

## CVEN 4830 – Fall 08

### GENERAL COURSE INFORMATION

#### Goals and Objectives

The overarching goal of this course is to provide students with a “real-world” design experience with multiple constraints. The real-world nature of the design experience will be provided by using an actual project that is subject typical (cost, schedule, technical, regulatory, societal) project constraints.

Specific objectives for the course for this semester are:

1. Integrate the technical sub-disciplines of structural, geotechnical, hydraulic and construction engineering to create a professional-level solution to the assigned design problem
2. Gather relevant data, understand client needs, identify constraints, and identify and use applicable regulations, codes and standards
3. Create feasible alternative designs and carry out trade-off analyses
4. Prepare multiple, *increasingly detailed* designs that satisfy the project's constraints and conform to relevant codes and regulations
5. Prepare design documentation including design rationale and intent, design details and integrated project planning, scheduling and cost analysis to support each design stage
6. Work in multi-disciplinary teams

#### Conduct of the Course:

The class is designed for civil engineering students who are interested in careers in structural engineering, geotechnical engineering, storm water management or construction engineering and management. The class will be organized into six teams with a goal of insuring that each team has knowledge in each of the four primary subject areas.

Each team will be required to produce a design for an assigned project. Each team will do the same project. This semester the assigned project is the new building housing the Institute for Behavior Science Building in the Grand Terrace area of CU Boulder. Teams will be provided with the basic program plan and architectural considerations. The design will consist of three separate deliverable packages, namely preliminary design, PD, intermediate design, ID, and final design, FD. The final design package will be formally presented to the entire class and to a panel of professional judges. Each of the deliverable packages will have a structural, geotechnical, storm water management and construction component. The instructors for the course are regular CEAE faculty, with participation from industry mentors. They include,

<b>NAME</b>	<b>ROLE</b>	<b>AREA – Responsibility</b>
KW: Kaspar Willam	Professor - CU	Structures
JS: JoAnn Silverstein	Professor - CU	Water Resources
BA: Bernard Amadei	Professor - CU	Geotechnical
BY: William Yearsley	Professor - CU	Construction
Philip Simpson	Campus Architect - CU	Owner's Representative
John Graham	Industry Mentor – Architect AMD, Denver	IBS Architect
BY: William Yearsley	Industry Mentor - CU	Construction Engineering and Management
Len Wright	Industry Mentor – CAROLLO ENGINEERS Broomfield	Storm Water Management
Robert Scavuzzo	Industry Mentor – CTC GEOTEK Inc Denver	Geotechnical Engineering, Foundation Design
Ben Nelson	Industry Mentor – MARTIN/MARTIN Consulting Engineers Lakewood	Structures

### **Meeting Times:**

The class is scheduled to formally meet on Tuesday and Thursday afternoons from 3:30-5:30pm. There will be occasional need for teams to meet at other times with the professors and the industry mentors. The first hour of the sessions will generally be used to present general information, professional aspects of engineering and projects in general. This will include presentations by the faculty, industry mentors on the role of their specialization in projects, and by other invited industry guest speakers on professional practice issues and professional considerations. The second hour on Tuesdays will include some of these presentations in the early part of the semester, and then will be set aside for team meetings in the later part of the semester.

In addition to the scheduled class meetings, each team will need to conduct internal team meetings and meet with the faculty and with the industry mentors on an as-needed basis. During the course of the semester you will need to meet separately with the structures, geotechnical, storm water management, and construction industry mentors. The precise timing of these meetings will be arranged by the team leaders in consultation with the mentors. As the emphasis of the project shifts from conceptual issues during preliminary design to intermediate and final design issues, the importance

of the sub-disciplines (Structural, Geotechnical, Storm Water Management and Construction) will change and therefore the frequency of the meetings with the various mentors will change. Sometimes your team will meet in the mentor's offices and sometimes at CU. Each team is required to have a 20 minute progress meeting with the Teaching Assistant Ben Blackard.

### **Roles and Responsibilities:**

CU Architect/Facilities Management (Phil Simpson, Bill Ward) will act in the role of the owner's representative. Mr. Simpson will provide the program plan, design documents and standard CU specifications as detailed by the architect John Graham of the IBS project. Prof. R. Jessor, chair of the building committee of IBS faculty will present the client view of the new building. Frank Bruno will address public issues which arose during his tenure as City Manager of Boulder. Mr. Ward from Facility Management will describe some of the construction issues of ongoing building projects on CU Campus. Mr. Simpson will be the final arbiter of the intent of the design and the requirements of the client. Mr. Ward will be

CU Professors (Willam, Amadei, Silverstein, Yearsley) will serve as "academic" advisors and will be available to advise the students on the methods and techniques that they learned in class and direct them to academic references and software tools that are available to them, etc. In addition, Professor Willam will act as the class coordinator and manage the logistics and organization of the class. Each team will meet with the faculty on an as needed basis.

Our TA Ben Blackard will be a central resource for design questions, he will meet each group for the weekly progress report.

Industry Mentors (Graham, Nelson, Scavuzzo, Wright) will serve as "professional" advisors. They will answer student team's questions about professional practice issues and codes and regulations. The role of the industry mentors is crucial to assure that the project experience is a professional one, not merely an academic exercise.

