Course: Advanced Mechanics of Composite Materials - VM 518
Class Location: CRQ106
Class Times: Monday/Wednesday 12:10-13:50PM
(Optional) Book 1: Advanced Composite Materials by Stephen Swanson
ISBN: 978-0024185549
(Optional) Book 2: Mechanics of Composite Materials (Second Edition) by Robert M. Jones
ISBN: 978-1560327127

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Course Description

Prerequisite: Vm211

Mechanics of composite solids with an emphasis on the derivation of macroscopic constitutive laws based on the microstructure. Homogenization methods are introduced, and the effective stiffness properties and failure mechanics and theories of composites are developed. Classical laminated plate theory is used for the design and analysis of plates in bending, tension, compression, and in a humid environment. Composite manufacturing and fabrication techniques are introduced.

Grading:

Item	Percent of Grade
Homework	35%
Exam 1	20%
Final Project (1. Fabrication of laminate 5%, Charazterization report 10%, Final Project delivery 30%)	45%

Grading System:

96-100	A+	67-69	C
90- 95	A	64-66	C-
85- 89	A-	60-63	D
80- 84	B+	below 60	F
75- 79	B		
70- 74	B-		

Classroom Policies

Expectations

Bring your book, calculator, notes, and an open mind to class every day. Class participation is encouraged, and extra points given for participation will be added directly to your exam score.

Make up exams

No make up quizzes or exams will be given except in cases of emergency.

Class Attendance

Class attendance will be taken randomly. Missing 2 random class attendance checks will result in a 5% overall VM518 grade deduction. Missing more attendance checks will result in an additional 5% grade deduction per class.

Dishonesty

Any form of dishonesty or falsehood related to the general conduct of the class (exams, homework, project, quizzes, etc.) will be considered a major offense and will be brought before the Honor Council for appropriate action.

Cellphones and Texting

Cellphones must be turned off or be in the silent mode during class hours. Cellphone operation (including reading or sending text messages) during class hours is not allowed and will be considered as cheating during exams.

Laptops

Laptops in class must be used for the class! Do not use them to chat, play games or other non-class activities during class. Violation will result in a documented class absence. See attendance policy for details.

Homework

Homework must be turned in by the posted due date. Each day late will result in 10% reduction in the homework score. This means that you get a zero for the homework assignment after 10 days late.

Tentative Course Schedule:

1	9/10/2017	Syllabus, Grading, Composites Intro
2	9/12/2017	Rule of Mixtures and Manufacturing Intro
3	9/17/2017	Bernoulli-Euler Composite Beams and Laminates
4	9/19/2017	Stiffness Matrix Anisotropic Materials
5	9/26/2017	Composite Fabrication in Lab
6	9/27/2017	Stiffness Matrix Anisotropic Materials in Class, Composite Preparation
7	10/8/2017	Composite Laminate Tensile Testing in Lab
8	10/10/2017	Classical Lamination Theory + w/Matlab
9	10/15/2017	Failure Mechanisms and Theories, Final Course Project Given
10	10/17/2017	Abaqus Element/Beam Isotropic Tutorial
11	10/22/2017	Abaqus Nonlinear Composite with Failure Tutorial
12	10/24/2017	Damage: Delamination and Matrix Cracking
13	10/29/2017	Laminated Beams
14	10/31/2017	Hygrothermal Behavior of Composites
15	11/5/2017	Course Project Presentations
16	11/7/2017	Design Problems [Examples]
17	11/12/2017	Non-destructive Evaluation of Composite Structures
18	11/14/2017	Midterm Exam
19	11/19/2017	Advanced Composite Manufacturing
20	11/21/2017	Reconfigurable Moulds, Custom Composite Manufacturing
21	11/26/2017	Course Project Review
22	11/28/2017	Micromechanics
23	12/3/2017	Micromechanics
24	12/5/2017	Course Summary
25	12/TBD/2017	Final Project Demonstration