# REQUEST FOR ADDITION, EXPIRATION, OR REVISION OF AN UNDERGRADUATE COURSE

<table>
<thead>
<tr>
<th>Course Number</th>
<th>30200</th>
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**Proposed:**

- **Subject Abbreviation:** CEM
- **Long Title:** Practical Applications for Construction Engineering
- **Short Title:** Practical Appl for Constr Engr

**Existent:**

- **Subject Abbreviation:**

**Terms Offered:**

- Check all that apply:
  - Summar
  - Fall
  - Spring

**Campus(es) Involved:**

- Calumet
- Cont Ed
- Ft. Wayne
- Indianapolis
- N. Central
- Tech Statewide
- W. Lafayette

**Course Attributes:**

- 6 Registration Approval Type
- Instructor
- 7 Variable Title
- 8 Honors
- 9 Full Time Privilege
- 10 Off Campus Experience

**Course Description:**

Prerequisite: CEM 30100 Project Control & Life Cycle Execution of Constructed Facilities

Scheduling utilizing industry software such as: Project Planning and Scheduling techniques, Resource Management and Project Monitoring. Reading and Interpreting Contract Plans, Estimating and Contract Bidding, Development and exploration of various elements of Project Cost, Cash Flow and Risk Management will also be studied.

**Course Learning Outcomes:**

At the conclusion of this course, the students should demonstrate proficiency in Reading and Interpreting Contract Plans, Estimating and Contract Bidding, Development and exploration of various elements of Project Scheduling utilizing industry software such as: Project Planning and Scheduling techniques, Resource Management and Project Monitoring.
FOROGE UNIVERSITY
REQUEST FOR ADDITION, EXPIRATION,
OR REVISION OF AN UNDERGRADUATE COURSE
(10000-40000 LEVEL)

DEPARTMENT: Division of Construction Engineering and Management
EFFECTIVE SESSION: Spring 2011 (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

PROPOSED:
Subject Abbreviation: CEM
Course Number: 30200
Long Title: Practical Applications for Construction Engineering
Short Title: Practical Appl for Constr Engr

EXISTING:
Subject Abbreviation
Course Number
Long Title
Short Title

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

CAMPUS(ES) INVOLVED:
- Calumet
- Cost Ed
- Ft. Wayne
- Indianapolis
- N. Central
- Tech Statewide
- W. Lafayette

CREDIT TYPE:
1. Fixed Credit: Cr. Hrs.
2. Variable Credit Range:
   Minimum Cr. Hrs (Check One) To Cr
   Maximum Cr. Hrs
3. Equivalent Credit:
4. Schedule Type
   - Lecture
   - Recitation
   - Presentation
   - Laboratory
   - Lab Prep
   - Studio
   - Balance
   - Experiential
   - Research
   - Ind. Study
   - Pract/observe

5. % of Credit Allocated

6. Registration Approval Type
   - Department
   - Instructor

7. Variable Title
8. Honors
9. Full Time Privilege
10. Off Campus Experience

COURSE DESCRIPTION (INCLUDE REQUIREMENTS/RESTRICTIONS):
Prerequisite: CEM 30100 Project Control & Life Cycle Execution of Constructed Facilities
Scheduling utilizing industry software such as: Project Planning and Scheduling techniques, Resource Management and Project Monitoring. Reading and Interpreting Contract Plans, Estimating and Contract Bidding, Development and exploration of various elements of Project Cost, Cash Flow and Risk Management will also be studied.

COURSE LEARNING OUTCOMES:
At the conclusion of this course, the students should demonstrate proficiency in Reading and Interpreting Contract Plans, Estimating and Contract Bidding, Development and exploration of various elements of Project Scheduling utilizing industry software such as: Project Planning and Scheduling techniques, Resource Management and Project Monitoring.

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 Department Head: ____________________________ Date: ____________
North Central Van Chancellor for Academic Affairs: ____________________________ Date: ____________

West Lafayette Department Head: ____________________________ Date: ____________
West Lafayette College/School Dean: ____________________________ 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 30200
Practical Applications for Construction Engineering

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 30200 Practical Applications for Construction Engineering
Sem. 2, Lecture 3, cr.3.
Prerequisite: CEM 30100 - Project Control & Life Cycle Execution of Constructed Facilities

Description: This course teaches practical applications of the theories, tools and skills taught in CEM 201 and CEM 301. Construction processes will be studied through hands on exercises working with actual contract plans and specifications and computerized project scheduling of the sample project that is the focus of the class. Topics that will be explored are Contract Format, Understanding Contract Specifications.

