Western University - Faculty of Engineering Department of Civil and Environmental Engineering

CEE3348a Project Management & Engineering Cases - Course Outline 2024/25

This course introduces students to the planning, controlling and management of civil engineering projects. The course covers basic elements of Construction Project Management - the science and engineering of managing and optimizing space, time and resources on construction projects. Through studying and analyzing actual case studies students will be exposed to the complex and multidisciplinary nature of the decisions faced by civil engineers on a daily basis in real world applications.

Calendar Copy:

Students develop decision making skills based upon case histories including those involving project management and sustainable development.

Prerequisites:

Completion of second year of the Civil Engineering program or third year of the Integrated Engineering program

Antirequisites:

None

Corequisites:

None

Note: It is the student's responsibility to ensure that all Prerequisite and Corequisite conditions are met or that special permission to waive this requirement has been granted by the Faculty. It is also the student's responsibility to ensure that they have not taken a course listed as an Antirequisite. The student may be dropped from the course or not given credit for the course towards their degree if they violate the Prerequisite, Corequisite or Antirequisite conditions.

Contact Hours:

2 lecture hours/week; Lectures are organized into weekly learning modules, composed primarily of in class lectures and in-person discussion. Students should review the online lectures in the week they are posted, and be prepared to discuss and apply the concepts presented during the weekly lecture sessions. Review of lecture material and attendance at lecture sessions should take approximately 6 hours per week.

3 tutorial hours/week when held; There are 5 tutorial events, some of which might include mandatory field trips, and all of which that result in gradable work to be handed in at the end of the tutorial for intra mural work, and no more than 2 days later for any work associated with field trips. Despite being titled tutorials, these events are in effect Laboratory events.

Additional self-study: 3 hours/week.; This varies by student. Three hours should be considered typical. It may include a combination of pre-lecture familiarization and post lecture review.

Contingency plan for an in-person class pivoting to 100% online learning:

In the event of a COVID-19 resurgence during the course that necessitates the course delivery moving away from face-to-face interaction, all remaining course content will be delivered entirely online, either synchronously (i.e., at the times indicated in the timetable) or asynchronously (e.g., posted on OWL for students to view at their convenience). The grading scheme will not change. Any remaining assessments will also be conducted online as determined by the course instructor.

Some components of this course may involve online interactions. We do not presently plan to have any online sessions, but if due to COVID-19 protocol, we are required to move the class back online, then proper online behaviors need to be adhered to as now will be described. To ensure the best experience for both you and your classmates, please honour the following rules of etiquette:

- please "arrive" to online events on time
- please use your computer and/or laptop if possible (as opposed to a cell phone or tablet)
- ensure that you are in a private location to protect the confidentiality of discussions in the event that a class discussion deals with sensitive material
- to minimize background noise, and ensure the privacy of housemates, kindly mute your microphone for the entire class until you are invited to speak, unless directed otherwise
- [suggested for classes larger than 30 students] In order to give us optimum bandwidth and web quality, please turn off your video camera for the entire class unless you are invited to speak, or unless advised otherwise by the instructor.
- [suggested for cases where video is used] please be prepared to turn your video camera off at the instructor's request if the internet connection becomes unstable.
- unless invited by your instructor, do **not** share your screen in the meeting.

The course instructor will act as moderator for the class and will deal with any questions from participants. To participate please consider the following:

- if you wish to speak, use the "raise hand" function and wait for the instructor to acknowledge you before beginning your comment or question
- remember to unmute your microphone and turn on your video camera before speaking
- self-identify when speaking.
- remember to mute your mic and turn off your video camera after speaking (unless directed otherwise)

General considerations of "netiquette":

- Keep in mind the different cultural and linguistic backgrounds of the students in the course.
- Be courteous toward the instructor, your colleagues, and authors whose work you are discussing.
- Be respectful of the diversity of viewpoints that you will encounter in the class and in your readings. The exchange of diverse ideas and opinions is part of the scholarly environment.
- Be professional and scholarly in all online postings. Cite the ideas of others appropriately.

