UTTyler ENGINEERING

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MENG *5333 - Mechanics of Composite Materials*
Course Syllabus

Semester / Year	Summer 2026
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	
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 • Since the mechanical engineering program is designed to prepare students for professional practice, all submitted work (e.g., homework, lab reports, projects, presentations) is expected to meet professional standards. Work that does not reflect professional quality may be subject to grade reductions, even if professionalism is not explicitly listed in the grading rubric. • AI tools are allowed to support students' learning and productivity, provided that their use aligns with academic integrity standards. When required, students must disclose their use of AI.
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	Final Exam date: TBD – Exams will be taken in person.
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	By the end of this course, students should be able to: 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	**TENTATIVE TOPICS** ○ 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	https://www.uttyler.edu/offices/academic-affairs/faculty-resources/syllabus-information/