ESF Course Proposal Form
Committee on Instruction - ESF Faculty Governance
Office of Instruction & Graduate Studies

Date: April 19, 2010
Course Number: CME 422
Course Title: Composite Materials for Sustainable Construction

☐ New Course  OR  ☑ Changes in existing course (check all that apply):

☐ Prefix  ☑ Description
☐ Number
☐ Credits
☐ Title

☑ Pre-requisite(s)
☐ Co-requisite(s)

☑ Shared Resources
☐ Course Format
☐ Content
☐ Semester Offered

This course meets the General Education standards in the following knowledge and skills area (check all that apply):

☐ American History  ☐ Humanities  ☐ Other World Civilizations
☐ The Arts  ☐ Mathematics  ☐ Social Sciences
☐ Basic Communication  ☐ Natural Sciences  ☐ Western Civilization

Prerequisites or co-requisite requirements:

☑ Prerequisites: CME 226, Statics & Mechanics of Materials  ☐ Co-requisites:

Institutional Impact:

Anticipated Enrollment: 25 per semester

Technology and Classroom Resource Demands: Standard classroom use of Baker Lab facilities
Computing Resources: Normal access to computer labs
Library Resources: Normal access
Transportation Requirements: None
Forest Properties or Field Practicum Facilities Required: None
Health and Safety Considerations:

Conditions or situations present in association with the course?  

1. **Will substances with any of the following properties be used during instruction:** flammability, toxicity, corrosivity, reactivity, registered pesticide, legally controlled, or other characteristics with the potential to cause harm or injury?  
   - Yes / No  
   - No

2. **Will any physical hazards be present during instruction?** (e.g., machines that need safety guards; razor blades or syringes; compressed gases, etc.).  
   - Yes / No  
   - No

3. **Will any biological hazards be present during instruction?** (e.g., handling animals (rabies or hantavirus); cultures or stocks of infectious agents (fungal spores, viruses, bacteria, etc.).  
   - Yes / No  
   - No

4. **Will any radiation hazards be present during instruction?** (e.g., radioisotopes, X-rays, ultraviolet rays, lasers, etc.).  
   - Yes / No  
   - No

5. **Will any electrical equipment that, due to its design, location, or method of use, pose any threat to safety during instruction?** (Give considerable thought to electrical use outdoors, or any potentially wet location.).  
   - Yes / No  
   - No

6. **Will there be any personal safety issues related to the class?** (e.g., due to time of day or location, at the end of any organized class exercise, will students be in danger of physical assault, etc.).  
   - Yes / No  
   - No

7. **Will any students be driving official state or research sponsored land or water vehicles during any class or instructional exercise?**  
   - Yes / No  
   - No

8. **Will any type of personal protective equipment be necessary during class exercises?** (e.g., hard-hats, eye/face protection, hearing protection, hand/foot protection, lab coat, visibility clothing, etc.)  
   - Yes / No  
   - Yes

If the answer was “Yes” to any of the HEALTH AND SAFETY questions, please explain:

Eye protection during laboratory demonstrations/exercises

**CATALOG DESCRIPTION** (Please provide using the precise format currently used in the ESF catalog, please do not exceed 500 characters):

CME 422. Composite Materials for Sustainable Construction    (3)  
Two hours of lecture, three hours of laboratory per week. Properties, manufacture and design of multiphase materials. Applications and testing for service in sustainable construction systems and life-cycle analysis. Fall.  
Prerequisite: CME 226, Statics and Mechanics of Materials
DETAILED COURSE DESCRIPTION

COURSE: CME/WPE 422 – Composite Materials for Sustainable Construction
3 Credit Hours – Fall Semester
2 Hours Lecture; 3 Hours Laboratory per week
Prerequisite(s): CME226, Statics and Mechanics of Materials

SCOPE:

1. Level of Instruction:
   a. The second course in a three-course sequence on engineering materials. Required for CME Juniors.

2. Relation to curriculum or to other ESF or Syracuse University courses:
   a. Available as elective for SU engineering or architecture students.
   b. Shared Resource Requirements: None

STUDENT LEARNING OUTCOMES:

Completion of this course prepares the student to:

1. Select composite materials for structural applications;
2. Understand test methods used for composites;
3. Specify composites maintenance programs;
4. Select adhesives and finishes for composite systems;
5. Understand preservatives used on composites;
6. Identify and design to prevent failures in service; and
7. Relate life-cycle analysis to modern composites.

MAJOR CONCEPTS OR METHODOLOGIES:

This is a materials science course that relates the structure of composite materials to performance in construction systems. Physical and mechanical properties are related to chemical makeup and manufacturing processes. Multiphase materials based on polymers, metals, ceramics and wood fiber are tested and evaluated according to ASTM and other standards.

The student will be able to select materials based on structural needs and specify them for various applications. The environmental implications and life-cycle analysis will be covered. Sustainability issues and renewability of materials are major focal areas. Hands on testing serves to demonstrate theoretical concepts.

CATALOG DESCRIPTION

CME 422 Composite Materials for Sustainable Construction (3)

Two hours of lecture, three hours of laboratory per week. Properties, manufacture and design of multiphase materials. Applications and testing for service in sustainable construction systems and life-cycle analysis. Fall.

Prerequisite(s): CME 226, Statics and Mechanics of Materials
COURSE HISTORY:

Approved in 1968 as a revision of WPE 522, renumbered as WPE 422 in 1973. Rewritten as basic course on wood composites in 1981. Topic coverage expanded to include other composites in 1992 when ERE 364, Engineering Materials, was dropped as a required course.

Revised 2/26/10
ESF Course Proposal Form
Committee on Instruction - ESF Faculty Governance
Office of Instruction & Graduate Studies

Date: February 12, 2010
Course Number: CME 422
Course Title: Composite Materials for Sustainable Construction

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☑ Description
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Prequisites or co-requisite requirements:

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If the answer was “Yes” to any of the HEALTH AND SAFETY questions, please explain:

CATALOG DESCRIPTION (Please provide using the precise format currently used in the ESF catalog, please do not exceed 500 characters):

CME 422. Composite Materials for Sustainable Construction  (3)
The design, manufacture and performance of composite materials. Structural elements, panel products and finishing systems of multiphase components. Modern renewable and recyclable materials and their life cycle analysis. Fall.
Prerequisite: CME 226.
DETAILED COURSE DESCRIPTION

COURSE: CME/WPE 422 – Composite Materials for Sustainable Construction
3 Credit Hours – Fall Semester
2 Hours Lecture; 3 Hours Laboratory per week
Prerequisite(s): CME226, Statics and Mechanics of Materials

SCOPE:

1. Level of Instruction:
   a. The second course in a three-course sequence on engineering materials. Required for CME Juniors.
2. Relation to curriculum or to other ESF or Syracuse University courses:
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