

# DEPARTMENT OF CIVIL AND ENVIRONMENTAL ENGINEERING SCHOOL OF MINING AND PETROLEUM ENGINEERING

**Graduate Studies Handbook** 

September 2022-August 2023

Note: Some of the procedures and processes stated in this handbook may be modified due to the ongoing COVID-19 pandemic. Please consult the Department Graduate Office if you have any questions or concerns regarding your program.

Updated: October 5, 2022



# Welcome!

Welcome to the Department of Civil and Environmental Engineering and the School of Mining and Petroleum Engineering at the University of Alberta!

You are joining one of the best engineering departments in Canada to benefit from a true spirit of cooperation between engineering education and industry. The insight and knowledge shared between professors and students has inspired new ideas and resulted in more excellent research learning opportunities.

We hope your studies will be rewarding and wish you great success in your personal, academic, and professional life.



Natural Resources Engineering Facility (NREF)



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### 1. Introduction

This handbook contains information specific to the graduate programs offered in the Department of Civil and Environmental Engineering and the School of Mining and Petroleum Engineering. Graduate students must make themselves aware of the contents of the graduate portions of the University of Alberta Calendar (linked below) and the Graduate Program Manual from the Faculty of Graduate Studies and Research (FGSR, also linked below). If there is a discrepancy between the information presented here and that contained in the Calendar, the Calendar takes precedence.

University of Alberta Calendar: calendar.ualberta.ca

FGSR Graduate Program Manual:

ualberta.ca/graduate-studies/about/graduate-program-manual

Graduate students take full responsibility for their programs. They must ensure that their program satisfies the requirements set by the FGSR and the Department.

# 2. Important Contacts and Information

#### 2.1 Graduate Program Contacts

Graduate Program Advisors	Department Contact Address
Ms. Ellie Kim – 7-209 Donadeo ICE	Department of Civil and Environmental Engineering and
Ms. Arlene Figley – 7-211 Donadeo ICE	the School of Mining and Petroleum Engineering
Ms. Trina Cattral – 7-215 Donadeo ICE	7-207 Donadeo Innovation Centre for Engineering (ICE)
Email: cgradvis@ualberta.ca	Edmonton, Alberta, CANADA T6G 1H9
Associate Dean, Graduate Students CEE/MP	Department Reception
Dr. Zaher Hashisho	7-203 Donadeo ICE
Office: 7-241 Donadeo ICE	Phone: (790) 492-4235
Email: ad.ceegrad@ualberta.ca	
MEng Academic Coordinator	
Dr. Selma Guigard	
Office: 7-233 Donadeo ICE	
Email: civmeng@ualberta.ca	
Website	

ualberta.ca/engineering/civil-environmental-engineering



#### 2.2 Group Graduate Coordinators

Individual research groups within the Department enjoy a certain level of autonomy in setting their procedures; there may be variations between groups. Listed below are the graduate coordinators for each of these groups. If you have questions about the program, please contact the appropriate group graduate coordinator listed below.

Construction Engineering and Management	Environmental Engineering
Dr. Ahmed Hammad – 6-308 Donadeo ICE <a href="mailto:ahammad@ualberta.ca">ahammad@ualberta.ca</a>	Dr. Bipro Dhar – 6-277 Donadeo ICE bipro@ualberta.ca
Geotechnical Engineering	Mining Engineering
Dr. Michael Hendry – 6-226 Donadeo ICE hendry@ualberta.ca	Dr. Yashar Pourrahimian – 6-243 Donadeo ICE pourrahi@ualberta.ca
Petroleum Engineering	Structural Engineering
Dr. Hassan Dehghanpour – 6-279 Donadeo ICE dehghanpour@ualberta.ca	Dr. Yong Li – 6-259 Donadeo ICE yong9@ualberta.ca
Transportation Engineering	Water Resources Engineering
Dr. Stephen Wong – 6-269 Donadeo ICE sdwong1@ualberta.ca	Dr. Amy She – 7-259 Donadeo ICE <a href="mailto:yshe@ualberta.ca">yshe@ualberta.ca</a>
Cross-Disciplinary Studies	MEng Academic Coordinator
Dr. Qipei Mei – 6-263 Donadeo ICE qipei@ualberta.ca	For all MEng students  Dr. Selma Guigard – 7-233 Donadeo ICE <u>civmeng@ualberta.ca</u>

