EFD 40-09

Office of the Registrar
FORM 40 REV. 11/09

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

DEPARTMENT: Division of Construction Engineering and Management
EFFECTIVE SESSION: ~~Spring 2010 (201020)~~ 201110

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

- [x] 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:		EXISTING:	
Subject Abbreviation	CEM	Subject Abbreviation	
Course Number	20100	Course Number	
Long Title	Life Cycle Engineering and Management of Constructed Facilities		
Short Title	Life Cycle Engr Construct Fac		

Abbreviated title will be entered by the Office of the Registrar if omitted. (30 CHARACTERS ONLY)

TERMS OFFERED
Check All That Apply:
[ ] Summer [x] Fall [x] Spring

CAMPUS(ES) INVOLVED
[ ] Calumet [ ] N. Central
[ ] Cont Ed [ ] Tech Statewide
[ ] Ft. Wayne [x] W. Lafayette
[ ] Indianapolis

CREDIT TYPE
1. Fixed Credit: Cr. Hrs. 3.0
2. Variable Credit Range:
Minimum Cr. Hrs
(Check One) To [ ] Or [ ]
Maximum Cr. Hrs
3. Equivalent Credit: Yes [ ] No [x]

COURSE ATTRIBUTES: Check All That Apply
1. Pass/Not Pass Only [ ]
2. Satisfactory/Unsatisfactory Only [ ]
3. Repeatable [ ]
Maximum Repeatable Credit: [ ]
4. Credit by Examination [ ]
5. Special Fees [ ]
6 Registration Approval Type
Department [ ] Instructor [ ]
7 Variable Title [ ]
8 Honors [ ]
9 Full Time Privilege [ ]
10 Off Campus Experience [ ]

Schedule Type	Minutes Per Mtg	Meetings Per Week	Weeks Offered	% of Credit Allocated
Lecture	50	3	16	
Recitation				
Presentation				
Laboratory				
Lab Prep				
Studio				
Distance				
Clinic				
Experiential				
Research				
Ind. Study				
Pract/Observ				

Cross-Listed Courses
CE 22200

COURSE DESCRIPTION (INCLUDE REQUISITES/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.

Calumet Department Head	Date	Calumet School Dean	Date
Fort Wayne Department Head	Date	Fort Wayne School Dean	Date
Indianapolis Department Head	Date	Indianapolis School Dean	Date
North Central School Dean	Date	North Central Vice Chancellor for Academic Affairs	Date
West Lafayette Department Head	12/29/09 Date	West Lafayette College/School Dean	4/5/10 Date
		West Lafayette Registrar	5/20/10 Date

OFFICE OF THE REGISTRAR

5/19/10

EFD 40-09

Office of the Registrar
FORM 40 REV. 11/09

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.

- [x] 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:		EXISTING:	
Subject Abbreviation	CEM	Subject Abbreviation	
Course Number	20100	Course Number	
Long Title	Life Cycle Engineering and Management of Constructed Facilities		
Short Title	Life Cycle Engr Construct Fac		

Abbreviated title will be entered by the Office of the Registrar if omitted. (30 CHARACTERS ONLY)

TERMS OFFERED (Check All That Apply): [ ] Summer [x] Fall [x] Spring

CAMPUS(ES) INVOLVED: [ ] Calumet [ ] Cont Ed [ ] Ft. Wayne [ ] Indianapolis [ ] N. Central [ ] Tech Statewide [x] W. Lafayette

CREDIT TYPE

1. Fixed Credit: Cr. Hrs. 3.0
2. Variable Credit Range: Minimum Cr. Hrs ____ (Check One) To [ ] Or [ ] Maximum Cr. Hrs ____
3. Equivalent Credit: Yes [ ] No [x]

COURSE ATTRIBUTES: Check All That Apply

1. Pass/Not Pass Only [ ]
2. Satisfactory/Unsatisfactory Only [ ]
3. Repeatable [ ] Maximum Repeatable Credit: [ ]
4. Credit by Examination [ ]
5. Special Fees [ ]
6. Registration Approval Type: Department [ ] Instructor [ ]
7. Variable Title [ ]
8. Honors [ ]
9. Full Time Privilege [ ]
10. Off Campus Experience [ ]

Schedule Type	Minutes Per Mtg	Meetings Per Week	Weeks Offered	% of Credit Allocated
Lecture	50	3	16	
Recitation				
Presentation				
Laboratory				
Lab Prep				
Studio				
Distance				
Clinic				
Experiential				
Research				
Ind. Study				
Pract/Observ				

Cross-Listed Courses: CE 22200

COURSE DESCRIPTION (INCLUDE REQUISITES/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.

Calumet Department Head	Date	Calumet School Dean	Date		
Fort Wayne Department Head	Date	Fort Wayne School Dean	Date		
Indianapolis Department Head	Date	Indianapolis School Dean	Date		
North Central School Dean	Date	North Central Vice Chancellor for Academic Affairs	Date		
West Lafayette Department Head	12/29/09 Date	West Lafayette College/School Dean	4/5/10 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 3/30/10

Chairman ECC R. Cipra

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:

Halpin, D. W. (2006). Construction Management (3rd Edition). John Wiley and Sons, Inc.

CATALOG DESCRIPTION

This course introduces concepts relating to the engineering and construction of facilities through it 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

*	Assignments	30%
*	Exam No. 1	20%
*	Exam No. 2	20%
*	Final Exam	30%
	Total	**100%**

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)