

CE 494 CE Project Management and Design II Spring 2005

Required or Elective Course:	Required
Catalog Course Description:	CE 494 (3 credits) Synthesis of civil engineering specialties in a diverse multi-disciplinary project. Teamwork approach in design of components and systems to meet stated objectives. Consideration of alternative solutions, methods, and products including constraints such as economic factors, safety, reliability, and ethics. Preparation of design documents, including: memoranda, computations, drawings, cost estimates, specifications, bidding materials; written and oral presentations. Two lectures, one 3-hour design project laboratory period.
Prerequisite(s):	CE 484, senior standing in civil engineering
References:	Recommended references are included with the individual project descriptions and include local and national codes and standards and similar material.

Course Objective(s): This course is designed to address the following ABET outcomes:

- (a) an ability to apply knowledge of mathematics, science, and engineering: showcase the results of your education at PSU.
- (b) an ability to design and conduct experiments, as well as to analyze and interpret data
- (c) an ability to design a system, component, or process to meet desired needs: have a better understanding of the process of designing to local codes and standards
- (d) an ability to function on multi-disciplinary teams:
 1. Develop a preliminary design using team-based decision-making and cooperation. The team experience goals are to have students realize the importance of being proactive and the importance of knowing how their work impacts the work of others.
 2. Have students experience the satisfaction of working in a successful team environment.
 3. The project management part of the course discusses and illustrates the importance of teamwork in producing a quality product.
- (e) an ability to identify, formulate, and solve engineering problems:
 1. The nature of the projects involves technical problem solving ability – see below.
 2. The project management part of the course discusses the logistics involved in getting teams to solve engineering problems.
- (f) an understanding of professional and ethical responsibility
 1. Professionalism and honesty - Students in this course are expected to conduct themselves in a professional and honorable manner. They are expected to respect the dignity of others in the class and have responsibilities to the instructor and to teammates to perform the class activities in a timely and honest manner.
 2. Team culture – emphasis on teamwork and ground rules for team behavior. Teams are organized around the following principles:
 - a. Establish procedures and networks of communication, in order to facilitate answering questions and disseminating information to the team.

- b. Establish trust and respect between team members and the client.
 - c. Establish a mindset of cooperation and sharing within the team.
 - d. Establish planning procedures within the team to facilitate getting the work done.
3. The project management part of the course has a strong professional and ethical responsibility component.

(g) an ability to communicate effectively:

- 1. Submit the preliminary design both in oral and hard-copy formats. The product of the preliminary design should showcase the results of the learning the student has done in the undergraduate program.
- 2. Present the results of the design to a faculty panel and other interested parties.
 - a. Realize the importance of the presentation in convincing the stakeholders that their design is valid and well-planned.
 - b. Experience what is involved in presenting material well.

(h) the broad education necessary to understand the impact of engineering solutions in a global and societal context; (i) a recognition of the need for, and an ability to engage in life-long learning: the strong tie of the project management part of the course and professional practice emphasizes the need to keep current with modern issues and methods; (j) a knowledge of contemporary issues: the project management part of the course covers current practice in project management and determining project budgets and costs; (k) an ability to use the techniques, skills, and modern engineering tools necessary for engineering practice.

For (h), (i), (j), and (k):

- 1. The nature of the projects touches upon these outcomes – projects this year include community service for the City of Portland Parks and Recreation Department, ecoroof/stormwater filtering systems design for the PSU parking garages, and a seismic rehabilitation study for a potential PSU Civil Engineering laboratory facility.
- 2. As a part of the Leif Erikson Drive study for the City of Portland, the students are learning some GIS and slope stability techniques. In the seismic rehab study, students are becoming familiar with current National seismic design standards, and may use our structural analysis software in designing some of the components of the rehab. In the ecoroof/stormwater study the students are learning how facilities meet LEED certification, and current state of the art techniques for filtering stormwater.
- 3. The ecoroof/stormwater project addresses the global issue of sustainable design. The Leif Erikson Drive study helps students perform a service for their community. In the seismic rehabilitation study students are learning about earthquake hazards in the Pacific Northwest.
- 4. The project management part of the course covers modern methods for managing projects.

Topics Covered:

- 1. Project management: construction law review, engineering ethics, project scheduling, tracking and control, design coordination, construction phase, project closeout
- 2. Design lab: guest speakers, evaluation of alternatives, implementation, group meetings and presentations

Class/Laboratory Schedule:

Lectures: 1 session each week, 1 hour and 40 minutes per session

Labs: 2.5 hour design lab in addition to lectures each week

Contribution of Course to Meeting Professional Component: Engineering Design 100%

Relationship of Course to Program Outcomes: (Break out total number of course credits with percentages as it relates to appropriate outcome, if applicable. May include course matrix)

See course matrix: A, C, D, E, F, G, H, I, J, K

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