

**The University of Western Ontario
Faculty of Engineering
Department of Civil and Environmental Engineering**

CEE 4441 - Civil Engineering Design Project - Course Outline 2009/2010

This course is the capstone design for the undergraduate program in the Department. The general objectives are for students to:

- Analyze and interpret data and information provided by others to determine project-specific design criteria and parameters.
- Perform an open-ended analysis of a civil engineering structure or system and make recommendations based on engineering principles and judgment including comparison of options.
- Gain experience functioning on multi-disciplinary teams that may include participating consulting engineers, architects and landscape architects.
- Understand professional and ethical responsibility through the refinement of the design to address the public needs.
- Develop the ability to carry out literature search to find information necessary for completing the project.
- Develop an ability to use the techniques, skills and modern engineering tools necessary for engineering practice.
- Improve communication skills by:
 - (a) Meeting regularly with external and internal advisors.
 - (b) Documenting design decisions in clear and concise calculations and notes.
 - (c) Planning and preparing drawings, specifications, and a final report, including cost estimate, that completely describes the proposed design.
 - (d) Presenting and defending the final design before peers and before the general public.
 - (e) Keeping records of time spent on various aspects of the project.
 - (f) Allotting the distribution of grades to the individual members of the design team.

Prerequisites: Completion of Year III of the Civil Engineering Program

Corequisites: None

Note: It is the **student's responsibility** to ensure that all prerequisite, corequisite and antirequisite conditions are met. Unless you have either the requisites for this course or written special permission from your Dean to enrol in it, you will be removed from this course and it will be deleted from your record. This decision may not be appealed. You will receive no adjustments to your fees in the event that you are dropped from a course for failing to have the necessary prerequisites.

Course Coordinator: Dr. W. Zhou, P.Eng., wzhou@eng.uwo.ca, Secretary SEB3005.

City of London Project Coordinators:

Structural Project & Design Competition:

Dr. D.J. Harman, P.Eng., djharman@rogers.com, Secretary SEB3005

Environmental Project: Dr. G. Nakhla, P.Eng., gnakhla@eng.uwo.ca, Secretary SEB3005

BLWTL Project Coordinator:

Dr. G.A. Kopp, P.Eng., gakopp@uwo.ca, Secretary BLWT103.

Contact Hours:

1 lecture hour/week; 4 tutorial hours/week; meetings with advisors

Project Teams:

The maximum size of a project team is five students. Special permission is required for larger teams. Smaller teams shall not be encouraged.

Lectures and Tutorials:

Students are expected to attend all lectures. Assigned laboratory time will be spent: attending special lectures, working on the project, meeting with advisors, making presentations, and carrying out activities related to the design.

Textbooks and References:

No specific textbooks are assigned. References include pertinent codes and standards, government publications and legislation and other technical references from Taylor Library. Students are encouraged to contact Kristin Hoffmann (email: khoffma8@uwo.ca) at Taylor Library for any questions regarding literature and references.

Kristin will give a lecture on literature and information search in Taylor Library's Kellogg Room from 1:30 – 3:00 PM on Oct. 2 and again on Oct. 9 (same place and time). You are expected to attend one of these two lectures.

Computing:

Students are required to use personal computers running a Windows environment and other computing facilities available in the Civil Engineering Design Room (SEB 16), Don Smith Design Studio (TEB 454), and the Faculty of Engineering Computing Laboratories. SEB 16 can be booked through the Civil & Environmental Engineering Department office (SEB 3005). Students should not remove any materials from the room and should keep it in a clean and tidy condition.

Units:

SI units will be used in lectures, tutorials, calculations and drawings.

Course Deadlines and Evaluation (all submissions are due 11:00 am in the Civil & Environmental Engineering Department Office, SEB 3005):

The deadlines are listed below and the final mark will be determined as follows:

	<u>Date</u>	<u>Mark</u>	
<u>INDIVIDUAL WORK:</u>			
Logbook	09 Nov2009	5%	
Preliminary Submission of Calculations	04 Dec 2009	<u>15%</u>	
		20%	20%
<u>GROUP WORK:</u>			
Preliminary Proposal	24 Sep 2009	0%	
Final Design Proposal	19 Oct 2009	5%	
Preliminary Design Submission (Design Brief & Drawings)	04 Dec 2009	10%	
(Note: By 01 January 2010, 35% of course marks are awarded.)			
Draft of Final Design Portfolio	08 Jan 2010	0%	