Note that disruptive behaviour of any type during online classes, including inappropriate use of the chat function, is unacceptable. Students found guilty of Zoom-bombing a class or of other serious online offenses may be subject to disciplinary measures under the Code of Student Conduct.

<u>Instructor & TA Leadership team (for further details see Owl Brightspace):</u>

Instructor: Kevin McGuire P.Eng., PMP kmcgui5@uwo.ca

Office hours: by appointment in Zoom or in person at office ACEB 3478

TA: Jack Warden jwarden6@uwo.ca

TA: Jessica Jordyn Van Den Heuvel <u>jvand293@uwo.ca</u>

Administrative Assistant: CEE Office SEB 3005 civil@uwo.ca

The instructor will be available to meet every Monday prior to or immediately following the scheduled lectures. Please make an appointment as drop-in meetings may not be acceptable. Students will note the published schedule included herein. Supplemental arranged make up lectures are possible, but in worst case, may require several days advance co-ordination. Please do not assume that if you miss a lesson, that the instructor will book time to review the full lesson with you.

The instructor will also be available via e-mail. His email can be found on the 3rd page of this syllabus as well as the Course Home tab of our D2L site. The instructor will check e-mail a minimum of 3 times per week and the students should as well. E-mail will be checked at minimum once per weekend, as well as once early in the work week, and once late in the work week. All e-mails will receive a response. For detailed comprehensive responses, bring forward questions that affect the entire group. These are the preferred type of questions to be brought forward. Detailed questions relating to your work specifically will receive individually tailored responses. DO NOT use messaging in D2L to contact the instructor or TAs.

Please feel free to initiate supplementary Zoom meetings with the instructor by sending an e-mail or arranging a time.

The students will not typically have text or telephone access to the instructor although this can be arranged if the necessity arises.

Textbook:

Project Management - The Managerial Process 8th Edition Larson & Gray; McGraw Hill; ISBN 978-1-260-57043-4 Purchase of the textbook is mandatory

Other References:

The Project Management Body of Knowledge (PMBOK) – 7th edition – PMI ISBN: 978-1628251845

Purchase of this reference is not mandatory

All other course material will be posted to D2L Brightspace.

If students need assistance with the course D2L site, they can seek support on the Brightspace Help page. Alternatively, they can contact the Western Technology Services Helpdesk. They can be contacted by phone at 519-661-3800 or ext. 83800.

Units:

Both SI and FPS unit systems may be used in lectures, tutorials and examinations. Notably the application of FPS units is likely during the discussion and Laboratory experience with psychrometry calculations.

Specific Learning Objectives:

The lectures and tutorial assignments will prepare students to do the following [GA Indicator]:

- Apply knowledge of planning, executing and controlling to the management of construction projects;
 [EPM1, EPM2, EPM3, EPM4]
- Utilize professional planning and scheduling software to create, schedule and effectively optimize a project activities and resources; [EPM2]
- Identify, formulate, analyze and plan project main elements, specifically time, cost and quality while working individually or functioning on a team; [ITW3, CS2]
- Develop an awareness of construction project management from actual life on-site situations; [ITW1, EPM1, EPM2, EPM4]
- Examine, in some depth, the specific management processes applied in utilizing construction resources on the project. [CS2, CS3,EPM 1, EPM 2, EPM 3, EPM 4]
- Recognize the need for life-long learning to keep abreast of new planning and construction methods, enhance one's abilities as a construction project manager, and maintain one's professional competence. [CS1, CS2]
- Develop decision making skills based upon case histories including those involving project management and sustainable development. [EPM 1, EPM 2, EPM 3, EPM 4]

Course Content: Shown as lessons 1 through 11

- Lesson 1 Introduction to Project Management
- Lesson 2 Introduction to Construction and Estimating
- Lesson 3 Project Planning and Scheduling
- Lesson 4 Bidding Law and Bonds
- Lesson 5 Construction Contracts and Delivery Methods
- Lesson 6 Basic Systems in Buildings
- Lesson 7 Site Logistics
- Lesson 8 Project Cost Management (Cash Flow)
- Lesson 9 Term Project Overview
- Lesson 10 LEED In Construction
- Lesson 11 LEAN Construction Management

Please note: An opportunity for students to learn more about modern construction and infrastructure maintenance will be provided. This experience through the Smart Cities Laboratory will introduce students to terrestrial, aquatic, and aerial drones as well as augmented reality. Times and dates to be announced in class.

