Technical Minor
Department of Mechanical Engineering & Mechanics

Mechanics of Materials

The minor in Mechanics of Materials provides a view of mechanical strength and behavior of materials based on understanding a few basic concepts and using simplified material models. Courses selected for the minor emphasize concepts such as superposition of loadings, relation between external loads and internal stresses, factor of safety, safe design based on allowable stress or allowable loads, allowable deformation, and reliability of structures. Courses offer a wide variety of topics including analytical and numerical methods for solving mechanics problems, manufacturing, and polymer processing.

The Mechanics of Materials minor requires a minimum of 15 credits, which must be taken from MEM offerings. Two courses are required and three additional electives must be selected.

The minor is not available for students having a major in the Department of Mechanical Engineering & Mechanics.

Required Courses (6 credits):

MECH 003 Fundamentals of Engineering Mechanics (3 credits) Static equilibrium of particles and rigid bodies. Analysis of simple truss and frame structures, internal forces, stress, strain, and Hooke's Law, torsion of circular shafts; pure bending of beams. Is intended as a prerequisite for MECH 012. Credit not given for both MECH 002 and MECH 003.

Prerequisites: (MATH 022 or MATH 032) and PHY 011
Can be taken Concurrently: MATH 022, MATH 032

MECH 012 Strength of Materials (3 credits) Stress due to normal, bending, and shear loads in beams; stress transformations via Mohr's circle; principal stress analysis; plastic yield criteria; design of thin-walled pressure vessels; deflection of beams and static indeterminacy; finite element analysis of simple structures; stresses in thick-walled cylinders; stress concentration effects.

Prerequisites: MECH 003 and (MATH 023 or MATH 033)
Can be taken Concurrently: MATH 023, MATH 033

Elective Courses (9 credits):

Select three of the following:

ME 010 Graphics for Engineering Design
ME 215 Engineering Reliability
ME 240 Manufacturing
ME 252 Mechanical Elements
ME 385 Polymer Product Manufacturing
MECH 102 Dynamics
MECH 305 Advanced Mechanics of Materials
MECH 312 Finite Element Analysis
MECH 313 Fracture Mechanics

Minor Chair: Prof. Edmund Webb III (ebw210@lehigh.edu)

Please complete the form and return it to the Department of Mechanical Engineering & Mechanics.

Lehigh University
Mechanical Engineering & Mechanics

Mechanics of Materials Minor Declaration Form

Name: _____

LIN: _____ **Email:** _____

Major: _____ **Expected Graduation Date:** _____

Major Advisor: _____

Proposed Minor Courses:

	Course Number	Semester/Year
Required	MECH 003	
Required	MECH 012	
Elective 1	[choose one]	
Elective 2	[choose one]	
Elective 3	[choose one]	

Student Signature: _____ **Date:** _____

Approved by: _____ **Date:** _____
Edmund Webb, Minor Program Chair

Approved by: _____ **Date:** _____
Hannah Dailey, Associate Chair, MEM