	<u>Date</u>	<u>Mark</u>	
Oral Presentation & Defence of Draft Portfolio	15 Jan 2010	5%	
Review of Another Group's Draft Portfolio (Written Critique)	18 Jan 2010	5%	
Project Presentation at CEE Presentation Day	12 Feb 2010	<u>5%</u>	
		30%	30%

FINAL SUBMISSION:

Final Design Portfolio:	24 Feb 2010**		
Covering Letter & Final Design Brief		10%	
Calculations		20%	
Drawings		15%	
Specifications		<u>5%</u>	
Total		50%	<u>50%*</u>
			100%

NOTE:

- Students who do not attend at least 15 weekly meetings with their Advisors shall not pass the course.
- Students who do not achieve a passing grade on each of the three course components (individual work, group work, and final submission) shall not pass the course. They shall be assigned a mark of 48% or the aggregate mark whichever is less.
- Criteria for the various submissions are described later in this document.
- The penalty for late submission shall be 10% per day; thus, if any submission is more than 5 days late it cannot receive a passing grade.
- The mark for group work (the maximum indicated thus "**") shall be multiplied by the number of group members and the product allocated to the members in proportion to each member's contribution to the work. At the end of the course, group members must individually recommend in writing, with stated reasons, a suitable allocation to be used. A summary of the work done by each member with reference to the final report must be attached.
- The actual deadline for final submission "***" will follow the city of London public presentation.

1. Logbook

Each student shall keep a logbook listing at least the following:

- Details of meetings - date, time, duration, those present, and main topics.
- Details of CEE441 lectures (including the lecture on literature and information search) attended - date, time, speaker, and topic.
- Details of work on the Design Project - date, duration, and *aspects of work done personally*.

2. Preliminary Proposal (submission by e-mail to the course coordinator is permitted)

The preliminary proposal shall include:

- Group name.
- Names of Group Members.
- Name and e-mail of Group Leader, who will be responsible for regular reporting to the Faculty Advisor and Faculty Coordinators.
- Topic for Design Project: each group must have *two preferred choices*. The course coordinator reserves the right for the final assignment of the topic of the design project.
- The preferred date (either Oct. 2 or Oct. 9) at which the group would like to attend the lecture on literature search at Taylor Library. The course coordinator reserves the right for assigning the date when the group attends the lecture.

3. Final Design Proposal (two copies are to be submitted)

The final design proposal shall indicate:

- a) Work done by each group member to date.
- b) Identification of outstanding tasks (work still to be done including drawings and specifications).
- c) Assignment of outstanding tasks to group members.
- d) Proposed mechanism for coordination of the activities of each group member.
- e) Schedule for remaining work.

The evaluation of the final design proposal shall be based on layout, completeness, and the use of English.

4. Preliminary Submission of Calculations and Preliminary Design Submission (2 copies are to be submitted)

Draft of items 7.1 (design brief-group submission), 7.2 (calculations-individual submission), and 7.3 (drawings-group submission) are to be submitted. For this submission, neatly drawn hand sketches can replace drawings.

5. Draft of Final Design Portfolio (Project is 80% complete) (Four copies are to be submitted)

A complete draft of the final design portfolio, explained in section 7, must be submitted on the date specified in the Course Deadlines section. One copy will be given to the student reviewers; one will be given to the Faculty Advisor and two will be made available for other Faculty Advisors to review.

Between the date of the draft submission and the date of the defense, the assigned student reviewing group and faculty advisors will formally review the draft of each final design portfolio. At the defense, the student review group and the faculty advisors will have the opportunity to ask questions.

Students are expected to improve their Portfolio between the oral defence and final submission. Topics of criticism that were not raised by either the students or the advisors at the oral defence, or provided in writing on the day of the defence, may not be used to reduce the final mark given to a Design Portfolio.

6. Review of Draft Final Design Portfolio by Others (Two copies are to be submitted)

Each group shall prepare a written critique of the Draft Portfolio assigned to them for review. This critique shall be submitted after the oral defense of the Project.

7. Final Design Portfolio (Three copies are to be submitted)

The final design portfolio consists of a covering letter and final design brief, calculations, drawings, and specifications as described in detail below.

