UNIVERSITY OF ALBERTA

# ONLINE MASTER OF **ENGINEERING**

## CONSTRUCTION ENGINEERING & MANAGEMENT

### ENGINEER YOUR NEXT BIG MOVE

**100% ONLINE**

Looking to take the next steps in your career? Engineer your next big move with our Online Master of Engineering Specialization in Construction Engineering and Management.

The University of Alberta's Online Master of Engineering (MEng) Specialization in Construction Engineering and Management is designed to prepare working professionals to advance engineering practice in modern Construction Engineering. The program will equip you with the required knowledge, skills, methods, tools, and experience to level up your contributions to the Civil Engineering industry and society at large.

DEPARTMENT OF CIVIL AND ENVIRONMENTAL ENGINEERING

# WHY TAKE THE **ONLINE MENG PROGRAM?**

**100% ONLINE**

No requirement to physically attend campus — complete your graduate degree from anywhere and still obtain the University of Alberta credential.

**INNOVATIVE ONLINE LEARNING**

Experience engaging, interactive content designed to bring engineering education to life in a world-class digital environment via UAlberta's learning management system, CANVAS.

**BUILT FOR WORKING PROFESSIONALS**

Earn your degree while working full-time, with 100% online delivery, affordable tuition and flexible **2 to 4 year, part time schedule** (1 or 2 courses per term).

**LEARN FROM EXPERTS**

Study with leading professors and researchers in Civil & Environmental Engineering, while benefiting from the U of A's strong connections to Western Canada's energy and construction sectors. The online program is completely separate from the in-person program with a dedicated instructor and Teaching Assistants for each course.

**A WORLD-CLASS REPUTATION**

Graduate from a top 100 global university and a top 5 Canadian engineering school.

## UNIVERSITY OF ALBERTA **RANKINGS**

| | WORLD | CANADA |
|---|---|---|
| ACADEMIC RANKING OF WORLD UNIVERSITIES | **101** | **4** |
| QUACQUARELLI SYMONDS | **94** | **4** |
| TIMES HIGHER EDUCATION | **119** | **4** |

# ONLINE MENG
# **PROGRAM INFO**

## PROGRAM
## **OBJECTIVES**

The MEng Online Program is designed to enhance the technical and professional proficiency of students for engineering practice in modern Construction Engineering. It will equip students with the knowledge, skills, methods, tools and experience to succeed in today's Civil Engineering industry.

## LEARNING
## **OUTCOMES**

- Estimate the cost and duration for construction activities
- Apply the critical path method and production planning methodologies to a construction project
- Evaluate project performance, analyze project cash flow and identify sources of uncertainty in construction projects
- Schedule and manage construction project timelines, resources, and workflows
- Optimize and oversee construction methods and processes
- Identify, assess, and mitigate project-level risks in construction
- Apply advanced production planning theories, human factors principles, and digital technologies to improve overall construction project management


A sample of module content from CIV E 601 online.

# ONLINE MENG PROGRAM
# KEY FACTS

## ADMISSION REQUIREMENTS

- An undergraduate degree in engineering/science or a relevant field.
- An admission GPA of at least 3.0 on the 4-point scale (or equivalent).
  - GPA calculated on the last 60 units or equivalent of the last two years of coursework.
- Proof of English Language Proficiency where applicable.
- One letter of reference (academic reference preferred) and your Curriculum Vitae (CV).

WESTERN CANADA'S **FIRST** FULLY ONLINE MASTER'S DEGREE IN CONSTRUCTION ENGINEERING

DELIVERY MODE
**100% ONLINE**

**COURSE-BASED**
NO SUPERVISOR REQUIRED

**EQUAL IN QUALITY:** MEETS THE **SAME RIGOROUS ACADEMIC STANDARDS** AS THE IN-PERSON PROGRAM
PARCHMENT DOES NOT INDICATE PART-TIME OR ONLINE, JUST THE DEGREE.

**APPLICATION DEADLINES**
FALL 2026 ENROLLMENT:

**Applications Open:** October 1, 2025
**Applications Close:** July 15, 2026
(domestic & international)

**APPLICATION DEADLINES**
WINTER 2027 ENROLLMENT:

**Applications Open:** February 1, 2026
**Applications Close:** October 15, 2026
(domestic & international)

*International students do not require a study permit or visa for this fully online program.*

# ONLINE MENG PROGRAM
# COURSE STRUCTURE

- 9 — Includes 9 (3-credit) courses (one of which is a capstone course)
- Courses are designed in a modular format for paced asynchronous delivery over a 12-13 week term.
- Students should plan to invest approximately 6-9 hrs per week on coursework including readings, activities, and assessments.
- All courses have deadlines and deliverables (assignments and projects) and they will follow the typical 4-month university term structure for fall/winter.
- Asynchronous proctored exams are expected to be scheduled within a specified time window.
- Interaction between students and the instructional team will be encouraged through online content, activities, and groupwork in the Canvas Learning Management System, discussions using the EdDiscussion platform, and video conferences using Zoom or Google Meet.
- Instructors will be available to students via live, online office hours as well as by email and the Ed Discussion tool.

