THE OHIO STATE UNIVERSITY
COLLEGE OF ENGINEERING

Introduction to Laminated Composite Materials

MECHENG 5162

Credit Hours:
3.00

Course Levels:
Undergraduate (1000-5000 level)
Graduate (5000-8000 level)

Course Components:
Lecture

Course Description:
Introduction to anisotropic material behavior and failure assessment of laminated composite materials. Classical lamination theory, beams, plates and shells.

Prerequisites and Co-requisites:
Prereq: 2020 (420) or 2040; or Grad standing in Engineering; or permission of instructor.

Course Goals / Objectives:
- Introduce students to the analysis techniques required to design and assess the behavior of continuous fiber laminated composite structures
- The behavior of orthotropic lamina subjected to various loads as well as thermal and hygral effects
- Conduct failure assessment of orthotropic lamina subjected to various loads, including thermal and hygral
- Analyze continuous fiber orthotropic laminates
- Analyze continuous fiber composite beams.

Course Topics:

- Stress-strain relations for orthotropic mateirlas
- Mechanical, thermal, and hygral response of orthotropic lamina
- Michromechanics models of orthotropic materials
- Lamina failure theories
- Mechanical test methods for orthotropic materials
- Classical lamination theory
- Equations of motion and analysis procedures for laminated composite beams
- Equations of motion and analysis procedures for laminated composite plates
- Equations of motion and analysis procedures for laminated composite shells

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Designation:

Elective