Western University
Faculty of Engineering
Department of Civil and Environmental Engineering

CEE 4413B – Building Information Modelling

COURSE OUTLINE 2025-2026

DESCRIPTION
In this course, students will explore various Building Information Modelling (BIM) technologies and practice BIM processes using BIM-enabled software. The course provides essential knowledge required to manage and implement BIM technologies in construction processes. Students will identify the benefit of BIM and outline the criteria for developing a BIM implementation plan. Students will be exposed to the various skills to use BIM in the design and construction of facilities, with an emphasis on structural and civil roles. Autodesk Revit will be the primary platform used by students to further develop BIM models and apply advanced modeling techniques.

ENROLLMENT RESTRICTIONS
Enrollment in this course is restricted to graduate students in Civil and Environmental Engineering, as well as any student that has obtained special permission to enroll in this course from the course instructor as well as the Graduate Chair (or equivalent) from the student's home program.

INSTRUCTOR CONTACT INFORMATION

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Contact policy:
• Contact instructor via email (above) or through messages in OWL
• Weekly Office hours
• A general FAQ section on the 'forums' section of OWL will be used for students to pose course-related questions so that all have the same information:

COURSE FORMAT
Students are expected to participate in in-person learning activities as outlined in the course syllabus and/or described by the instructor. If you have issues that will impede your ability to participate in in-person class activities, please discuss them with the course instructor at the beginning of the course.

TOPICS

Topic #	Description	Learning Activities	Tentative timeline
1	Introduction to BIM	• In-class lecture and discussions	Week 1-2

		• Support	
2	Theory: BIM in Use Modeling: Architectural & Landscape Modeling	• In-class lecture and discussions • Support	Week 3-4
3	Theory: Value and Uses of BIM Modeling: Structural Modeling	• In-class lecture and discussions • Support	Weeks 5-6
4	Theory: BIM Execution Plan Modeling: Structural Modeling	• In-class lecture and discussions • Support	Week 7-8
5	Theory: LOD Modeling: Parametric Elements	• In-class lecture and discussions • Support	Week 9-10
6	Theory: Collaboration Workflow Modeling: Collaboration Within a BIM Environment	• In-class lecture and discussions • Support	Week 11-12

SPECIFC LEARNING OUTCOMES

Degree Level Expectation	Weight	Assessment Tools	Outcomes
Depth and breadth of knowledge	25%	• Assignments • Project • Examinations	• Understanding of advanced concepts and theories • Awareness of important current problems in the field of study • Understanding of computational and/or empirical methodologies to solve related problems
Research & scholarship	15%	• Project	• Ability to conduct a critical evaluation of current advancements in the field of specialization • Ability to conduct coherent and thorough analyses of complex problems using established techniques/principles and judgment
Application of knowledge	30%	• Assignments • Project • Examinations	• Ability to apply knowledge in a rational way to analyze a particular problem • Ability to use a coherent approach to design a particular engineering system using existing design tools
Professional capacity/autonomy	5%	• Project	• Awareness of academic integrity • Ability to implement established procedures and practices in the coursework • Defends own ideas and conclusions • Integrates reflection into his/her learning process
Communication skills	15%	• Project	• Ability to communicate (oral and/or written) ideas, issues, results, and conclusions clearly and effectively

Awareness of limits of knowledge	10%	• Project	• Awareness of the need for assumptions in complex scientific analyses and their consequences • Understanding of the difference between theoretical and empirical approaches • Ability to acknowledge analytical limitations due to the complexity of practical problems

ASSESSMENTS

Assessment Type	Material Covered	Tentative Due Date	Weight
Lab Work (Ten)	Topic 1-6	within 5 days of each session	15%
Group Discussions (Ten)	Topic 1-6	During the class hours	10%
Quizzes (two)	Topics 1-2 and topics 3-5	Week 6 and 10	15%
Summative Project	Project Model component BIM Execution Plan/report component	week 10 week 14	15% 15%
Timed Final Exam (lab)	Topics 1-6	week 14	30%

Activities in which collaboration is permitted:
- Summative Project
- Group Discussions

Activities in which students must work alone (collaboration is not permitted):
- Lab Work
- Quizzes
- Exercise

REQUIRED SOFTWARE
Autodesk Revit (Revit 2026), Microsoft Office

REQUIRED TEXTBOOK
Not required

OPTIONAL COURSE READINGS
Canadian Practice Manual for BIM, building SMART Canada
BIM Project Execution Planning Guide 2.1, Penn State University

STATEMENT ON THE USE OF GENERATIVE ARTIFICIAL INTELLIGENCE (AI)
Students are permitted to use generative AI tools (such as ChatGPT, Grammarly, or similar platforms) to assist with specific aspects of their group project work. These tools may be used to

support grammar correction, sentence structure refinement, idea organization, and overall clarity of written communication.

