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.
Lessons, practice with a software implementing micro and macromechanics 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%3a458cbee969be476aa9eaa632273a6e8b%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.)
Micromechanics. (15 h.)
Macromechanics. (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.