UNIVERSITY of NICOSIA

Course Code	Course Title	ECTS Credits
MENG-270	Strength of Materials	6
Department	**Semester**	**Prerequisites**
Engineering	Fall, Spring	MENG-250
Type of Course	**Field**	**Language of Instruction**
Required	Engineering	English
Level of Course	**Year of Study**	**Lecturer(s)**
1st Cycle	2nd	Dr Ernestos Sarris
Mode of Delivery	**Work Placement**	**Co-requisites**
Face-to-face	N/A	None

Objectives of the Course:

The student should obtain a clear concept about the strength of materials and the concept of elastic and Elastoplastic behavior of solids under different loading conditions. The various strain and stress situations that elastic solids will undergo will be analyzed. The students will hence learn to analyze through mathematical analysis the qualitative as well as quantitative behavior of materials under different loading scenarios. The main objective is to eventually assess the performance of materials under normal and extreme conditions.

Learning Outcomes:

After completion of the course students are expected to:

- Compute stress-strain for different loading conditions
- Measure and select the mechanical properties of materials.
- Select yield/failure and safety criteria.
- Select the appropriate material based on its mechanical properties, applied stress-strain and safety criteria.
- Utilize their scientific knowledge obtained by the course to address engineering problems. (i.e assess deformation, stability and functional prospects).

Course Contents:

- Stress and strain definitions
- Elastic behavior of solids
- Stress-strain diagram
- Axial Loading
- Uniaxial tension
- Engineering beam bending theory
- Torsion Theory
- Deflections of beams and thin walls cross-sections
- Shearing stresses in beams and thin walls cross-sections
- Plane stress and strain analysis

- Elastoplastic behavior under axial loading.
- Stress and Mohr's circle
- Yield and Failure criteria, Von Mises and Mohr-Coulomb

Learning Activities and Teaching Methods:

The course is being taught through lectures providing the theoretical fundamentals. Solving extensive examples through a continuous exchange with the students creates firm understanding of the various topics. Referring to practical aspects related to the topics matures the general concept of the students about their studies. The course is being accompanied on occasions by practical presentations of functioning principles on demonstrative examples in class.

Assessment Methods:

Homework (applied exercises), midterm exam, final exam.

Required Textbooks/Reading:

Authors	Title	Publisher	Year	ISBN
Beer Johnson and DeWolf	Mechanics of Materials Sixth edition	McGraw Hill	2009	9780073380285

Recommended Textbooks/Reading:

Authors	Title	Publisher	Year	ISBN
Hibbeler, R.C	Mechanics of Materials Eighth edition	Prentice-Hall	2011	9780136022305