



## IDENTIFYING DATA

### Mechanical Engineering Design

|                     |   |          |      |            |
|---------------------|---|----------|------|------------|
| Subject             | Mechanical Engineering Design                                 |          |      |            |
| Code                | V04M141V01214   |          |      |            |
| Study programme     | (*)Máster Universitario en Enxeñaría Industrial               |          |      |            |
| Descriptors         | ECTS Credits  | Choose   | Year | Quadmester |
|                     | 3   | Optional | 1st  | 2nd        |
| Teaching language   | English   |          |      |            |
| Department          |   |          |      |            |
| Coordinator         | Casarejos Ruiz, Enrique                                       |          |      |            |
| Lecturers           | Casarejos Ruiz, Enrique                                       |          |      |            |
| E-mail              | e.casarejos@uvigo.es  |          |      |            |
| Web                 | <a href="http://moovi.uvigo.gal/">http://moovi.uvigo.gal/</a> |          |      |            |
| General description | Standard and Numerical Calculation of Mechanical Elements     |          |      |            |

## Training and Learning Results

|      |  |
|------|--|
| Code |  |
| C14  | CTI3. Ability to design and test machines.   |
| D9   | ABET-i. A recognition of the need for, and an ability to engage in life-long learning. |

## Expected results from this subject

| Expected results from this subject  | Training and Learning Results |
|---|-------------------------------|
| - Know the most common components of the machines and his use.                  | C14                           |
| - Know calculate the elements more commonly used in machines.                   | D9                            |
| - Know the general appearances of the construction and calculation of machines. |                               |

## Contents

| Topic                          |  |
|--------------------------------|--|
| Introduction                   | - Study Cases & Applications<br>- Previous & Linked Subjects |
| Transmission:                  | - Element Characterization                                   |
| - Shafts                       | - Application Details  |
| - Gears                        | - Calculation and Selection                                  |
| - Bearings                     |  |
| Transmission:                  | - Element Characterization                                   |
| - Belts & Chains               | - Application Details  |
| - Lead screws                  | - Theoretical Calculation and Selection                      |
| - Couplings                    |  |
| Joints:                        | - Element Characterization                                   |
| - Shaft-Hub. Tolerances        | - Application Details  |
| - Bolts & Screws               | - Theoretical Calculation and Selection                      |
| Integration of complex systems | - Gear-boxes<br>- Analysis Cases: design, evaluation         |

## Planning

|  | Class hours | Hours outside the classroom | Total hours |
|--|-------------|-----------------------------|-------------|
|  |             |                             |             |

|                                 |    |    |    |
|---------------------------------|----|----|----|
| Presentation                    | 10 | 0  | 10 |
| Problem solving                 | 6  | 0  | 6  |
| Case studies                    | 8  | 0  | 8  |
| Problem and/or exercise solving | 0  | 6  | 6  |
| Case studies                    | 0  | 20 | 20 |
| Project                         | 0  | 23 | 23 |

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

| Methodologies   |   |
|-----------------|---|
|                 | Description   |
| Presentation    | Lectures about topics.<br>Applications.<br>Study Cases. |
| Problem solving | Discussion of exercises                                 |
| Case studies    | Discussion of practical cases                           |

| Personalized assistance         |  |
|---------------------------------|--|
| Methodologies                   | Description  |
| Problem solving                 | Common discussions for the resolution of problems and/or exercises proposed.     |
| Case studies                    | Common discussions to solve the doubts related to the proposed case.             |
| Presentation                    | Common discussions to solve the doubts related to the developed project.         |
| Tests                           | Description  |
| Problem and/or exercise solving | Individual discussions for the resolution of problems and/or exercises proposed. |
| Case studies                    | Individual discussions to solve the doubts related to the proposed case.         |
| Project                         | Individual discussions to solve the doubts related to the developed project.     |

| Assessment                      |  |               |                               |    |
|---------------------------------|--|---------------|-------------------------------|----|
|                                 | Description  | Qualification | Training and Learning Results |    |
| Problem and/or exercise solving | Resolution of exercises and problems using the standards | 25            | C14                           | D9 |
| Case studies                    | Analysis of a proposed case .                            | 40            | C14                           | D9 |
| Project                         | Analysis of a realistic case .                           | 35            | C14                           | D9 |

### Other comments on the Evaluation

The evaluation will be done according to the scores in working blocks: #calculation with standards (25%) #case-study (40%) #project (35%). Students must achieve at least 35% of the partial score of each block to pass the evaluation.

The continuous evaluation will be done considering both the regular exercises, the case-study and the project, to hand in. If any student gives up (officially) the continuous evaluation, the evaluation will be done with the exam and the case-study and the project. The distribution of the evaluation will be of 25% for the exam and 75% for the case-study and the project.

It is expected an adequate ethical behaviour of the student. In case of detecting unethical behaviour (copying, plagiarism, unauthorized use of electronic devices, etc.) 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).

The use of any electronic device for the assessment tests is not allowed unless explicitly authorized. The fact of introducing unauthorized electronic device in the examination room will be considered reason for not passing the subject in the current academic year and will hold overall rating (0.0).

| Sources of information  |
|---|
| <b>Basic Bibliography</b>   |
| VVAA, <b>Shigley's mechanical engineering design</b> , McGraw-Hill, |
| <b>Complementary Bibliography</b>                                   |
| Norton, R., <b>Diseño de Máquinas</b> , Pearson, 2000               |
| Mott, R.L., <b>Diseño de elementos de máquinas</b> , Pearson, 2006  |
| Ansys, <b>Ansys, documentation</b> ,                                |
| VVAA, <b>SolidWorks documentation</b> ,                             |

| Recommendations                            |
|--|
| <b>Subjects that continue the syllabus</b> |

