

AEROSPACE ENGINEERING (LM52)

(Brindisi - Università degli Studi)

Teaching ADDITIVE MANUFACTURING C.I.

GenCod A005803

Owner professor TERESA PRIMO

Teaching in italian ADDITIVE MANUFACTURING C.I.

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SSD code ING-IND/16

Reference course AEROSPACE ENGINEERING

Course type Laurea Magistrale

Credits 3.0

Teaching hours Front activity hours: 27.0

For enrolled in 2019/2020

Taught in 2020/2021

Course year 2

Language ENGLISH

Curriculum Percorso comune

Location Brindisi

Semester First Semester

Exam type

Assessment

Course timetable

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

BRIEF COURSE DESCRIPTION

The course aims to provide an overview of Additive Manufacturing processes, explain their underlying physical principles, discuss current research and an appreciation for why AM is so important to many branches of industry.

It will be outlined the rapid development of this technology from humble beginnings that showed promise but still requiring much development, to one that is now maturing and showing real benefit to product development organizations.

In order to take maximum advantage from the capabilities of additive metal technology in the most economical way, will be studied how to design for this technology by following its principles. At the same time, the aspects relating to the design for additive metal manufacturing (DFAM) concept and, the act of integrating product design and additive manufacturing principles into one activity, will be illustrated.

The course introduces some of the DFAM rules of the additive metal technology by going through the details of its capabilities and constraints.

Laboratory exercises will be carried out by 3D printer with FFF (Fused Filament Fabrication) and Wax Jet Printing technology, in addition to laboratory exercises that will be focused on tools for the finite element simulation of additive processes.

REQUIREMENTS

Knowledge of Technical Industrial Design is useful.

COURSE AIMS

- Knowledge for characterization and use of Additive Manufacturing technologies.
- Basic knowledge of Design for Additive Manufacturing.

TEACHING METHODOLOGY

Frontal lessons and computer lab exercises

ASSESSMENT TYPE

The exam consists of an oral test where the student discusses the contents of the course, illustrating their level of knowledge and understanding of the topics covered.

ASSESSMENT SESSIONS

According to the academic calendar.

FULL SYLLABUS

- Additive manufacturing production
 - Classification of additive manufacturing processes
 - Overview of existing manufacturers and their specific equipment
 - Additive manufacturing technologies for metallic materials: METAL POWDER, METAL WIRE, METAL SHEETS
 - Powder Fusion Mechanisms (solid-state sintering, chemically-induced binding, liquid-phase sintering, full melting)
 - AM technologies for plastic component production (powder, solid and liquid material)
 - Additive Manufacturing Process Steps
 - Design for Additive Manufacturing
 - Additive manufacturing technologies and applications in the aerospace industry
 - Finite element simulation techniques for additive manufacturing and its application to case studies
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REFERENCE TEXT BOOKS

Testi di riferimento

- Class Notes.