

مختصر توصيف المقرر

(Course Information)

معلومات المقرر*

اسم المقرر:	الفيزياء الرياضية 1
رقم المقرر:	فيز 2042
اسم ورقم المتطلب السابق:	حساب التفاضل والتكامل رياض 1022
اسم ورقم المتطلب المرافق:	--
مستوى المقرر:	الثاني
الساعات المعتمدة:	3 (0+0+3)
Module Title:	Mathematical Physics I
Module ID:	PHYS 2042
Prerequisite:	Calculus MTH 1022
Co-requisite:	--
Course Level:	Second
Credit Hours:	3 (3+0+0)

Module

وصف المقرر :

Description

This course intends to provide the student of the fundamental mathematical methods that will have significant application in physics. It is a continuation course for previously given mathematical skills.

Module Aims

أهداف المقرر :

1	The aim of this course is to provide a base to students for his future research and study planning.	1
2	After successful completion of this course student will be able to understand Fundamentals of Mathematical Methods of Physics and some basics way of its application	2

Learning Outcomes:

مخرجات التعليم:

1	Knowledge <ul style="list-style-type: none"> State the Fundamental Concepts of Determinants, Matrices Vector Algebra. Outline Gradient, Divergence, Curl and Laplace operator Describe Line, Surface, and Volume Integrals and know its Physics meaning. Tell the differences between Gauss theorem, Stock's theorem and Green's theorem Describe Spherical polar coordinates, Cylindrical coordinates and Dirac delta function 	1
2	Cognitive Skills <ul style="list-style-type: none"> Can correlate and understand the problem solving techniques. Interpret/operate differential equations, integrations, and Matrices. 	2
3	Interpersonal Skills and Responsibility <ul style="list-style-type: none"> Work in a group and learn time management. 	3

	<ul style="list-style-type: none"> Present a short report in a written form and orally using appropriate scientific methods and take care about its ethical value. 	
4	Communication, Information Technology and Numerical Skills <ul style="list-style-type: none"> Rise questions during the lecture, work in groups, and communicate with class fellows and with instructor electronically and periodically and visit the web sites he recommends. Students use information technology in the classroom. 	4
5	Psychomotor Not applicable.	5

Course Contents:

محتوى المقرر:

ساعات التدريس (Hours)	عدد الأسابيع (Weeks)	قائمة الموضوعات (Subjects)
9	3	Determinants, Matrices, Solving linear equations and differential equations by matrices.
6	2	Application on the motion of the rotation of the rigid body.
6	2	Vector Algebra: Vector products, Position, Displacement, Vector transformation.
9	3	Gradient, The Divergence, The Curl, Laplace operator
6	2	Line, Surface, and Volume Integrals, Gauss theorem, Stock's theorem, Green's theorem.
9	3	Spherical polar coordinates, Cylindrical coordinates, The Dirac delta function

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
10 th ed. (2011)	Wiley	Erwin Kreyszing	Advanced Engineering Mathematics • ISBN-10: 9780470458365
سنة النشر Publishing Year	اسم الناشر Publisher	اسم المؤلف (رئيسي) Author's Name	اسم المرجع Reference
5 th ed (2016).	Wellesley-Cambridge Press	Gilbert Strang	Introduction to Linear Algebra ISBN-10: 0980232775
Har/Cdr ed. (2001)	SIAM: Society for Industrial and Applied Mathematics	Carl D. Meyer	Matrix Analysis and Applied Linear Algebra ISBN-10: 0898714540