Modelling in Aerospace Engineering

Academic Year: (2018 / 2019) **Review date: 26-06-2018**

Department assigned to the subject: Department of Bioengineering and Aerospace Engineering

Coordinating teacher: GARCIA-VILLALBA NAVARIDAS, MANUEL

Type: Compulsory ECTS Credits : 6.0

Year : 2 Semester : 2

STUDENTS ARE EXPECTED TO HAVE COMPLETED

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

COMPETENCES AND SKILLS THAT WILL BE ACQUIRED AND LEARNING RESULTS.

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 (assigments, 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