Modelling in Aerospace Engineering

Academic Year: (2019 / 2020)   **Review date: 05-05-2020**

Department assigned to the subject: Bioengineering and Aeroespace 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 Ordinary differential equations
9 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