AI tools must be used strictly as a support resource. They are not to be used for generating original content, creating or fabricating information, or replacing student-led critical thinking and analysis. All AI-assisted content must be thoroughly reviewed, edited, and finalized by group members to ensure it accurately reflects their own understanding and contributions.

Use of AI must comply with the institution's policies on academic integrity and responsible technology use. Misuse of AI tools may result in academic consequences as per institutional regulations.

CHEATING, PLAGIARISM/ACADEMIC OFFENCES
Academic integrity is an essential component of learning activities. Students must have a clear understanding of the course activities in which they are expected to work alone (and what working alone implies) and the activities in which they can collaborate or seek help; see information above and ask instructor for clarification if needed. Any unauthorized forms of help-seeking or collaboration will be considered an academic offense. University policy states that cheating is an academic offence. If you are caught cheating, there will be no second warning. Students must write their essays and assignments in their own words. Whenever students take an idea or a passage of text 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 offence. Academic offences are taken seriously and attended by academic penalties which may include expulsion from the program. Students are directed to read the appropriate policy, specifically, the definition of what constitutes a Scholastic Offence at the following website: https://www.uwo.ca/univsec/pdf/academic_policies/appeals/scholastic_discipline_grad.pdf

All required papers may be subject to submission for textual similarity review to the commercial plagiarism-detection software under license to the University for the detection of plagiarism. All papers submitted for such checking will be included as source documents in 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).

CONDUCT
Students are expected to follow proper etiquette to maintain an appropriate and respectful academic environment. Any student who, in the opinion of the instructor, is not appropriately participating in course activities and/or is not following the rules and responsibilities associated with the course activities, will be reported to the Associate Dean (Graduate) (after due warning has been given). On the recommendation of the Department concerned, and with the permission of the Associate Dean (Graduate), the student could be debarred from completing the assessment activities in the course as appropriate.

HEALTH/WELLNESS SERVICES
As part of a successful graduate student experience at Western, we encourage students to make their health and wellness a priority. Western provides several health and wellness related services

to help you achieve optimum health and engage in healthy living while pursuing your graduate degree. Information regarding health- and wellness-related services available to students may be found at http://www.health.uwo.ca/.

Students seeking help regarding mental health concerns are advised to speak to someone they feel comfortable confiding in, such as their faculty supervisor, their program director (graduate chair), or other relevant administrators in their unit. Faculty of Engineering has a Student Wellness Counsellor. Information on how to schedule an appointment with the counsellor is available at: https://www.eng.uwo.ca/undergraduate/academic-support-and-accommodations/Student-Wellness-Counselling.html.

Students who are in emotional/mental distress should refer to Mental Health@Western: http://www.uwo.ca/uwocom/mentalhealth/ for a complete list of options about how to obtain help.

STATEMENT ON GENDER-BASED AND SEXUAL VIOLENCE
Western is committed to reducing incidents of gender-based and sexual violence (GBSV) and providing compassionate support to anyone who is going through or has gone through these traumatic events. If you are experiencing or have experienced GBSV (either recently or in the past), you will find information about support services for survivors, including emergency contacts at the following website: https://www.uwo.ca/health/student_support/survivor_support/get-help.html. To connect with a case manager or set up an appointment, please contact support@uwo.ca.

SICKNESS
Students should immediately consult with the Instructor (for a particular course) or Associate Chair (Graduate) (for a range of courses) if they have problems that could affect their performance. The student should seek advice from the Instructor or Associate Chair (Graduate) regarding how best to deal with the problem. Failure to notify the Instructor or the Associate Chair (Graduate) immediately (or as soon as possible thereafter) will have a negative effect on any appeal. Obtaining appropriate documentation (e.g., a note from the doctor) is valuable when asking for accommodation due to illness.

Students who are not able to meet certain academic responsibilities due to medical, compassionate or other legitimate reason(s), could request for academic consideration. The Graduate Academic Accommodation Policy and Procedure details are available at: https://www.eng.uwo.ca/graduate/current-students/academic-support-and-accommodations/index.html

ACCESSIBLE EDUCATION WESTERN (AEW)
Western is committed to achieving barrier-free accessibility for all its members, including graduate students. As part of this commitment, Western provides a variety of services devoted to promoting, advocating, and accommodating persons with disabilities in their respective graduate program. Graduate students with disabilities (for example, chronic illnesses, mental health conditions, mobility impairments) are strongly encouraged to register with Accessible Education Western (AEW): http://academicsupport.uwo.ca/accessible_education/index.html
AEW is a confidential service designed to support graduate and undergraduate students through their academic program. With the appropriate documentation, the student will work with both AEW and their graduate programs (normally their Graduate Chair and/or Course instructor) to ensure that

appropriate academic accommodations to program requirements are arranged. These accommodations include individual counselling, alternative formatted literature, accessible campus transportation, learning strategy instruction, writing exams and assistive technology instruction.