مدونة المناهج السعودية

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الموقع التعليمي لجميع المراحل الدراسية

في المملكة العربية السعودية

مختصر توصيف المقرر

معلومات المقرر * **(Course Information)**

اسم المقرر:	الفيزياء الحسابية
رقم المقرر:	فيز 3082
اسم ورقم المتطلب السابق:	فيز 3072
اسم ورقم المتطلب المرافق:	--
مستوى المقرر:	السادس
الساعات المعتمدة:	3 (0+0+3)

Module Title:	Computational Physics
Module ID:	PHYS 3082
Prerequisite (Co-requisite) :	PHYS 3072
Co-requisite :	--
Course Level:	Sixth
Credit Hours:	3 (3+0+0)

وصف المقرر : **Module Description**

Introduction: Computation and Science, The emergence of Modern Computers, Computer Algorithms and Languages: Applications: Newton and Kepler Laws. Numerical linear Algebra: Systems of linear equations, Eigen values and Eigen vectors. Interpolation, Extrapolation and Data Fitting: Polynomial Interpolation, Data fitting, Least squares fitting. Ordinary differential equations: Initial-value problems, The Euler and Picard methods, The Runge-Kutta method, Chaotic dynamics of the driven pendulum, Boundary -value and eigenvalue problem, The one-dimensional Schrödinger equation.

أهداف المقرر : **Module Aims**

1	This course will make the student be able to deal with the physical problems	
2	Using the appropriate logarithms for solving the problems using the suitable computer programs	

مخرجات التعليم: **Learning Outcomes:**

1	**Knowledge:** • The student will be to study the principles of Computation and Science	
2	**Interpersonal skills and responsibility:** • The ability to form groups and distribute the duties. • The skills of presentation in front of the others. • The skill of constructive criticism, and discussion. • The ability to express opinions clearly and accept others opinion	

3	**Cognitive Skills:** • Solve different exercises in the course book. • know the basic elements of the Computer Algorithms and Languages • To develop the ability of the student skills by doing some Applications: Newton and Kepler Laws. Numerical linear Algebra throughout the semester	

Course Contents: **محتوى المقرر:**

ساعات التدريس (Hours)	عدد الأسابيع (Weeks)	قائمة الموضوعات (Subjects)
6	1	Introduction to Computation and Science,
4	3	The emergence of Modern Computers, Computer Algorithms and Languages
4	2	Applications: Newton and Kepler Laws. Numerical linear Algebra
6	3	Systems of linear equations, Eigen values and Eigen vectors. Interpolation, Extrapolation and Data Fitting: Polynomial Interpolation, Data fitting, Least squares fitting.
4	2	Ordinary differential equations: Initial-value problems.
6	3	The Euler and Picard methods, The Runge-Kutta method, Chaotic dynamics of the driven pendulum, Boundary -value and eigenvalue problem, The one-dimensional Schrodinger equation

Textbook and References: **المقرر والمراجع المساندة:**

سنة النشر Publishing Year	اسم الناشر Publisher	اسم المؤلف (رئيسي) Author's Name	اسم الكتاب المقرر Textbook title
(2006) **ISBN**: 0131469908	Nicholas J. Giordano, Hisao Nakanishi	Addison, Wesely,	Computational Physics
سنة النشر Publishing Year	**اسم الناشر Publisher**	**اسم المؤلف (رئيسي) Author's Name**	**اسم المرجع Reference**