PURDUE UNIVERSITY
REQUEST FOR ADDITION, EXPIRATION,
OR REVISION OF AN UNDERGRADUATE COURSE
(10000-40000 LEVEL)

DEPARTMENT: Division of Construction Engineering and Management
EFFECTIVE SESSION: Spring 2010 (2010EE)

INSTRUCTIONS: Please check the item(s) below which describe the purpose of this request.

1. New course with supporting documents
2. Add existing course offered at another campus
3. Expiration of a course
4. Change in course number
5. Change in course title
6. Change in course credit type
7. Change in course attributes (department head signature only)
8. Change in Instructional hours
9. Change in course description
10. Change in course requisites
11. Change in semesters offered (department head signature only)
12. Transfer from one department to another

PROPOSED:
Subject Abbreviation: CEM
Course Number: 20100
Course Title: Life Cycle Engineering and Management of Constructed Facilities

EXISTING:

TERMS OFFERED:
Check All That Apply:
- Summer
- Fall
- Spring

CAMPUS(ES) INVOLVED:
- Calumet
- Coint Ed
- Ft. Wayne
- Indianapolis
- Tech Eastside
- W. Lafayette

Abbr. Title will be entered by Office of the Registrar (50 CHARACTERS ONLY)

CREDIT TYPE
1. Fixed Credit Cr. Hrs.: 3.0
2. Variable Credit Range:
   Minimum Cr. Hrs.:
   Maximum Cr. Hrs.:
3. Equivalent Credit: Yes

COURSE ATTRIBUTES:
- 6 Registration Approval Type
- 7 Variable Title
- 8 Honors
- 9 Full Time Prerequisite
- 10 Off Campus Experience

Schedule Type
- Lecture
- Recitation
- Presentation
- Laboratory
- Lab Prep
- Studio
- Distance
- Clinic
- Experience
- Research
- Ind. Study
- Pred/CoReq

Minutes Per Mill Weeks % of Credit
Per Week Offered Allocated
Lecture 50 3 16
Recitation
Presentation
Laboratory
Lab Prep
Studio
Distance
Clinic
Experience
Research
Ind. Study
Pred/CoReq

Prerequisites:
First Year Engineering Curriculum must be completed
This course introduces concepts relating to the engineering and construction of facilities throughout their life cycle. Topics that will be explored include the nature of the construction industry, construction contracts, legal and management organization of construction companies, basics of the design and construction process, as well as an introduction to the role of estimating and project scheduling. Cost, time, safety and quality concepts of construction management relationships will also be discussed.

COURSE LEARNING OUTCOMES
* Work with construction schedules and determine which activities are critical to the timely completion of the project.
* Identify different types of construction contracts and specifications.
* Calculate the productivity and the costs associated with construction equipment labor.
* Calculate the peak financial requirement for a given project based on project revenues and expenses.
* Understand the importance of safety on the construction site.
* Understand the principles involved in estimating and controlling costs on a construction project.

Column Department Head Date
Fort Wayne Department Head Date
Indiana West Department Head Date
North Central Department Head Date
West Lafayette Department Head Date

Column School Dean Date
Fort Wayne School Dean Date
Indiana West School Dean Date
North Central Vice Chancellor for Academic Affairs Date
West Lafayette College/School Dean Date

West Lafayette Registrar Date
PURDUE UNIVERSITY
REQUEST FOR ADDITION, EXPIRATION,
OR REVISION OF AN UNDERGRADUATE COURSE
(10000-40000 LEVEL)

DEPARTMENT: Division of Construction Engineering and Management
EFFECTIVE SESSION: Spring 2010 (201020)

INSTRUCTIONS: Please check the items below which describe the purpose of this request.

☑ 1. New course with supporting documents
☑ 2. Add existing course offered at another campus
☐ 3. Expiration of a course
☐ 4. Change in course number
☐ 5. Change in course title
☐ 6. Change in course credit/type
☐ 7. Change in course attributes (department head signature only)
☐ 8. Change in instructional hours
☐ 9. Change in course description
☐ 10. Change in course requisites
☐ 11. Change in semesters offered (department head signature only)
☐ 12. Transfer from one department to another

PROPOSED:
Subject Abbreviation: CEM
Course Number: 20100
Long Title: Life Cycle Engineering and Management of Constructed Facilities
Short Title: Life Cycle Eng Constr Fac

EXISTING:
Subject Abbreviation: 
Course Number: 
Long Title: 
Short Title: 

TERMS OFFERED:
Check All That Apply:
☐ Summer ☑ Fall ☑ Spring

CAMPUS(ES) INVOLVED:
Calumet ❒ N. Central ❒
Cont Ed ❒ Tech Statewide ❒
PI W. Lafayette ❒
Indianapolis ❒

