Engineering Faculty Document No. 66-07

August 20, 2008

**To:** The Faculty of the College of Engineering

**From:** Division of Construction Engineering and Management

**Subject:** New Course

The Faculty of the Division of Construction Engineering and Management (CEM) has approved the following new course listed below. This action is now submitted to the Engineering Faculty with recommendation for approval.

**CEM 42300 Selection and Utilization of Construction Equipment**
Sem. 2, Class 5, cr.3.
Prerequisite: CEM 29100 – Construction Internship II
CEM 32100 – Planning & Scheduling

Course Description: A study of economics and functional applications for major categories of construction equipment. Operational characteristics are identified for selected equipment items and are applied to typical construction situations.

Reason: This course will be taught by the same instructor of the existing CE 52300 Selection and Utilization of Construction Equipment. This course will be co-listed and continue to be offered in the Spring semester. The syllabus for the existing course is attached. This course will serve as a key course at the 400 level for CEM majors, as part of their undergraduate curriculum. CEM majors must enroll in this course to fulfill degree requirements.

Makarand Hastak August 20, 2008
Professor and Head

SUPPORTING DOCUMENTATION

**CE 523 – SELECTION AND UTILIZATION OF CONSTRUCTION EQUIPMENT**
**Spring 2008**

**Instructor:** Dr. Phillip S. Dunston
CIVL 1243; 494-0640; dunston@ecn.purdue.edu
Office Hours: M 1000-1200; T W 1500-1600; **otherwise by e-mail or appointment**

**TA:** Mr. Sharvil S. Shah
CIVL 1255; 494-0696; shahss@purdue.edu
Office Hours: W 0900-1000; F 0900-1000

**Course Time and Location:** T Th @ 1030-1145; FRNY B124 (Note there will be NO LABS in this course)
Your Vista Blackboard section of CE 523 is being prepared and should be up and running by the end of the week.

**Required Text**
*Construction Equipment Management* by John E. Schaufelberger, Prentice Hall, Upper Saddle River, New Jersey, 1999.

**Aditional References:** (handouts from these may be distributed in class as deemed appropriate)
*Deere Performance Handbook*, 2003 edition, John Deere, Moline, IL.
*Caterpillar Performance Handbook*, edition 31, Caterpillar Inc., Peoria, Ill, 2000
Nunnaly, S. W., *Construction Methods and Management*, edition 5, Prentice Hall, 2001.
Peurifoy, R. L., and Schexnayder, C., *Construction Planning, Equipment and Methods*, edition 7, McGraw Hill, 2006.

**Objective**
To familiarize the student with various types of heavy construction equipment, their appropriate use, and methods for estimating costs. Attention is focused upon estimating equipment productivity.

**Grading**

| Performance Category | |
|---|---|
| Homework | 20% |
| Midterm Exams I-IV | 60% |
| Group Project | 20% |

A curve will not be used for grading. The minimum cutoff for an A is 90%; for a B is 80%; for a C is 70%; and for a D is 60%. Anything below 60% is considered an F.

