

COURSE SYLLABUS (2 Page)

Course Number:	CEGR 3201
Course Name:	Systems and Design
Credits and Contact Hours:	3
Instructor:	David Naylor
Textbook:	Course materials from all pre-requisite courses.
Other Supplemental Materials:	None
Catalog Description:	Systems engineering techniques applied to civil engineering problems emphasizing methodological considerations, evaluating alternatives and developing engineering plans carried out by small groups of students. <i>Most Recently Offered (Day): Spring 2016, Fall 2015, Spring 2015</i> <i>Most Recently Offered (Evening): Course has not been offered in 3 years</i>
Pre-Requisites/Co-Requisites:	CEGR 2154, CEGR 3122, CEGR 3141, CEGR 3143, CEGR 3161, CEGR 3278, Construction Engineering and one design elective in any of the four core areas of Civil Engineering (Environmental, Geotechnical, Structures, Transportation) with a C or above; Senior standing in Civil Engineering.

Course is: Required (R)

- Goals:**
1. Design a Civil Engineering system for a problem that is not completely defined, and often multi-disciplinary, using and applying engineering design principles and applicable engineering standards and codes, while challenged with multiple constraints;
 2. Emphasize teamwork, leadership, and constructive peer evaluation;
 3. Discuss issues regarding sustainability, ethics, and professional responsibility;
 4. Incorporate aspect of sustainability in their design;
 5. Require students to interact and seek feedback or input from the local design community;
 6. Expose students to current engineering design codes, guidelines, and other regulatory requirements;
 7. Improves students' abilities to make decisions by deepening their understanding of decision theory;
 8. Introduce students to the elements of engineering design specifications and allow them to utilize their engineering drafting skills (automated and manual);
 9. Prepare design proposals, project budgets, progress reports, and final

- reports;
10. Communicate (orally and in writing) about various aspects of their projects, and to defend their designs to peers, faculty, and industry professionals;
 11. Discuss project scheduling and project management;
 12. Expose students to impacts of their designs on/from public policy administration; and
 13. Highlight the need for and the impacts of effective leadership.

Student Outcomes Addressed:

In this course, students will develop the following Student Outcomes:

- A. an ability to apply knowledge of mathematics, science, and engineering
- 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 within realistic constraints such as economic, environmental, social, political, ethical, health and safety, manufacturability, and sustainability
- D. an ability to function on multidisciplinary 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, economic, environmental, and societal context
- I. a recognition of the need for, and an 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
- L. an ability to explain key concepts and problem-solving concepts used in management
- M. an ability to explain key concepts and problem solving processes used in business, public policy, and public administration
- N. an ability to explain the role of the leader and leadership principles

Course Topics:

Project management; multidisciplinary engineering design and documentation; systems engineering; team management; project planning and administration; exposure and application of specifications, building, design and safety codes; exposure to and use of blue prints project plans; oral and written technical communications and peer evaluations; engineering ethics, leadership, and professional responsibility.