

ME499 - COMPOSITES**SYLLABUS**Dr. Todd D. Coburn. tdcoburn@cpp.edu. (909) 869-2235. Office 17-2111.

Office Hours: 10 am - 12 pm MW or by appointment (2015 W).

Class	Section	Number	Lecture	Location
ME499	1	13890	8:00 am - 9:50 pm TuTh	Bldg 9, Room 335

CLASS SCHEDULE

Week	Date	Lec	Day	Topics	Jones Sections	Kaw Sections	HW Due	Proj. Due
1	6-Jan	1	Tu	Composites, Matrices, & MATLAB	1	1	-	-
1	8-Jan	2	Th	Lamina Macro Stiffness & Compliance	2.1 - 2.5	2.1 - 2.4	1	-
2	13-Jan	3	Tu	Lamina Macro Orientation	2.6 - 2.7	2.5 - 2.7	2	1
2	15-Jan	4	Th	Lamina Macro Strength	2.8 - 2.9.6	2.8-2.8.7	3	-
3	20-Jan	5	Tu	Lamina Micro Stiffness	3.1 - 3.2.5	3.3-3.3.1.4	4	2
3	22-Jan	6	Th	Lamina Micro Strength	3.5 - 3.6	3.4	5	-
4	27-Jan	7	Tu	Classical Lamination Theory	4.1-4.2.4	4.1-4.4.2	6	3
4	29-Jan	-	Th	Test #1 (Lectures 1-6)	---	---	-	-
5	3-Feb	8	Tu	Laminate Special Cases	4.3-4.4.6	5.1-5.2.4	7	4
5	5-Feb	9	Th	Hygro-Thermal Analysis	4.5.3-4.5.4	4.5 - 4.5.2	8	-
6	10-Feb	10	Tu	Bending of Beams	---	6	9	5
6	12-Feb	11	Th	Interlaminar Stresses	4.6-4.6.7	5.5.3	10	-
7	17-Feb	-	Tu	Test #2 (Lectures 7-10)	---	---	-	-
7	19-Feb	12	Th	Fatigue, Holes, & Fracture Mechanics	6.3-6.5.2	5.5.5-5.5.6	11	-
8	24-Feb	13	Tu	Sandwich Structures	---	5.5.1	12	6
8	26-Feb	14	Th	Experimental Strength & Stiffness	2.8.2	3.4	13	-
9	3-Mar	15	Tu	Buckling & Vibration	5.1-5.6,7,2,7.5	---	14	7
9	5-Mar	16	Th	Composite Fabrication	1	1	15	-
10	10-Mar	-	Tu	Test #3 (Lectures 11-16)	---	---	16	-
10	12-Mar	17	Th	Composite Research	---	---	-	-
11	17-Mar	-	Tu	Final Exam 7:00 AM - 9:00 AM	---	---	-	-

GRADING SCALE & WEIGHTS**Course Grading -----**

Homework	15%
Projects	15%
Quizzes	15%
Test #1	15%
Test #2	15%
Test #3	15%
Final Exam	10% Optional for students with 93% or better after Test #3.

----- Grading Scale -----		
B+	89 % - 87%	A- 92 % - 90 %
C+	79 % - 77%	B- 82 % - 80%
D+	69 % - 66%	C- 72 % - 70%
		D- 60 % - 56%
		F 55 % - 0%

Required (Hardcopy) Text (One or more of following):

- Jones, R.M. Mechanics of Composite Materials, 2nd Edition. Taylor & Francis. 1999.
- Kaw, A.K.. Mechanics of Composite Materials, 2nd Edition. CRC Press, Taylor & Francis. 2006.
- Agarwal, Broutman & Chandrashekhara. Analysis and Performance of Fiber Composites, 3rd Edition. John Wiley & Sons. 2006.

Required Tools:

- Pencil, Paper (Quad or Quint Pad Recommended), Engineering or Scientific Calculator

Prerequisites:

- C- or better in ME 315 & ME 319.

Course Description: An introduction to composite materials & their manufacture with a focus on the mechanics of fiber-reinforced composites. Micromechanics & macromechanics of a lamina, macromechanics of a laminate including classical lamination theory, strength of lamina, laminate & constituents, analysis & test procedures, special cases, limitations & emergent research will all be covered. The focus will be on hand analysis procedures, but MATLAB programs will also be developed & utilized.

