PURDUE UNIVERSITY
REQUEST FOR ADDITION, EXPIRATION, OR REVISION OF AN UNDERGRADUATE COURSE (100-400 LEVEL)

DEPARTMENT Engineering  EFFECTIVE SESSION Fall 2010

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

- New course with supporting documents
- Add existing course offered at another campus
- Expiration of a course
- Change in course number
- Change in course title
- Change in course credit / type
- Change in course attributes (department head signature only)
- Change in instructional hours
- Change in course description
- Change in course requisites
- Change in semesters offered (department head signature only)
- Transfer from one department to another

PROPOSED:

Subject Abbreviation  CE
Course Number  31500
Long Title  Civil Engineering Materials
Short Title

EXISTING:

Subject Abbreviation
Course Number

TERMS OFFERED

Check All That Apply:
- Summer
- Fall
- Spring

CAMPUS(ES) INVOLVED

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

Abbreviated title will be entered by the Office of the Registrar if omitted. (22 CHARACTERS ONLY)

CREDIT TYPE

1. Fixed Credit: Cr. Hrs. 3
2. Variable Credit Range: (Check One) Maximum Cr. Hrs.
   Minimum Cr. Hrs.
   (Check One) To Or
3. Equivalent Credit: Yes No
4. Thesis Credit: Yes No

COURSE ATTRIBUTES: Check All That Apply

1. Pass/Not Pass Only
2. Satisfactory/Unsatisfactory Only
3. Repeatable
4. Credit by Examination
5. Designator Required
6. Special Fees
7. Registration Approval Type
   - Department
   - Instructor
8. Variable Title
9. Remedial
10. Honors
11. Full Time Privilege
12. Off Campus Experience

INSTRUCTIONAL TYPE

- Lecture
- Recitation
- Presentation
- Laboratory
- Lab Prep
- Studio
- Distance
- Clinic
- Experiential
- Research
- Ind. Study
- Pract/Obser

Minutes Per Mth
Lecture 75
Recitation
Presentation
Laboratory
Lab Prep
Studio
Distance
Clinic
Experiential
Research
Ind. Study
Pract/Observe
Meetings Per Week

Weeks Offered

% of Credit Allocated

Delivery Method (Asyn, Cr Syn.)
Synchronized

Delivery Medium (Audio, Internet, Live, Text-Based, Video)

COURSE DESCRIPTION (INCLUDE REQUISITES):

C: CE 252. Study the nature and performance of civil engineering materials and evaluation of their physical and mechanical properties. This course focuses on materials used in construction and maintenance of buildings and infrastructure such as ferrous and nonferrous metals, aggregates, Portland cement, concrete, masonry, asphalt and asphalt mixtures, wood and composites. Emphasis will be placed on selection criteria, design, applications and proper use of these materials.

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 Chancellor  Date

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

OFFICE OF THE REGISTRAR
**Required Course**  
**CE 315 - Civil Engineering Materials**  
Offered each fall and spring

**Catalog Data**  
Class: 3. Credits: 3  
Study the nature and performance of civil engineering materials and evaluation of their physical and mechanical properties. This course focuses on materials used in construction and maintenance of buildings and infrastructure such as ferrous and nonferrous metals, aggregates, Portland cement, concrete, masonry, asphalt and asphalt mixtures, wood and composites. Emphasis will be placed on selection criteria, design, applications and proper use of these materials

**Prerequisite**  
None

**Corequisite**  
**CE 252 - Strength of Materials**  
Authorized equivalent courses or consent of instructor may be used in satisfying course pre-requisites.

**Required Textbook**  

**Reference**  


**Course Objectives**  
The objective of this course is to understand the characteristics and behavior of civil engineering materials used in buildings and infrastructure. Students will learn how to select materials based on their properties and their proper use for a particular facility under prevailing loads and environmental conditions.

**Schedule:**  
Two classes of 75 minutes per week

**Lecture Topics**  
1. Basic materials properties  
2. Stress and strain, and elastic, plastic and time dependent deformations  
3. Atomic structure of materials  
4. Steel production and properties  
5. Aluminum  
6. Mineral Aggregates  
7. Portland Cement, Mixing water, and admixtures  
7. Portland Cement Concrete: mix design  
7. Portland Cement Concrete: Mixing and handling of concrete  
7. Portland Cement Concrete: Finishing and curing of concrete  
8. Masonry  
9. Asphalt binders  
9. Asphalt concrete mix design  
3 Classes  
3 Classes  
2 Classes  
1 Class  
2 Classes  
1 Class  
3 Classes  
1 Class  
4 Classes  
1 Class
9. Asphalt concrete production
10. Wood
11. Composites

Course Outcomes
Upon successful completion of this course, students shall be able to:
1. Understand basic materials properties including stress and strain, and elastic, plastic and time dependent deformations [a (1)]
2. Identify atomic structure of materials [a (1)]
3. Describe the strength and durability characteristics of steel, Portland cement concrete, polymers, fiber reinforced polymers, and hot-mix asphalt. [a (1)]
4. Calculate proportion of Portland cement concrete mixes to be used in the construction of civil engineering structures. [c (4), e (2)]
5. Identify the basic pavement performance parameters used in the SuperPave hot-mix asphalt design procedure. [c (4)]
6. Apply the field quality control procedures in the manufacturing and placing of Portland cement concrete and hot-mix asphalt. [f (7)]
7. Select appropriate material in the design phase and in the life-cycle cost of engineering facilities. [c (4), e (2)]

ABET category:
Engineering science: 2.5 credits or 83%
Engineering design: 0.5 credits or 17%