Department of Mechanical& Mechatronics Engineering

College of Engineering

Salahaddin University – Hawler

Subject: Strength of Materials

Course Book –Year 2: Third Semester

Lecturer's name: Abdulbasit A. Hamza

Academic Year: 2019 -2020

Course Book

1. Course name	Strength of Materials
2. Lecturer in charge	Abdulbasit Abdulqadir Hamza
3. Department/ College	Mechanic and Mechatronics Eng. / Engineering Collage
4. Contact	abdulbasit.hamza@su.edu.krd eng.basitkadir@gmail.com
5. Time (hr. / week)	Theory: 2 Tutorial: 1
6. Office hours	Tuesday, Wednesday, Thursday 80:30 – 13:30

7. Course overview: "Strength of Materials" is a well-established topic in Mechanical Engineering, taught to the senior students (2nd year), through a theoretical weekly program of three hours supported by "laboratory applications" which is a separate "multi discipline subject" with its own credit hours**.** The subject of **strength of materials** involves analytical methods for determining the strength, stiffness (deformation characteristics), and stability of the various members in a mechanical system. The behavior of a member depends not only on the fundamental laws that govern the equilibrium of forces, but also on the mechanical characteristics of the material**.**

11. Course objective:
The main objective of the study of mechanics of materials is to provide the students with the means of analyzing and designing various mechanics and load bearing structures, to ensure that the structure used will be safe against the maximum internal effects that may be produced by any combination of external loading.
After completing, a student should be able to:
1. Solve axially loaded members in statically Determinate or Indeterminate cases
2. Solve torsionally loaded shafts in statically Determinate or Indeterminate cases
3- Compute the principal stresses, principal angles, maximum shear stress and angles, and stresses on any arbitrary plane, given the state of stress at a point.
4. Solve beams under bending for stresses.
5. Solve transversely loaded beams for internal shear forces, bending moments
6. Apply singularity functions to beam problems.
7. Solve for stresses in beams with combined axial and transverse loads.
8. Know the basics of mechanical design of process vessels that they use in the processing industry.
9. Use some of the available computer packages which solve strength of materials problems.
10. Communicate effectively by writing technical reports.

9. Student's Obligation
  - ➢ Regular attendance is required according to the university rules.
  - ➢ The use of mobile phone during the class is prohibited.
  - ➢ Only the students who are officially enrolled can attend the class, guests and children are not admitted.
  - ➢ Daily participation and conducting assignments are required.

10. Forms of Teaching: The essence of the teaching program is prepared on MS power point presentations. Elaborations and explanations of the details are done both verbally and on whiteboard, if needed. As an assisting instruction tool, multimedia presentations are used to demonstrate the presented ideas through basic diagrams or real-life applications. There are also assignments and seasonal projects appointed to individual students or groups that help the evaluation process and also support the team work effort**.**

11. Assessment Scheme:
Assignments (Quizzes, Reports, Assignments and HomeWorks): 20%
Mid-term Exam: 20%
Final Exam: 60%

12. Course Reading List:

15 Weeks: From the 30th of September 2019 to the 31st of January 2020

1st Week	Simple stresses & Strain
2nd Week	Mechanical Properties of Materials
3rd Week	brief review of shearing stress and strain
4th Week	Deformation of axially loaded members
5th Week	statically determinate members, thermal stress
6th Week	Torsion of circular shafts
7th Week	Bending moment and shear force diagrams
8th Week	Stresses in beams
9th Week	Transverse shear stress in beams
10th Week	Midterm exam
11th Week	Stresses in thin walled pressure vessels, combined loading
12th Week	Analysis of Biaxial stresses and principal stress

13th Week	Mohr's circle for biaxial stress
14th Week	Deflection of Beams
15th Week	Final exam