Lecture Schedule

Lectures (some possibly with voice over) will be posted to the course Brightspace website shortly before each scheduled lecture. In lectures we will primarily go over curriculum materials. Also, information concerning each laboratory will be discussed. At these times, objectives will be reviewed for completing each laboratory. Students are strongly encouraged to attend lectures as attendance will be documented and will go towards the 5% participation mark.

Laboratory Schedule

Each graded laboratory assignment will be made available on the Monday, the week of each lab meeting, a minimum of one hour before the laboratory commences. Monday lab meetings will be used to answer questions related to the laboratory exercise and to discuss the expectations and required outcomes. Students will have until 2:30 pm in the afternoon of each laboratory to complete it penalty free.

General Learning Objectives:

Note: Attributes are being assessed at a "Developing" level.

E=Evaluate, T=Teach, I=Introduce; (I) = Introduction, (D) = Developing, (A) = Advanced level

Knowledge Base		Engineering Tools	T	Impact on Society	I
Problem Analysis	T	Teamwork	Е	Ethics and Equity	
Investigation		Communication	Е	Economics and Project Management	Е
Design		Professionalism		Life-Long Learning	

Accreditation Units

Engineering Science: 100%, Engineering Design: 0%, Complementary Studies: 0%

Evaluation Breakdown:

Laboratories:

Lab 1: 4%
Lab 2: 4%
Lab 3: 4%
Lab 4: 4%
Lab 5: 4%
Assignment #1: 15%
Term Project: 35%

Exam: 25% (In person intramural event on campus)
Participation: 5% (based upon attendance to lectures & labs)*

Total 100%

Evaluation Notes:

Students must turn in all laboratory reports, and achieve a passing grade in the laboratory component, to pass this course. (10/20) Students who do not satisfy this requirement will be assigned 48% or the aggregate mark, whichever is less.

Students who have failed this course previously must repeat all components of the course. No special permissions will be granted enabling a student to retain laboratory, assignment or test marks from previous years. Previously completed assignments and laboratories cannot be resubmitted.

Term Project

- 1. Term Project: We will have a mandatory site visit of the Schmeichel building upper floors sometime likely to be in early to mid-October. This visit may or may not require PPE including steel toe shoes, hard hats, and vests. Vests will be provided by the instructor. Steel toes must be provided by the student. If you do not have any, you must borrow or purchase some for the event if advised that PPE will be required. Failure to do so will result in not being allowed on the construction site, and may result in receiving a grade of ZERO for the major assignment. Your hard hat from O-week will suffice for head protection if need be. If you no longer have that hard hat, you may be asked by the instructor to purchase or borrow one. Failure to do so will result in not being allowed on the construction site, and may result in receiving a grade of ZERO for the major assignment.
- 2. Term Project: Supplementary construction videos may be shared to complement the tour(s).
- 3. Term Project: We will be using alternative construction sites / completed construction sites if the instructor deems that the Schmeichel visit will not provide sufficient learning outcomes. More details will be provided to you then if it becomes necessary for us to change our Term Project undertaking in any way.

Participation

1. Participation: Typically lecture attendance will be taken by completion of a pass/fail in class exercise or quiz where full marks are obtained for a genuine effort on the exercise. However, head count may also be resorted to. The instructor may also choose to not take attendance on any given week. Full attendance will be assumed if the instructor does not take attendance. All labs are completed on campus. Attendance to a lab means you are on campus completing it.

