**محتويات المقرر COURSE SYLLABUS**

**Master course**

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| **1. رقم المقرر : COURSE NO.** | 203601-3 (Special course3) |
| **2. عنوان المقرر : COURSE TITLE** | فيزياء حسابية Computational Physic |
| **3. عدد الساعات : NUMBER OF HOURS** | 3 hours |
| **4. الفرقة والفصل الدراسى:YEAR & SEMISTER**  | High graduate students (Master) |
| **5. وصف المقرر : COURSE DESCRIPTION**The course introduces the students to principles of numerical techniques and its applications in physics problems. |

**6 . أهداف المقرر :COURSE GOALS**

**\*** Developing the student's problem solving, and skills needed to find numerical solutions and graphs for physics problems.

**7. متطلبات السابقة أو المتوازية : PREREQUESITES AND COREQUISITES**

**الفيزياء الرياضية المتقدمة Advanced Math. Method in Physics**

| **م** | **مخرجات التعلم****Intended Learning Outcomes** | **الموضوع Topic** | **الزمن المتوقع لكل موضوع** | **الأنشطة والواجبات والتعيينات****Activities, Tasks and Assignment** | **المصادر التعليمية****Educational Resources** | **التقويم****Assessment** |
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|  | The students have to recognize the following:1. Computational errors in physical measurements.
2. Using least square fitting technique and making graphs.
3. Numerical methods of differentiation and integration.
4. Using numerical analysis for solving differential equations.
 | 1. Computational errors- Floating point- Root finding- Bisection method- Newton's method. Programming
2. Polynomial approximation. Least square method.
3. Numerical differentiation and integration methods.
4. Numerical solution of ordinary differential equations.
5. Numerical solution for a system of linear differential equations.
 | 6hr9hr12hr9hr6hr | * Lectures.
* Problems and essay assignments.
* Computer Simulations
 | * Computer simulation programs and slides.
* Transparences.
* Manual of solved problems (answer and solutions)

**- Text Books**1- Applied numerical analysis by Gerald Addison- Wesley.2- Elementary numerical analysis by Samuel D.Conte & Carlde Boor (McGrew Hill).3- An Introduction to numerical analysis by Kendall E.A Liknson (Wiley)  | - Semester activities including class room interactions and Quizzes.- Mid-term exam- Lab performance evaluation.- Oral exam.* Final exam.
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