# ONLINE M.ENG.
# TUITION AND FEES

## DOMESTIC STUDENTS

Students are assessed both instructional and non-instructional fees each term. Instructional fees are course-based, while non-instructional fees are term-based. For Canadian citizens and permanent residents, the 2026/27 instructional fee is $1,004.16 CAD per 3-credit course. Non-instructional fees are estimated to be approximately $1,670 CAD per year for off-campus students in full time study.
**Estimated Total Domestic Student Program Tuition (2 years): ~$12,380 CAD**

## INTERNATIONAL STUDENTS

The M.Eng instructional program fee is $52,533.20. However, online students receive a $10,000 discount from the in-person rate, which brings the program fee to $42,533.20 for those entering the program in Fall 2026. This fee is assessed over the two-year program. Instructional and non-instructional fees are assessed by term. The annual tuition amount for Fall/Winter 2026/27 is $21,266.60 for online students. Non-instructional fees are ~$1,670.00 / year for off-campus students in full-time study.
**Estimated Total International Student Program Tuition: ~$45,900**

**Please Note:** fee information presented on these pages is based on current rates, which are subject to change in subsequent years
For general information, please visit the Online Master's of Engineering Specialization in Construction Engineering and Management Faculty of Graduate & Postdoctoral Studies site.

# ONLINE MENG
# REQUIRED COURSES

Earn your degree while working full-time, with flexible 100% online delivery, affordable tuition and part-time options up to four years. The program is designed to balance structure with flexibility. All courses are delivered online with scheduled timelines and weekly activities. The part-time program can be taken at your own pace and is typically completed in two years.

| | |
|---|---|
| **CONSTRUCTION ENGINEERING CORE COURSES (COMPLETE ALL 3, 3-CREDIT COURSES):** | **CIV E 601** Analytical Methods for Project Management<br>**CIV E 611** Lean Construction<br>**CIV E 630** Construction Safety & Human Factors |
| **CONSTRUCTION ENGINEERING ELECTIVE COURSES (CHOOSE 3, 3-CREDIT COURSES):** | **CIV E 709(i)** Smart Digital Systems & Processes in Construction<br>**CIV E 603** Construction Informatics<br>**CIV E 709(ii)** Resilient Infrastructure Design<br>**CIV E 606** Design and Analysis of Construction Operations |
| **ELECTIVES (COMPLETE BOTH 3-CREDIT COURSES):** | **CIV E 661** Dynamics of Structures<br>**CIV E 779** Machine Learning for Engineers |
| **CAPSTONE (3 CREDITS):** | **CIVE 900** The capstone course features a project that showcases the learning outcomes achieved throughout the program. |
| **ETHICS AND ACADEMIC CITIZENSHIP (NON-CREDIT):** | **INT D 710** 6-hour, online, non-credit course |
| **PROFESSIONAL DEVELOPMENT/ INDIVIDUAL DEVELOPMENT:** | All graduate students at the University of Alberta are required to meet the Professional Development Requirement to complete their program. |

# STUDENT **SUPPORT**

*Once admitted, students have access to our dedicated team of advisors and coordinators.*

GRADUATE
**PROGRAM ADVISORS**

Trina Cattral
Christina Ezekowitz
Arlene Figley

ONLINE MENG
**ACADEMIC ADVISOR**

Qipei Mei

ASSOCIATE DEAN
**GRADUATE STUDENTS CEE/MP***

Zaher Hashisho

CONSTRUCTION ENGINEERING
**GRADUATE COORDINATOR**

Gaang Lee

***CEE/MP: Civil & Environmental Engineering / Mining & Petroleum**

For inquiries and support, please contact our admissions team at **engg.gradadm@ualberta.ca**

