Course : ***Civ-Env 382: Capstone Design: Spring, 2017 Civil Engineering***

Credits : 1 unit

Instructors: Corr, D., Dowding, C., and Haresh Rao

Text: Selected readings posted on Blackboard Course Management System website; interaction with component specific design experts

Description: Culminating, team based, design experience in Civil & Environmental Engr. with an overview of the function, design and operation of modern infrastructure systems.

Prerequisite: Senior standing in Civil or Environmental Engr or consent of instructor

Required: Yes

Specific Goals for the Course: By the end of this course, students should be able to

1. Understand that engineering design requires organized team effort and a can-do attitude
2. Learn to integrate subspecialties of civil and environmental engineering during design in a team format
3. Overcome differences in personal operational styles to deliver design in a short time period
4. Appreciate the complexity of cost estimation for design with multiple, interlocking specialties
5. Appreciate spatial relationships and appearance as design constraints and components and should be able to:
6. Explain the basic concepts in management, business, public policy, and leadership in the successful completion of a civil engineering project.
7. Employ various design criteria (calculations, code, regulations, client response, etc) to evaluate possible alternatives (appendices)
8. Gather relevant data and performance criteria from diverse sources such as maps, field sampling, historical data, client files, etc (Depot data files)
9. Communicate in oral, written and graphical form with both technical and non- technical audience (oral presentations, written report)
10. Employ where applicable software and computer techniques for design and communication (3D CAD, AutoCAD, checkable excel, Google Docs/CM)

Relation of "course specific goals" to programmatic student learning outcome through Course *Assessment Table (CAT), which feeds into Program Assessment Table (PAT)*

Course Goals	Outcome	Assessment via	Performance Indicator	Assessm't	Proposed action
4,5,6	c Design System to Meet Needs	Final Report Body	Report rubric Faculty	100/65	Use EN's Appendix as benchmark for ENVISION
1,3	d Function on Teams	Team Standards	Team Std. rubric	100/65	
2,8	e Solve Engineering Problems	Final Report Appendix	Report rubric DE's	82/65	Develop explicit requirement for cost analysis of alternative in body
9	g Communication	Final Report Body Final report Appendix	Report rubric Faculty Report rubric DE's	100/65 88/65	More discussion on graphical illustrations
7	h Impact of Engineering Solutions	Alternate Analysis – 2nd Oral Report	2nd Oral rubric (2)	100/65	Include life cycle energy cost in construction cost
10	k Modern Engineering Tools	File Sharing Manag't CAD/Revit – 2D & 3D Excel/professional software	yes/no yes/no yes/no	84/Y 100/Y 100/Y	If have component teams create Google Doc files for all

Topics Covered:

CIV_ENV 382 - Capstone Design - Course Schedule				Spring 2017
Week	**Date**	**Meeting Activity**	**Assignment Due**	**Feedback Given**
1	3/28	Project Description (Corr, Dowding, Rao) Client Introduction (Gray) Team Assignments		
	3/30	Domain Expert lectures: Hydrology (Schmanski), Geotech (Gitskin)	**Thursday Evening:** Domain Expert Lectures: Transportation (Magnuson) and ENVISION (Lazzara)	
2	4/4	Domain Expert lectures: Architecture (Mozina & Schabel), Structures (Babalan)	Teamwork Assignments Due Tuesday, 4/5 noon	
	4/6	Domain Expert lectures: Construction Management (Carlos), and Energy (Luning)		Teamwork Assignments
3	4/11	30% Design, Alternative design analysis	Component Groups Meet w/ DEs	
	4/13		First Technical Design Memo - Due Thurs, 4/13	
4	4/18			First Technical Design Memo
	4/20			
5	4/25			
	4/27	First Oral Team Progress Report Presentations		
6	5/2			First Oral Team Progress Report Presentations
	5/4	Small Group Assessment - last 1/2 hr of class		
7	5/9			
	5/11		Second Technical Design Memo - Due Thurs, 5/11	
8	5/16			Second Technical Design Memo
	5/18			
9	5/23			
	5/25	Second Oral Team Progress Report Presentations	Drawings and Cost & Quantity Calculations - Due Friday, 5/26 at noon	
10	5/30			Second Oral Team Progress Report & Drawings and Cost & Quantity Calculations
	6/1	Senior Lunch	Practice Presentations	
11	Mon, 6/5		Final Written Report, both hard copy and electronic form, due at noon	
	Wed, 6/7		Final Oral Presentation at 5 pm in room TBA Self, Peer and Course Evaluations due by midnight	

Course Instructors:

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Grades

- Individual Products/Responsibilities (Total 50%):
  - First Technical Design Memo – 5%
  - Second Technical Design Memo – 5%
  - Final design of your component (appendix) – 20%
  - Evaluation of your teamwork and contributions to the team products by your teammates and instructors – 15%
  - Evaluation of your interaction with your component's design expert -- 5%
- Team Products (Total 50%):
  - Team Standards and Schedule – 2.5%
  - File sharing/management – 2.5%
  - First Oral Team Progress Report – 5%
  - Second Oral Team Progress Report – 5%
  - Final Presentation – 10%
  - Final Report – 25%