#### 2.3 Desks and Offices

Graduate students will be assigned desks following the Civil and Environmental Engineering (CEE) Office Space Policy. Important points of this policy are outlined below.

- Graduate students in MSc and PhD programs will be assigned desks by the policy. Graduate students in the MEng program are not eligible for office space.
- Graduate students may be housed in NREF if available; otherwise, space is open in designated areas on the 6th floor of Donadeo ICE (6-244, 6-361, and 6-362).
- Office space in NREF is managed by research programs. A delegate of these groups is responsible for assigning these offices.
- Office space in Donadeo ICE is managed by the Department. All requests for space are to go through the Administrative Assistant to the Chair.
- If no space is available, all requests for graduate student office space will be added to a waiting list, with priority given to PhD students.



### 2.4 Building Access and Keys

Some spaces in Donadeo ICE and NREF are accessible to authorized personnel only by using keys or a Proximity ONEcard. Office and laboratory keys are available to graduate students with a mandatory \$20 refundable deposit. A key requisition form can be picked up from the CEE-MP Reception desk at 7-203 Donadeo ICE, signed by your supervisor, and submitted back to the receptionist. Please allow one full working day for your keys to be issued.

Additionally, if you have been assigned office space in the ICE building, please see the receptionist for Proximity ONEcard access information.

Keys are non-transferable; they are not to be loaned to anyone, including family members. If keys are lost and new ones are issued, the deposit will not be refunded when the second set of keys is returned to the office.

All keys must be returned upon program completion or termination.

Further information on obtaining your Proximity ONEcard is available on the ONEcard Office website at: <a href="mailto:ualberta.ca/onecard">ualberta.ca/onecard</a>

#### 2.5 Personal Information

Students are responsible for the accuracy and validity of their contact information in Bear Tracks (<u>beartracks.ualberta.ca</u>), including mailing address, email address, and telephone number.

Transcripts can be requested from the Office of the Registrar at: <u>ualberta.ca/registrar/records/transcripts</u>.

International students must submit a copy of their study permits to Shared Services at: <a href="mailto:ualberta.ca/services/staff-service-centre">ualberta.ca/services/staff-service-centre</a>—please include your ID number

International students should also obtain a Social Insurance Number (SIN). A SIN is required for all graduate students receiving financial assistance. Please submit the SIN number directly to Shared Services at <a href="mailto:apps.ualberta.ca/sharedservices/staff/contact">apps.ualberta.ca/sharedservices/staff/contact</a>.

#### 2.6 Mail Service

Campus Mail: Currently, a Graduate Student Mailbox for Department-specific mail is unavailable. Department mail for students will be held, and you will be contacted via email to come and pick it up. Campus mail should not be used for sending or receiving personal mail.

#### 2.7 Email

A Campus Computing ID (CCID) and password are issued to every student applicant upon receipt of their application for admission to the University. An email account is provided for communication between the applicant and the University. Note that your CCID is your email username.

Students can access their university email account at <u>ualberta.ca/gmail</u>



# 3. Funding and Financial Support

The Department may provide financial support to Master's and Doctoral graduate students in a variety of ways, such as Graduate Teaching Assistantships (GTAs), Research Assistantships (RAs), Graduate Research Assistantship Fellowships (GRAFs), and scholarships. Please contact your supervisor or Group Graduate Coordinator for information. All students who receive pay from the University must provide their banking information on Bear Tracks.

The Department is unable to provide financial assistance to graduate students in the MEng program.