# COURSE INFO

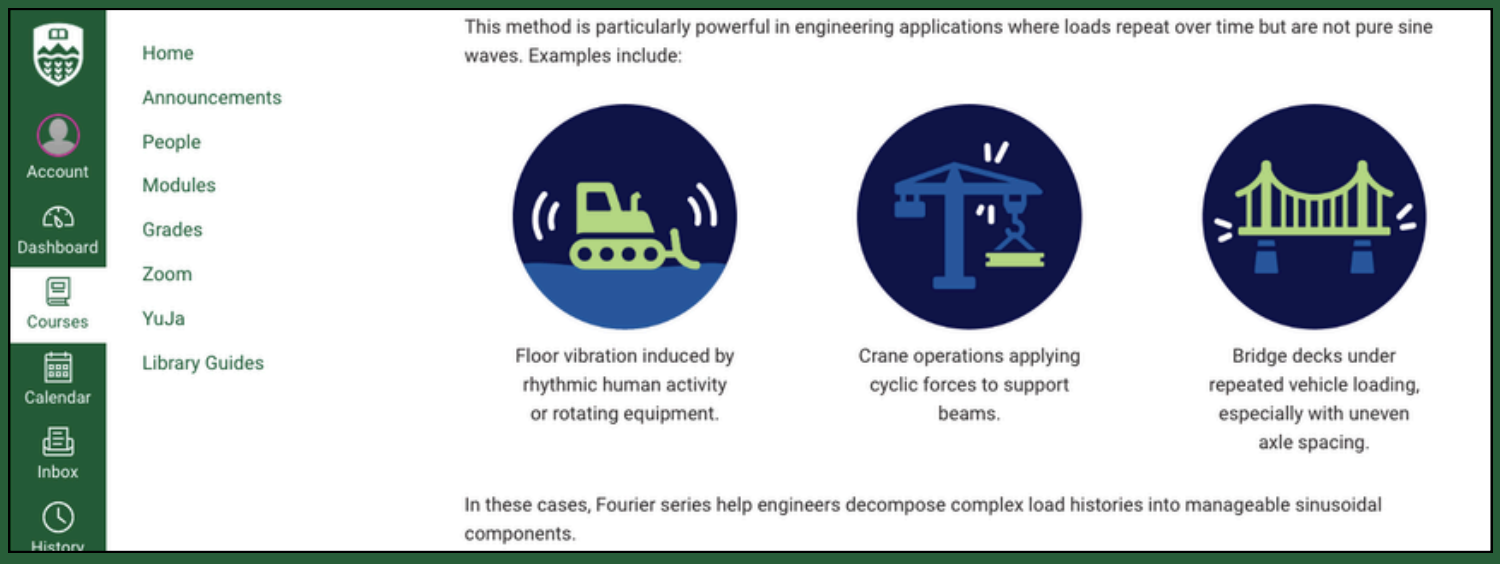
## CIV E 601
## ANALYTICAL METHODS FOR PROJECT MANAGEMENT

### COURSE **OBJECTIVES**

This course provides updated knowledge and analytical methods to extend basic concepts and techniques in project management while keeping the analytical flavor typical of an engineering course.

### LEARNING **OUTCOMES**

- Distinguish balanced versus unbalanced pricing in project tendering through bid factor analysis
- Follow industry best practices in performing project breakdown and preparing project network models
- Apply path-float based critical path method to simplify project scheduling and time cost trade-off analysis
- Critically apply Earned Value management in project cost control
- Apply a non-computer approach to resource scheduling by updating project network models
- Interpret complex precedence relationships on project network models by applying formalized transform schemes
- Perform risk analysis and simulation analysis for contingency estimating in bidding and path float based project scheduling
- Critically apply linear scheduling and repetitive scheduling methods
- Gain teambuilding and project management experiences through a group-based Term Project



# COURSE INFO

## CIV E 603
## CONSTRUCTION INFORMATICS

### COURSE OBJECTIVES

This course introduces various aspects of information management and computer applications within the construction domain to familiarize students with the use and capabilities of these applications for research and industrial purposes.

### LEARNING OUTCOMES

- Develop small computer programs for research problems in Python
- Design and develop relational databases for research or small business applications
- Apply basic data mining techniques to research or construction operations data
- Evaluate and assess the quality of data mining outcomes

## CIV E 606
## DESIGN AND ANALYSIS OF CONSTRUCTION OPERATIONS

### COURSE OBJECTIVES

This course provides an overview of production management in construction. Students will learn about techniques for modelling construction operations, design of efficient processes, measurement, productivity, and computer simulation techniques for modeling and analysis.

