DEGREE CURRICULUM

ADVANCED MANUFACTURE SYSTEMS

Coordination: COMELLAS ANDRÉS, MARTÍ

Academic year 2017-18

Subject's general information

Subject name	ADVANCED MANUFACTURE SYSTEMS
Code	14521
Semester	2nd Q(SEMESTER) CONTINUED EVALUATION
Typology	<table><tr><th>Degree</th><th>Course</th><th>Typology</th><th>Modality</th></tr><tr><td>Master's Degree in Industrial Engineering</td><td>1</td><td>COMPULSORY</td><td>Attendance-based</td></tr></table>
ECTS credits	6
Groups	1GG
Theoretical credits	3
Practical credits	3
Coordination	COMELLAS ANDRÉS, MARTÍ
Department	INFORMATICA I ENGINYERIA INDUSTRIAL
Teaching load distribution between lectures and independent student work	1 ECTS = 10h attendance lessons + 15h of autonomous work Attendance: 40% Autonomus work: 60%
Important information on data processing	Consult this link for more information.
Language	Catalan (part of the material in Spanish and English)

Teaching staff	E-mail addresses	Credits taught by teacher	Office and hour of attention
ADELL POCH, FRANCESC	francesc@intech3d.es	1,6	
CAMPILLO BETBESÉ, MANEL	manelcampillo81@hotmail.com	,8	
COMELLAS ANDRÉS, MARTÍ	mcomellas@diei.udl.cat	1,2	Thursday, 11:00 to 12:00 Thursday, 17:00 to 18:00 CREA Building, Office 0.19
CUCURULL BONCOMPTE, GERARD	gerardcb07@hotmail.com	,8	
SALAT DUCH, RAMON	ramon.salat@diei.udl.cat	1,6	

Subject's extra information

There are no previous requirements to do the subject.

During the visits to enterprises it is compulsory to use the individual protection equipment (IPE) set by the centre.

Learning objectives

General objectives:

Understand the different actors that are involved in an advanced productive process. The subject will be focused on the management and quality issues, and special attention will be given to the additive manufacturing.

Particular objectives:

- Know the additive manufacturing technologies
- Design a part in order to be built with 3D printing.
- Set up 3D printing parameters
- Print 3D parts
- Know quality certifications and enterprise structure
- Know what quality implies in a productive process
- To implement quality systems
- Verify the quality of a product
- Know the different managing tools of production systems
- Apply product managing using an specific software

Competences

Basic competences:

- **CB2.** To be able to apply the knowledge gained and to solve problems in new environments in wider contexts (or multidisciplinary) related with the area of study.
- **CB5.** To possess the skills to continue learning self-directed and freelance.

General competences EPS:

- **CG4.** Capacity to conceive, design and implement projects and/or provide new solutions, using the tools that the engineering offers.

Specific competences:

- **CE2.** Knowledge and capacity to project, calculate and design integrated manufacturing systems.
- **CE8.** Capacity to design and project automated production and advanced process control systems.
- **CE13.** Knowledge on methods and techniques of transportation and industrial maintenance services.

Subject contents

1 Additive manufacturing

1.1 Introduction to additive manufacturing systems

1.2 FDM technology

1.3 Polymeric materials

1.4 CAD/CAE/CAM design oriented to additive manufacturing

1.5 Software: Layers and printing parameters

2 Quality control

2.1 Introduction to Quality

2.2 ISO certification at enterprises

2.3 Enterprise structure

2.4 Quality at productive processes

2.5 Verification and validation of a product

2.6 Audit (Internal / External).

2.7 Corrective actions and Non-conformity products

3 Productive systems managing

3.1 Introduction to the different managing tools

3.2 Product data managing (PDM)

3.3 Product life cycle managing (PLM)

3.4 Enterprise resources plan (ERP)

Methodology

Lectures: In the lectures, the contents of the subject is exposed orally by a teacher without the active participation of students.

Problems solving: In the activities of problems solving, the professors present a complex issue that students must solve, whether working individually or in teams.

Practices: Practices allow to apply and set up, in a practice level, the theory of a knowledge scope in a particular context.

Visits: Activity of a group of students, guided by the teachers, which consists of going to a certain place to get direct information that favours the learning process.

Work in group: Learning activity that has to be done through collaboration between members of a group.

Development plan

Week	Methodology	Unit	Attendance hours	Autonomous work hours	Professor
1-4	Lectures, Problems solving, Practices	Unit 1: Additive manufacturing	16	27	F. Adell
5-8	Lectures, Problems solving, Practices	Unit 2: Quality control	16	27	M. Campillo G. Cucurull
10-13	Lectures, Problems solving, Practices	Unit 3: Productive systems managing	16	27	R. Salat
14	Visit	Units 1-3	6	5	M. Comellas
15	Work in group	Units 1-3	4	4	M. Comellas

Evaluation

Objectives	Evaluation activities	Criteria	%	Dates	M/V (1)	I/G (2)	Observations
Unit 1	Exam 1	(*)	15	Week 4	M	I	Unit 1 will be evaluated in written form
Unit 1	Practices Report Unit 1		15	Week 4	M	G	Practices reports will be evaluated
Unit 2	Exam 2	(*)	15	Week 8	M	I	Unit 2 will be evaluated in written form
Unit 2	Work Report Unit 2		15	Week 8	M	G	Work report will be evaluated
Unit 3	Exam 3	(*)	15	Week 13	M	I	Unit 3 will be evaluated in written form
Unit 3	Work Report Unit 3		15	Week 13	M	G	Work report will be evaluated
Units 1-3	Visits Report		10	Week 16-17	M	G	Visits report will be evaluated

(1) Mandatory / Voluntary

(2) Individual / in Groups

(*) A minimum score of 4 out of 10 is required

Bibliography

Basic Bibliography

Antonio Domínguez Machuca y otros. Dirección de operaciones: Aspectos tácticos y operativos en la producción y los servicios. Ed. Mc Graw-Hill.

Jay Heizer y Barry Render. Dirección de la producción, decisiones estratégicas.Ed. Prentice Hall.

Luis Cuatrescasas. Diseño avanzado de procesos y plantas de producción flexible. Ed Profit.

Aguayo Gonzalez F. Metodología del diseño industrial: un efoque desde la ingeniería concurrente. Ed. Rama.

Complementary Bibliography

UNE-EN ISO 9001:2015. Sistemas de gestión de la calidad.

Other resources

Eliyahu M.Golddratt Jeff Cox. La Meta, Un proceso de mejora continua. Ed. Diaz de Santos.

Xavier Sala i Martín. Economía liberal, para no economistas y no liberales. Ed. DeBolsillo.