Important Notes, Expectations & Comments:

- Be on time to class. Late arrival will result in loss of homework, project & quiz points.
- Attendance is required. Every class has deliverables which will result in loss of points for missing class. Also, students who do not attend class may be dropped from the class.
- Cell phones & laptops may not be used in class. Use will result in loss of class credit.
- Eating, drinking & sleeping are not allowed in the classroom.
- Cheating is unacceptable and will result in immediate failure of the class.
- Participation in class is desired, recommended, and rewarded.

Homework & Project Expectations & Guidelines:

- Homework & project due-dates are shown in the Syllabus.
- Homework & projects are due at the start of class. Credit will be lost if turned in after class starts.
- Homework & projects will not be accepted or scored after class ends on the day they are due.
- Collaboration on homework & projects is recommended. Copying is considered cheating.
- Homework & projects must be graded by student per grading procedure shown below prior to submittal. Ungraded submittals will not be scored or recorded by instructor.
- Projects consist of MATLAB programs & solutions composed by students. The programming portion of this class enables students to prepare error-free solutions for complex laminates after careful programming and debugging. MATLAB basics will be taught in this course, but students with limited programming experience should plan additional time to master the MATLAB portion of the class.

Quiz & Test Expectations & Guidelines:

- Quizzes will be given nearly every class. Expect them & be prepared.
- Quizzes will usually be given at the start of class. Late arrival will likely miss the quiz.
- No make-up quizzes or exams will be administered.
- Most quizzes & exams will be open book (hardcopy only) & closed notes.
- An instructor-prepared reference sheet with key formulas will be available for download from Bb, & an unmarked copy of it will be allowed on many exams & quizzes. Be sure to have the latest copy with you each class.
- No electronic devices (including electronic texts) except calculators will be allowed during exams or quizzes.
- During quizzes & tests, talking, communicating, sharing with other students, and getting out of seat without permission are not allowed and will be considered cheating. Raise your hand to be recognized if you need something during a quiz or test and do not get out of your seat without permission except to turn in your completed work.

HOMEWORK & PROJECT GRADING PROCEDURE

Each student must grade their own homework & project prior to submittal using a colored pen or marker that stands out from your work. Any ungraded or unidentified work will not be scored, & will show a zero in my gradebook. Detailed grading procedure as follows.

Homework Grading Procedure:

- Score each problem as follows:
 - SETUP: Score 1 point if all the following is present in your solution:
 - Problem Number - Identified (1, 2, 3, etc) & circled
 - Given, Find, & Solution - Clearly marked & appropriate pertinent data recorded.
 - Sketch – Pertinent sketch of problem shown.
 - Neatness – Setup is legible & clear.
 - WORK: Score 2 points if all the following is present in your solution:
 - Equations – All pertinent equations needed and/or used are shown
 - Sketches & FBDs – Includes sketch of problem or idealization & FBDs showing applied loads and reactions wherever possible.
 - Neatness – All work is legible and clear.
 - Complete - Problem is worked to completion & all answers are boxed.
 - ACCURACY: Score 0, 1, or 2 points, as follows.
 - If all answers of a problem are boxed & match the answer provided, score 2 points.
 - In only some of the answers provided match the solution, score 1 point.
 - If no answer is provided, score 0 points (as if you got it right).
- This means each problem score will range from 1 to 5 based on the above.
- Sum your scores to the top of the first page with the total points earned over the total possible (5 times the number of problems), and circle the total score conspicuously.
- If you want me to see or score something, write “See XYZ” & I will take a look & evaluate.
- I will make any modifications to the grades as needed, and may score punitive point reductions if I feel the scoring is intentionally misleading.
- Any ungraded homework or homework without a name will not be scored, and will show a zero in my gradebook.
- Some homework problems will be designed to measure student performance. These will initially be graded by student per normal procedure, but will be rescored by professor and may even be worth more points.

Project Grading Procedure:

- Score each project as follows:
 - CODE: (5 points)
 - Present code first. Score 5 points if complete and annotated.
 - OUTPUT: (5 points)
 - Present the output of the code second.
 - Score 5 points if output for each problem requested is shown.
 - ACCURACY: (5 points)
 - If answers are provided or available from homework, score 5 points if code output matches all subparts. Score partial credit for partial matches.
 - If no answers are provided or available, score all 5 points as if correct.
- This means each project score will range from 0 to 15 based on the above.
- Sum your scores to the top of the first page with the total points earned over the total possible & circle the total score conspicuously.
- I will make any modifications to the grades as needed, & may score punitive point reductions if I feel the scoring is intentionally misleading.

If there are questions, see me.