Laboratories

- 1. Some laboratories are group work, and some are individual. To determine which are which, students can consult the Assessment area of Owl Brightspace.
- 2. Laboratories may require preparation, and if the student does not complete the preparation in advance of the laboratory, then the student will NOT be permitted to submit their laboratory for grading. Examples of this are when excursions outside the classroom are taken on as a group and are applied as the basis for the ensuing laboratory exercise. Lack of attendance to the out of classroom portion, will result in a zero for the laboratory.
- 3. All laboratory work will be submitted electronically through Brightspace using the assignment tab in the course area. Failure to meet deadlines without the instructor's written permission will result in a reduction of marks. Labs received after the due date will be reduced 25% per day (including weekends). Except in exceptional circumstances, approved by the instructor before the due date, Labs more than 3 days late will not be accepted and a mark of 0% will be assigned.

Notes on Laboratories:

- a. Must be academic in style and content
- b. Must have a clear focus
- c. Must present ideas in a logical and well-thought-out flow
- d. Arguments and conclusions must be based on clearly identified research and sources
- e. Must be in paragraph format

Assignment #1

- 1. Students must provide documentation to be considered for academic accommodation on this assessment.
- 2. This assessment is a group work activity.
- 3. This assignment requires students to apply research and creativity in establishing proposals for construction in the greater London Ontario area. It will involve independent investigation of some of the major engineering firms in southwestern Ontario and across Canada.
- 4. There is one assignment in this course. It is a group assignment worth 15%. All students in the group are expected to participate and contribute to the assignment. Each group will submit only ONE submission per group for this assignment. Each group will also submit exactly ONE agreed upon set of minutes documenting the participation and compliance with work assigned for each team member. The expectation is that these minutes will only be used in extraordinary circumstances to adjust grades and that it is a normal expectation of teamwork that subtle levels of contribution effort level are always a characteristic of group work assignments. In other words, the instructor expects that each group will regulate the compliance of each team member with the understanding that this can only be accomplished when teams are working well ahead of deadlines.

- As such, teams are expected to be working well ahead of deadlines. The instructor may request documented evidence of this in the event of any difficult team-work experiences.
- 5. The Assignment will be submitted electronically through Brightspace using the Assessment tab in the course area. Failure to meet deadline without the instructor's written permission will result in a reduction of marks. Assignments received after the due date will be reduced 25% per day (including weekends). Except in exceptional circumstances, approved by the instructor before the due date, assignments more than 3 days late will not be accepted and a mark of 0% will be assigned.

Notes on Assignment Submissions:

- a. Must be academic in style and content
- b. Must have a clear focus
- c. Must present ideas in a logical and well-thought-out flow
- d. Arguments, analysis and conclusions must be based on clearly identified research
- e. Must be in paragraph format
- f. Must comply to APA format referenced on assignment paper.
- g. Must cite all references from other sources

Notes on Assignment Grading:

90-100	One could scarcely expect better from a student at this level
80-89	Superior work which is clearly above average
70-79	Good work, meeting all requirements, and eminently satisfactory
60-69	Competent work, meeting requirements
50-59	Fair work, minimally acceptable
below 50	Fail

Exam

- 1. The exam is a three-hour, closed book, in-person. It will be supplemented by an instructor provided equation sheet. The exam is mixed in format including responses over the range of multiple choice to short essay and all in between.
- 2. Fair exam questions will be based upon all lecture and laboratory materials as well as all associated topics either covered in class, assigned as supplementary in nature, or provided in Owl Brightspace as contextual to any topic under consideration.
- 3. Except for the use of a calculator, and instructor provided cheat sheet, the final examination is closed book. Only approved programmable calculators are permitted in the final examination. Students should consult the list of approved calculators posted outside the Civil and Environmental Engineering Department Office.

I. Missed/Late Accommodation Policy:

- 1. Students missing a test/assignment/lab or examination you will report the absence by submitting Academic Consideration Request form through <u>STUDENT ABSENCE PORTAL</u>.
- 2. Documentation must be provided as soon as possible.

II. Exam Accommodation:

- 1. If you are unable to write a final examination, report your absence using the Academic Consideration Request Form through STUDENT ABSENCE PORTAL.
- 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, headache, 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 submit an the Academic Consideration Request Form through <u>STUDENT ABSENCE PORTAL</u>. PLEASE NOTE: It is the student's responsibility to check the date, time and location of the Special Examination.

