62953 - Design for additive manufacturing

Información del Plan Docente

Academic Year	2017/18
Faculty / School	110 - Escuela de Ingeniería y Arquitectura
Degree	562 - Master's in Product Development Engineering
ECTS	4.5
Year	1
Semester	Second semester
Subject Type	Optional
Module	---

1.General information

1.1.Introduction

1.2.Recommendations to take this course

1.3.Context and importance of this course in the degree

1.4.Activities and key dates

2.Learning goals

2.1.Learning goals

2.2.Importance of learning goals

3.Aims of the course and competences

3.1.Aims of the course

3.2.Competences

4.Assessment (1st and 2nd call)

4.1.Assessment tasks (description of tasks, marking system and assessment criteria)

5.Methodology, learning tasks, syllabus and resources

5.1.Methodological overview

The methodology followed in this course is oriented towards achievement of the learning objectives. A wide range of teaching and learning tasks are implemented, such as analysis and discussion of theoretical contents, lectures, case studies, and design projects for additive manufacturing.

5.2.Learning tasks

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The course (4.5 ECTS: 112.5 hours) includes the following learning tasks:

- Lectures, problem solving and cases (28 hours).
- Practice sessions (12 hours).
- Project (30 hours).
- Tutorials (5 hours).
- Autonomous work and study (35.5 hours).
- Assessment tests (2 hours).

5.3.Syllabus

The course will address the following topics:

1. Introduction to additive fabrication. History, classification and workflow phases.
2. Additive manufacturing technologies. Strengths and weaknesses. Features of the final piece.
3. Design of Additive Manufacturing.
4. Tools processing point clouds. reverse engineering, exact surfaces, parametric surfaces and straightforward design.
5. Specific tools for manufacturing preparation, file repair and analysis.
6. Optimal design tools in additive manufacturing. Topological design and lattice structures
7. Use and maintenance of professional and personal equipment in additive manufacturing
8. Sectors of application and application tools dedicated by sector.

Assignments (The instructions and details will be provided in class)

- Assignment of analysis of technologies.
- One or more design projects by sector using the adequate tools for treatment, results, and conclusions.

5.4.Course planning and calendar

Further information concerning the timetable, classroom, office hours, assessment dates and other details regarding this course, will be provided on the first day of class.

5.5.Bibliography and recommended resources

- Chee Kai Chua, Kah Fai Leong, Chu Sing Lim "Rapid Prototyping: Principles and Applications", World Scientific, 2010.
- Tom Page, Design for Additive Manufacturing: Guidelines for Cost Effective Manufacturing, Lap Lambert Academic Publishing GmbH KG, 2012
- Ian Gibson, David Rosen, Brent Stucker "Additive Manufacturing Technologies: 3D Printing, Rapid Prototyping, and Direct Digital Manufacturing", Springer, 2014
- Steinar Killi, Designing for Additive Manufacturing: Perspectives from Product Design, Arkitektur- og designhøgskolen, 2013
- Sai Nithin Reddy Kantareddy, "Designing for Metal Additive Manufacturing: Design Challenges with Three Industry Relevant Components", 2016