UNIVERSIDAD DE CASTILLA - LA MANCHA
GUÍA DOCENTE

1. General information

Course: MACHINE DESIGN

Type: CORE COURSE

Degree: 2328 - MASTERS DEGREE PROGRAMME IN INDUSTRIAL ENGINEERING

Center: 605 - SCHOOL OF INDUSTRIAL ENGINEERS. AB

Year: 1

Main language: Spanish

Use of additional languages:

Web site:

Code: 310622

ECTS credits: 6

Academic year: 2019-20

Group(s): 10 20 21

Duration: First semester

Second language: English

English Friendly: N

Bilingual: Y

Lecturer: **JESUS MIGUEL CHACON MUÑOZ** - Group(s): **20**

Building/Office	Department	Phone number	Email	Office hours
Politécnico/2-A08	MECÁNICA ADA. E ING. PROYECTOS	926295486	jesusmiguel.chacon@uclm.es	Se publicará en "Campus Virtual" al comienzo del curso

Lecturer: **PUBLIO PINTADO SANJUAN** - Group(s): **20**

Building/Office	Department	Phone number	Email	Office hours
Politécnico/2-A14 (coordinador)	MECÁNICA ADA. E ING. PROYECTOS	Vía Teams	publio.pintado@uclm.es	Telemática: permanente en el campus virtual (Plataforma Moodle) y en la dirección de mail: publio.pintado@uclm.es Presencial: a cualquier hora previa cita con el profesor a través de email.

Lecturer: **FRANCISCO JAVIER SANCHEZ-REYES FERNANDEZ** - Group(s): **20**

Building/Office	Department	Phone number	Email	Office hours
Politécnico/2-A09	MECÁNICA ADA. E ING. PROYECTOS	926295463	javier.sanchezreyes@uclm.es	Se publicará en "Campus Virtual" al comienzo del curso

2. Pre-Requisites

A solid background in the following fields is required:

- Dynamics, mechanisms, machine components. The student must have taken courses such as: "Mechanism and machine theory", "Theory of elasticity and strength of materials", "Machine component design", or "Mechanisms and structures".
- Engineering graphics. All courses in this field, as required for a bachelor's degree in engineering, must have been taken.

3. Justification in the curriculum, relation to other subjects and to the profession

Reasons for including this course in the program

This subject or course belongs to the group designated "Industrial Tecnologies", and is linked to specific abilities as described in the Appendix of CIN/311/2009 (February-9-2009). This regulation specifies the requirements of study programs that confer the status of Professional Industrial Engineer.

The course reinforces abilities that are key in the development of Master's Dissertations related to mechanical design.

4. Degree competences achieved in this course

Course competences

Code	Description
A01	To have appropriate knowledge of the scientific and technological aspects of mathematical, analytical and numerical methods in engineering, electrical engineering, energy engineering, chemical engineering, mechanical engineering, continuous medium mechanics industrial electronics, automation, manufacturing, materials, quantitative management methods, industrial computing, town planning, infrastructures, etc.
A02	To plan, calculate and design products, processes, facilities and plants.
B03	Capacity to design and test machines.
CB06	Knowledge and skills to organise and manage enterprises.
CB07	Strategy and planning knowledge and skills applied to different organisational structures.
CB08	Knowledge of commercial and labour law.
CB09	Knowledge of financial and costs accounting.
CB10	Knowledge of information systems for management, industrial organisation, production, logistics and quality management systems.
D05	Knowledge of transportation and industrial maintenance methods and techniques.

5. Objectives or Learning Outcomes

Course learning outcomes

Description

Acquire knowledge to enable them to design and analyse machines and mechanisms.

Apply the basic features of computer tools for solid modelling, kinematic and dynamic analysis of mechanisms, and stress and deformation analysis in key components.

Use a process of learning-by-doing, being assigned the design of a machine or mechanism with a specific function and requirements. With the assistance and tuition of the teaching staff responsible for the course, students will have to complete the design of a machine or mechanism with all its mechanical and geometric details.

6. Units / Contents

Unit 1: Introduction to machine design.

Unit 2: Principles and computer tools for solid modelling.

Unit 3: Principles and computer tools for kinematic and dynamic analysis of mechanisms and machines.

7. Activities, Units/Modules and Methodology

Training Activity	Methodology	Related Competences (only degrees before RD 822/2021)	ECTS	Hours	As	Com	R	Description
Class Attendance (theory) [ON-SITE]	Lectures	A01 A02 B03 CB06 CB07 CB08 CB10 D05	0.6	15	N	-	-	
Class Attendance (practical) [ON-SITE]	Lectures	A01 A02 B03 CB06 CB07 CB08 CB10 D05	0.4	10	N	-	-	
Computer room practice [ON-SITE]	Cooperative / Collaborative Learning	A01 A02 B03 CB07 CB10	0.4	10	N	-	-	
Workshops or seminars [ON-SITE]	Workshops and Seminars	A01 CB06 CB07 CB09 CB10	0.2	5	N	-	-	
Progress test [ON-SITE]	Combination of methods	A02 B03 CB06 CB07 CB09	0.2	5	N	-	-	
Project or Topic Presentations [ON-SITE]	Group Work	A02 B03 CB06 CB07 CB08 CB09	0.2	5	Y	Y	Y	
Writing of reports or projects [OFF-SITE]	Guided or supervised work	A02 B03 CB06 CB07 CB08 CB09	4	100	Y	Y	Y	
		Total:	**6**	**150**				
		Total credits of in-class work: 2				**Total class time hours: 50**		
		Total credits of out of class work: 4				**Total hours of out of class work: 100**		

