



IDENTIFYING DATA

Advanced Mechanical Engineering Design

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|---------------------|---------------------------------------------------------------------|------------------|-------------|-------------------|
| Subject | Advanced Mechanical Engineering Design | | | |
| Code | V04M141V01203 | | | |
| Study programme | (*)Máster Universitario en Enxeñaría Industrial | | | |
| Descriptors | ECTS Credits 3 | Type Optional | Year 1st | Quadmester 2nd |
| Teaching language | English | | | |
| Department | | | | |
| Coordinator | Casarejos Ruiz, Enrique | | | |
| Lecturers | Casarejos Ruiz, Enrique | | | |
| E-mail | e.casarejos@uvigo.es | | | |
| Web | http://www.faitic.uvigo.es | | | |
| General description | Classical and numerical calculation of Mechanical Elements | | | |

Competencies

| Code | Typology |
|--------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------|
| CE14 CT13. Ability to design and test machines. | <ul style="list-style-type: none"> • know • Know How • Know be |
| CT9 ABET-i. A recognition of the need for, and an ability to engage in life-long learning. | <ul style="list-style-type: none"> • know • Know How • Know be |

Learning outcomes

| Learning outcomes | Competences |
|---------------------------------------------------------------------------------|-------------|
| - Know the components of the machines, his use and maintenance. | CE14 |
| - Know calculate the elements more commonly used in machines. | CT9 |
| - Know the general appearances of the construction and calculation of machines. | |
| - Capacity of analytical study of transmissions in machinery | |

Contents

| Topic | |
|-------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Presentation of the contents | <ul style="list-style-type: none"> - Introduction - Syllabus |
| Shafts, gears and bearings | <ul style="list-style-type: none"> - Definition of the element - theoretical Calculation and selection - Software of calculation |
| Belts, chains and springs. Lead screws. | <ul style="list-style-type: none"> - Definition of the element - theoretical Calculation and selection - Software of calculation |
| Joints - shat-hub and tolerances - screws | <ul style="list-style-type: none"> - Definition of the element - theoretical Calculation and selection - Software of calculation |
| Introduction to FEM | <ul style="list-style-type: none"> - FEM calculation - Definition of a FEM case |

| Planning | | | |
|----------------------------------------------------------|-------------|-----------------------------|-------------|
| | Class hours | Hours outside the classroom | Total hours |
| Master Session | 10 | 0 | 10 |
| Case studies / analysis of situations | 5 | 0 | 5 |
| Troubleshooting and / or exercises | 5 | 0 | 5 |
| Group tutoring | 2 | 0 | 2 |
| Troubleshooting and / or exercises | 0 | 30 | 30 |
| Practical tests, real task execution and / or simulated. | 2 | 0 | 2 |
| Jobs and projects | 0 | 21 | 21 |

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

| Methodologies | |
|---------------------------------------|----------------------------------------------------------------------------------------------|
| | Description |
| Master Session | Review of previous contents of design / calculation of machines. Presentation of syllabus |
| Case studies / analysis of situations | Discussion of particular cases |
| Troubleshooting and / or exercises | Resolution of exercises |
| Group tutoring | Discussion and resolution of doubts about the development of works and projects |

| Personalized attention | |
|------------------------------------|---------------------------------------------------------------------------------------|
| Tests | Description |
| Troubleshooting and / or exercises | Individual discussions for the resolution of problems and/or exercises proposed |
| Jobs and projects | Individual discussions to solve the doubts related to the works and projects proposed |

| Assessment | | | |
|----------------------------------------------------------|-----------------------------------------|---------------|-----------------------|
| | Description | Qualification | Evaluated Competences |
| Troubleshooting and / or exercises | Resolution of exercises and problems | 50 | CE14 CT9 |
| Practical tests, real task execution and / or simulated. | Resolution and presentation of problems | 20 | CE14 CT9 |
| Jobs and projects | Resolution of a realistic case proposed | 30 | CE14 CT9 |

Other comments on the Evaluation

The continuous evaluation will be done considering both the regular exercises and the project to hand in. The quota of the exam will pass to the project.

In anyone gives up (officially) the continuous evaluation, the examination for the evaluation will be done together with the proposed project, and the distribution of the evaluation will be of 50% for the examination.

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

Basic Bibliography

various authors, Shigley's mechanical engineering design, McGraw-Hill,

Complementary Bibliography

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

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

Ansys, documentation,

Recommendations