Reason: This course will be taught in fulfillment of the Construction Engineering (CNE) degree requirements. The syllabus of the course is attached. This course will be offered in the Spring semester. 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. Ciras
**CEM 497-005 PRACTICAL APPLICATIONS FOR CONSTRUCTION ENGINEERING**

**Professor:** Victor Gervais  
CIVL 1233  
Phone: (765) 494-0642

Email: vgervais@purdue.edu

Office Hours: Mon: 2:00 - 3:00 p.m.

**Teaching Assistant:** Nader Naderpajouh  
CIVL 1255  
Phone: (765) 494-0696

Email: np@purdue.edu

Office Hours: Tues: 4:15 – 5:15 p.m.

Thurs: 4:15 – 6:15 p.m.

**TIME:** Spring Semester 2010

**VENUE:** MWF: 2:30 p.m. - 3:20 p.m.  
CIVL 2118

**SUMMARY**

This course teaches practical applications of the theories, tools and skills taught in perquisite courses. Construction processes will be studied through hands on exercises working with actual contract plans and specifications and computerized project scheduling of the sample project that is the focus of the class. Topics that will be explored will be Contract Format, Understanding Contract Specifications, Reading and Interpreting Contract Plans, Estimating and Contract Bidding, Development and exploration of various elements of Project Scheduling utilizing industry software such as: Project Planning and Scheduling techniques, Resource Management and Project Monitoring. Cost, Cash Flow and Risk Management will also be studied. Course includes individual and group graded assignments on specific topics, and a comprehensive group project to develop the complete cost estimate and a detailed project schedule for a real facility. A comprehensive bid package including project schedule will be required.
COURSE PREREQUISITES

- CEM 497-003 Engineering Management of Constructed Facilities Life
- CEM 497-004 Project Control Life Cycle Constructed Facilities

TEXTBOOK(S) AND/OR OTHER REQUIRED MATERIAL

Textbooks/required material:


   This is a custom textbook which includes 1. and 2. in their entirety. ISBN10: 0558457797

4. One complete set of plans and specifications ("package") for the group project. This "package" will be issued to each of the teams.

5. RS Means Building Construction Data

   This set of reference books will be issued to each project team on a loan basis for the duration of the project. The team will be responsible for maintaining the original issue condition.

References:


OBJECTIVES OF THE COURSE

By the end of this course, the student will be able to:

- Ability to read, comprehend and interpret construction contract plans and specifications. Through hands on use of plans and specifications from an actual project, they will be taken through the process of using and understanding the various sections of the contract documents.
- Identify and distinguish the different types of building construction project estimates and the role they play in the facility development process.
- Demonstrate specific skills in the interpretation of construction plans and specifications, estimate planning and organization, quantity takeoffs and pricing, construction contracts, labor and equipment productivity, conceptual estimating, bidding strategies, and overhead costs.
- Ability to develop and utilize a computerized network schedule for the example construction project. Scheduling will address logic flow and contract status through data analysis of activities updates including resource and dollar loading.
- Identify and use principal methods, tools, and techniques used to develop building construction project estimates and project schedules.

TOPICS COVERED

Topics that will be explored will be Contract Format, Understanding Contract Specifications, Reading and Interpreting Contract Plans, Estimating and Contract Bidding, Development and exploration of various elements of Project Scheduling utilizing industry software such as: Project Planning and Scheduling techniques, Resource Management and Project Monitoring. Cost, Cash Flow and Risk Management will also be studied.

Attendance

In accordance with University Regulations, Part 2, Section VI A, effective Fall Semester 1999, "... Students are expected to be present for every meeting of classes 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." Thus, a class sign-up sheet will be passed each lecture, and will become the record of the student's attendance during the semester. Any anticipated absences must be cleared with the instructors, in advance if possible, with a typewritten or word-processed memorandum stating the date and the reason for the absence or the absence will be considered unexcused. A student may have no more than two (2) unexcused absences. In addition, for seniors only, up to a total of three (3) plant trips will be considered excused absences.

Three unexcused absences will result in a grade reduction of 5% points from the overall student score. Any subsequent unexcused absence (beyond three) will result in an additional grade reduction of 2% points per absence from the overall student score.
Failure to be present at any class does not relieve the student of his/her obligations for the materials covered or assigned in class.

LECTURES AND ASSIGNED READINGS
The detailed list of lecture topics and assigned readings is contained in the Course Schedule. The lectures provide the conceptual framework for the course and supplement (i.e., not replace) the assigned readings. The student is expected to have a good understanding of the lecture and reading materials, whether they are present in the class or not.