#### 3.1 Teaching and Research Assistantships

#### 3.1.1 Graduate Teaching Assistantships (GTAs)

GTAs provide support to the undergraduate program. This may be in the form of marking, or it may involve assisting in a laboratory or tutorial. Students interested in being a Graduate Teaching Assistant in specific courses should inform their group coordinator.

GTAs are assigned on a term-by-term basis, and the number of hours per week ranges from 3 to 12. This number reflects the average time commitment of the assignment and not the peak time commitment in any one week. It should be noted that, while the academic term is thirteen weeks long, a student with a GTA is paid for sixteen weeks of work.

Note: Students are not eligible for TA funding in their first semester at the U of A.

- New students arriving at the University of Alberta in their first semester should be focused on getting settled in and completing their coursework and other program requirements (ethics, professional development, etc.)
- New students will learn over this first semester what it is like to be a student at the U of A (i.e. what resources, help, etc. is available, what professors expect from students, etc.)
- TA training is typically offered in August or late December/early January and is only open to students registered in a program at the U of A at the time of offering. Thus, new students arriving in Fall 2022 complete the TA training in late December 2022/early January 2023

#### 3.1.2 Graduate Research Assistantships (GRAs)

The duties of a Graduate Research Assistant (GRA) are primarily in support of a faculty member's academic research. Such responsibilities may include, but are not limited to, collecting/coding/analyzing data, literature reviews, library research, writing reports, designing conference presentations, and preparing materials for submission to funding agencies.

The Graduate Assistantship Supervisor and the GRA is an employment relationship. Please note that hours related to GRA are the maximum hours students can work per week.

#### 3.1.3 Graduate Research Assistant Fellowships (GRAF)

A Graduate Research Assistantship Fellowship (GRAF) is a form of financial assistance provided to graduate students to focus on their education and training, which relates to their own thesis or cited capstone project (directed research project). The relationship between the Assistantship Supervisor and GRAF is not an employment relationship. The GRAF is normally funded through restricted funds (a supervisor's research grant) and may form part of a funding package to support graduate students in their



studies. The value of the fellowship may vary by discipline and by the requirements of the restricted funds supporting the GRAF. There is a minimum stipend to be considered a fully-funded GRAF.

## 3.2 Awards and Scholarships

Detailed information on all available scholarships can be found on the FGSR website: ualberta.ca/graduate-studies/awards-and-funding/scholarships

#### 3.3 Fees

The University of Alberta's fees policies and procedures are stated in the *Tuition and Fees* section of the Calendar: <a href="mailto:calendar.ualberta.ca">calendar.ualberta.ca</a>

For information on fees for graduate students, please refer to <u>gradstudies.ualberta.ca</u> for 2022–2023 fees information and additional sample fee assessments.

Individuals seeking fees information should email grad.fees@uaberta.ca

# 4. Program Requirements

All graduate students in the Department must fulfill the requirements described in this section. As a graduate student in the Department, <u>you</u> are responsible for ensuring that all program requirements are met on the required timeline. Please contact the Graduate Program Advisors if anything is unclear or if you have questions about any requirements or deadlines.

# 4.1 Registration

Although students are ultimately responsible for the accuracy and completeness of their registration, the Department and specifically the supervisor and/or supervisory committee must assist the graduate student in planning the student's program (see *Responsibilities Related to Graduate Programs* in the Calendar).

### 4.2 Appointment of Supervisor(s) for MSc/PhD Students

#### 4.2.1 Supervisor

Every student in a thesis-based program is required to have a supervisor identified in the admissions process.

#### 4.2.2 Supervisor on Leave

If a supervisor's leave exceeds two months, they are required to make adequate provision for supervision of their graduate students during their leave. They must submit a written statement to the Department and the student, describing arrangements for satisfactory supervision during leave.

#### 4.2.3 Supervisory Committee

The supervisory committee is typically formed no later than the end of the first year of the student's program. The Department nominates the supervisory committee on an *Approval of Supervisor and Supervisory Committee* form to the FGSR.