### LEARNING OUTCOMES

- Design simulation models that represent and simplify construction processes for improved efficiency
- Use discrete event and continuous simulation concepts for modeling construction processes
- Implement and run experiments on models using the Simphony simulation environment
- Test, validate, and evaluate developed models using different techniques including statistical methods

# COURSE INFO

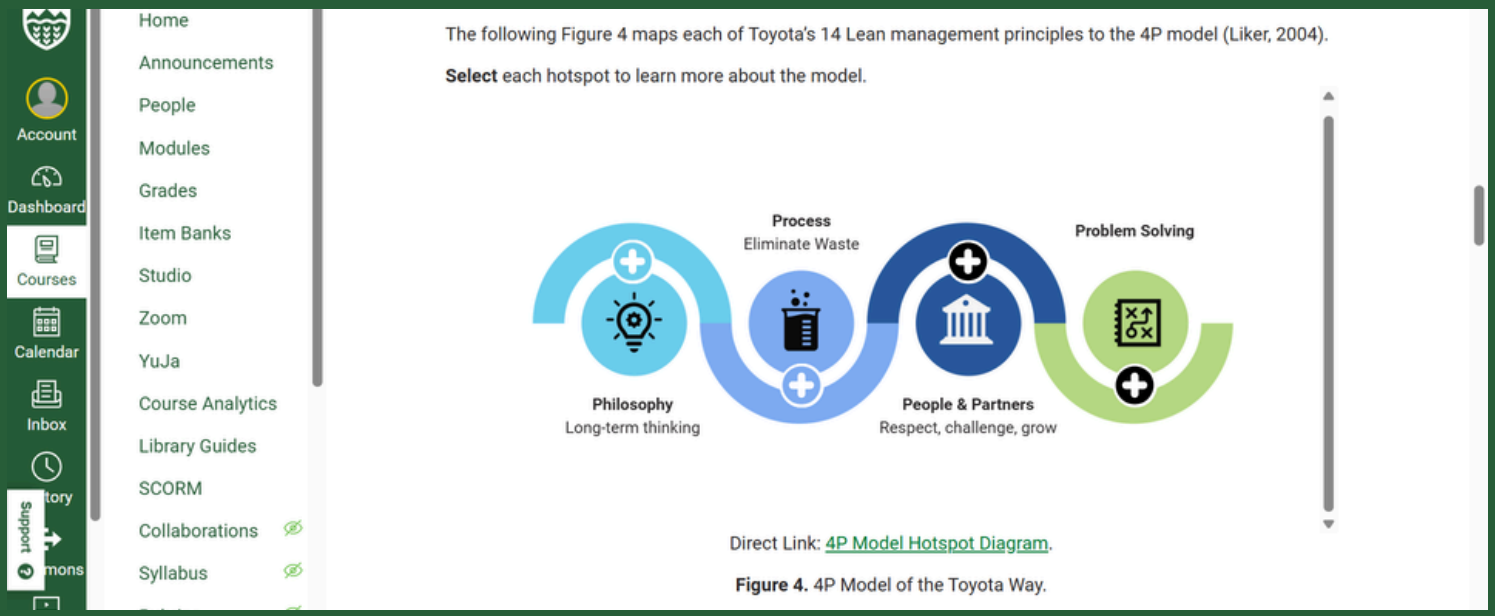
## CIV E 611
## LEAN CONSTRUCTION

### COURSE OBJECTIVES

In this course, students will learn about the Toyota production system, the last planner system, value stream mapping, integrated project delivery (IPD), location-based management, target value design, process improvement, and many other lean concepts. Students will also learn fundamental project management concepts and techniques to define, plan and execute construction projects. The focus will be on actions that can be taken to meet and exceed expectations for project time, cost and quality. The importance of communication and risk management throughout all project stages will be emphasized. Students will be trained in academic paper writing and communication. Students will also be exposed to software applications that aid project management. Students will be challenged as individuals and as members of a team to deliver a paper-based project.

### LEARNING OUTCOMES

- Define and explain the management principles of Lean Construction
- Map construction processes and identify wasteful activities
- Measure value in construction process flows
- Propose improvement measures for construction processes
- Explain the basics of Integrated Project Delivery (IPD)
- Perform advanced location-based management planning assessments
- Demonstrate the understanding of the Last Planner's System for production planning and control



