AEROSPACE ENGINEERING (LM52)

(Brindisi - Università degli Studi)

Teaching PROCESSING AND PROPERTIES OF COMPOSITE MATERIALS FOR AERONAUTICS

GenCod A004095

Owner professor Alfonso MAFFEZZOLI

Teaching in italian PROCESSING AND PROPERTIES OF COMPOSITE

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SSD code ING-IND/24

Reference course AEROSPACE ENGINEERING

Course type Laurea Magistrale

Credits 9.0

Teaching hours Front activity hours: 81.0

For enrolled in 2019/2020

Taught in 2020/2021

Course year 2

Language ENGLISH

Curriculum DESIGN

Location Brindisi

Semester Second Semester

Exam type Oral

Assessment Final grade

Course timetable
https://easyroom.unisalento.it/Orario

BRIEF COURSE DESCRIPTION

This course provides a strong interdisciplinary approach to composite materials in view of their application in aeronautic structure. Competences on polymer matrices and reinforcements, mechanics of anisotropic materials, fabrication technologies of thermoplastic and thermosetting matrix composites are provided.

REQUIREMENTS

knowledge of solid mechanics and materials science and technology

COURSE AIMS

Knowledge and understanding:
The course provides the basis of knowledge to understand and solve complex new problems in design and processing of composite materials accounting for anisotropy and reactive processing
Applying knowledge and understanding
The student will be able to apply the basic knowledge on mechanics of anisotropic materials to the design of simple structural elements. A multidisciplinary approach is presented accounting for chemical, materials and mechanical engineering aspects.
Making judgements
Simplification and synthesis of complex problems is presented in order to promote the judgement and evaluation capabilities of the students
Communication
The course promotes the development of the following skills of the student: ability to expose in precise and formal terms an abstract model of concrete problems, identifying the salient characteristics of them and discarding the inessential characteristics; ability to describe and analyze an efficient solution for the problem under consideration. A seminar on composite properties is assigned to students
Learning skills
Autonomous learning is promoted thanks to the use of: different books and slides, numerical methods, homework exercise to be solved in groups of two.

TEACHING METHODOLOGY	Lessons, practice with a software implementing micro and macromechanic of composite materials, visit to an industrial plant. Self evaluation tests after each topic by Kahoot
ASSESSMENT TYPE	Interview after a seminar on composite properties and a homework .
ASSESSMENT SESSIONS	Discussion of an assignment followed by an interview
OTHER USEFUL INFORMATION	For any question write an email to alfonso.maffezzoli@unisalento.it. Link to the team for online interviews: https://teams.microsoft.com/l/team/19%3a458cbee969be476aa9eea632273a6e8b%40thread.tacv2/conversations?groupId=7f7c14aa-bc49-4e0a-83a3-df9179e7e81e&tenantId=8d49eb30-
FULL SYLLABUS	Introduction (2 h.) Reinforcement materials (15 h) Thermosetting and thermoplastic matrices and core materials. (10 h.) Micromechanic. (15 h.) Mcromechanic. (20 h.) Properties (4 h.) Fabrication technologies of polymer matrix materials (12 h.) Visit to an industrial plant (3 h.)
REFERENCE TEXT BOOKS	P.K. Mallick "Fiber-reinforced composites"CRC Press, R.M. Jones "Mechanics of composite materials" Taylor & Francis Slides of the course provided by the teacher