☑ 1. Pass/Fail Only
☐ 2. Satisfactory/Unsatisfactory Only
☐ 3. Repeatable
☐ 4. Credit by Examination
☐ 5. Special Fees

Schedule Type
Lecture Recitation Presentation Laboratory Lab Prep Studio Clinic Experiential Research Ind. Study Prod/Observ
Min Hours Per Week 50 3 16
Meeting Per Week
Weeks 16
% of Credit Offered Allocated

COURSE DESCRIPTION (INCLUDE PREREQUISITE/RESTRICTIONS):
Prerequisite: First Year Engineering Curriculum must be completed.
This course introduces concepts relating to the engineering and construction of facilities throughout their life cycle. Topics that will be explored include the nature of the construction industry, construction contracts, legal and management organization of construction companies, basics of the design and construction process, as well as an introduction to the role of estimating and project scheduling.
Cost, time, safety and quality concepts of construction management relationships will also be discussed.

COURSE LEARNING OUTCOMES:
* Work with construction schedules and determine which activities are critical to the timely completion of the project.
* Identify different types of construction contracts and specifications.
* Calculate the productivity and the costs associated with construction equipment labor.
* Calculate the peak financial requirement for a given project based on project revenues and expenses.
* Understand the importance of safety on the construction site.
* Understand the principles involved in estimating and controlling costs on a construction project.

Catumet Department Head Date
Catumet School Dean Date

Port Wayne Department Head Date
Port Wayne School Dean Date

Indianapolis Department Head Date
Indianapolis School Dean Date

North Central Department Head Date
North Central Vice Chancellor of Academic Affairs Date

West Lafayette Department Head Date
West Lafayette College/School Dean Date

West Lafayette Registrar Date

OFFICE OF THE REGISTRAR
TO: The Faculty of the College of Engineering
FROM: Division of Construction Engineering and Management
RE: New Undergraduate Course CEM 20100
     Life Cycle Engineering and Management of Constructed Facilities

The faculty of the Division of Construction Engineering and Management has approved the following new course. This action is now submitted to the Engineering Faculty with a recommendation for approval.

CEM 20100 Life Cycle Engineering and Management of Constructed Facilities
Sem. 1 & 2, Lecture 3, Cr.3.
Prerequisite: First Year Engineering curriculum completion or equivalent

Description: This course introduces concepts relating to the engineering and management of facilities throughout their life cycle. Topics that will be explored include the nature of the construction industry, construction contracts, legal and management organization of construction companies, basics of the design and construction process, as well as an introduction to the role of estimating and project scheduling. Cost, time, safety and quality concepts of construction management relationships will also be discussed.

Reason: This course will be taught in fulfillment of the Construction Engineering (CNE) degree requirements. The syllabus of the course is attached. This course has been taught as a CEM 497 course and will be offered in both the Spring and Fall semesters. CEM majors must enroll in this course to fulfill degree requirements.

Makarand Hastak, Professor and Head
Division of Construction Engineering and Management

APPROVED FOR THE FACULTY
OF THE SCHOOLS OF ENGINEERING
BY THE ENGINEERING CURRICULUM COMMITTEE

ECC Minutes #21
Date 3/30/16
Chairman ECC R. Cira
CE 49700-013/CEM 49700-001 – Life Cycle Engineering and Management of Constructed Facilities

Professor: Dr. Dulcy M. Abraham
Office: CIVL 1241  email: dulcy@ecn.purdue.edu (best way)
Office Hours: Wednesday 1:30 p.m. - 2:30 p.m.
   Thursday 12:30 p.m. - 1:30 p.m.
   Friday 11:30 a.m. - 12:30 p.m.
Other hours by appointment

Lectures: Monday/Wednesday/Friday 10:30 a.m. - 11:20 a.m.
CIVL 1144

Teaching Assistants: Mr. Madhur Gupta
CIVL B147 email: gupta1@purdue.edu  phone: 765-237-2360
Office hours: Wednesday 11:30 a.m. – 1:00 p.m.
   Thursday afternoon 1:30 p.m. – 3:00 p.m.
Other hours by appointment

Mr. Vivek Puri
CIVL B147 email: vpuri@purdue.edu  phone: 765-491-3216
Office hours: Tuesday 10:00 a.m. – 11:30 a.m.
   Thursday 10:00 a.m. – 11:30 a.m.
Other hours by appointment
TEXTBOOK:

CATALOG DESCRIPTION
This course introduces concepts relating to the engineering and construction of facilities through its life cycle. Topics that will be explored include the nature of the construction industry, construction contracts, legal and management organization of construction companies, basics of the design and construction process, as well as an introduction to the role of estimating and project scheduling. Cost, time, safety and quality concepts of construction management relationships will also be discussed.

OBJECTIVES OF THE COURSE
The course is designed to introduce students to the basic concepts of construction management.

