29920 - Resistance of Materials

Información del Plan Docente

Academic Year	2017/18
Faculty / School	110 - Escuela de Ingeniería y Arquitectura
Degree	435 - Bachelor's Degree in Chemical Engineering
ECTS	6.0
Year	3
Semester	First semester
Subject Type	Compulsory
Module	---

1.General information

1.1.Introduction

Short presentation of the course

Strength of Materials (also known as Mechanics of Materials) is the study of the internal effects of external forces applied to structural members. Stress, strain, deformation deflectio, torsion, flexure, shear diagram and moment diagram are some of the tpics covered by this subject.

The knoledge of this subject is a must in all engineering studies.

1.2.Recommendations to take this course

1.3.Context and importance of this course in the degree

1.4.Activities and key dates

2.Learning goals

2.1.Learning goals

The student, in order to pass the course, will have to demonstrate the following results:

1. The student is able to understand the concepts of stress and strain and its relationships

2. The student knows how to calculate shear and moment diagrams

3. The student is able to solve torsion and bending problems

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4. The student is aware of the buckling phenomenon

5. The student is able to aplly the knowledge of strength of materials on engineering applications and design problems using a computer program

2.2.Importance of learning goals

3.Aims of the course and competences

3.1.Aims of the course

3.2.Competences

4.Assessment (1st and 2nd call)

4.1.Assessment tasks (description of tasks, marking system and assessment criteria)

5.Methodology, learning tasks, syllabus and resources

5.1.Methodological overview

Teaching methodology

Teaching for this course will consist primarily of lectures where the fundamental theory will be presented, followed by examples to illustrate how the theory can be applied to solve practical engineering mechanics problems. Students will learn how to use computer programs to apply the knowledge of strength of materials, that has been described in the lectures, on engineering applications and design problems. They will be required to perform calculations using the results of the programs to demonstrate their understanding of the underlying theory. Students will develop their understanding of the course content through the reading of the textbook, practice problem solving through tutorial questions and attendance at lectures where problem solving strategies are presented and discussed.

5.2.Learning tasks

The distribution of the learning activities during the semester of the course is:

- 14 hours of lectures devoted to the exposition of the concepts

- 25 hours of practical lessons

- 12 hours of practical computing

- 9 hours of assignments

- 90 hours of homework: learning activities with tutorials.

5.3.Syllabus

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Course syllabus:

1. Theory of Elasticity. Calculation of internal pressure vessels

2. Strength of Materials: Shear and moment diagrams, stress and strain calculations in beams

3. Buckling in columns

4. Structural analysis: basic concepts

5.4.Course planning and calendar

The calendar of the course is established by the college and can be consulted in its web page.

Tutorials will be announced in advance.

5.5.Bibliography and recommended resources

BB	Ortiz Berrocal, Luis. Elasticidad / Luis Ortiz Berrocal . - 3ª ed., [reimp.] Madrid : McGraw-Hill, D. L. 2004
BB	Ortíz Berrocal, Luis. Resistencia de materiales / Luis Ortíz Berrocal . - 3ª ed., [reimpr.] Madrid [etc.] : McGraw-Hill/Interamericana, D.L. 2010
BB	[Timoshenko] Gere, James Monroe. Resistencia de materiales / James M. Gere ; revisión técnica, Gabriel Bugeda Castelltort . Madrid [etc.] : International Thomson Editores, D.L. 2002