The supervisory committee meets with the graduate student annually to review their program and progress. This annual supervisory committee meeting typically occurs no later than August 31 of a given year.

More information can be found by consulting:

- The Supervision and Supervisory Committees section of the University Calendar
- Areas of Responsibilities Related to Graduate Programs in the FGSR Graduate Program Manual

#### 4.3 Completion of the Supervisor-Student Guidelines

All students registered in a thesis-based program are required to meet with their supervisor (assigned at admission or with an interim academic advisor or the graduate coordinator if one has not yet been assigned—see <u>Timeline for the Appointment of Supervisors</u>) to complete the <u>Supervisor-Student Guidelines</u> <u>Form</u> as soon as possible after registration in the first academic term but no later than the submission of the first Progress Report, which is due in FGSR within 12 months from the student's program start date.

If there is a change in supervisor at any point in a student's program of study, the form should be completed again by the timeline noted.

Completion of the Guidelines Form is required. In instances where the Supervisor-Student Guidelines Form is not submitted within the first 12 months from the student's program start date, the student's registration in subsequent terms will be temporarily restricted as a last resort, until a plan for completion is submitted. In these unlikely instances, FGSR will assist the student and supervisor(s) in completing the form and remove registration restrictions immediately. Note: both the student and supervisor(s) will receive reminders to complete the form in advance of any deadlines, allowing for inquiries to assist or to set out an alternate completion deadline.

If there are changes to the content of the Supervisor-Student Guidelines Form, these changes will be recorded on the student's Progress Report indicating both parties have discussed and mutually agreed to them.

#### 4.4 Progress Report

Student progress in thesis-based programs will be reported at least once annually to the Faculty of Graduate Studies and Research using the standardized Progress Report form. Progress reports are due in FGSR at a minimum once every 12 months of the student's original program start date. The Progress Report Form should be filled out during the annual meeting required for all PhD students. Master's thesis-based students also require at least one progress report completed within a full academic year.

Note: The Progress Report form will be initiated by FGSR for all student-supervisor pairings, as noted on the <u>Appointment of Supervisor(s) & Supervisory Committee</u> form, which is submitted by the academic unit to FGSR. You will receive an email prompt from FGSR when it's time to complete the report.

Completion of the Progress Report is required. In instances where the progress report is not submitted at least once within 12 months, the student's registration in subsequent terms will be restricted as a last resort and temporarily to determine a plan for completion. In these unlikely instances, FGSR will assist the student and supervisor(s) in completing the progress report and remove registration restrictions immediately.



Note: Both the student and supervisor(s) will receive reminders to complete the progress report in advance of any deadlines, allowing for inquiries to assist or to set out an alternate completion deadline.

In instances where more detailed monitoring of a student's academic standing may be required, a progress report form may be filled more than once annually; however, only one (1) progress report may be submitted every four (4) months.

A student who receives two (2) consecutive evaluations of "in need of improvement" or one (1) "unsatisfactory" rating will usually be required to withdraw from their program on the recommendation of the Associate Dean Graduate Students CEE and/or the Department Chair.

#### 4.5 Ethics and Academic Citizenship Requirement

Graduate students, as members of the University of Alberta community, are expected to uphold the highest degree of ethical practice in the conduct of their education, research, workplace behaviour, and professional activities.

Graduate students are responsible for understanding their rights, responsibilities, and obligations, and for adhering to approved university policies and practices including the Code of Student Behaviour, Intellectual Property Guidelines for Graduate Students and Supervisors, <u>Discrimination and Harassment and Duty to Accommodate Policy</u>, <u>Research and Scholarship Integrity Policy</u>, Animal Ethics Policy, Standards for the Protection of Human Research Participants, Conflict of Commitment and Conflict of Interest Policy, and Sexual Violence Policy, among others. Graduate students are also responsible for meeting departmental guidelines and expectations, Tri-Council or other funding bodies ethical requirements, and any ethical codes mandated by a student's professional governing body.

