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

Date: February 24, 2010
Course Number: WPE 350
Course Title: Construction Methods and Equipment (Shared resource with ERE 525)

☐ 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: None
☐ Co-requisites: None

Institutional Impact:

Anticipated Enrollment: 15-20 per semester

Technology and Classroom Resource Demands:
Computer and computer projection system, document camera projector, internet access, smart board and white board, video, VHS and DVD capability.

Computing Resources:
Student computer laboratory with server capacity and student computer configuration to allow rapid data storage and access for word processing and spreadsheet and presentation development software and internet access.

Library Resources: None

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 / 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.).  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.).  No

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:

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

WPE 350. Construction Methods and Equipment (3)
Three hours of lecture/discussion per week. The study of production, methods of operation and costs of heavy construction equipment concentrating on earthworks operations. Economics of equipment use. Focus on productivity and cost calculations. Spring.  Note: Credit will not be granted for both WPE 350 and ERE 525

Prerequisite(s): None
DETAILED COURSE DESCRIPTION

COURSE: WPE 350 Construction Methods and Equipment (Shared resource with ERE 525)
3 Credit Hours – Spring Semester
3 Hours Lecture/discussion per Week
Prerequisite(s): none

SCOPE:

1. Level of Instruction:
   a. WPE 350 is an elective course intended to fulfill upper division requirements.

2. Relation to curriculum or to other ESF or Syracuse University courses:
   a. It is also one of the elective courses for a Minor in Construction Management by the Civil Engineering Faculty at Syracuse University and the Construction Management minor at ESF. It is open to lower and upper division students as an elective with permission of the instructor.
   b. Shared resource requirements: Offered in conjunction with ERE 625 Construction Methods and Equipment.

STUDENT LEARNING OUTCOMES:

After completing this course the student should be able to:

1. Understand, and define the safety requirements for earthworks operations in excavation and trenches in accordance with 29 CFR 1926 Subpart P.
2. Understand and define depreciation methods and costs.
3. Understand and define ownership and operating costs.
4. Understand and define productivity issues and calculations for the following families of equipment: bulldozers, excavators, scrapers, front end loaders, compactors and off road hauling units.
5. Understand and define geosynthetics and their application in earthworks projects.
6. Understand and define dewatering and compressed air systems.
7. Understand and define cranes and crane safety.
8. Understand and define digitized earthwork quantities.

MAJOR CONCEPTS OR METHODOLOGIES:

WPE 350 is a course of three sections. Section one identifies and explains the federal safety regulations as defined by OSHA. Section two addresses the economics of heavy equipment use. Procedures to calculate ownership and operating costs are presented. This information is then used to calculate unit cost or hourly cost for each of the equipment families listed above. This information is then used to perform cost comparisons between groups of equipment to perform the entire project. The differences between purchasing, renting or leasing are discussed so that the student can make a comparative analysis between them. Section three covers the analysis of construction operations utilizing the families of equipment listed above. Productivity formulas are presented to allow for the selection of the optimum piece or pieces of heavy equipment or systems. The operations covered are earthmoving, excavating and lifting, loading and hauling and compacting. Auxiliary operations of dewatering and compressed air systems are also addressed. This course through its assignments and final project allows the students to apply the concepts presented in class concerning safety regulations, cost determination, productivity calculation and equipment selection. The use of a digitizer in the calculation of earthwork quantities is also presented.
CATALOG DESCRIPTION (Please provide using the precise format to be included in the ESF catalog, please do not exceed 50 words)

WPE 350 Construction Methods and Equipment (3)  
Three hours of lecture/discussion per week. The study of production, methods of operation and costs of heavy construction equipment concentrating on earthworks operations. Economics of equipment use. Focus on productivity and cost calculations. Spring.  
Note: Credit will not be granted for both WPE 350 and ERE 525

Prerequisite(s): none

COURSE HISTORY:

Course first approved 4/30/87
Course retitled 5/7/90
Course revised 4/18/91
Course revised 4/23/92
Course revised 3/22/01
Course revised 2/24/10 to new college format