعات المعتمدة:
Module Title:	Partial Differential Equations in Physics
Module ID:	PHYS 2062
Prerequisite:	PHYS 2022
Co-requisite:	--
Course Level:	4 th
Credit Hours:	3 (3+0+0)

Module

وصف المقرر :

Description

This course enhances the ability of students to understand the basics of PDEs and implement this knowledge to model and solve a variety of problems. Students will acquire the knowledge to understand branches in physics, which use partial differential equations; students will develop the ability to solve partial differential equations, which are common in physics.

Module Aims

أهداف المقرر :

1	Understanding the most important definitions and concepts of partial differential equations.	1
2	Modelling physical phenomena with first and second order of partial differential equations.	2

Learning Outcomes:

مخرجات التعليم:

1	<p>Knowledge</p> <ul style="list-style-type: none"> • Rename the most important definitions and concepts of partial differential equations. • Form the PDEs. • Classify the PDEs. 	1
---	---	---

2	Cognitive Skills <ul style="list-style-type: none"> Using several methods in solving PDEs. Apply different PDE methods in physical problems. Introduce the physical problems in a mathematical model. 	2
3	Interpersonal Skills and Responsibility <ul style="list-style-type: none"> Interact professionally with others, to engage effectively in teamwork. Develop in each student the good writing skills so that they are able to communicate effectively and clearly Develop in each student good oral communication skills so that they are able to communicate effectively with others 	3
4	Communication, Information Technology and Numerical Skills <ul style="list-style-type: none"> Develop the team working skills necessary to perform effectively. Develop the ability to argue scientifically with the instructor. Using the computer program to analyze the data, and make some simulation Search in the web for any updated information concerning the assigned experiment. Analyze the data with good mathematics and theory. 	4
5	Psychomotor Not applicable.	5

Course Contents:

محتوى المقرر:

ساعات التدريس (Hours)	عدد الأسابيع (Weeks)	قائمة الموضوعات (Subjects)
2	2	Classification and formation of PDEs.
9	3	First order PDEs- Solution using Lagrange's method.
9	3	Second order linear PDEs in several variables.
9	3	Physical applications using Separation of variables.
6	2	Some boundary value problems.
6	2	Eigen function Expansion method.

Textbook and References:

الكتاب المقرر والمراجع المساندة:

سنة النشر Publishing Year	اسم الناشر Publisher	اسم المؤلف (رئيسي) Author's Name	اسم الكتاب المقرر Textbook title
(1993) ISBN-13: 978-0486676203	Dover Publications	Stanley J. Farlow	Partial Differential Equations for Scientists and Engineers
سنة النشر Publishing Year	اسم الناشر Publisher	اسم المؤلف (رئيسي) Author's Name	اسم المرجع Reference

1 st ed. (2016) ISBN-10: 3319020986	Springer	Peter J. Olver	Introduction to Partial Differential Equations
4 th ed. (2003) ISBN-10: 0130652431	Prentice Hall	Richard Haberman	Applied Partial Differential Equations: With Fourier Series and Boundary Value Problems