The Ethics and Academic Citizenship Requirement ensures that all graduate students have equal access to information about academic integrity, understand what it means to act with integrity, and are equipped to conduct themselves in ways that uphold the <u>values of the University of Alberta</u>.

To meet this requirement, graduate students will complete the following by the end of the first term of registration in their degree program:

#### Master's Course Based and Thesis

• The six-hour, online, non-credit course INT D 710—Ethics and Academic Citizenship

#### **Doctoral**

- The six-hour, online, non-credit course INT D 710—Ethics and Academic Citizenship
- The two-hour, online, non-credit course INT D 720—Advanced Ethics and Academic Citizenship

Doctoral students who completed their Master's degree at the University of Alberta and previously passed INT D 710 Ethics and Academic Citizenship are only required to take INT D 720—Advanced Ethics and Academic Citizenship.



If a student does not complete the above-noted courses by the end of their first term of registration in their degree program, their registration in subsequent terms will be restricted until the course(s) are completed and a plan for completion is submitted by the student to the Faculty of Graduate Studies and Research.

Note: FGSR will send students reminders to complete the requirement before the end of their first term (if not completed already).

The INT D 710 Ethics and Academic Citizenship course provides foundational knowledge of ethical principles and relevant university policies, including land acknowledgement, academic integrity, plagiarism, introduction to research ethics, conflict of interest, and workplace ethics and self-care (Master's level)

The INT D 720 Advanced Ethics and Academic Citizenship course provides advanced treatment of ethical principles, including Indigenization, academic citizenship, research and scholarship, and ethical principles in university teaching (PhD level).

For information about INT D 710 Ethics and Academic Citizenship and INT D 720 Advanced Ethics and Academic Citizenship, students should refer to FGSR's website.

The Ethics and Academic Citizenship Requirement is a minimum institutional requirement mandated by the Faculty of Graduate Studies and Research and does not supersede discipline-specific requirements stipulated by professional accreditation bodies or agencies. All graduate students are responsible for completing the requirement to successfully complete their course work and the conduct of research.

Ethics education is an integral part of all graduate programs. In addition to the Ethics and Academic Citizenship Requirement, students are expected to seek opportunities to broaden their knowledge of ethics and good practice throughout their programs. Students can find opportunities on the FGSR website.

4.5 Professional Development Requirement for Graduate Students

Engineering students are required to:

- Complete <u>FGSR's professional development requirement</u>, which includes an individualized career plan document called Individual Development Plan (IDP) and eight hours of professional development activities inspired by their career plan;
- 2. Complete professional development requirements specific to the Faculty of Engineering:
  - a. Students doing their first graduate degree in the Faculty of Engineering at the University of Alberta are required to complete an ENGG Grad PD 01 module; or,
  - b. Students who have completed ENGG 600 and/or ENGG Grad PD 01 in a previous degree are required to complete four hours of professional development in the areas of communication, networking, EDI, university teaching, and career development. These hours must be included in the student's IDP and approved by their supervisor/advisor. Students should submit the PD/IDP forms to the Department Graduate Office.

PD opportunities can be found here on the FGSR website: ualberta.ca/graduate-studies/professional-development/events



The Department has the authority to determine whether a session/workshop is acceptable as the PD requirement for our students. Each department has different criteria for accepting and recognizing the PD requirement, and a session/workshop accepted as PD by one department may not be accepted by another.

#### 4.6 Degrees Offered

The Department offers MEng, MSc, and PhD degrees in ten research disciplines and cross-disciplinary studies. The Cross-Disciplinary study allows students to tailor their courses to more than one discipline to obtain a general research degree in Civil Engineering.

The specific course requirements for each research discipline and the Cross-Disciplinary study are outlined in Section 5.

