**محتويات المقرر COURSE SYLLABUS**

**Master course**

|  |  |
| --- | --- |
| **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** |
| --- | --- | --- | --- | --- | --- | --- |
|  | 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. | 6hr  9hr  12hr  9hr  6hr | * 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. |