

Academic Year: (2018 / 2019)

Review date: 26-06-2018

Department assigned to the subject: Bioengineering and Aerospace Engineering Department

Coordinating teacher: GARCIA-VILLALBA NAVARIDAS, MANUEL

Type: Compulsory ECTS Credits : 6.0

Year : 2 Semester : 2

REQUIREMENTS (SUBJECTS THAT ARE ASSUMED TO BE KNOWN)

Calculus I and II
 Linear Algebra
 Physics I and II
 Programming
 Advanced Mathematics

OBJECTIVES

Knowledge and understanding of numerical modelling applied to aerospace engineering problems

DESCRIPTION OF CONTENTS: PROGRAMME

- 1 Introduction to numerical modelling in aerospace engineering (structures, fluid mechanics, flight mechanics, optimization, etc)
- 2 Non-linear equations
- 3 Linear systems
- 4 Interpolation
- 5 Curve fitting
- 6 Numerical differentiation
- 7 Numerical integration
- 8 Numerical optimization
- 9 Ordinary differential equations
- 10 Partial differential equations

LEARNING ACTIVITIES AND METHODOLOGY

Theory sessions.
 Problem sessions working individually and in groups.
 Lab-sessions with mathematical software.

ASSESSMENT SYSTEM

End-of-term exam (60%)
 Continuous evaluation (40%)

The continuous evaluation may include lab sessions, group projects, exams in the computer room, etc.

The end-of-term exam may consist of a written part and/or exercises in the computer room.

In order to pass the subject, two requirements need to be met:

- 1) to have a MINIMUM mark of 4.0/10 in the end-of-term exam;
- 2) to have a MINIMUM overall mark of 5.0/10 (weighing 60% the end-of-term exam mark and 40% the mark of the continuous evaluation).

% end-of-term-examination:	60
% of continuous assessment (assignments, laboratory, practicals...):	40

BASIC BIBLIOGRAPHY

- J. H. Mathews, K. D. Fink Numerical methods using MATLAB, Pearson Prentice Hall, 2004

- U.M. Ascher, C. Greif A first course in numerical methods, siam, 2011

ADDITIONAL BIBLIOGRAPHY

- J. D. Hoffman Numerical methods for engineers and scientists, CRC Press, 2001
- R. Butt Numerical Analysis using MATLAB, Jones and Bartlett, 2010