As: Assessable training activity
Com: Training activity of compulsory overcoming
R: Rescheduling training activity

8. Evaluation criteria and Grading System

	Grading System		
Evaluation System	**Face-to-Face**	**Self-Study Student**	**Description**
Oral presentations assessment	50.00%	0.00%	
Practicum and practical activities reports assessment	50.00%	0.00%	
Total:	**100.00%**	**0.00%**	

9. Assignments, course calendar and important dates

Not related to the syllabus/contents	
Hours	**hours**
Progress test [PRESENCIAL][Combination of methods]	5
Project or Topic Presentations [PRESENCIAL][Group Work]	5
Writing of reports or projects [AUTÓNOMA][Guided or supervised work]	100
Unit 1 (de 3): Introduction to machine design.	
Activities	**Hours**
Class Attendance (theory) [PRESENCIAL][Lectures]	4.5
Class Attendance (practical) [PRESENCIAL][Lectures]	2
Unit 2 (de 3): Principles and computer tools for solid modelling.	
Activities	**Hours**
Class Attendance (practical) [PRESENCIAL][Lectures]	5
Computer room practice [PRESENCIAL][Cooperative / Collaborative Learning]	5
Workshops or seminars [PRESENCIAL][Workshops and Seminars]	3.5
Unit 3 (de 3): Principles and computer tools for kinematic and dynamic analysis of mechanisms and machines.	
Activities	**Hours**
Class Attendance (theory) [PRESENCIAL][Lectures]	10.5
Class Attendance (practical) [PRESENCIAL][Lectures]	3
Computer room practice [PRESENCIAL][Cooperative / Collaborative Learning]	5
Workshops or seminars [PRESENCIAL][Workshops and Seminars]	1.5
Global activity	
Activities	**hours**
Class Attendance (practical) [PRESENCIAL][Lectures]	10
Class Attendance (theory) [PRESENCIAL][Lectures]	15

Computer room practice [PRESENCIAL][Cooperative / Collaborative Learning]	10
Workshops or seminars [PRESENCIAL][Workshops and Seminars]	5
Progress test [PRESENCIAL][Combination of methods]	5
Project or Topic Presentations [PRESENCIAL][Group Work]	5
Writing of reports or projects [AUTÓNOMA][Guided or supervised work]	100
Total horas:	150

10. Bibliography and Sources

Author(s)	Title/Link	Publishing house	Citv	ISBN	Year	Description
Chacón, J.M., Sánchez-Reyes,J.	Expresión Gráfica en Ingeniería Industrial www.editoraldonostiarra.com	Donostiarra	San Sebastián	978-84-7063-476-5	2013	Texto básico sobre dibujo normalizado
Erdman, A. G.	Mechanism Design: Analysis and Synthesis, Vol. I	Prentice-Hall			1997	
Gómez, S.	El gran libro de SolidWorks http://www.marcombo.com/El-gran-libro-de-solidworks_isbn9788426721730.html	Marcombo		9788426721730	2015	Texto básico sobre SolidWorks
Hamrock, Bernard J.	Elementos de máquinas	McGraw-Hill/Interamericana		970-10-2799-X	2000	
Juvinall, Robert C.	Fundamentals of machine component design	John Wiley & Sons		0-471-24448-1	2000	
Mabie, Hamilton H.	Mecanismos y dinámica de maquinaria	Limusa Wiley		978-968-18-4567-4	2007	
Mott, Robert L.	Diseño de elementos de máquinas	Pearson Educación		978-970-26-0812-7	2006	
Pintado, Publio	Teoría de Máquinas	UCLM			1999	
Shigley, Joseph Edward	Diseño en ingeniería mecánica	McGraw-Hill Interamericana		970-10-3646-8	2002	
Spotts, Merhyle Franklin	Elementos de máquinas	Prentice Hall		970-17-0252-2	1999	
Sánchez-Reyes, J., Chacón, J.M.	Apuntes de la asignatura https://campusvirtual.uclm.es/	UCLM Campus virtual			2018	
Tran, P.	SolidWorks 2018. Basic Tools https://www.sdcpublications.com/Textbooks/SOLIDWORKS-2018-Basic-Tools/ISBN/978-1-63057-162-7/	SDC Publications		978-16305701627	2017	Texto básico sobre SolidWorks