1. BASIC INFORMATION

Course	Project: Theory of Machines and Mechanisms
Degree program	Bachelor's Degree in Industrial Systems Engineering
School	School of Architecture, Engineering, Science and Computing
Year	2
ECTS	6
Credit type	Mandatory
Language(s)	English
Delivery mode	Face to face
Semester	S1
Academic year	25-26
Coordinating professor	Juan Luis Carrasco

2. PRESENTATION

In this subject, you will approach the design of machines and mechanisms through the study of the kinematic and dynamic behavior of basic machine components and mechanisms (gears, cams, flywheels, etc.). This subject serves as a foundation for acquiring knowledge that will be useful in later subjects such as Machine Design and Machine Maintenance.

3. LEARNING OUTCOMES

Knowledge

KNO10: Knowledge of the principles of machine theory and mechanisms

- Identify the requirements and specifications of mechanical parts and assemblies

Skills

SK19: Ability to apply the principles of machine theory and mechanisms

- Analyze the kinematic and dynamic conditions of machines and mechanisms
- Evaluate the kinematic and dynamic conditions of machines and mechanisms
- Evaluate the operation of different simple mechanical components
- Sizing Different Simple Mechanical Components
- Design a mechanism for subsequent automation

Competences

CP3: Ability to solve problems with initiative, decision-making, creativity, critical reasoning and to communicate and transmit knowledge, skills and abilities in the field of Industrial Engineering.

CP9: Create new ideas and concepts based on known ideas and concepts, reaching conclusions or solving problems, challenges and situations in an original way in the academic and professional environment.

CP13: Cooperate with others in the achievement of a shared academic or professional goal, participating actively, empathetically and exercising active listening and respect for all members

CP14: Integrate analysis with critical thinking in a process of evaluating different ideas or professional possibilities and their potential for error, based on evidence and objective data that lead to effective and valid decision-making.

4. CONTENT

- Introduction to machines and machine elements
- Kinematics & dynamics
- Passive resistors. Tribology. Wear. Lubrication
- Rigid transmitting elements. Cams, eccentrics, shafts and keyways
- Gears. Gear trains
- Springs. Shock absorbers

5. TEACHING-LEARNING METHODOLOGIES

The types of teaching-learning methodologies used are indicated below:

- Master class
- Cooperative learning
- Problem based learning
- Project-based learning (PBL)
- Workshop-based learning
- Simulation environments

6. LEARNING ACTIVITIES

Listed below are the types of learning activities and the number of hours the student will spend on each one:

Campus-based mode:

Learning activity	Number of hours
Master classes	10
Practical seminars	15
Problem solving	10
Written reports and essays	5
Research and projects	40
Autonomous study	60
Debates and panel discussions	5
Face-to-face assessment test	5
TOTAL	**150**

7. ASSESSMENT

Listed below are the assessment systems used and the weight each one carries towards the final course grade:

Campus-based mode:

Assessment system	Weight min. %	Weight max.%
Face-to-face assessment test	50	60
Case/problem	15	40
Performance evaluation	5	5
Research / projects	20	40

When you access the course on the *Campus Virtual*, you'll find a description of the assessment activities you have to complete, as well as the delivery deadline and assessment procedure for each one.

8. SCHEDULE

This table shows the delivery deadline for each assessable activity in the course:

Campus-based mode:

Actividades evaluables	Fecha
Activity 1. Completion of different works, problems and application exercises, reports of laboratory practices, reports of visits, conferences and workshops carried out and collaborative works	Week 1-18
Activity 2: Active participation (issues and problems proposed and discussed in the classroom or in the subject forum)	Week 1-18
Activity 3: Intermediate written tests	Week 9-10
Activity 4: Final project of the subject	Week 14-18
Activity 5: Final exam of the subject	Week 13-14

This schedule may be subject to changes for logistical reasons relating to the activities. The student will be notified of any change as and when appropriate.

9. BIBLIOGRAPHY

The main reference work for this subject is:

- Design of Machinery: An introduction to the Synthesis and Analysis of Mechanisms and Machines, 6th Edition – Robert L. Norton

The recommended Bibliography is:

- Theory of Machines and Mechanisms – Joseph Edward Shigley, John Joseph Uicker Jr.

10. EDUCATIONAL GUIDANCE, DIVERSITY AND INCLUSION UNIT

From the Educational Guidance, Diversity and Inclusion Unit we offer support to our students throughout their university life to help them reach their academic achievements. Other main actions are the students inclusions with specific educational needs, universal accessibility on the different campuses of the university and equal opportunities.