By the end of this course, students should be able to:
a) Work with construction schedules and determine which activities are critical to the timely completion of the project.
b) Identify different types of construction contracts and specifications.
c) Calculate the productivity of construction equipment.
d) Calculate the costs associated with construction equipment and construction labor.
e) Calculate the peak financial requirement for a given project based on project revenues and expenses.
f) Understand the importance of safety on the construction site.
g) Understand the principles involved in estimating and controlling costs on a construction project.

The course contributes to the following BSCE/BSCEM Program Objectives at Purdue University:
Technical Knowledge, Complementary Knowledge, Opportunities for Learning, and Professional Preparation.

ATTENDANCE
In accordance with Purdue University Regulations: “Students are expected to be present for every meeting of classes they are enrolled, (unless there is an emergency/health issue). All matters relative to attendance, including the make-up of missed work, are to be arranged between the student and the instructor involved.” Any anticipated absences must be cleared with the instructors, in advance if possible, with a word-processed memorandum stating the date and the reason for the absence or the absence will be considered unexcused.
Failure to be present at any class does not relieve the student of his/her obligations for the materials covered or assigned in class. **NO ABSENCES WILL BE EXCUSED ON DAYS OF SCHEDULED EXAMS. All assignments have to be turned in by the time and date specified or they will not receive any credit.**

**MAJOR CAMPUS EMERGENCY**

In the event of a major campus emergency, course requirements, deadlines and grading percentages are subject to changes that may be necessitated by a revised semester calendar or other circumstances beyond the instructor’s control. Here are ways to get information about changes in this course. Blackboard Vista web page, my email address: dulcy@ecn.purdue.edu

**READINGS AND ASSIGNMENTS**
The text and supplementary materials play a major role in the presentation of the course. Students will be required to study these materials by completing the specified readings prior to a particular session.

Assignments should be turned via Blackboard in the prescribed format. Assignments are due at the beginning of class (at 10:30 a.m.) on **Friday of the week after which it was assigned** (e.g., the first homework assignment is due on **September 4, 2009**). Late assignments will not be accepted, and hence will receive no credit. Students should attempt the homework assignments by themselves BEFORE approaching the teaching assistants and the professor for additional assistance.

**EXAMS**
There are three exams (2 exams during the semester, 1 final exam) in the course. The exams cover material discussed in the lectures or included in the assigned readings up to the time of the exam. The final exam will be cumulative.

**GRADING**

<table>
<thead>
<tr>
<th>*</th>
<th>Assignments</th>
<th>30%</th>
</tr>
</thead>
<tbody>
<tr>
<td>*</td>
<td>Exam No. 1</td>
<td>20%</td>
</tr>
<tr>
<td>*</td>
<td>Exam No. 2</td>
<td>20%</td>
</tr>
<tr>
<td>*</td>
<td>Final Exam</td>
<td>30%</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td></td>
<td><strong>100%</strong></td>
</tr>
</tbody>
</table>
There will be **no curve** for the final grade, only straight averages. The ranges for grades are as follows:

- Above 90.0 – A; 86.5 – 89.9 – A-
- 83.5 – 86.4 – B+; 80.0 – 83.4 – B; 76.5 – 79.9 – B-
- 73.5 – 76.4 – C+; 70.0 – 73.4 – C; 66.5 – 69.9 – C-
- 60.0 – 65.4 – D; Below 60 – F

All matters relating to grading have to be presented through a word-processed memo, addressed to Professor Abraham and the teaching assistants. **The teaching assistants will first review the memo, and will present their recommendation to Professor Abraham.** The final and binding decision will be made by Professor Abraham and the teaching assistants. If there are any further unresolved questions regarding the grading issue, they can be directed to the Head of the School of Civil Engineering.
### Topics covered in CE 49700-013/CEM 49700-001 – Life Cycle Engineering and Management of Constructed Facilities

- The construction industry and its stakeholders
- Life cycle of a constructed facility (identification of need through its operation in perpetuity, renewal or decommissioning)
- Use of life-cycle matrix
  
  (2 weeks)

- Project delivery systems
- Construction contracts (impact on risk and cost)
- Project organization structures
  
  (2 weeks)

- Estimating at different phases (preliminary, parametric, engineer’s, bid estimate, change order estimate)
  
  (2.5 weeks)

- Project planning and scheduling (Critical path method, resource use over time)
  
  (1.5 weeks)

- Project cash flow and company cash flow
  
  (1.5 weeks)

- Construction equipment – performance and cost considerations of heavy construction equipment
- Resource cycles, production rates of different operations
  
  (1.5 weeks)

- Safety during construction (Prevention through Design (PtD), linking safety with productivity of construction operations and costs)
  
  (1.5 weeks)

- Labor relations/construction labor costs
  
  (1 week)

- Quality during life cycle (emphasis on work and material specifications, total quality control)
  
  (0.5 week)

- Construction cost control
  
  (0.5 week)