

1. CEE 3120 – Mechanics of Materials Laboratory
2. Course credit hours: 1
Contact hours per week: 2
Credit category: Engineering Topics
3. Course coordinator: G. Ramirez
4. Textbook: Department of Civil and Environmental Engineering, *Laboratory Manual, Mechanics of Materials*, Tennessee Technological University, March 1992.

5. Course information:

2020 Catalog description	A series of experiments which demonstrate the theory of mechanics of materials and the most important characteristics of engineering materials.
Prerequisite(s)	CEE 3110
Course type	Selected Elective – choice of two of CEE 3040, CEE 3430, or CEE 3120 labs are required

6. Course instructional outcomes:

Course Outcome No.	Course Outcome (CO)	ABET Student Outcome
CO1	Identify different types of loads acting on materials and the failure pattern that is likely to result from such loading	1, 3, 6
CO2	Know the procedures and equipment required for measuring different mechanical properties of materials	6
CO3	Describe the stress-strain behavior of materials in tension	1
CO4	Describe the load-deflection behavior of both short and long columns under compressive loading	1, 3, 6
CO5	Describe the stress-strain behavior of ductile materials in torsion	1, 3, 6
CO6	Measure and calculate deflections and stresses in both simply supported beams and statically indeterminate beams	1, 3, 6
CO7	Determine the stress distribution and the stress concentration factor near a hole in a flat plate subjected to tension	1, 3, 6
CO8	Prepare clear engineering reports consisting of drawings and graphs coupled with written procedures, results, and conclusions	6

ABET criterion 3 Student Outcomes addressed by this course:

SO No.	Student Outcome (SO)
3.1	An ability to identify, formulate and solve complex engineering problems by applying principles of engineering, science, and mathematics
3.3	An ability to communicate effectively with a range of audiences
3.6	An ability to develop and conduct appropriate experimentation, analyze and interpret data, and use engineering judgment to draw conclusions

7. Course topics:

1. Brittle and ductile tensile stress-strain mechanical behavior (10%)
2. Compressive stress-strain behavior of short columns (10%)
3. Brittle and ductile torsional stress-strain mechanical behavior (10%)
4. Flexural stress in simply supported beams (10%)
5. Buckling study of long columns (10%)
6. Statically indeterminate beams (10%)
7. Stress concentrations of plates under tension (10%)
8. Impact and hardness tests (10%)
9. Fatigue behavior of materials (10%)

Program criteria (curriculum) addressed by this course:

1. Apply knowledge of mathematics through differential equations, calculus-based physics, chemistry, and at least one additional area of basic science
2. Conduct experiments in at least two technical areas of civil engineering and analyze and interpret the resulting data

8. Additional topics, assignments, or requirements for dual-level (4000/5000) course:

N/A

9. Date: 02/25/2020