Turboprop Design

Academic Year: (2020 / 2021) **Review date: 10-07-2020**

Department assigned to the subject: Bioengineering and Aeroespace Engineering Department

Coordinating teacher: RAIOLA , MARCO

Type: Electives ECTS Credits : 3.0

Year : 4 Semester :

REQUIREMENTS (SUBJECTS THAT ARE ASSUMED TO BE KNOWN)

- Fluid Mechanics
- Thermal Engineering
- Aerodynamics
- Aerospace Propulsion

OBJECTIVES

The goal of this course is that the student acquires a basic knowledge of aircraft propellers and turbo-prop engines.

DESCRIPTION OF CONTENTS: PROGRAMME

Introduction to propulsion systems
- Review of basic principles of propulsion
- Overview of different aeronautic engines

The Propeller
- Geometry and characteristics of propellers
- Momentum and blade element theory
- Propeller propulsive efficiency
- Propeller noise
- Propeller testing
- Design of optimum propellers

Turboprop and Turboshaft Engines
- Cycle analysis of conventional-free-turbine turboprop engine
- Optimization of turboprop engines
- Installation issues
- The impact on regional aviation
- The Unducted Fan

LEARNING ACTIVITIES AND METHODOLOGY

- Theory sessions.
- Problem sessions.
- Computer sessions.
- Lab-sessions.

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 (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

- D.R. Greatrix Powered Flight. The engineering of Aerospace Propulsion, Springer, 2012
- J. L. Kerrebrook Aircraft Engines and Gas Turbines, The MIT Press, 1992
- R. Von Mises Theory of flight, Courier Dover Publications, 2012