From this unit we offer to our students:

1. Accompaniment and follow-up by means of counselling and personalized plans for students who need to improve their academic performance.
2. In terms of attention to diversity, non-significant curricular adjustments are made in terms of methodology and assessment for those students with specific educational needs, pursuing an equal opportunities for all students.
3. We offer students different extracurricular resources to develop different competences that will encourage their personal and professional development.
4. Vocational guidance through the provision of tools and counselling to students with vocational doubts or who believe they have made a mistake in their choice of degree.

Students in need of educational support can write to us at:

orientacioneducativa@universidadeuropea.es

11. ONLINE SURVEYS

Your opinion matters!

The Universidad Europea encourages you to participate in several surveys which help identify the strengths and areas we need to improve regarding professors, degree programs and the teaching-learning process.

The surveys will be made available in the “surveys” section in virtual campus or via e-mail.

Your assessment is necessary for us to improve.

Thank you very much for your participation.

WORK PLAN FOR THE COURSE

HOW TO COMMUNICATE WITH YOUR PROFESSOR

Whenever you have a question about the content or activities, don't forget to post it to your course forum so that your classmates can read it.

You might not be the only one with the same question!

If you have a question that you only want to ask your professor, you can send him/her a private message from the Campus Virtual. And if you need to discuss something in more detail, you can arrange an advisory session with your professor.

It's a good idea to check the course forum on a regular basis and read the messages posted by your classmates and professors, as this can be another way to learn.

SCHEDULE ACTIVITIES

This table shows the delivery deadline for each assessable activity in the course, as well as the delivery dates:

Week	Contents	Learning activities /Assessables	Weight of evaluable activity

This schedule may be subject to changes for logistical reasons relating to the activities. The student will be notified of any change as and when appropriate.

DESCRIPTION FOR ASSESSMENT ACTIVITIES

Activity 1.

Activity 2.

Activity 3.

Activity 4.

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ASSESSMENT REQUIREMENTS

First exam period

To pass the course in the first exam period, you must obtain: **(EJEMPLO)**

- A grade equal or higher than 5,0 over 10 in the project
- A grade equal or higher than 5,0 over 10 in class and deliverable exercises
- Deliver the reports of all lab practices
- A grade equal or higher than 5,0 over 10 in the final exam
- 50% attendance **(MÍNIMO POR ESCUELA, PERO SE PUEDE AUMENTAR)**

When the minimum required to carry out the weighted average of the evaluable activities is not met (the minimum is not reached in any of the previous points), the final grade will be:

- the weighted mean if its value is less than or equal to 4
- 4 if the value of the weighted mean is greater than 4

The grade in the first exam period will be considered as NP (Not Presented) when the student has not delivered any evaluable activity of those that are part of the weighted average.

Second exam period

To pass the course in the second exam period, you must obtain: **(EJEMPLO)**

- A grade equal or higher than 5,0 over 10 in the project
- A grade equal or higher than 5,0 over 10 in class and deliverable exercises
- Deliver the reports of all lab practices
- A grade equal or higher than 5,0 over 10 in the final exam

When the minimum required to carry out the weighted average of the evaluable activities is not met (the minimum is not reached in any of the previous points), the final grade will be:

- the weighted mean if its value is less than or equal to 4
- 4 if the value of the weighted mean is greater than 4

The grade in the second exam period will be considered as NP (Not Presented) when the student has not delivered any evaluable activity of those that are part of the weighted average.

The student must deliver the activities not successfully completed in the first exam period after having received the corresponding corrections from the professor, or those that were not delivered in the first place.

RUBRICS FOR ASSESSMENT ACTIVITIES

PLAGIARISM REGULATION

In accordance with the current student disciplinary regulations at Universidad Europea:

- Plagiarism, in full or in part, of intellectual works of any kind, is considered a very serious offense.
- Very serious offenses relating to plagiarism and the use of fraudulent means to pass assessment tests shall result in exclusion from the exams for the relevant period, as well as the inclusion of the offense and its details in the student's academic record. For more information you can find all information regarding disciplinary regulations at the following link:

USE OF IA REGULATION

The student must be the author of his/her work/activities.

The use of Artificial Intelligence tools (AI) must be authorized by the teacher in each assignment/activity, indicating in what way it uses are permitted. The teacher will inform in advance in which situations AI tools may be used to improve spelling, grammar and editing in general. The student is responsible for clarifying the information given by the tool and duly declaring the use of any AI tool, according to the

guidelines given by the teacher. The final decision on the authorship of the work and the appropriateness of the reported use of an AI tool rests with the lecturer and those responsible for the degree.