

AEROSPACE ENGINEERING (LM52)

(Brindisi - Università degli Studi)

Teaching

GenCod A006484

Owner professor TERESA PRIMO

Teaching in italian FUNDAMENTALS OF AEROSPACE TECHNOLOGIES C.I.

Teaching

Language

SSD code ING-IND/16

Curriculum CURRICULUM AEROSPACE TECHNOLOGY

Reference course AEROSPACE ENGINEERING

Course type Laurea Magistrale

Location Brindisi

Credits 3.0

Semester First Semester

Teaching hours Front activity hours: 27.0

Exam type Oral

For enrolled in 2022/2023

Assessment

Taught in 2023/2024

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

BRIEF COURSE DESCRIPTION

The course aims to deepen the aspects related to production technologies applied in aeronautical constructions with particular reference to the choice and function performed by the construction materials and the transformation technologies connected to them.

In the field of plastic deformation technologies, the fundamental principles of plasticity theory, formability and material behaviour, Sheet Metal Forming Processes and their applicability to the aeronautical sector will be illustrated.

At the same time, the aspects relating to assembly processes and in particular those relating to the welding of metallic materials, riveting and Adhesive Bonding of the components will be treated. Lastly non-destructive testing for verification of product quality will be tackled.

Numerical exercises will be carried out on some aspects covered in the theory part to familiarize with the physical quantities that characterize them, in addition to laboratory exercises that will be focused on tools for the finite element simulation of sheet metal forming.

REQUIREMENTS

It is necessary to have passed Mechanical Technology exam. Knowledge of Technical Industrial Design exam is useful

COURSE AIMS

- Knowledge of elasto-plastic behavior of materials and rheological models
- Basic knowledge of Assembly Processes
- Basic knowledge for the Sheet Metal Forming Simulation

TEACHING METHODOLOGY

Frontal lessons

ASSESSMENT TYPE

The exam consists of two test:

Oral: the student discusses the contents of the course, illustrating their level of knowledge and understanding of the topics covered.

Practical: it will be focused on the tools for the finite element simulation of sheet metal forming.

FULL SYLLABUS

Elasto-plastic behavior of materials and Rheological Models
Sheet Metal Forming Processes
Formability and material behaviour
Sheet Metal Forming Simulation: One Step (Inverse) Method
Sheet Metal Forming Simulation: Incremental Explicit/Implicit FEA Methods
Welding Processes
Structural Assembly
Adhesive Bonding

REFERENCE TEXT BOOKS

- Class Notes.
 - F.C. Campbell, Manufacturing Technology for Aerospace Structural materials, First Edition, Elsevier, 2006.
 - Mikell P. Groover, Fundamentals of Modern Manufacturing, Materials, Processes and Systems.