III. <u>Late Assignments:</u>

- 1. Students must advise the course instructor if they are having difficulty completing an assignment on time (prior to the due date of the assignment).
- 2. Students should be prepared to submit the Academic Consideration Request Form and provide documentation if requested to do so by the course instructor (see reverse side for information on documentation).
- 3. If granted an extension, a revised due date should be established with the course instructor. The approval of the Chair of your Department (or the Assistant Dean, First Year Studies, if you are in first year) is not required if assignments will be completed prior to the last day of classes.
- 4. This course has 2 assignments, (assn #1, major assignment) both of which count towards your final grade. Academic consideration will not be granted for missed assignments. If students miss any assignments, they will receive a grade of zero on each missed assignment.
- 5. This course employs firm deadlines for assignments. The assignment deadlines can be found above in the course outline. For each assignment, students are expected to submit the assignment by the deadline listed. Should students submit their assessment past the deadline, a late penalty of 20% per day will be subtracted from the assessed grade.
- 6. Extensions beyond the end of classes must have the consent of the instructor, the department Chair and the Associate Dean, Undergraduate Studies. Documentation is mandatory.

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

IV. Medical Accommodation:

- 1. Requests for Academic Consideration Request Form through <u>STUDENT ABSENCE PORTAL</u>.
- 2. Requests for academic consideration must include the following components:
 - a. Self-attestation signed by the student (*This is only accepted for the first/one absence*)
 - b. Medical note
 - c. Indication of the course(s) and assessment(s) affected by the request
 - d. Supporting documentation as relevant
- 3. Requests without supporting documentation are limited to one per term per course.

- 4. Students must request academic consideration as soon as possible and no later than 48 hours after the missed assessment.
- 5. Once the request and supporting documents have been received and reviewed, appropriate academic consideration, if granted, shall be determined by the instructor in consultation with the academic advisor, in a manner consistent with the course outline. Academic consideration may include extension of deadlines, waiver of attendance requirements for classes/labs/tutorials, or reweighting of course requirements. Some forms of academic consideration, such as arranging Special Examinations, assigning a grade of Incomplete, or granting late withdrawals without academic penalty, may only be granted by the Academic Advising office of the Faculty of Engineering.

V. Religious Accommodation:

When scheduling unavoidably conflicts with religious holidays, which (a) require an absence from the University or (b) prohibit or require certain activities (i.e., activities that would make it impossible for the student to satisfy the academic requirements scheduled on the day(s) involved), no student will be penalized for absence because of religious reasons, and alternative means will be sought for satisfying the academic requirements involved. If a suitable arrangement cannot be worked out between the student and instructor involved, they should consult the appropriate Department Chair and, if necessary, the student's Dean.

It is the responsibility of such students to inform themselves concerning the work done in classes from which they are absent and to take appropriate action.

VI. Academic Integrity:

In the Faculty of Engineering, we encourage students to create a culture of honesty, trust, fairness, respect, responsibility, and courage, befitting the professional degree you are pursuing.

Please visit Academic Integrity Western Engineering for more information

VII. Academic Offences:

Plagiarism means using another's work without giving credit. The university has rules against plagiarism and other scholastic offences. Western Engineering has a zero-tolerance policy on plagiarism. The minimum penalty is zero on the course work and a repeat offence will earn you zero on the course. A third offence may lead to expulsion from the university.

Scholastic Discipline for Undergraduate Students & Cheating, Plagiarism and Unauthorized Collaboration: What Students Need to Know

Students must write their reports, 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. University policy states that cheating, including plagiarism, is a scholastic offence. The commission of a scholastic offence is attended by academic penalties, which might include expulsion from the program. If you are caught cheating, there will be no second warning.