# COURSE INFO

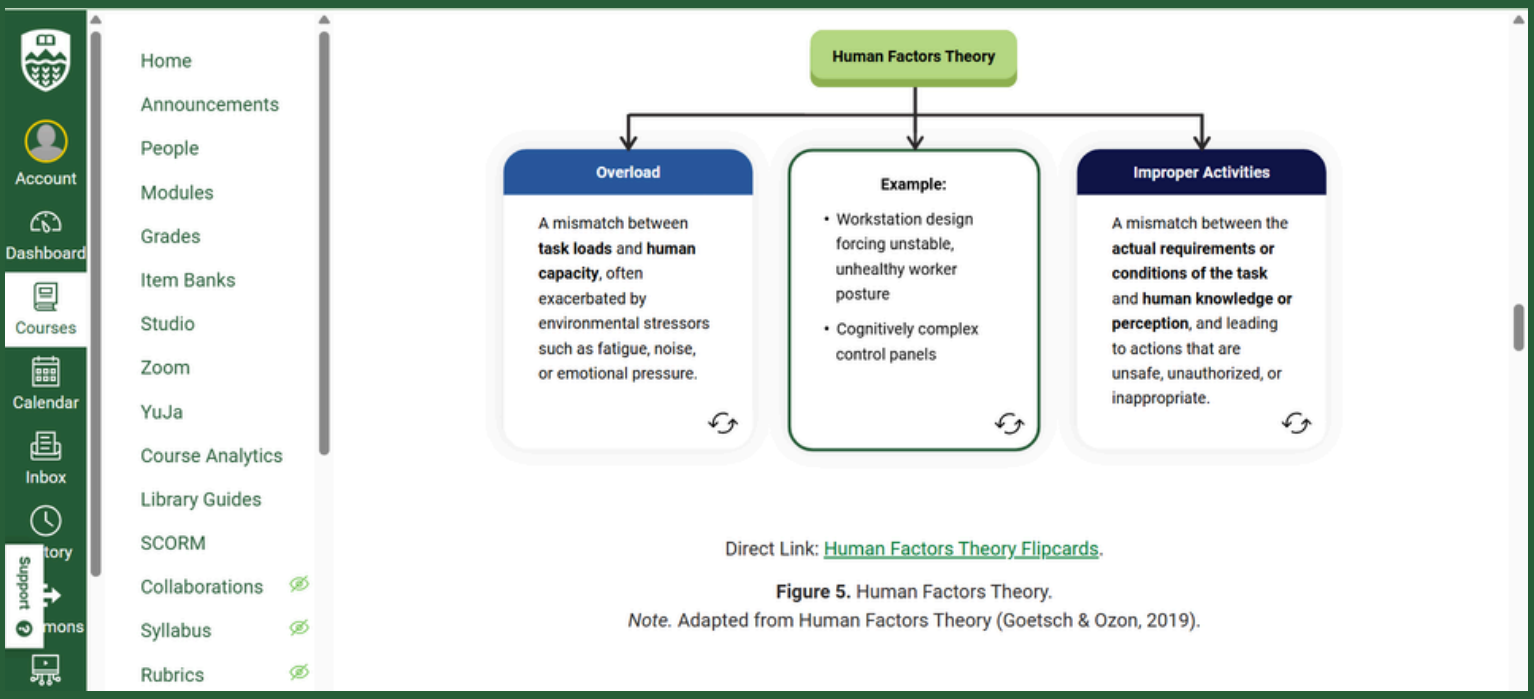
## CIV E 630
## CONSTRUCTION SAFETY AND HUMAN FACTORS

### COURSE **OBJECTIVES**

This course aims to empower students to understand current construction safety management practices, including their underlying mechanisms and limitations, and to advance these practices by applying advanced psychological, physiological and socio-cognitive theories, as well as cutting-edge sensing and data analytics techniques.

### LEARNING **OUTCOMES**

- Understand construction safety management practices, including their underlying rationales and limitations
- Provide interventions to improve worker safety in specific construction site situations by applying relevant psychological, physiological, or socio-cognitive theories
- Design applications of data analytics with sensors, such as cameras, location tracking systems, and biosensors, to enhance worker safety in specific construction site situations




Direct Link: Human Factors Theory Flipcards.