QUIZZES
There will be a quiz about every two weeks, covering the course material for that period. Quizzes missed as a result of an "unexcused" absence CANNOT be made up.

PRACTICAL Project Reports
Practical project reports will be due at the beginning of the lecture period after the period in which it was assigned until stated otherwise. Project reports should be turned in word-processed format or handwritten on engineering paper. Only one side of the paper should be used. Project reports that deviate from these instructions will not be accepted. Project reports should be turned in with team member names, course number, and report number on the cover sheet. Pages should be numbered. Professional presentation, good organization, and proper documentation are very important components of the report grade. The reports will generally be developed, collected and graded by the teaching assistant. Any questions regarding project assignments should be directed to the teaching assistant before involving the instructor.

TERM PROJECT
There is one (1) term project that will be completed during the second half of the semester. The term project tests the students' understanding of the principal concepts covered in the course within the context of a comprehensive "real-world" problem. In the group project, teams will prepare a complete bid including network schedule using a complete set of plans and specifications for a real facility. The term project has one (1) Final Bid Submittal. This submittal will receive a single group grade. The term project is considered a bid, i.e., it has to be turned in on the date and time it is due or it will not receive any credit. Set of plans must be returned along with the Final Bid Submittal.
Exams

There are three (3) exams in the course. The exams will test the individual student's understanding of some of the principal concepts covered in the course. The exams cover material discussed in the lectures or included in the assigned readings up to the time of the exam. Each exam will include two sections (a) a closed book section, and (b) an open-book section. No absences will be excused on the days of exams.

GRADING

* Quizzes 20%
* Practical Projects 30%
* Team Project 20%
* Exams (equal weights) 30%

Total 100%

There will be no curve for the final grade. 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.

PROCEDURE IN THE EVENT OF A 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. Here are ways to get information about changes in this course. Blackboard Vista web page, my email address: vgervais@purdue.edu, and my office phone: 494-0642.
<table>
<thead>
<tr>
<th>WEEK</th>
<th>LECTURE TOPIC</th>
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<tbody>
<tr>
<td>1</td>
<td>Contract - Bidding, Plans, Specs Role of Estimating in Construction</td>
</tr>
<tr>
<td>2</td>
<td>Discuss Project Drawings Study Project Pics - Excavation, Piling, Shoring Project Site Visit</td>
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<tr>
<td>3</td>
<td>Sitework /Shoring Sitework</td>
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<tr>
<td>4</td>
<td>Concrete - Piles, Footings, Foundations, Slabs Concrete</td>
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<td>5</td>
<td>Concrete – Rebar Concrete/Rebar</td>
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<td>6</td>
<td>Structural Steel Estimating Steel</td>
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<tr>
<td>7</td>
<td>Masonry Masonry</td>
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<td>8</td>
<td>Wood Construction Wood</td>
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<tr>
<td>9</td>
<td>Labor Costs Equipment Use and Productivity</td>
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<tr>
<td>10</td>
<td>Bar Chart Schedules Introduction to CPM Scheduling</td>
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<td>11</td>
<td>Creating the Network Logic Diagram Determining Durations</td>
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<td>12</td>
<td>Calculating Float Reviewing and Analyzing the Schedule</td>
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<td>13</td>
<td>Updating the Schedule Using the Schedule to Forecast and Balance Resources</td>
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<td>14</td>
<td>Cost Schedule Control System Criteria Introduction to Computerized CPM Scheduling</td>
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<tr>
<td>15</td>
<td>Managing Projects - Primavera Project Planner (P3)</td>
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<td>16</td>
<td>Managing Projects Using SureTrak</td>
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<thead>
<tr>
<th>ASSIGNED READINGS/ IMPORTANT DATES</th>
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<tbody>
<tr>
<td>Chapter 1 - 2</td>
</tr>
<tr>
<td>Mackey Renovation Contract Memorandum regarding term project</td>
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<tr>
<td>Chapter 8 Quiz 1</td>
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<td>Chapter 9</td>
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<td>Chapter 9 Quiz 2</td>
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<td>Chapter 11 Exam 1</td>
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<td>Chapter 12 Quiz 3</td>
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<td>Chapter 6 - 7</td>
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<td>Chapter 29 - 30</td>
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<tr>
<td>Chapter 31 - 33 Quiz 4</td>
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<td>Chapter 34 - 36 Exam 2</td>
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<td>Chapter 39 - 40</td>
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<tr>
<td>Chapter 41,44 Quiz 5</td>
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<tr>
<td>Chapter 45 Submission of Term Reports</td>
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<td>Chapter 46</td>
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