**DETAILED COURSE DESCRIPTION**

**COURSE:** ERE 275 – Ecological Engineering I

3 Credit Hours – Spring Semester

2 Hours Lecture and 3 Hours of Group Instruction Per Week

Prerequisite(s): 1 semester each of Calculus, Biology, Chemistry, and Ecology.

Environmental Resources Engineering students only or by

permission of instructor.

**SCOPE:**

1. *Level of Instruction:*
   1. This is a lower division undergraduate course.
2. *Relation to curriculum or to other ESF or Syracuse University courses:*
   1. There are no similar courses at ESF or SU. This course provides foundation for ERE 440 Water Pollution Engineering, ERE 468 Solid Waste Management, and ERE 475 Ecological Engineering II, all three of which are part of the ERE curriculum.

**STUDENT LEARNING OUTCOMES:**

After completing this course, students will understand and be able to:

1. Use ecology, biology and chemistry for ecological engineering;
2. Choose among and use ecological engineering empirical models for waste treatment and ecosystem restoration;
3. Explain and discuss the potential role of ecological engineering in global society;
4. Apply fundamental principles of math and science to develop ecological engineering designs;
5. Apply ecological engineering problem solving methodology;
6. Describe the relationship of ecological engineering tools to current problems

**MAJOR CONCEPTS OR METHODOLOGIES:**

Major Concepts or Methodologies:

1. Overview fundamental concepts and development of ecological engineering;
2. Discuss different models and case studies of ecological engineering;
3. Present the components of system analysis and ecological design;
4. Consider the necessity and utility of the system perspective in engineering design;
5. Consider sustainability in design and how ecological engineering contributes to that;
6. Design and construct an ecological engineering system in lab;
7. Discuss topical issues in ecological engineering.

The course provides an introduction to fundamental concepts in ecological engineering for sophomore-level students. The course presents ecological engineering theory from a systems perspective.

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

ERE 275. Ecological Engineering I (3)

Two hours of lecture and three hours of group instruction per week. Overview of ecological engineering theory and practice. Key concepts, empirical models, and case studies of ecological engineering. Living machines, treatment wetlands, bioremediation, municipal composting, agroforestry, traditional ecological knowledge, emergy analysis, and ecosystem restoration. Spring.

Prerequisite(s): 1 semester each of Calculus, Biology, Chemistry, and Ecology. Environmental Resources Engineering students only or by permission of instructor.

**COURSE HISTORY:**

This course was taught in the spring 2008 as ERE 296. Revised:March 6, 2008. Approved by CoI action 14 April 2008. Version: 5.5.2008

Revised course prefix from FEG 275 to ERE 275, and updated program and/or department name from Environmental Resources and Forest Engineering to Environmental Resources Engineering: September 28, 2010