

CE 493 ENGINEERING IN PRACTICE

Elective Course

Spring 2009

Instructor: S.Togan Alper

Course Data: Hours: Th 15:00 – 18:00

Course Description:

CE 493 Engineering in Practice in Civil and Environmental Engineering (3+0+0)3

Understanding the professional and ethical values, and related responsibilities of a civil engineer in practice using case studies in construction and engineering sector. Familiarization with different roles and related job descriptions of an engineer. Use of planning, negotiation, presentation, and communication techniques to develop and relay engineering ideas. Discussion on project/construction management, quantity take-off and general contracting procedures to implement the engineering solutions.

Course Objectives:

The course is designed to prepare the undergraduate students to their professional life in the engineering and construction sector, To familiarize the student with integrated project approach and the complete lifecycle of an engineering project introduce the different roles and related responsibilities of a Civil Engineer such as Consultant Engineer, Design Engineer, Owners Representative, Field Engineer, QA/QC Engineer, Health and Safety Representative assist with interdisciplinary presentation skills introduce to applied strategic planning to develop plans on site that really work motivate to further explore the interdisciplinary life of a civil engineer in to days construction and engineering sector

Textbook / Ref. Books:

Handouts, Selected Papers

“Professional Construction Management”, Barrie,D.S., Paulson, B.C., McGraw Hill, 1992

“The Contractors Field Guide”, Thomas,P.I., Prentice Hall 1990

Curricular Context: This elective course is designed to introduce real-life management topics to engineers. It aims to discuss realistic constraints in design, and managerial issues pertaining to such realistic setups.

Computer Usage:

PowerPoint, MS Project and Excel for presentations and strategic planning applications

Laboratory Sessions: N/A

Class Policies:

The grading will be based on two homework assignments (25 % each) and a final project (%30 written submittals, %20 presentations).

Contribution of the course to Program Outcome:

This course is intended to contribute to the following outcomes:

- ✓ (d) An ability to function on multi-disciplinary teams
- ✓ (e) An ability to identify, formulate and solve engineering problems
- ✓ (f) An understanding of professional and ethical responsibility
- ✓ (g) An ability to communicate effectively
- ✓ (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 ability to engage in life-long learning
- ✓ (j) A knowledge of contemporary issues
- ✓ (k) An ability to use the techniques, skills and modern engineering tools necessary for engineering practice

Course Assessment:

The course will be assessed on the basis of the accomplishments regarding the course objectives and the contributions to the program outcomes. The evaluation will consist mainly of the responses from the students, who will provide their comments to various course related questions in the final week of the semester.

WEEK	Topics	Objectives
1	Introduction Project Setup /Large Projects Roles of StakeHolders	Introduction. Discuss virtual project setup including contents, shareholders, participants Discuss the roles and responsibilities of the parties. A sample project setup is discussed with respect to human resources and management aspects
2	Participating Parties I: Role of the Lead Agent / Owner / Owners Representative, Preparation of Spec's, Contract Documents	Review the duties and roles of the owner's representative and/or the lead agent Discuss how to best communicate with a lead agent are discussed in detail. The keys to the preparation of Technical and Performance Spec's with minimum disputes will be presented. A guest speaker will also (time permitting) attend the class and give a short presentation followed by a Q&A session
3	Participating Parties II: Role of the Consultant(s), Management of Consultants and Subcontractors	Review the ethical and professional responsibilities of a consultant as an expert or an independent third party. How to manage and work with consultants. Review the methods to select a good consultant.
4	Participating Parties III: Role of Field Engineers, Planning and Presentations I	Review the responsibilities of a field engineer. Review the preparation methods for successful meetings on the site. Importance of field documentation. Review methods for planning and presenting a chain of thoughts using different presentation techniques.
5	Project Management Tasks I: Cost Engineering, Proposal Preparation	How to prepare a risk based proposal and the costs related to the project. Cost tracking and Cost control on engineering projects. Integrated cost control systems.
6	Project Management Tasks II: Health and Safety on the Job Site, Role of the Engineer on Safety	Develop capability to understand and implement health and safety measures required on the job site. In addition understanding the assessment of risk on the job site. Methods to mitigate risk and how to implement the mitigation techniques.
7	Project Management Tasks III: QA/QC on the Job Site, Role of the QA/QC Manager	Develop capability to prepare and implement QA/QC plans on the job site. Develop an understanding to the frequency and type of QA/QC measures. In addition understanding the assessment of reliability of the results. A guest speaker will also (time permitting) attend the class and give a short presentation followed by a Q&A session
8	Project Management Tasks IV: Public Relations on the Job Site, Sensitive Projects / Public Hearings	Develop a good template to deal with public interest and press. Develop experience to present engineering ideas in public hearings and community meetings, including confrontation techniques
9	Personal Development I: Engineering Ethics	Develop awareness and understand ethical and social responsibilities of an Engineer on the job site and in the society. Review of the Code of Conduct for Engineers (USA based approach).
10	Personal Development II: Preparation of Successful Presentations to relay an idea and to convince people from different disciplines	Develop capability to prepare, delegate and deliver winning presentations. In addition understand the respond of the listeners from the questions and body language
11	Personal Development III: Dealing with Disputes on the Job Site, Dispute between the Stakeholders, Dispute Management	Review of dispute management strategies, using real life scenarios and case studies.
12	Personal Development IV: Career Management	Develop a successful career plan for each individual. How to review career goals and objectives. How to keep an current career development program
13	Personal Development / Project Management V: Project Presentations	Every student will give a (max. 8 minute) presentations on their final project in the class