

Academic Year: ( 2020 / 2021 )

Review date: 02-11-2020

Department assigned to the subject: Bioengineering and Aerospace Engineering Department

Coordinating teacher: IANIRO , ANDREA

Type: Compulsory ECTS Credits : 3.0

Year : 2 Semester : 1

**REQUIREMENTS (SUBJECTS THAT ARE ASSUMED TO BE KNOWN)**

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

**OBJECTIVES**

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).

<b>% end-of-term-examination:</b>	25
<b>% of continuous assessment (assignments, laboratory, practicals...):</b>	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