

| IDENTIFYING DATA | | | | |
|---|---|---|---|---|
| **(*)Deseño de Maquinaria Asistido** | | | | |
| Subject | (*)Deseño de Maquinaria Asistido | | | |
| Code | V04M141V01316 | | | |
| Study programme | (*)Máster Universitario en Enxeñaría Industrial | | | |
| Descriptors | ECTS Credits | Choose | Year | Quadmester |
| | 6 | Optional | 2nd | 1st |
| Teaching language | | | | |
| Department | | | | |
| Coordinator | Casarejos Ruiz, Enrique | | | |
| Lecturers | Casarejos Ruiz, Enrique | | | |
| E-mail | e.casarejos@uvigo.es | | | |
| Web | http://faitic.uvigo.es | | | |
| General description | | | | |

| Competencies | |
|---|---|
| Code | |
| A2 | That the students can apply their knowledge and their ability to solve problems in new or unfamiliar environments within broader (or multidisciplinary) contexts related to their field of study. |
| A3 | That students are able to integrate knowledge and handle complexity and formulate judgments based on information that was incomplete or limited, include reflecting on social and ethical responsibilities linked to the application of their knowledge and judgments. |
| C1 | CET1. Project, calculate and design products, processes, facilities and plants. |
| C14 | CTI3. Ability to design and test machines. |

| Learning outcomes | |
|---|---|
| Expected results from this subject | Training and Learning Results |
| - Integration of components in the design of machines. | A2 |
| - Knowing and applying computational techniques of 2D and 3D mechanical design modeling. | A3 |
| - To complement the classic calculation of machine elements, and kinematic and dynamic calculations of mechanisms computational techniques. | C1<br>C14 |

| Contents | |
|---|---|
| Topic | |
| Presentation of the matter | - Introduction to the matter<br>- previous Knowledges: design of machines; software of modelling, analysis, simulation and validation<br>- Definition of the project to realise: design, analysis, simulation and validation of a machine |
| Calculation of axes and trees | - Definition of the element<br>- theoretical Calculation and selection<br>- Software of calculation |
| Calculation of gears | - Definition of the element<br>- theoretical Calculation and selection<br>- Software of calculation |
| Calculation of rollings and bearings | - Definition of the element<br>- theoretical Calculation and selection<br>- Software of calculation |

| | |
|---|---|
| Calculation of joints:<br>- axis-cube joints and tolerances<br>- soldered and hit joints<br>- bolted and rivet joints | - Definition of the element<br>- theoretical Calculation and selection<br>- Software of calculation |
| Calculation of springs | - Definition of the element<br>- theoretical Calculation and selection<br>- Software of calculation |
| Calculation of belts and chains | - Definition of the element<br>- theoretical Calculation and selection<br>- Software of calculation |

**Planning**

| | Class hours | Hours outside the classroom | Total hours |
|---|---|---|---|
| Introductory activities | 1 | 0 | 1 |
| Practice in computer rooms | 18 | 0 | 18 |
| Case studies / analysis of situations | 2 | 0 | 2 |
| Troubleshooting and / or exercises | 11 | 55 | 66 |
| Group tutoring | 10 | 0 | 10 |
| Troubleshooting and / or exercises | 2 | 0 | 2 |
| Practical tests, real task execution and / or simulated. | 4 | 0 | 4 |
| Jobs and projects | 0 | 47 | 47 |

*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 | I review of previous contents of design / calculation of machines |
| Practice in computer rooms | Resolution, by part of the professor and of the student body, of the distinct calculation elements of machines, his analysis, simulation and validation, by means of computer programs |
| Case studies / analysis of situations | Presentation and explanation of particular cases, by part of the students and the professor. |
| Troubleshooting and / or exercises | Resolution, by part of the professor and of the student body, of the calculation of distinct elements of machines, his analysis, simulation and validation |
| Group tutoring | Exhibition and resolution of doubts of development of works. |

**Personalized attention**

| Methodologies | Description |
|---|---|
| Troubleshooting and / or exercises | The student will advance in the development of the work supporting in the personalised attention that will help him to solve those problems that pose him . |
| Practice in computer rooms | The student will advance in the development of the work supporting in the personalised attention that will help him to solve those problems that pose him . |
| Group tutoring | The student will advance in the development of the work supporting in the personalised attention that will help him to solve those problems that pose him . |

**Assessment**

| | Description | Qualification | Training and Learning Results | |
|---|---|---|---|---|
| Troubleshooting and / or exercises | Resolution of exercises and problems, by means of analytical calculation and/or by means of the use of software, consistent in the design, analysis, simulation and validation of the elements of a machine for academic cases | 30 | A2<br>A3 | C1<br>C14 |
| Practical tests, real task execution and / or simulated. | Resolution of exercises and problems, by means of analytical calculation, consistent in the design, analysis, and validation of the elements of a machine | 20 | A2<br>A3 | C1<br>C14 |
| Jobs and projects | Resolution of a realistic case proposed by means of the use of technicians of design, analysis and simulation. | 50 | A2<br>A3 | C1<br>C14 |

**Other comments on the Evaluation**

If the students renounces officially to the continuous evaluation, the final proof of the continuous evaluation will complete with exercises or a work/project of design, analysis, simulation and validation of a machine.

Ethical commitment: It is expected an adequate ethical behaviour of the student. In case of detecting unethical behaviour (copying, plagiarism, unauthorized use of electronic devices, etc.)Â shall be deemed that the student does not meet the requirements for passing the subject. In this case, the overall rating in the current academic year will be Fail (0.0).

## Sources of information

Norton, R., Diseño de Máquinas, Pearson, 2012

Shigley, J.E., Diseño en Ingeniería Mecánica, McGraw-Hill, 2008

Mott, Robert L., Diseño de elementos de máquinas, Pearson, 2006

Lombard, M., Solid Works 2009 bible, Wiley, 2009

## Recommendations