



Course Code MENG-452	Course Title Stress Analysis	ECTS Credits 6
Department Engineering	Semester Fall, Spring	Prerequisites MENG-250, MENG-270, MATH-350
Type of Course Elective	Field Engineering	Language of Instruction English
Level of Course 1 st Cycle	Year of Study 4 th	Lecturer(s) Dr Vasileios Drakonakis
Mode of Delivery Face-to-face	Work Placement N/A	Co-requisites None

Objectives of the Course:

The main objectives of the course are to:

- Develop a strong foundation on stress analysis.
- Demonstrate the ability to analyze a range of structural problems.
- Develop engineering thinking and comprehension through stress and structural analysis.
- Comprehend and evaluate the different methodologies applied to the analysis of structural members (beams, plates, shells, etc.)
- Critically evaluate the applicability and limitations of the methods and the ability to make use of original thought and judgement when approaching structural analysis.

Learning Outcomes:

After completion of the course students are expected to:

- Demonstrate knowledge and understanding of stress analysis methodologies.
- Be able to analyze and solve multiple engineering problems.
- Understand the relation between the various forms of loading and the stresses that can be caused.
- Be able to approach an engineering problem with different solution methodologies.
- Decision making and problem solving when it comes to engineering problems.

Course Contents:

- Basics of Material Engineering
- Stress and Strain Relationship
- Stress Due to Pressure Conditions
- Failure Criteria
- Beam Analysis Theory

- Plate Analysis Theory
- Elastic Stability and Buckling
- Fatigue Analysis
- Energy Methods
- Numerical and Finite Element Methods
- Composite Analysis Theory
- Fasteners and Joint Connections
- CAD Stress Analysis Simulations
- Introduction to Theory of Elasticity

Learning Activities and Teaching Methods:

Lectures, In-class examples and exercises, In-class Activities, Videos

Assessment Methods:

In-class Activities, Participation, Homework (Applied Exercises), Mid-Term Exam, Final Exam

Required Textbooks/Reading:

Authors	Title	Publisher	Year	ISBN
Amir Javidinejad	Essentials of Mechanical Stress Analysis	CRC Press, Taylor & Francis Group	2014	9781482258479

Recommended Textbooks/Reading:

Authors	Title	Publisher	Year	ISBN
Jianqiao Ye	Structural and Stress Analysis: Theories, Tutorials and Examples, Second Edition	CRC Press, Taylor & Francis Group	2015	9781482220339
Timoshenko, S.	Theory of Elasticity	McGraw-Hill	1970	9780070858053