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

Date: June 7, 2010
Course Number: FEG 335
Course Title: Numerical and Computing Methods

☐ 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: MAT 485
☐ Co-requisites:

Institutional Impact:

Anticipated Enrollment: 20 per semester

Technology and Classroom Resource Demands: Projector, white board, computer lab

Computing Resources: Computer software including MS Office, MATLAB, and MS Visual Studio

Library Resources: No

Transportation Requirements: No

Forest Properties or Field Practicum Facilities Required: No
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: No

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):

Three hours of lecture/discussion per week. Introduction to numerical and computing methods for engineers. Writing computer code to analyze and solve engineering problems using state-of-the-art software packages. Fall. Prerequisite(s): MAT 485
DETAILED COURSE DESCRIPTION

COURSE: FEG 335 – Numerical and Computing Methods
3 Credit Hours – Fall Semester
3 Hours Lecture Per Week
Prerequisite(s): MAT 485

SCOPE:

1. Level of Instruction:
   a. FEG 335 is an introductory engineering course intended to provide knowledge and skills on numerical methods and programming. This course will be offered to junior engineering students, giving them the exposure to numerical and computational engineering tools and methods

2. Relation to curriculum or to other ESF or Syracuse University courses:
   a. This is a Required Course for BS Environmental Resources and Forest Engineering (ERFEG) students. This course provides tools and knowledge that will be reinforced in upper level engineering curriculum, especially in FEG and ERE courses.
   b. There is a similar course at Syracuse University (MAT 581: Numerical Methods and Programming), which is at too high a level to be required within the ERFEG undergraduate curriculum.
   c. Shared resource requirements: ERE 530 for graduate students who have no programming experience to improve their programming skills. Note: Credit will not be granted for both FEG 335 and ERE 530.

STUDENT LEARNING OUTCOMES:

After completing this course the student should be able to:

1. identify, formulate, and solve engineering problems.
2. use the techniques, programming skills, and modern engineering tools necessary for engineering practice.

MAJOR CONCEPTS OR METHODOLOGIES:

Numerical and computing methods, commonly used in engineering. This course aims to provide a solid grounding for students on algorithm development and the computing techniques of solving problems. It trains students to apply numerical and computing methods to solve engineering problems using state-of-the-art software packages (e.g., MATLAB and Visual Basic) by writing computer code and analyzing solutions of problems.

The numerical methods include roots of equations, linear algebraic equations, optimization, curve fitting, and interpolation. Real world engineering examples and practices will be provided for students to further improve their understanding of the computing methods and their programming skills. Students will work on group projects to practice their knowledge and analytical techniques, and programming skills that they have obtained during the course.

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

FEG 335. Numerical and Computing Methods (3)
Three hours of lecture/discussion per week. Introduction to numerical and computing methods for engineers. Writing computer code to analyze and solve engineering problems using state-of-the-art software packages. Fall.

Prerequisite(s): MAT 485

**COURSE HISTORY:**

This is a new course within the ERFEG curriculum, and has not been previously taught at ESF. Approved: April 14, 2008. Version: 5.5.2008

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