Advanced Aeroelasticity

Academic Year: (2019 / 2020) **Review date: 06-05-2020**

Department assigned to the subject: Bioengineering and Aeroespace Engineering Department

Coordinating teacher: FAJARDO PEÑA, PABLO

Type: Compulsory ECTS Credits : 3.0

Year : 1 Semester : 2

REQUIREMENTS (SUBJECTS THAT ARE ASSUMED TO BE KNOWN)

A basic knowledge of aeroelastic phenomena

OBJECTIVES

Good knowledge of the different aeroelastic phenomena and dynamics loads, with special emphasis on their computation using aeroelastic codes as MSC NASTRAN

DESCRIPTION OF CONTENTS: PROGRAMME

1. Advanced Aeroelasticity. Getting Started.
2. Environmental Vibration
3. Powerplant Dynamics
4. Impacts
5. Normal Modes
6. 3D unsteady aerodynamics: DLM
7. Static Aeroelasticity. Trim Solution. Control Surface Effectiveness.
8. Flutter
9. Dynamic Landing
10. Discrete Tuned Gust (DTG)
11. Continuous Turbulence (CT)
12. Dynamic case or buffet

LEARNING ACTIVITIES AND METHODOLOGY

Theory sessions and case studies (root cause analysis).
Lab-sessions with computational aeroelasticity software.

ASSESSMENT SYSTEM

End-of-term exam (25%)
Assignments, Quiz (75%)

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

1) to have a MINIMUM mark of 4.0 in the end-of-term exam and the quizzes
2) to have a minimum overall mark of 5.0/10 (weighing 25% the end-of-term exam mark and 75% the mark of the continuous evaluation).

% end-of-term-examination:	25
% of continuous assessment (assigments, laboratory, practicals…):	75

BASIC BIBLIOGRAPHY

- Wright, J.R. and Cooper, J.E. Introduction to Aircraft Aeroelasticity and Loads, John Wiley & Sons Ltd., 2007

ADDITIONAL BIBLIOGRAPHY

- Bisplinghoff, R. L., Ashley, H., and Halfman, R.L. Aeroelasticity, Addison-Wesley, Reading, 1955
- Bisplinghoff, R., and Ashley, H. Principles of Aeroelasticity, Dover Publications Inc. , 1962
- Fung, Y.C. An Introduction to the Theory of Aeroelasticity, John Wiley and Sons, 1955

- Rodden, W.P. Theoretical and Computational Aeroelasticity, UBuildABook, 2011

- Rodden, W.P. and Johnson, E.H. MSC/NASTRAN Aeroelastic Analysis User¿s guide, The MacNeal-Schwendler Corporation, 1994