**Figure 5.** Human Factors Theory.
*Note.* Adapted from Human Factors Theory (Goetsch & Ozon, 2019).

# COURSE INFO

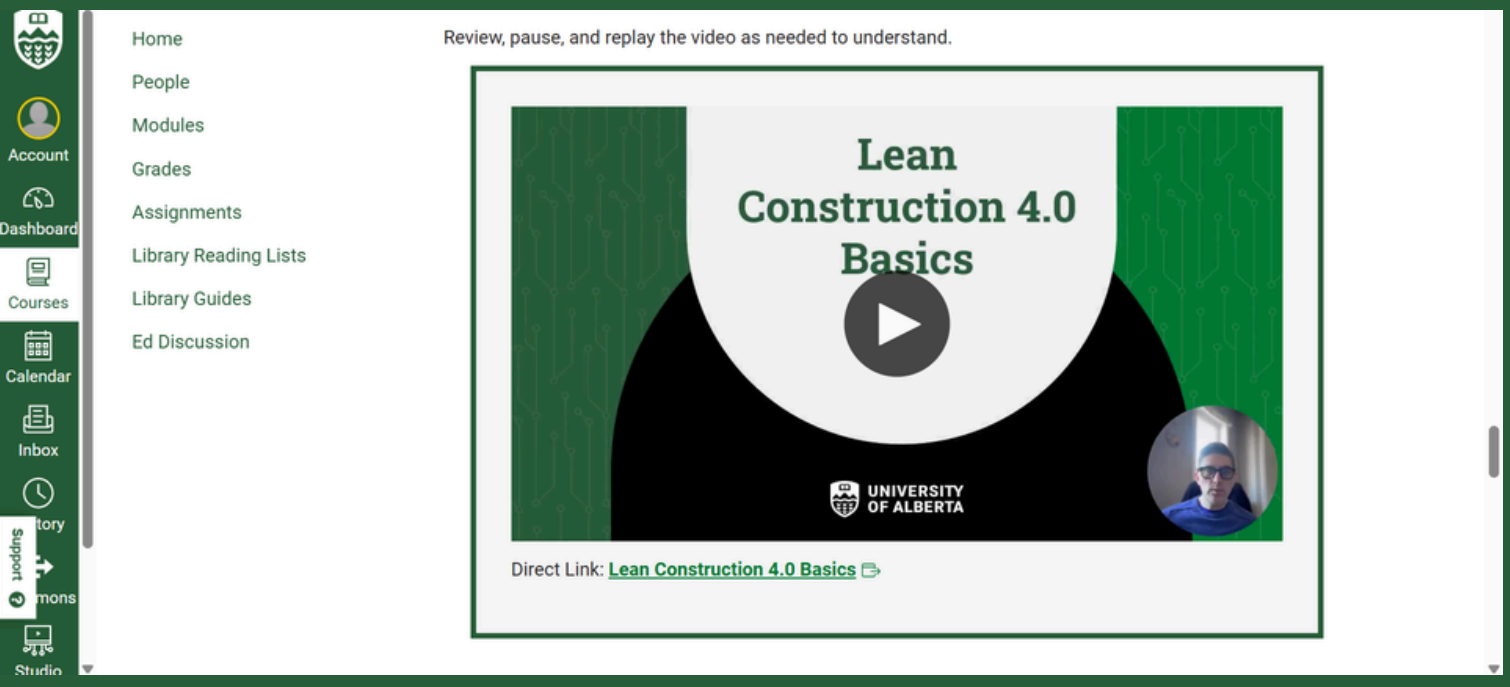
## CIV E 709(i)
## SMART DIGITAL SYSTEMS & PROCESSES IN CONSTRUCTION

### COURSE OBJECTIVES

In this course, students will describe and use the Lean Construction 4.0 concept as the integration of lean production-based theory for construction, people and culture. The course also highlights industry 4.0-inspired mart digital technologies and everything under the umbrella of Human-Centered Design.

### LEARNING OUTCOMES

- Distinguish the different Lean Construction 4.0 components, namely Lean Production theory in Construction, Industry 4.0-driven smart digital technologies, and Human-Centered Design, which in unison, can improve the production performance of Architecture, Engineering, and Construction (AEC) projects
- Evaluate the potential of Lean Construction 4.0 and its components to be implemented in AEC projects
- Create human-centric strategies to optimize the implementation of Lean Production and industry 4.0-driven Smart Digital Technologies in AEC projects
- Evaluate management approaches to effectively integrate Lean Production principles with Industry 4.0-driven Smart and Digital Technologies in AEC projects
- Evaluate the impacts of using Lean Construction 4.0 principles and tools on AEC project performance



# COURSE INFO

## CIV E 709(ii)
## RESILIENT INFRASTRUCTURE DESIGN

### COURSE OBJECTIVES

This course introduces the principles, methods, and real-world applications involved in building resilient physical infrastructure systems. Students will examine emerging climate-related infrastructure challenges and learn to address them using data-driven, equity-centered and management-informed approaches. The course integrates technical methods, including damage modeling, network analysis, geospatial analytics, and Artificial Intelligence and Machine Learning (AI/ML), with socio-economic perspectives, including community vulnerability and partner decision-making. Through case studies and hands-on projects, students will examine how infrastructure systems interact, respond, and recover under disruption and uncertainty. Emphasis is placed on resilience-based planning and design as a foundation for long-term sustainability, equity and risk reduction.

### LEARNING OUTCOMES

- Explain the concepts of resilience and vulnerability within the context of infrastructure systems
- Analyze the effects of climate-induced hazards on urban infrastructure performance restoration, and recovery
- Apply quantitative and computational methods to identify infrastructure damage and evaluate system resilience.
- Design economic and equitable infrastructure adaption and mitigation strategies for resilient infrastructure development

## CIV E 779
## MACHINE LEARNING FOR CIVIL ENGINEERS

### COURSE OBJECTIVES

The course will give engineering students the necessary knowledge to develop and implement machine learning algorithms to solve their engineering problems. The course content includes: linear regression, logistic regression, neural network, support vector machine, clustering, principal component analysis, reinforcement learning, and  practical tips for machine learning.