All required papers may be subject to submission for textual similarity review to commercial plagiarism detection software under license to the University for the detection of plagiarism. All papers submitted will be included as source documents on the reference database for the purpose of detecting plagiarism of papers subsequently submitted to the system. Use of the service is subject to the licensing agreement, currently between the University of Western Ontario and Turnitin.com (http://www.turnitin.com). Scholastic offences are taken seriously and students are directed to read the appropriate policy, specifically, the definition of what constitutes a Scholastic Offence, in the relevant section of the

Academic Handbook:

http://www.uwo.ca/univsec/pdf/academic policies/appeals/scholastic discipline undergrad.pdf

VIII. Faculty of Engineering AI Policy:

The use of generative Artificial intelligence (GenAI) tools won't be discouraged in the Faculty of Engineering. As we pride ourselves on building the future we can't hide from the use of GenAI tools to contribute to the understanding of the course materials. However, the use of GenAI tools in any assignment or contribution during the course will have to be disclosed, as a resource. GenAI tools use won't be permitted in any type of examination or other assessments where the faculty have prohibited their use. If use of GenAI tools is detected by the instructor in these instances, academic offences penalties might be imposed against the student.

IX. <u>Use of English Policy:</u>

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 except for 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.

X. Accessibility:

Western is committed to achieving barrier free accessibility for persons with disabilities studying, visiting and working at Western. As part of this commitment, there are a variety of services, groups and committees on campus devoted to promoting accessibility and to ensuring that individuals have equitable access to services and facilities. To help provide the best experience to all members of the campus community, please visit the <u>Accessibility Western University</u> for information on accessibility-related resources available at Western.

Students with disabilities may arrange for academic accommodation at Western. For a more detailed explanation, please visit <u>Academic Support & Engagement -Academic Accommodation</u>.

XI. Inclusivity, Diversity, and Respect:

The Faculty of Engineering at Western University is committed to creating equitable and inclusive learning environments that value diverse perspectives and experiences. We recognize that university courses often marginalize students based on social identity characteristics such as, but not limited to, Indigeneity, race, ethnicity, nationality, ability, gender identity, gender expression, sexuality, age, language, religion, and socioeconomic status. Understanding this, we strive to facilitate equitable experiences and inclusion within the classroom by respecting and integrating multiple ways of knowing, being, and doing. Please visit the Office of Equity, Diversity and Inclusion.

XII. <u>Health and Well-Being:</u>

- <u>Health & Wellness Services Students -</u> Offers appointment-based medical clinic for all registered part-time and full-time students.
- <u>Mental Health Support</u> Provides professional and confidential services, free of charge, to students needing assistance to meet their personal, social and academic goals. Services include consultation, referral, groups and workshops, as well as brief, change-oriented psychotherapy.
- <u>Crisis Support</u> For immediate assistant, please visit Thames Hall Room 2170 or call 519-661-3030. The crisis clinic operates between 11:00 am 4:30 pm. For after-hours crisis support, click here.
- Gender-Based Violence and Survivor Support Western is committed to reducing incidents of gender-based and sexual violence and providing compassionate support to anyone who has gone through these traumatic events. If you have experienced gender-based or sexual violence (either

recently or in the past), you will find information about support services for survivors, including emergency contacts, <u>here.</u> To connect with a case manager or set up an appointment, please contact support@uwo.ca.

Important Contacts:

Engineering Undergraduate Services	SEB 2097	519-661-	engugrad@uwo.ca
		2130	
Civil & Environmental Engineering	SEB 3005	519-661-	civil@uwo.ca
		2139	
Office of the Registrar/Student	WSSB 1120	519-661-	
Central		2100	

Important Links:

- WESTERN ACADEMIC CALENDAR
- ACADEMIC RIGHTS AND RESPONSIBILITIES

Revision History:

Rev 00 – Originally submitted to Brightspace August 21, 2024. Students advised of changes forthcoming to syllabus on September 8th, 2024 – prior to the first class.

Rev 01 – Most notable changes include the fact that the laboratory 20% of the course must be passed for the student to pass the course. The entire Roman numeral area after the Exam description is new. All assessments have been described in greater detail. September 30th date corrections have been included in laboratory and lecture schedules. September 30th is teaching free to comply Truth and Reconciliation recommendations being adhered to by the university. Duplication of Learning Objectives removed. Corequisite considerations added: none; Lateness policy detailed in III.; Selection of Assignment #1 as requiring formal documentation to support accommodation included. Accreditation Units defined. An option to purchase the PMBOK included – enrichment only.;