

MENG 5333 - Mechanics of Composite Materials
Course Syllabus

Semester / Year	
Catalog Description	Explores fundamental relationships between both the mechanical and hygrothermal behavior and the composition of multiphase media with an emphasis on fiber-reinforced polymers. Topics include using analytical tools to calculate strength, behavior, and failure of lamina.
Prerequisites	Grade C or better in MENG/CENG 3306, or Graduate standing
Section Number	050, 051, 060
Instructor Name	Tahsin Khajah
Contact Information	Email: tkhajah@uttyler.edu Zoom Meeting ID: 903 566 7245 Phone: 903 566 7245
Class Type / Instruction Mode / Location	Online/Hybrid
Class Time	Online offering – please see Canvas
Office Hours	M 3:30 pm – 5:00 pm, Th 2:00 pm – 3:30 pm by appointment
No. of Credits	3 credits
Required Textbook	Autar K. Kaw. Mechanics of Composite Materials, 2nd Edition. CRC Press. ISBN 9780849313431 – available for free to students
Optional References	Robert M Jones. Mechanics of Composite Materials, 2nd Edition. CRC Press. ISBN 9781560327127
Additional Rules and Requirements	Matlab working knowledge
Evaluation Method	Mid-term Exam 30% Final Exam 25% Homework 15% Project 30%
Grading Policy / Scale	Letter grades, scale: A: 90 – 100; B: 80 – 89; C: 70 – 79; D: 60 – 69; F: < 60
Important Events / Dates	Course start date: August 25, 2025 Course last date: October 12, 2025. Census date: August 29, 2025. Last date to withdraw: September 25, 2025. Exam date: TBA Final date: October 11, 2025 according to university calendar.
Attendance / Makeup policy / other rules	Homework Assignments: homework will be assigned according with the topics covered in lectures. Assignments are considered very important for the understanding of the course material. Completing your homework independently is an absolute necessity to do well in this course. Canvas: Course syllabus, course material such as handouts and example problems with solutions, homework, assignments, homework solutions, review material, exam solutions will all be posted on Canvas. Please review all the material posted on Canvas on a regular basis.

Course Learning Objectives / ABET & PEOs Relation	<p>By the end of this course, students should be able to:</p> <ol style="list-style-type: none"> 1. Demonstrate an understanding of the benefits and limitations of the use of FRP (Fiber Reinforced Plastics) in engineering applications 2. Describe the underlying concepts of composite materials 3. Use analytical tools to calculate material properties for a single ply, unidirectional fiber-reinforced composite 4. Utilize analytical tools to determine the elastic strength and behavior of unidirectional and multidirectional lamina. 5. Develop an appropriate ply layup for an engineering design based on elastic behavior and failure of multidirectional lamina 6. Students are required to complete a composite material design project using MATLAB or a similar software that will produce a draft of a publishable level paper.
Tentative Topics / Course Plans	<p>TENTATIVE TOPICS</p> <ul style="list-style-type: none"> ○ Introduction to Composite Materials ○ Macromechanical Analysis of Lamina ○ Mechanical Analysis of Lamina ○ Ultimate Strength of a Unidirectional Lamina ○ Macromechanical Analysis of Laminates ○ Fatigue, Analysis, and Design of Laminates
University Policies	<p>https://www.uttlyer.edu/offices/academic-affairs/files/syllabus-information.pdf</p>