Computational Physics

Academic Year: (2019 / 2020)   **Review date: 20-04-2020**

Department assigned to the subject:

Coordinating teacher: REYNOLDS BARREDO, JOSE MIGUEL

Type: Compulsory ECTS Credits : 6.0

Year : 1 Semester : 2

REQUIREMENTS (SUBJECTS THAT ARE ASSUMED TO BE KNOWN)

Plasma physics

OBJECTIVES

- Get acquainted with the use of advanced programming languages (FORTRAN, C or Matlab).
- Reach a basic knowledge of the fundamental algorithms used in physical simulations.
- Been able to model a physical problem and implement it on the chosen programming language.

DESCRIPTION OF CONTENTS: PROGRAMME

- 1. Finite differences I: Ordinary Differential Equations
- 2. Finite differences II: Partial Differential Equations
- 3. Linear Algebra
- 4. Continuous Eulerian Methods
- 5 Lagrangian and Particle Methods

LEARNING ACTIVITIES AND METHODOLOGY

- Topics are discussed in class with the help af slides that are provided to students.
- Selected projects from the area of fusion plasmas are handed to the students that must work through them, simulate them numerically.

ASSESSMENT SYSTEM

Delivery of assignments and individual projects.

% end-of-term-examination: 0

% of continuous assessment (assigments, laboratory, practicals…):   100

BASIC BIBLIOGRAPHY

- William H. Press, Saul A. Teukolsky, William T. Vetterling, Brian P. Flannery Numerical Recipes in Fortran, The art of Scientific Computing, second edition, Cambridge University Press, 1994