### **Scope of the Project:**

This semester the new home of the Research Institute for Behavioral Science, IBS, on Grandview Terrace will be the focus of our class project. The Program Plan was completed earlier this year, and the architectural plans have been posted on our CVEN 4830 website at <http://civil.colorado.edu/~willam/>. The scope of the project will include structural design, the geotechnical/foundation design, drainage issues, and construction schedule and cost issues. Teams will not be required to work on the Mechanical/Electrical/Plumbing systems, architectural features. The complete and particular requirements for each of the three project deliverables will be discussed at the time each assignment is made.

### **Expectations:**

### Professionalism & Respect

Many very busy people have volunteered to help with this course. Please understand that all of the industry mentors have full time jobs and respect their time constraints. Be punctual and professional in all of your dealings with the mentors. Be prepared for your meeting; have specific and explicit questions for your mentor. To that end, you will be required to prepare a formal agenda 24 hours prior to a meeting with any industry mentors. The agenda should state objectives for the meeting; it must be emailed to the mentor, with a copy to our TA Ben Blackard and the respective faculty in the particular specialty area 24 hours before the appointed time.

### Organization/Time Management

This course requires considerable work. However, the demanding aspect of the course is the coordination and organization of the work. Not only does each team need to synchronize the work of the four sub-disciplines, they also need to coordinate meetings with four different sets of industry mentors. Each team will need to decide how to organize and allocate the work among the team members. One approach is to pick one person to be the overall team lead and to have other team members take primary responsibility for the individual sub-disciplines, i.e., a structures lead, a geotechnical lead, a storm water management lead, and a construction lead. Using this approach, the main responsibility of the overall team lead is to plan, coordinate and control the progress of the work. Clearly, for instance, geotechnical design decisions impact structures and construction; facilitating communication among team members is a key responsibility of the team lead.

Time management will be a crucial aspect of your team's success. To help you make appropriate progress, each team member will prepare a personal time card that details the activities worked during the week, the date the work was performed and the time spent on each activity. Each team member must sign his/her time cards. These time cards will be submitted to the team leader each week. These time cards will be available for faculty review at any time, and will be turned in to Professor Willam at the end of the semester.

### **Grading:**

Preliminary Design Submittal	25%
Intermediate Design Submittal	25%
Final Design and Construction Docs	25%
Final Presentation	25%

### **CU-Boulder Class Policies**

*If you qualify for accommodations because of a disability, please submit to me a letter from Disability Services in a timely manner so that your needs may be addressed. Disability Services determines accommodations based on documented disabilities. Contact: 303-492-8671, Willard 322, and [www.Colorado.EDU/disabilityservices](http://www.Colorado.EDU/disabilityservices).*

*Campus policy regarding religious observances requires that faculty make every effort to reasonably and fairly deal with all students who, because of religious obligations, have conflicts with scheduled exams, assignments, or required attendance. In this class, please see me if you have such a conflict. See full details at [http://www.colorado.edu/policies/fac\\_relig.html](http://www.colorado.edu/policies/fac_relig.html)*

*Students and faculty each have responsibility for maintaining an appropriate learning environment. Students who fail to adhere to such behavioral standards may be subject to discipline. Faculty have the professional responsibility to treat all students with understanding, dignity and respect, to guide classroom discussion and to set reasonable limits on the manner in which they and their students express opinions. Professional courtesy and sensitivity are especially important with respect to individuals and topics dealing with differences of race, culture, religion, politics, sexual orientation, gender variance, and nationalities. Class rosters are provided to the instructor with the student's legal name. I will gladly honor your request to address you by an alternate name or gender pronoun. Please advise me of this preference early in the semester so that I may make appropriate changes to my records. See policies at:*

*<http://www.colorado.edu/policies/classbehavior.html> and at [http://www.colorado.edu/studentaffairs/judicialaffairs/code.html#student\\_code](http://www.colorado.edu/studentaffairs/judicialaffairs/code.html#student_code)*

*All students of the University of Colorado at Boulder are responsible for knowing and adhering to the academic integrity policy of this institution. Violations of this policy may include: cheating, plagiarism, aid of academic dishonesty, fabrication, lying, bribery, and threatening behavior. All incidents of academic misconduct shall be reported to the Honor Code Council ([honor@colorado.edu](mailto:honor@colorado.edu); 303-725-2273). Students who are found to be in violation of the academic integrity policy will be subject to both academic sanctions from the faculty member and non-academic sanctions (including but not limited to university probation, suspension, or expulsion). Other information on the Honor Code can be found at: <http://www.colorado.edu/policies/honor.html> and at <http://www.colorado.edu/academics/honorcode/>*

*The University of Colorado at Boulder policy on Discrimination and Harassment*

*The University of Colorado policy on Sexual Harassment and the University of Colorado policy on Amorous Relationships applies to all students, staff and faculty. Any student, staff or faculty member who believes s/he has been the subject of discrimination or harassment based upon race, color, national origin, sex, age, disability, religion, sexual orientation, or veteran status should contact the Office of Discrimination and Harassment (ODH) at 303-492-2127 or the Office of Judicial Affairs at 303-492-5550. Information about the ODH and the campus resources available to assist individuals regarding discrimination or harassment can be obtained at <http://www.colorado.edu/odh> (<http://www.colorado.edu/policies/discrimination.html>,*