Date: February 17, 2011
Course Number: CME770
Course Title: Biodegradation of Wood

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

☒ Prefix
☐ Number
☐ Credits
☐ Title

☒ Description
☐ 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
☐ The Arts
☐ Basic Communication
☐ Humanities
☐ Mathematics
☐ Natural Sciences
☐ Other World Civilizations
☐ Social Sciences
☐ Western Civilization

Prequisites or co-requisite requirements:

☐ Prerequisites: Introductory biology and permission of instructor

☐ Co-requisites:

Institutional Impact:

Anticipated Enrollment: 8 per semester

Technology and Classroom Resource Demands: laboratory with incubators, autoclave sterilizer, transfer hood, laminar flow hood, supplies for culturing fungi

Computing Resources:

Library Resources:

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

2. Will any physical hazards be present during instruction? (e.g., machines that need safety guards; razor blades or syringes; compressed gases, etc.)  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

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

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

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

Fungal cultures and flame sterilization techniques will be used during laboratory instruction. Students will be instructed on the proper use to prevent exposure to fungal spores, and safety precautions for using flame during aseptic culturing.

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

CME 770 Biodegradation of Wood   3 credit hours
Two hours of lecture and 1 hour of laboratory/demonstration/discussion per week.
Biology of lignicolous fungi and other microorganisms concerning their effects on wood properties. Anatomical, biological and chemical aspects of the major types of wood decay.
Spring.
Prerequisite: Introductory biology and permission of instructor.
DETAILED COURSE DESCRIPTION

COURSE: CME 770 Biodegradation of Wood
3 Credit Hours – Spring Semester
3 Hours Lecture Per Week
Prerequisite(s): Introductory Biology and Permission of Instructor

SCOPE:

Level of Instruction: CME 770 is a graduate level course for graduate students in Wood Science and other related disciplines.
Relation to curriculum or to other ESF or Syracuse University courses:
   a. CME 770 is a graduate level elective course offered by faculty in the Department of Sustainable Construction Management and Engineering. This course is open to all disciplines at ESF and SU if space allows, especially students in biology, wood science, materials science, paper science, chemistry or other structure related disciplines.
   b. Shared resource requirements: none

STUDENT LEARNING OUTCOMES:

After completing this course the student should be able to:
   a. Recognize the types of decay in wood products and the fungi that cause the decay.
   b. Understand biodegradative pathways for cellulose, hemicellulose and lignin.
   c. Describe the conditions necessary for decay to occur in wood products and be able to test wood products for their durability.
   d. Describe ways to implement decay preventive practices and treatments.
   e. Be knowledgeable of current research on decay mechanisms, decay prevention, decay detection methods, effects of decay on wood properties.

MAJOR CONCEPTS OR METHODOLOGIES:

This course is designed to provide knowledge of wood decay for wood products graduate students who desire a deeper understanding of the basic concepts of mycology, the processes of wood decay, and the effect of decay on wood properties. Topics to be covered include mycology; ultrastructural and chemical aspects of the three major decay types of decay; decay prevention, and the occurrence and effects of decay on wood products. The major focus is on the biology of lignicolous fungi. Also included is the attack of wood by other organisms (bacteria, insects, marine organisms). The effects on wood properties, including strength, will be studied in relation to wood processing and utilization. Other topics include the natural durability of wood, the use of preservatives, biopulping, decay detection methods. Laboratories and demonstrations include microscopic examination of decay; wood block decay tests, culturing techniques, identification of fungi and effects of decay on wood properties. Have knowledge regarding processes of biodegradation of wood and other cellulose-based products by fungi and other organisms.
   a. Have the ability to understand the basis for implementing proper utilization and protection of wood products.
   b. Current knowledge of building practices and products that prevent decay will be discussed.
   c. Understand the impact of wood decay on the wood products industry.
CATALOG DESCRIPTION  (Please provide using the precise format to be included in the ESF catalog, please do not exceed 50 words)

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   Spring.

   Prerequisite: Introductory biology and permission of instructor.

COURSE HISTORY:

This course was first taught as ERE 796 in 2000.  It was approved as ERE 770 Biodegradation of Wood in 2001 and taught since 2002.

Revised Draft: November 10, 2009 (form in protected format: 2/17/11)

Course prefix changed to reflect department name change and graduate program changes October 2010.