### LEARNING OUTCOMES

- Understand the fundamentals of machine learning
- Implement machine learning algorithms in Python
- Apply machine learning techniques to engineering problems
- Recognize the latest advancements in machine learning

# COURSE INFO

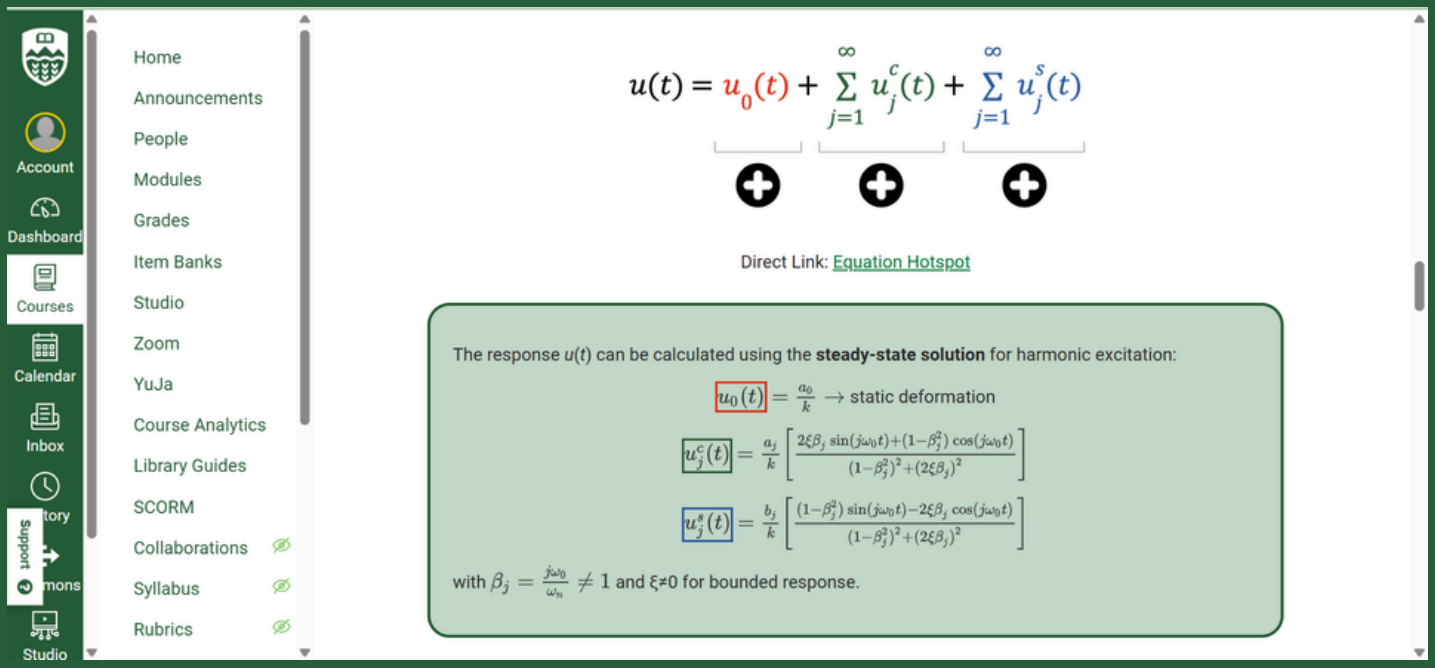
## CIV E 661
## DYNAMICS OF STRUCTURES

### COURSE OBJECTIVES

This course introduces the students to the dynamics of single and multiple degrees of freedom systems, time step methods, modal and response spectrum analysis for earthquake loading, random vibration analysis, dynamic wind loading analysis, and dynamics of foundations.

### LEARNING OUTCOMES

- Formulate the Equation of Motion (EoM) of Single Degree of Freedom (SDOF) systems and solve it using various methods (e.g. classical solution, Fourier series and Duhamel's Integral) for simple loading cases (e.g., free vibration, harmonic loading, periodic loading, and simple arbitrary loading)
- Apply the SDOF system concepts to formulate various applications (e.g., eccentric mass shakers, vibration measurement devices, force transmission and base excitation)
- Apply numerical methods for numerical response evaluation of linear/nonlinear systems under more complex loading
- Formulate earthquake response of linear systems and analyze them using response spectra
- Formulate the EoM of Multi Degree of Freedom Systems (MDOFs) and solve it using modal analysis for various loading cases (e.g., free vibration, harmonic loading and seismic loading)



