Course number and name: Strength of Materials
Credits: 6 ECTS (3 US credits)
Credit categorization: Engineering Topic
Instructor: To be determined

Office:
Email:
Office hours:

Text book:

Required:

- Stephen Timoshenko; Strength of Materials, Part 1 & Part 2. CBS Publishers & distributors. 2002.

Recommended supporting material:

- James M. Gere, Stephen P. Timoshenko; Mechanics of Materials. Brooks/Cole. 2003.
- Ferdinand P. Beer, E. Rusell Johnston Jr., John T. DeWolf, David F. Mazurek.; Mechanics of Materials. Mc Graw Hill. 2012.

Specific Course information:

Brief description:

This course provides students with the ability to calculate stresses, strains and displacements in structural components. Understanding the mechanical behavior of materials is fundamental to the design, dimensioning and manufacturing of engineering applications. The subject includes as essential contents: Internal forces in a beam, axial load, bending moment, shear force, torsion, elastic curves and deflection of beams, combined stress and columns.

Prerequisites or co-requisites:

Mathematics, Physics, Mechanics.

Required (Required, Elective or Selected Elective)

Course objectives and outcomes:

Course objectives:

1. Provide students with the basic principles required for understanding strength of materials and its role in society and engineering.
2. Understand equilibrium equations, material law equations geometry of deformation under single and combined stresses and strains and how to use them to solve engineering problems related to strength of materials.
3. Apply equilibrium equations, material law equations geometry of deformation to structural components under single and combined stresses and strains.
4. Develop fundamental engineering problem solving skills applied to strength of materials and structural components calculation considering material behavior limited to linear elastic range.

Course outcomes:

1. Formulate and solve problems of strength of materials (ABET outcome 1)
2. Ability to dimension structural and mechanical components with consideration of public health, safety, and welfare, as well as global, cultural, social, environmental, and economic factors (ABET outcome 2)

3. Ability to communicate effectively in oral and written communications (ABET outcome 3)
4. Ability to recognize ethical and professional responsibilities in dimensioning structural and mechanical components and make informed judgments, which must consider the impact of engineering solutions in global, economic, environmental, and societal contexts (ABET outcome 4)
5. Ability to function effectively on a team to complete laboratory experiments and class assignments related with strength of materials (ABET outcome 5)
6. Ability to develop and conduct appropriate experimentation in laboratory with strength of materials applications, analyze and interpret data, and use engineering judgment to draw conclusions, write and present reports (ABET outcome 6)

List of topics to be covered:

1. Introduction
2. Stress and strain. Tension, compression, and shear.
3. Axial Loaded Members
4. Bending Moment
5. Torsion
6. Deflections of Beams
7. Combined loadings
8. Buckling of columns

Assessment structure:

Methods of Evaluation	**Weight**	**Date/freq.**	**Description**
Final exam	40%	End of semester	Grading: 70% problems, 30% of theory
Following up activities	50%	Three/ course	Assessment controls of 1 hour lasting. Grading: ¿average of the 2 highest records?
Homework and presentations	5%	Every week	
Experimental work or fieldwork	5%	3 hours/ week	Assessment of experimental skills, report writing and oral communication presenting report