**Class Policy**
1. Attendance is required, and subject to standard CEM and University class attendance policy as described in the following excerpt from University Regulations, Part 2, Section VI A: "Students are expected to be present for every meeting of classes in which they are enrolled. ...All matters relative to attendance, including the make-up of missed work, are to be arranged between the student and the instructor involved." Therefore, **a class sign-up sheet will be circulated during each lecture after the second week of classes and will become the record of each student's attendance during the semester.** The instructor must be notified of any anticipated absences in writing (typed/word-processed memo or e-mail) and in advance, if possible, stating the date(s) and the reason for the absence. Otherwise, the absence will be noted as unexcused. Each student is allowed a **maximum of two (2) unexcused absences**. In addition, for seniors and graduates near the end of their program, up to a total of three (3) plant trips will be considered excused absences. ***Three (3) unexcused absences will result in a grade reduction of one letter. Four (4) unexcused absences will result in a grade of "I" or "F" depending on whether or not the student is passing in all other respects at the time of the fourth absence.***
2. All homework assignments, with the exception of the term project, will be done individually. Assignments will be turned in at the **beginning** of class on the date due. It is each student's responsibility to deliver any late assignments to the teaching assistant.
3. Assignments submitted after class but by noon the following day will receive a penalty of 30%. From that point, assignments received up to one class session late will receive a penalty of 40%, and thereafter a 100% penalty. All assignments must be submitted in order to avoid receiving an "I" letter grade.
4. Homework should have a professional appearance, being neat, logically formatted, and legible (on engineering paper or possibly by computer printout). All final solutions should be clearly highlighted (boxed, underlined, etc.). In addition, any table or figure used in solving a problem should be clearly cited. The Grader reserves the right not to grade (0 credit for the problem) or to deduct points for messy homework.
5. You are encouraged to put forth your best effort in clearly presenting your solutions. Sometimes, your solution to a problem may yet be misunderstood. To minimize the re-handling of homework assignments, however, only one resubmission (re-grading of a specific homework assignment) is allowed for the semester (except in the case of instructor/grader error that negatively affects most or all of the class).
6. Questions regarding grades earned should **first** be submitted to the grader in the form of a word-processed memo.

**Term Project**
A group term project will be given in lieu of a final exam, details to be provided later.

**Tentative Course Outline**
(exam dates will be set after 2nd week of class; additional lecture topics to be added if time permits)

| Date | Topic | Reading | Assignment |
|---|---|---|---|
| January 8 | Introduction<br>Engineering Economic Analysis | <br>Ch 2 | |
| 10 | Depreciation Accounting<br>Equipment Policy | Ch 3<br>Handout | |
| 15 | Owning and Operating Costs | Ch 4 | |
| 17 | Owning and Operating Costs<br>Cost Estimating | <br>Ch 5 | |
| 22 | Scheduling | Ch 6 | |
| 24 | Productivity Basics<br>Time and Motion Studies | Handout; Video | |
| 29 | Earthwork Planning (QTO/Mass Diagrams) | Handout | |
| 31 | Earthwork Planning (QTO/Mass Diagrams) | | |
| February 5 | **Exam I** | | |
| 7 | Earthmoving Fundamentals | Ch 7 | |
| 12 | Earthmoving Fundamentals | | |
| 14 | Tractors | Ch 8 | |
| 19 | Tractors | | |
| 21 | Loaders | Ch 9 | |
| 26 | Scrapers | Chp 10 | |
| 28 | **Exam II** | | |
| March 4 | Scrapers | | |
| 6 | Scrapers | | |
| 10-15 | **SPRING VACATION** | | |
| 18 | Stationary Excavators | Ch 11; Handout | |
| 20 | Stationary Excavators | | |
| 25 | Trucks and Haulers | Ch 12 | |
| 27 | **Semester Project Presentation** | | |
| April 1 | **Exam III** | | |
| 3 | Graders<br>Tires | Ch 13<br>Handout | |
| 8 | Soil Compaction and Stabilization | Ch 14 | |
| 10 | **FIELD TRIP – John Deere (tentative)** | | **ALL DAY 5 A.M. – 9 P.M.** |
| 15 | Soil Compactors<br>Operational Analysis | Ch 15<br>Ch 16 | |
| 17 | **Exam IV** | | |
| 22 | Lifting Equipment<br>Pile Driving Equipment | Ch 17<br>Ch 18 | |
| 24 | Concrete<br>Asphalt Paving<br>Advanced Machine Guidance | Ch 19<br>Ch 21 | |
| April 28-May3 | **FINAL EXAM week** | | **Semester Project Due** |

**Travel Dates for the Semester**
Some travel is a necessary part of being a faculty at a research university. By the list of dates below you should be warned in advance of dates that I will likely be unavailable. Efforts will be made to see that you can remain productive in the course during my absence and any necessary further details will be provided as the date(s) approach.

- March 3-5