Department of   Architectural Engineering

College of Engineering

University of Cihan- Sulaimaniya

Subject: Strength of Materials

Course Book – Year 2

Lecturer's name: Diyari B. Hussein

Academic Year: 2023/2024

Course Book

1. Course name	Strength of Materials
2. Lecturer in charge	Diyari B. Hussein
3. Department/ College	Architecture/Engineering
4. Time (in hours) per week	Theory: 3 Practical: 0
5. Office hours	Saturday (9:30 AM – 12:30 AM)
6. Course code	ARC2207
7. Teacher's academic profile	Earned a bachelor's degree in civil engineering at the University of Sulaimani, Sulaymaneyh/Iraq, and a master's degree in structural engineering at Budapest University of Technology and Economics, Budapest/Hungary, and individual thesis that was 'Comparative analysis of strengthening methods for RC monolithic columns'.
8. Keywords	Normal Stress, Shear Stress, Bending Stress, Normal Strain, And Torsion

9. Course overview:

This subject is about the performance of deformable solids in various materials under the action of different kinds of loads. Thus the main objective of the course will be to show how to determine the stress, strain, and deflection suffered by bi-dimensional (and simple tri-dimensional) structural elements when subjected to different loads (e.g. normal, shear, torsion, bending, and combined loads). Once the state of stresses and strains has been established for a particular structure type, the student will be able to evaluate the allowable loads and associated allowable stresses before mechanical failure.

10. Course objective:

Understanding the adequacy of mechanical and structural elements under different loads is essential for the design and safe evaluation of any kind of structure. That is why this course is a major subject in many different engineering careers (Aeronautics, civil engineering, antennas, etc.).

11. Student's obligation

Attendance, and solving homework are essential. Importance should be given to quizzes and students should study daily

12. Forms of teaching

Whiteboard and data show

13. Assessment scheme

Midterm Examination	**30 %**
Attendance, Quiz, Homework	**10 %**
Final theory exam	**60 %**

14. Student learning outcome:

Understand the fundamental concepts of stress and strain and the relationship between both through the strain-stress equations to solve problems for simple tri-dimensional elastic solids

Calculate and represent the stress diagrams in bars and simple structures

Solve problems relating to pure and non-uniform bending of beams and other simple structures

Solve problems relating to torsional deformation of bars and other simple tri-dimensional structures

Understand the concept of buckling and be able to solve the problems related to isolated bars

15. Course Reading List and References:

 Key reference: Mechanics of Materials by Hibbeler

16. The Topics:

Lecture No	Topic
1	Introduction-Concept of Stress: Equilibrium of deformable body
2	Average normal and shear stress, bearing stress, allowable stress, factor of safety, and deformation.
3	Stress and Strain - Axial Loading: Normal and shear strain
4	Stress and Strain - Axial Loading: the tension test, Hooke's law, Poisson's ratio.
5	Torsion: The torsion formula.
6	Torsion: The torsion formula.
7	Pure Bending Shear and moment diagrams
8	The flexure formula
9	Bending of composite beams
10	Shearing Stress in Beams: The shear formula
11	Shear stresses in beams, shear flow in built-up members

12	Combined stresses: moment and axial together
13	Combined stresses: moment and axial together
14	Deflection of beams: The elastic curve
15	Deflection of beams: slope and displacement by integration method
16	Deflection of beams: slope and displacement by integration method
Final Examination	

17. Peer review

Main Lecturer in charge
Mr. Diyari Burhan Hussein

Head of The Department
Mrs. Tara Azad Rauof