# COURSE INFO

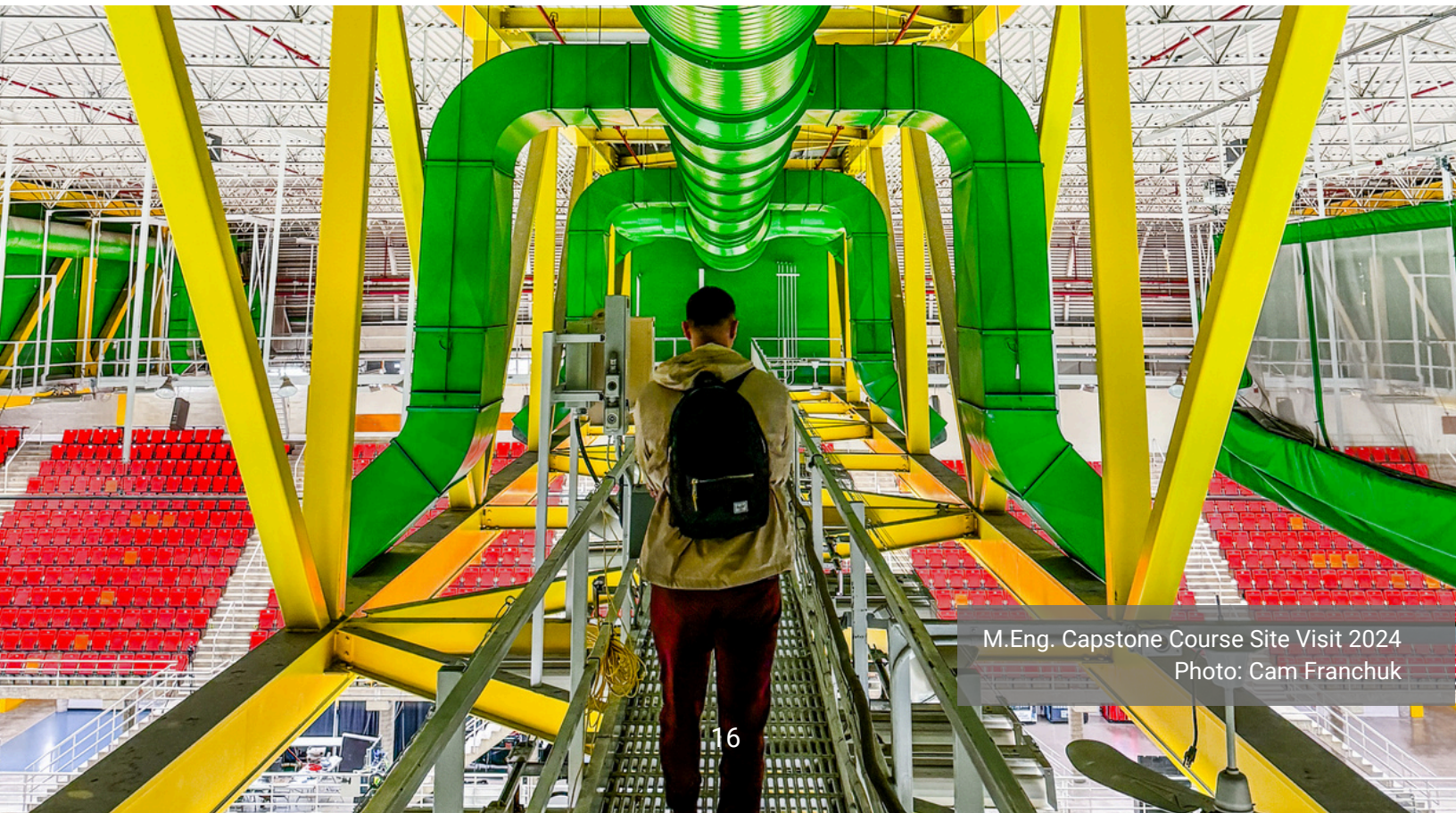
## CIV E 900
## CAPSTONE COURSE
## CONSTRUCTION

### COURSE OBJECTIVES

This capstone course provides an open-ended, team-based design experience. Students apply the knowledge and skills acquired throughout their program to plan, design, and present a comprehensive engineering project. Emphasis is placed on professional design and construction practices, technical and project management deliverables, and effective communication. Teams develop and evaluate alternative solutions, prepare team reports, technical memos, and detailed drawings, and deliver oral presentations that demonstrate their ability to produce a feasible and well-coordinated engineering design.

### LEARNING OUTCOMES

- Learn how to approach, break down, and solve an undefined (or poorly defined) problem
- Develop and execute a project workplan
- Effectively communicate design ideas and solutions to both technical and non-technical audiences
- Function effectively on a diverse team towards shared objectives



M.Eng. Capstone Course Site Visit 2024
Photo: Cam Franchuk

# NOTES