7.1 Final Design Brief

The length of the final design brief shall not exceed 15 typed pages. Suggested contents are: Executive Summary; Introduction, Design Criteria, particulars of design/analysis, Cost Estimate, and Recommendations (or Conclusions). The Design Criteria would include the design standards and technical references used; the particular design criteria adopted also must be indicated succinctly. The particulars of design/analysis would summarize the rationale behind the various design decisions. The evaluation of the final design brief shall be based on the format, layout, completeness, technical content and use of English.

7.2 Calculations

Calculations must be well organized, clear, complete, and done on calculation paper. Each calculation page shall be dated, and shall indicate the names or initials of the persons who performed and checked the calculations. A final calculation set, which must be current, checked and indexed, shall be submitted with the final design brief. Students are expected to submit checked calculations to their advisors as the design progresses, so that errors of a fundamental nature will be caught and corrected. The evaluation of calculations will be based on their clarity, completeness, technical content, originality, and accuracy.

7.3 Drawings

Each student is required to prepare at least one original drawing. Each drawing shall be dated, and shall indicate the name or initials of the person who did the drawing and the person who checked the drawing. The evaluation of drawings will be based on their technical content, clarity, completeness, and quality of drafting.

7.4 Specifications

Each student is required to submit one specification, or part of one specification, which must be at least two pages long. Master format is required. For environmental projects, an operations manual may be submitted in lieu of specifications. While it is acceptable to modify an existing specification, the specifications submitted must not be plagiarized. The evaluation of specifications will be based on their technical content, clarity, originality, and on the use of English.

8. Design Competition

If a design competition is offered in connection with CEE441, no student or group of students is compelled to enter. Deadlines and requirements for the competition are separate from CEE441 requirements. **STUDENTS ARE CAUTIONED TO ALLOCATE ADEQUATE TIME TO ALL COURSES; WINNING A COMPETITION WILL NOT OFFSET A POOR OR FAILING GRADE IN ANOTHER COURSE.**

9. Use of English

In accordance with Senate and Faculty Policy, students may be penalized up to 10% of the marks on all assignments, tests, and examinations for improper use of English. Additionally poorly written work with the exception of the final examination may be returned without grading. If resubmission of the work is permitted, it may be graded with marks deducted for poor English and/or late submission.

Cheating:

University policy states that cheating, including plagiarism, is a scholastic offence. The commission of a scholastic offence is attended by academic penalties that might include expulsion from the program. If you are caught cheating, there will be no second warning. (see Scholastic Offence Policy in the Western Academic Calendar).

Plagiarism:

Students must write all essays and assignments in their own words. Whenever students take an idea or a passage from another author, they must acknowledge their debt both by using quotation marks where appropriate and by proper referencing such as footnotes or citations. Plagiarism is a major academic offense (See Scholastic Offence Policy in the Western Academic Calendar), and will not be tolerated in this course. The penalty for plagiarism is a mark of zero on the submission and further penalties at the discretion of the Associate Dean–Academic.

Plagiarism Checking:

The University of Western Ontario uses software for plagiarism checking. Students may be required to submit their Final Design Briefs and Specifications in electronic form to Turnitin.com for plagiarism checking.

Conduct:

Students are expected to arrive at lectures on time, and to conduct themselves during class and at meetings in a professional and respectful manner.

Sickness and Other Problems:

Students should immediately consult with the course coordinator or department chair if they have any problems that could affect their performance in the course. Where appropriate, the problems should be documented (see attached). The student should seek advice from the course coordinator or department

chair regarding how best to deal with the problem. Failure to notify the instructor or department chair immediately (or as soon as possible thereafter) will have a negative effect on any appeal.

Notice:

Students are responsible for regularly checking their e-mail and notices posted on the course website.

Consultation:

Students are encouraged to discuss problems with their Advisor or one of the Coordinators. Other individual consultation can be arranged by appointment with the appropriate faculty member.

Course Breakdown:

Total = 92.4 AU's

Complimentary Studies = 7.4 accreditation units (8 %)

Engineering Design = 85 accreditation units (92 %)

The document "INSTRUCTIONS FOR STUDENTS UNABLE TO WRITE TESTS OR SUBMIT ASSIGNMENTS AS SCHEDULED" is part of this course outline.



