

1. BASIC INFORMATION

Course	Elasticity and strength of materials
Degree program	Bachelor's Degree in Industrial Systems Engineering
School	School of Architecture, Engineering, Science and Computing
Year	3º
ECTS	6
Credit type	Mandatory
Language(s)	English
Delivery mode	Face to face
Semester	S1
Academic year	25-26
Coordinating professor	Andrea Galán Salazar

2. PRESENTATION

In this course, the basic principles of elasticity and strength of materials will be explained, stresses and deformations in simple mechanical elements will be analyzed and evaluated, and the knowledge acquired will be applied to the calculation and design of a simple mechanical part or element.

3. LEARNING OUTCOMES

Skills

SK4: Knowledge and use of the principles of material strength.

- Apply the principles of elasticity to elastic solids.
- Use the basic principles of material strength to identify the type of stresses that occur in any part or element.
- Evaluate stresses and deformations in simple elements: beams, columns, shafts and, in general, any basic element subjected to mechanical stresses
- Evaluate safety coefficients.
- Apply the knowledge acquired to the design, calculation and/or structural validation of a piece or element of study.

Competences

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

- General theory of the elastic solid. Fundamental principles and concepts.
- Three-dimensional elasticity. Matrix of stresses and strains. Mohr circles.
- In plane tensional state. In plane strain state. Mohr circles.
- Types of stresses: tensile, compression, shear, torsion, buckling and bending.
- Introduction to combined loads.

5. TEACHING-LEARNING METHODOLOGIES

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

- Master class
- Project-based learning

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 class	10
Seminars	20
Problem solving	50
Self-study	60
Debates	5
Evaluation tests	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
Assessment tests	50 – 60 %
Reports	10 – 20 %
Case study or problem solving	20 – 30 %
Performance evaluation	5 %

When you access the course on the *Campus Virtual*, you'll find a description of the assessment activities you must 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:

Assessable activities	Deadline
Activity 1. Problem solving, case study, laboratory reports, workshops.	Week 1 – 18
Activity 2. Active participation in problem solving.	Week 1 – 18
Activity 3. Midterm exam.	Week 9 – 10
Activity 4. Project.	Week 15 - 18
Activity 5. Final exam.	Week 17 - 18

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:

- J. M. GERE-TIMOSHENKO, Resistencia de Materiales, Thomson.

The recommended Bibliography is:

- L. ORTIZ BERROCAL, Elasticidad. Mc Graw Hill
- L. ORTIZ BERROCAL Resistencia de Materiales. Mc Graw Hill.

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 mean 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 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.