

Academic Year: ( 2017 / 2018 )

Review date: 06-09-2017

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

Coordinating teacher: IANIRO , ANDREA

Type: Compulsory ECTS Credits : 3.0

Year : 2 Semester : 1

**STUDENTS ARE EXPECTED TO HAVE COMPLETED**

Students are expected to have a basic knowledge of aerodynamics and fluid mechanics.

**COMPETENCES AND SKILLS THAT WILL BE ACQUIRED AND LEARNING RESULTS.**

The goal of this course is that the student acquires knowledge about experimental methods in aerodynamics and about the methodology for the design of an experiment.

**DESCRIPTION OF CONTENTS: PROGRAMME**

Theoretical fundamentals of experimental aerodynamics: Buckingham pi theorem, fundamental equations and non dimensional numbers.

Statistical data characterization and elements of data processing

Experimental facilities and wind tunnel testing

Aim and principles of flow visualization

Flow pressure measurements

Temperature and heat-flux measurements

Density-based methods

Thermal Anemometry

Laser Anemometry

Volumetric Velocimetry

Measurement of wall shear stresses

Force and moments measurements

**LEARNING ACTIVITIES AND METHODOLOGY**

Theory sessions.

Problem sessions working individually and in groups.

Lab-sessions and homeworks

**ASSESSMENT SYSTEM**

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 (weighting 25% the end-of-term exam mark and 75% the mark of the continuous evaluation).

**% end-of-term-examination:** 25

**% of continuous assessment (assignments, laboratory, practicals...):** 75

**BASIC BIBLIOGRAPHY**

- Alexander J. Smits, T. T. Lim Flow Visualization: Techniques and Examples, ICP, 2012

- Stefano Discetti, Andrea Ianiro Experimental Aerodynamics, CRC Press , 2017