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

Date: April 2, 2012
Course Number: EFB 635
Course Title: Flowering Plants: Diversity, Evolution, and Systematics

☐ 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
☐ Social Sciences
☐ Other World Civilizations
☐ Western Civilization

Prequisites or co-requisite requirements:

☒ Prerequisites: General Biology I and II or permission of instructor. ☐ Co-requisites:

Institutional Impact:

Anticipated Enrollment: 20 per semester

Technology and Classroom Resource Demands:

Classroom and laboratory: computer/digital projector (incl. sound), internet connection, white board/chalk board, document camera, video.
Laboratory: 20 dissecting microscopes w/scope lights, freezer, storage space.

Computing Resources:

Software for word processing (MS Office), document viewing (Adobe Acrobat), internet (Internet Explorer), videoclips (Media Player) in classroom and laboratory.

Library Resources:

Specified course reserves, databases (e.g., ISI Web of Science), journals in botany/systematics.

Transportation Requirements:

Bus (for some laboratory sessions/field trips).

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: **Yes**

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: **No**

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

Students will use standard dissection kits for flower dissections in the labs following standard safety protocol. Field trips (3-5) into local state parks/nature areas will be of 3-hour duration, follow standard ESF procedures for bus field trips, and will be closely supervised by class instructor or teaching assistant. All students will move together as a single group during the field trip to minimize safety issues. Locations selected for field trips are generally safe, some include maintained hiking trails and visitor centers. Students will be advised to wear hiking boots and outdoors clothing appropriate for the weather. First aid kit will be available for any minor injuries that may occur (scrapes, twisted ankles, insect bites) and a cell phone will be used in case of any larger medical emergency. Students will carry botanical collections as independent projects and will be advised to work in small groups for safety.

**CATALOG DESCRIPTION** (Please provide using the precise format currently used in the ESF catalog, please do not exceed 1000 characters):

Two hours of lecture and three hours of laboratory per week. Diversity, evolution, and systematics of flowering plants with emphasis on flower structures and reproductive strategies. Flowering plant identification skills are built from examination of a broad diversity of species from major globally-distributed families with particular focus on flora of the Northeastern U.S. Students prepare professional presentations and lead discussion on current research issues in flowering plant diversity, evolution, and systematics. [Fall]
DETAILED COURSE DESCRIPTION

COURSE: EFB 635 – Flowering Plants: Diversity, Evolution, and Systematics
3 Credit Hours – Fall Semester
2 Hours Lecture and 3 Hours Laboratory Per Week
Prerequisite(s): General Biology I and II or permission of instructor.

SCOPE:

1. Level of Instruction:
   a. EFB 635 is a graduate course intended for beginning MS and PhD students.

2. Relation to curriculum or to other ESF or Syracuse University courses:
   a. EFB 635 constitutes an important elective for graduate students in Ecology, Applied Ecology, Conservation Biology, and Plant Science. Currently no graduate level course devotes a full semester to a detailed study of diversity, evolution, and systematics of flowering plants either at SUNY-ESF or Syracuse University.
   b. Shared resource requirements: EFB 435

STUDENT LEARNING OUTCOMES:

After completing this course the student should be able to:

1. Identify major globally distributed families of flowering plants, with special reference to the flora of North America and the northeastern U.S.
2. Identify species of flowering plants from any region using dichotomous keys.
3. To sight recognize representative species of the major families from the northeastern U.S.
4. Explain evolutionary relationships among flowering plants.
5. Describe the ecological, economic, and cultural significance of flowering plants.
6. Apply the vocabulary and methods of plant systematics and taxonomy.
7. Build a professional botanical collection.
8. Give a professional presentation and lead a discussion on current research issues in flowering plant diversity, evolution, and systematics.

MAJOR CONCEPTS OR METHODOLOGIES:

EFB 435 develops conceptual understanding and practical skills that will further students’ appreciation of the diversity and evolution of flowering plants, including their ecological, economic, and cultural significance and evolutionary implications of the diverse reproductive strategies of flowering plants. Approximately half of the course lecture topics cover major concepts in plant systematics and evolution, including:

- plant morphology in systematics (especially reproductive structures),
- pollination biology and plant reproduction,
- plant anatomy in systematics,
- introductory molecular systematics,
- methods and principles of plant systematics,
- nomenclature, specimen preparation, and identification,
- classification systems of flowering plants,
- evolution of plant diversity,
- biodiversity & biogeography,
- origins of Angiosperms, and
- phylogenetic relationships of Angiosperms.

The other half of the course lecture topics cover the taxonomy and systematics of globally distributed flowering plant families, with a special emphasis on families from the northeastern U.S. The theoretical
concepts introduced in the course are thus practically applied, in the study of approximately 50 selected families. Morphological, molecular, and ecological characteristics, and hypothesized evolutionary relationships, are discussed for each family. The geographical distribution and economic and cultural significance of each family is also discussed to provide broader background and to facilitate better retention of the studied material. Students prepare professional presentations and lead discussion on current research issues and papers from primary literature in flowering plant diversity, evolution, and systematics.

CATALOG DESCRIPTION  (Please provide using the precise format to be included in the ESF catalog, please do not exceed 50 words)

EFB 635 – Flowering Plants: Diversity, Evolution, and Systematics (3)

Two hours of lecture and three hours of laboratory per week. Diversity, evolution, and systematics of flowering plants with emphasis on flower structures and reproductive strategies. Flowering plant identification skills are built from examination of a broad diversity of species from major globally-distributed families with particular focus on flora of the Northeastern U.S. Students prepare professional presentations and lead discussion on current research issues in flowering plant diversity, evolution, and systematics. [Fall]

Prerequisite(s): General Biology I and II or permission of instructor.

COURSE HISTORY:

This is a renumbering of EFB 535 Flowering Plants: Diversity, Evolution, and Systematics, previously taught as Systematic Botany. The first listing of a Systematic Botany course was in the 1939 C. of F. Catalog (under the number F. Bot. 17). The 1941 C. of F Catalog listed it as F. Bot 120. The last course description for Systematic Botany is the one listed by the College in October, 1961; minor change 1/4/67. By the Faculty Action of 5/7/68, this course was renumbered as F. Bot 515, effective 9/1/68. Minor changes 4/26/73. The F. Bot abbreviation was redesignated FBO in August 1973, as part of the computerization of the College records. Course redesignated EFB 535 by Faculty Action 12/1/83.