*The University of Western Ontario
Faculty of Engineering
2009-2010*

***INSTRUCTIONS FOR STUDENTS UNABLE TO WRITE TESTS
OR EXAMINATIONS OR SUBMIT ASSIGNMENTS AS SCHEDULED***

IF, ON MEDICAL OR COMPASSIONATE GROUNDS, YOU ARE UNABLE TO WRITE TERM TESTS OR FINAL EXAMINATIONS OR COMPLETE COURSE WORK BY THE DUE DATE, YOU SHOULD FOLLOW THE INSTRUCTIONS LISTED BELOW. YOU SHOULD UNDERSTAND THAT ACADEMIC ACCOMMODATION WILL NOT BE GRANTED AUTOMATICALLY ON REQUEST. YOU MUST DEMONSTRATE TO YOUR DEPARTMENT (OR THE UNDERGRADUATE SERVICES OFFICE IF YOU ARE IN FIRST YEAR) THAT THERE ARE COMPELLING MEDICAL OR COMPASSIONATE GROUNDS THAT CAN BE DOCUMENTED BEFORE ACADEMIC ACCOMMODATION WILL BE CONSIDERED. DIFFERENT REGULATIONS APPLY TO TERM TESTS, FINAL EXAMINATIONS AND LATE ASSIGNMENTS. READ THE INSTRUCTIONS CAREFULLY. (SEE THE 2009 UWO ACADEMIC CALENDAR).

A. GENERAL REGULATIONS & PROCEDURES

1. CHECK THE COURSE OUTLINE TO SEE IF THE INSTRUCTOR HAS A POLICY FOR MISSED TESTS, EXAMINATIONS, LATE ASSIGNMENTS OR ATTENDANCE.
2. BRING YOUR REQUEST FOR ACADEMIC ACCOMMODATION TO THE ATTENTION OF THE CHAIR OF YOUR DEPARTMENT (OR THE UNDERGRADUATE SERVICES OFFICE IF YOU ARE IN FIRST YEAR) PRIOR TO THE SCHEDULED TIME OF THE TEST OR FINAL EXAMINATION OR DUE DATE OF THE ASSIGNMENT. IF YOU ARE UNABLE TO CONTACT THE RELEVANT PERSON, LEAVE A MESSAGE WITH THE APPROPRIATE DEPARTMENT (OR WITH THE UNDERGRADUATE SERVICES OFFICE, IF YOU ARE IN FIRST YEAR). THE ADDRESSES, TELEPHONE AND FAX NUMBERS ARE GIVEN AT THE END OF THESE INSTRUCTIONS. DOCUMENTATION MUST BE PROVIDED AS SOON AS POSSIBLE.
3. IF YOU DECIDE TO WRITE A TEST OR AN EXAMINATION YOU SHOULD BE PREPARED TO ACCEPT THE MARK YOU EARN. REWRITING TESTS OR EXAMINATIONS OR HAVING THE VALUE OF A TEST OR EXAMINATION REWEIGHTED ON A RETROACTIVE BASIS IS NOT PERMITTED.

B. TERM TESTS

1. If you are unable to write a term test, inform your instructor and the Chair of your Department (or the Undergraduate Services Office if you are in first year) prior to the scheduled date of the test. If the instructor is not available, leave a message for him/her at the department office and inform the Chair of the Department (or the Undergraduate Services Office if you are in first year).
2. Be prepared to provide supporting documentation to the Chair and the Undergraduate Services Office (see next page for information on documentation).
3. Discuss with the instructor if and when the test can be rescheduled. **N.B.** The approval of the Chair (or the Undergraduate Services Office if you are in first year) is required when rescheduling term tests.

C. FINAL EXAMINATIONS

1. If you are unable to write a final examination, contact the Undergraduate Services Office **PRIOR TO THE SCHEDULED EXAMINATION TIME** to request permission to write a Special Final Examination. If no one is available in the Undergraduate Services Office, leave a message clearly stating your name & student number (please spell your full name).
2. Be prepared to provide the Undergraduate Services Office with supporting documentation (see next page for information on documentation) the next day, or as soon as possible (in cases where students are hospitalized). The following circumstances are not considered grounds for missing a final examination or requesting special examinations: common cold, sleeping in, misreading timetable and travel arrangements.
3. In order to receive permission to write a special examination, you must obtain the approval of the Chair of the Department **and** the Associate Dean and in order to apply you must sign a "Recommendation for a Special Examination Form" available in the Undergraduate Services Office. The Undergraduate Services Office will then notify the course instructor(s) and reschedule the examination on your behalf.

N.B. It is the student's responsibility to check the date, time and location of the special examination.

