

Western University
Faculty of Engineering
Department of Civil and Environmental Engineering

CEE9518 - Building Information Modelling

COURSE OUTLINE SUMMER 2023

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.

PREREQUISITES

Foundational knowledge of building modeling and construction process.

TOPICS

| Topic # | Description | Learning Activities | Tentative timeline |
|----------------|--|--|---------------------------|
| 1 | Introduction to BIM | <ul style="list-style-type: none">• In-class lecture and discussions• Support | Week 1 |
| 2 | Theory: BIM in Use Modeling: Architectural & Landscape Modeling | <ul style="list-style-type: none">• In-class lecture and discussions• Support | Week 1-2 |
| 3 | Theory: Value and Uses of BIM Modeling: Structural Modeling | <ul style="list-style-type: none">• In-class lecture and discussions• Support | Weeks 3 |
| 4 | Theory: BIM Execution Plan Modeling: Parametric Elements | <ul style="list-style-type: none">• In-class lecture and discussions• Support | Week 4 |
| 5 | Theory: LOD Modeling: Energy Modeling | <ul style="list-style-type: none">• In-class lecture and discussions• Support | Week 5 |
| 6 | Theory: Collaboration Workflow Modeling: Collaboration Within a BIM Environment | <ul style="list-style-type: none">• In-class lecture and discussions• Support | Week 7 |

SPECIFIC LEARNING OUTCOMES

| Degree Level Expectation | Weight | Assessment Tools | Outcomes |
|---|--------|--|--|
| Depth and breadth of knowledge | 25% | <ul style="list-style-type: none"> • Assignments • Project • Examinations | <ul style="list-style-type: none"> • 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% | <ul style="list-style-type: none"> • Project | <ul style="list-style-type: none"> • 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% | <ul style="list-style-type: none"> • Assignments • Project • Examinations | <ul style="list-style-type: none"> • 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% | <ul style="list-style-type: none"> • Project | <ul style="list-style-type: none"> • 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% | <ul style="list-style-type: none"> • Project | <ul style="list-style-type: none"> • Ability to communicate (oral and/or written) ideas, issues, results, and conclusions clearly and effectively |
| Awareness of limits of knowledge | 10% | <ul style="list-style-type: none"> • Project | <ul style="list-style-type: none"> • 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 (five) | Topic 1, 2, 3, 4, 5 | within 5 days of each session | 15% |
| Quizzes (two) | Topics 1-2 and topics 3-5 | Week 3 and 6 | 15% |
| Summative Project | Project Model component BIM | Week 6 | 20% |
| | Execution Plan/report component | Week 7 | 20% |
| Online timed exercise | Topics 1-5 | Week 7 | 30% |

Activities in which collaboration is permitted:

- Summative Project

Activities in which students must work alone (collaboration is not permitted):

- Lab Work
- Quizzes
- Exercise

CONTACT INFORMATION

Course instructor: Mehdi Heidari Sarvestani

Email address: msarvest@uwo.ca

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.

REQUIRED SOFTWARE

Autodesk Revit (Revit 2022), 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

COURSE CONTENT

The lecture notes and lecture videos are copyrighted to the instructor and legally protected. Do not post these videos and lecture notes on any other website or online forums. The recording of the course sessions without permission from the instructor is prohibited. The illegal posting and sharing of the copyrighted course content could be subjected to legal actions.

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 the information above under “Assessments” and ask the 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 offense. 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 offense. Academic offenses 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 (see Western's scholastic discipline regulations for graduate students).

IN-PERSON LEARNING ACTIVITIES

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.

CONDUCT

Students are expected to follow proper etiquette during the in-person class activities to maintain an appropriate and respectful academic environment. Any student who, in the opinion of the instructor, is not appropriately participating in the learning activities and/or is not following the rules and responsibilities associated with the online learning 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

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 (remotely accessible) 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.

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.

ACCESSIBILITY

Please contact the course instructor if you require material in an alternate format or if any other arrangements can make this course more accessible to you. You may also wish to contact Accessible Education at 661-2111 x 82147 or http://academicsupport.uwo.ca/accessible_education/index.html, for any specific question regarding an accommodation.