



## IDENTIFYING DATA

### Systems for data analysis, simulation and validation

Subject	Systems for data analysis, simulation and validation			
Code	V12G380V01933			
Study programme	Degree in Mechanical Engineering			
Descriptors	ECTS Credits	Choose	Year	Quadmester
	6	Optional	4th	1st
Teaching language	Spanish			
Department				
Coordinator	Casarejos Ruiz, Enrique			
Lecturers	Casarejos Ruiz, Enrique González Baldonado, Jacobo López Campos, José Ángel			
E-mail	e.casarejos@uvigo.es			
Web	<a href="http://fatic.uvigo.es">http://fatic.uvigo.es</a>			
General description	Deseño, cálculo e análise de elementos de máquinas			

## Competencies

Code	
B1	CG1 Skills for writing, signing and developing projects in the field of industrial engineering, whose purpose, specializing in Mechanics, construction, alteration, repair, maintenance, demolition, manufacturing, installation, assembly or operation of: structures, mechanical equipments, energy facilities, electrical systems and electronic installations and industrial plants, and manufacturing processes and automation.
B3	CG3 Knowledge in basic and technological subjects that will enable students to learn new methods and theories, and provide them the versatility to adapt to new situations.
B4	CG4 Ability to solve problems with initiative, decision making, creativity, critical thinking and the ability to communicate and transmit knowledge and skills in the field of industrial engineering in Mechanical specialty.
C19	CE19 Knowledge and skills to apply the techniques of engineering graphics.
C20	CE20 Knowledge and abilities to calculate, design and test machines.
D2	CT2 Problems resolution.
D9	CT9 Apply knowledge.
D10	CT10 Self learning and work.
D17	CT17 Working as a team.

## Learning outcomes

Expected results from this subject	Training and Learning Results		
*CT10 - Learning and autonomous work	B1	C19	D2
	B3	C20	D9
	B4		D10
			D17

## Contents

Topic	
Presentation of contents	<ul style="list-style-type: none"> <li>- Introduction</li> <li>- Previous contents: design of machines; modeling software, analysis, simulation and validation</li> <li>- Definition of the project: design, analysis, simulation and validation of a machine</li> </ul>

Calculation of shafts	<ul style="list-style-type: none"> <li>- Definition of the element</li> <li>- Theoretical calculation: static and fatigue design</li> <li>- Software of calculation</li> </ul>
Calculation of gears	<ul style="list-style-type: none"> <li>- Definition of the element</li> <li>- Theoretical calculation and selection</li> <li>- Software of calculation</li> </ul>
Calculation of roller bearings	<ul style="list-style-type: none"> <li>- Definition of the element</li> <li>- Theoretical calculation and selection</li> <li>- Software of calculation</li> </ul>
Calculation of joints: - shaft-hub tolerances - welding - screws and rivets	<ul style="list-style-type: none"> <li>- Definition of the element</li> <li>- Theoretical calculation and selection</li> <li>- Software of calculation</li> </ul>
Calculation of springs	<ul style="list-style-type: none"> <li>- Definition of the element</li> <li>- Theoretical calculation and selection</li> <li>- Software of calculation</li> </ul>
Calculation of belts and chains	<ul style="list-style-type: none"> <li>- Definition of the element</li> <li>- Theoretical calculation and selection</li> <li>- Software of calculation</li> </ul>

## Planning

	Class hours	Hours outside the classroom	Total hours
Introductory activities	1	0	1
Lecturing	10	0	10
Case studies	10	0	10
Problem solving	19	0	19
Seminars	4	0	4
Problem and/or exercise solving	0	50	50
Laboratory practice	4	0	4
Project	0	52	52

\*The information in the planning table is for guidance only and does not take into account the heterogeneity of the students.

## Methodologies

	Description
Introductory activities	Lectures about previous topics
Lecturing	Lectures about topics
Case studies	Discussion of practical cases
Problem solving	Discussion of exercises
Seminars	Follow-up & discussion of projects

## Personalized assistance

Methodologies	Description
Problem solving	Discussion and resolution of doubts about the subject and proposed works
Tests	Description
Problem and/or exercise solving	Discussion and resolution of doubts about the subject and proposed works
Project	Discussion and resolution of doubts about the subject and proposed works

## Assessment

	Description	Qualification	Training and Learning Results		
Problem and/or exercise solving	Resolution of exercises and problems, by means of analytical calculation and/or by means of the use of software.	50	B1 B3 B4	C19 C20	D2 D9 D10
Laboratory practice	Resolution of exercises and problems. (exam)	20	B3 B4	C19 C20	D2 D9 D10 D17
Project	Resolution of a realistic case proposed.	30	B4		D2 D9 D10 D17

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**Other comments on the Evaluation**

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The continuous evaluation will be done considering both the regular exercises and the project. The quota of the exam will pass to the project. For those students who have officially withdrawn the continuous evaluation, the evaluation will be done considering both the project and the exam, and the distribution of the evaluation will be of 50% for the exam.

Ethical commitment: An adequate ethical behaviour of the student is expected at all times. In case an unethical behaviour is detected (copying, plagiarism, unauthorized use of electronic devices, and others); the student will be considered unfit to meet the necessary requirements to pass the subject. In this case, the overall qualification in the current academic year will be a Fail grade (0.0).

The use of any electronic devices during tests is completely forbidden unless is specified and authorized. The fact of introducing unauthorized electronic devices in the examination room will be considered reason enough to fail the subject in the current academic year and the overall qualification will be a Fail grade (0.0).

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**Sources of information**

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**Basic Bibliography**

various authors, **Diseño en Ingeniería Mecánica de Shigley**, 0, McGraw-Hill, 0

**Complementary Bibliography**

Norton, R., **Diseño de Máquinas**, Pearson, 2000

Mott, R.L., **Diseño de elementos de máquinas**, 0, Pearson, 2006

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**Recommendations**

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