D. LATE ASSIGNMENTS

1. Advise the instructor if you are having problems completing the assignment on time (**prior** to the due date of the assignment).
2. Be prepared to provide documentation if requested by the instructor (see reverse side for information on documentation).
3. If you are granted an extension, establish a due date. The approval of the Chair of your Department (or the Associate Dean if you are in first year) is not required if assignments will be completed prior to the last day of classes.
4. i) Extensions beyond the end of classes must have the consent of the instructor, the department Chair and the Associate Dean. Documentation is mandatory.

- ii) A Recommendation of Incomplete Form must be filled out indicating the work to be completed and the date by which it is due. This form must be signed by the student, the instructor, the department Chair and the Associate Dean.

SHORT ABSENCES

If you miss a class due to a minor illness or other problems, check your course outlines for information regarding attendance requirements and make sure you are not missing a test or assignment. Cover any readings and arrange to borrow notes from a classmate.

EXTENDED ABSENCES

If you are absent more than one week or if you get too far behind to catch up, you should consider reducing your workload by dropping one or more courses. (Note drop deadlines listed below). You may want to seek advice from the academic counsellor in your Department or the counsellors in the Undergraduate Services Office if you are in first year.

DOCUMENTATION

If you consulted Student Health Services regarding your illness or personal problem, you should complete a Records Release Form in your Departmental Office (or in the Undergraduate Services Office if you are in first year). This form will be forwarded to Student Health Services who in turn will provide confirmation of the problem to the Department or Associate Dean as requested. At your request the Department (or Undergraduate Services Office if you are in first year) will send confirmation to your instructor(s).

If you were seen by an off-campus doctor, you must provide the doctor with a Student Medical Certificate to complete and then bring it to the Department (or the Undergraduate Services Office if you are in first year). **This note must contain the following information: severity of illness, effect on academic studies, duration of absence.**

In Case of Serious Illness of a Family Member: Provide a Student Medical Certificate to your family member's physician to complete and bring it to the Department (or the Undergraduate Services Office if you are in first year).

In Case of a Death: Obtain a copy of the death certificate or the notice provided by the funeral director's office. You must include your relationship to the deceased and bring it to the Department (or the Undergraduate Services Office if you are in first year).

For Other Extenuating Circumstances: If you are not sure what documentation to provide, ask the Departmental Office (or the Undergraduate Services Office if you are in first year) for direction.

Note: Forged notes and certificates will be dealt with severely. To submit a forged document is a scholastic offence (see below).

ACADEMIC CONCERNS

You need to know if your instructors have a policy on late penalties, missed tests, etc. This information may be included on the course outlines. If not, ask your instructor(s).

You should also be aware of attendance requirements in some courses. You can be debarred from writing the final examination if your attendance is not satisfactory.

If you are in academic difficulty, check out the minimum requirements for progression in the calendar. If in doubt, see your academic counsellor.

Calendar References: Check these regulations in your 2009 Western Academic Calendar:

Absences Due to Illness - page 25
Academic Accommodations for Disabled Students - page 26
Academic Accommodations for Religious or Holy Days - page 28
Course Withdrawals - pages 45-46
Debarred from Writing Examinations - page 38
Incomplete Standing - page 18
Scheduling of Term Assignments - page 39
Scholastic Offences - page 21-25
Special Examinations - page 37

Note: These instructions apply to all students registered in the Faculty of Engineering regardless of whether the courses are offered by the Faculty of Engineering or other faculties in the University.

<u>Drop Deadlines:</u>	First term half course (i.e. "A" or "F"):	October 15, 2009
	Full courses and full-year half courses (i.e. "E", "Y" or no suffix):	November 30, 2009
	Second term half or second term full course (i.e. "B" or "G"):	February 12, 2010

Undergraduate Services Office:	SEB 2097	telephone: (519) 661-2130	fax: (519) 661-3757
Dept. of Chemical and Biochemical Engineering:	TEB 477	telephone: (519) 661-2131	fax: (519) 661-3498
Dept. of Civil and Environmental Engineering:	SEB 3005	telephone: (519) 661-2139	fax: (519) 661-3779
Dept. of Electrical and Computer Engineering:	TEB 279	telephone: (519) 661-3758	fax: (519) 850-2436
Dept. of Mechanical and Materials Engineering:	SEB 3002	telephone: (519) 661-2136	fax: (519) 661-3020