Date: June 7, 2010  
Course Number: EFB 645  
Course Title: Plant Ecology and Global Change

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<th>New Course</th>
<th>OR</th>
<th>Changes in existing course (check all that apply):</th>
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<td>Pre-requisite(s)</td>
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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: EFB 320 (General Ecology) or equivalent.
- Co-requisites:

Institutional Impact:

| Anticipated Enrollment: | 40 per semester |
| Technology and Classroom Resource Demands: | Computer/computer projection system (incl. sound and internet connectivity); white board/chalk board; overhead or document camera projector; video |
| Computing Resources: | As above |
| Library Resources: | Specified reserve materials and scientific databases such as ISI Web of Science and journals in ecology, botany, and global change (specific titles will be provided) |
| 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?

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

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.).

4. Will any radiation hazards be present during instruction? (e.g., radioisotopes, X-rays, ultraviolet rays, lasers, etc.).

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.).

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.).

7. Will any students be driving official state or research sponsored land or water vehicles during any class or instructional exercise?

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.)

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

CATALOG DESCRIPTION

EFB 645  Plant Ecology and Global Change [3 credit hours]

Three hours of lecture and discussion per week. Impacts of global changes in climate, biodiversity, land-use, and biogeochemical cycles on the structure and function of terrestrial plant communities and ecosystems. Global change impacts are examined across a wide range of spatial and temporal scales, from ecophysiological processes occurring at the scale of a leaf, to global patterns of primary productivity and biodiversity. [Spring]

Credits will not be granted for 445 and 645 (both undergraduate and graduate versions of the same course).
DETAILED COURSE DESCRIPTION

COURSE: EFB-645 Plant Ecology and Global Change

3 Credit Hours – Spring Semester
3 Hours Lecture Per Week
Prerequisite(s): EFB 320 or equivalent

SCOPE:

1. Level of Instruction: EFB 645 is a biology elective course suitable for graduate students from a variety of disciplines
2. Relation to curriculum or to other ESF or Syracuse University courses:
   a. Elective course Currently no graduate level course devotes a full semester to a detailed study of global change effects on terrestrial plant communities either at SUNY-ESF or Syracuse University
   b. Shared resource requirements: EFB 445, Students in EFB 645 are assigned additional, graduate-level tasks: (1) they act as discussion leaders for selected readings from primary literature, and (2) they prepare a review paper on a selected topic for submission to a peer-reviewed journal

STUDENT LEARNING OUTCOMES:

After completing this course the student should be able to:

1. Identify various aspects of global change and explain their causes and mechanisms
2. Explain major concepts in plant ecology and how they relate to global change
3. Construct and test hypotheses critical to plant ecology in a changing environment
4. Apply critical thinking and analytical skills in the study of plants and global change
5. Describe the impacts of global change on terrestrial plant communities
6. Effectively communicate and discuss scientific findings
7. Recognize plant species ‘iconic’ to plant ecology and global change
8. Describe in detail the leading issues in plant ecology and global change research.

MAJOR CONCEPTS OR METHODOLOGIES:

EFB 645 develops conceptual understanding, familiarity with crucial primary literature, and analytical skills that will further students’ appreciation of the effects of global change on terrestrial plant communities. Course lectures and discussions cover major concepts in plant ecology, and explore how these concepts interact with various aspects of global change, including

- Aspects of global change & its causes and effects on terrestrial plant communities
- Biomes – distribution of plants relative to climate, soil, and disturbance regimes
• Ecophysiology of carbon sequestration, water transport, and nutrient uptake
• Plant growth and resource allocation in a changing environment
• Plant population structure and dynamics in a changing environment
• Community interactions and assembly under global change
• Global change, plant life history strategies, and plant evolution
• Plants in ecosystem processes and global biogeochemical cycles
• Implications of changes in biodiversity, productivity, and community stability
• Literature review of major papers on global change effects on plant ecology

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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Prerequisite(s): EFB 320 (General Ecology) or equivalent

Credits will not be granted for 445 and 645 (both undergraduate and graduate versions of the same course).

COURSE HISTORY:

This course replaces EFB 645 Plant Ecology in terms of title and description, with adjustments to course content and philosophy (format) through (a) the addition of a Global Change component, (b) expansion of the discussion of primary literature embedded within the lectures, (c) incorporation of multimedia content into lectures, and (d) removal of the laboratory component.

This course was approved for the first time by the C. of E.S. & F. Faculty on 12/19/73. By Faculty action, semester changed on 3/29/79. Course was redesignated EFB 645 by Faculty action 12/1/83.

Revised Draft: November 10, 2009 (form in protected format: 6/7/10)