REGULAR COURSE SYLLABUS

School of: Professional Studies

Department: Engineering Technology

CIP Code: 15.0201

Prefix & Course Number: CET 4120

Course Title: Concrete Design I

Check All That Apply: Required for Major: _____ Required for Minor: _____ Specified Elective: X

Required for Concentration: X Elective: X Service Course: _____

Credit Hours: 3 (3+0)

Total Contact Hours per semester (assuming 15-16 week semester):

Lecture 45 Lab 0 Internship 0 Practicum 0 Other (please specify type and hours): _____

Schedule Type(s): L Grading Mode(s): L

Variable Topics Courses (list restrictions, including the maximum number of hours that can be earned**):

** NOTE: This information must be included in the course description.

Restrictions (Variable Topics Course): _____

Prerequisite(s): CET 3170 with a grade of “C” or better; or permission of instructor

Corequisite(s): None

Prerequisite(s) or Corequisite(s): _____

Banner Enforced:

Prerequisite(s): _____
Corequisite(s): _____
Prerequisite(s) or Corequisite(s): _____

APPROVED: _____ 3/1/08

Department Chair OR Program Director

Dean OR Associate Dean

Associate VP, Academic Affairs

*If crosslisted, attach completed Course Crosslisting Agreement Form
Prefix and Course Number: CET 4120

Catalog Course Description:
This course is a basic introduction to the fundamental principles of reinforced concrete design according to current ACI Code. The course covers flexural analysis and design of beams and one-way slabs, serviceability, bond and development lengths, and shear and diagonal tension.

Required Reading and Other Materials will be equivalent to:
2. ACI 318-05 Code-optional (recommended) American Concrete Institute.

Specific, Measurable Student Behavioral Learning Objectives:
Upon completion of this course the student should be able to:
1. Examine properties and mechanical behaviors of concrete and reinforcing steel.
2. Compare fundamental principles of ultimate strength method to analyze and design beams and one-way slabs.
3. Analyze reinforced concrete structures for serviceability.

Detailed Outline of Course Content (Major Topics and Subtopics) or Outline of Field Experience/Internship (experience, responsibilities and supervision):
I. Introduction to Material Properties of Reinforced Concrete and References to the American Concrete Institute Code
   A. Cement, aggregates and proportioning and mixing of concrete
   B. Properties of concrete in compression and tension
   C. Reinforcing steels for concrete
II. Flexural Analysis and Design of Beams
   A. Bending of homogeneous beams
   B. Reinforced concrete beam behavior
   C. Design of tension-reinforced rectangular beams
   D. Rectangular beams with tension and compression reinforcement
   E. Design and analysis of T-beams
III. Shear and Diagonal Tension in Beams
   A. Diagonal tension in homogeneous elastic beams
   B. Reinforced concrete beams with web reinforcement
   C. ACI code provisions for shear design
IV. Bond, Anchorage and Development Length
   A. Fundamentals of flexural bond
   B. Ultimate bond strength and development length
   C. American Concrete Institute (ACI) code provisions for development of tension remodeling
   D. Anchorage of tension bars by hooks
   E. Development of bars in compression
V. Crack Control and Deflections
   A. Cracking in flexural members
   B. American Concrete Institute (ACI) code provision for crack control
   C. Deflections due to long-and-short-term loads
   D. American Concrete Institute (ACI) code provisions for control of deflections

Evaluation of Student Performance:
1. Assigned homework problems
2. Written examinations