ME450 – Intro to Composite Materials and Design

Instructor:	Mark E. Tuttle	Office: Office Hrs: N E-mail: <u>tuttle</u>	MEB 210 \WF, 1:30-2:20pm <u>@u.washington.edu</u>	
Teaching Assi	stant: Melicent Stossel	Office: Office Hrs: T E-mail: <u>mms3</u>	MEB 236 h, 12:30-2:30pm <u>3@u.washington.edu</u>	
Lectures:	MWF, 12:30-1:20pm, Loew	NF, 12:30-1:20pm, Loew 216		
Textbook:	M. E. Tuttle, Structural Analysis of Polymeric Composite Materials, 2 nd edition, CRC Press/Taylor and Francis Group, ISBN 978-1439875124			
Course Web Site: http://courses.washington.edu/mengr450/				
Course Description: Stress and strain analysis of continuous fiber composite materials. Orthotropic elasticity, lamination theory, failure criterion, and design philosophies, as applied to structural composites. Recommended: MSE 475.				
Course Format:				
	Lectures: 3 one-hour lectures per week			
	 Homework: Combination of hand-graded and computer-graded (details TBA) Late homework will not be accepted without prior arrangements Exams: Combination of hand-graded and computer-graded (details TBA) Time allotments 1 her for midteem 2 here for final. Time adjustment for out of 			
	- Time allotment: I hr for midterm, 2 hrs for final. Time adjustment for out-of- town (EDGE) students			
	 Optional lab(s) will be held to illustrate hand lay-up techniques, autoclave cure, and composite tensile testing. 			
Grading Policy:				
	Homework: 30% Midterm Exam: 35% Final Exam: 35%	6 6		
Topics (Subject to Adjustments as Necessary): • Brief Introduction and Overview of:				

- Categories of composite materials
- Constituents used in polymeric composites
- Manufacturing processes used to produce polymeric composite structures
- Review of stress and strain
- Constitutive models/anisotropic elasticity
- Unidirectional composite plies subjected to plane stress
- Composite failure theories
- Theory of plates
- Unidirectional composite laminates
- Multi-angle composite laminates (Classical Lamination Theory, aka "CLT")
- Composite laminate failure predictions