

# ME450 – Intro to Composite Materials and Design

**Instructor:** Mark E. Tuttle

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**Office Hrs:** MWF, 9:30-10:20am

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**Office Hrs:** MW, 1:00-2:30pm

**Lectures:** M,W,F, 8:30-9:20, Loew 206

**Textbook:** M. E. Tuttle, *Structural Analysis of Polymeric Composite Materials*, Marcel-Dekker, New York, NY, ISBN 0-8247-4717-8 (2004)

**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:**

- Homework will be announced in class and posted on the website.
- They are usually due in class one week after the assigning date.
- Unless arranged in advance, no late homework will be accepted.

**Labs:**

- Optional labs will be held on hand lay-up techniques and testing.

**Grading Policy:**

**Homework:** 30%

**Midterm Exam:** 35%

**Final Exam:** 35%

**Topics (Subject to Adjustments as Necessary):**

Introduction and Overview of Manufacturing Processes

Review of Stress and Strain

Constitutive Models

Anisotropic Elasticity

Unidirectional Composite Laminates in Plane Stress

Theory of Plates

Unidirectional Composite Laminates

Composite Beams

Failure of Composites