#### 4.6.1 Doctor of Philosophy (PhD)

The PhD is a research-based degree with a minimum period of residence of two full-time academic years at the University of Alberta. The two years need not be consecutive. Residency requirements provide students with exposure to university life and interaction with faculty members and other graduate students. Through coursework, seminar participation, teaching, faculty interaction and faculty-directed research, students learn to be independent researchers and scholars in an academic discipline.

The course requirements for the PhD vary by research discipline (see Section 5); however, all PhD students must complete a minimum of ten (10) courses beyond their Bachelor's degree (three of which must be during their current PhD program) in addition to INTD 720 and the Faculty of Engineering Professional Development requirements. All PhD candidates must prepare and defend a thesis of high calibre on an approved topic.

#### 4.6.1.1 PhD Candidacy Examination

Normally, the candidacy exam occurs within two years of the beginning of the PhD program and not less than six months prior to the final examination. All program requirements, other than the thesis research, must be completed within 36 months of the commencement of a student's program.

Five (5) weeks prior to the candidacy examination, the supervisor proposes a date for the examination and the composition of the examining committee. The Department submits a Notice and Approval of Doctoral Candidacy Examining Committee & Examination Date form to FGSR.

After a successful examination, the Department submits a Report of Completion of Candidacy form to FGSR. If not successful, the Department recommends the best course of action to FGSR.

#### 4.6.1.2 PhD Final Oral Examination

Prior to setting examination dates and before the thesis is sent to the external examiner, all supervisory committee members declare in writing to the supervisor that the thesis is adequate to proceed to the final oral examination by signing the "Preliminary Thesis Acceptance Form".



#### 4.6.1.3 Timeline

Three months before examination	The supervisor nominates an external examiner.
Two months prior to examination	The Department nominates an external examiner to FGSR and completes a Request to Invite External Reader or Examiner for Final Doctoral Oral Examination form.  The Department invites the external examiner.
Five weeks prior to examination	The supervisor proposes a date for the examination, the composition of the rest of the examining committee and submits both the thesis and the Preliminary Thesis Acceptance Form.
	The Department recommends the examining committee to FGSR using a Notice and Approval of Doctoral Final Oral Examining Committee & Examination Date form. The Department notifies examiners (including the external examiner) of the date and supplies them with a copy of the thesis.
	No additional revised copies of the thesis should be sent to the examining committee or external examiner prior to the defense.
Shortly after the examination	The Department advises FGSR of the committee's decision on a Thesis Approval / Program Completion form.
Within six months of Final Oral examination	The student must submit their thesis for review and approval by FGSR.

#### 4.6.2 Master of Science (MSc)

The MSc is a research-based master's degree with no residency requirement. All MSc students must complete a minimum of six (6) courses (course requirements for the MSc vary by research discipline (Section 5), in addition to INTD 710 and the Faculty of Engineering Professional Development requirements.

All MSc students must defend the thesis before a panel of three or more academic staff members, including the thesis supervisor(s).

The time required to complete the MSc program will vary according to the previous training of the student and the nature of the research undertaken. However, two years is normally the minimum time required, with a maximum of four years to complete the program (from the date of first registration).

#### 4.6.2.1 Final Oral Examination

A minimum of 5 weeks prior to the exam, the supervisor proposes a date for the examination, the composition of the examining committee and submits the thesis. The Department recommends the examining committee members to FGSR using a Notice and Approval of a Master's Final Oral Examining Committee & Examination Date form, notifies examiners of the date, and supplies a copy of the thesis.

Shortly after the examination, the Department advises FGSR of the examining committee's decision, on the Thesis Approval / Program Completion form.



Within six months of examination, the student must submit their thesis for review and approval by the Faculty of Graduate Studies and Research.

#### 4.6.3 Master of Engineering (MEng)

The MEng is a non-thesis, course-based master's degree with no residency requirement. The MEng program can be completed in a minimum of twelve months with a maximum time of four years from the date of first registration.

An MEng requires the completion of a minimum of eight (8) graduate courses and a directed research project (900 level), as well as INTD 710 and the Faculty of Engineering Professional Development requirements. The directed research project is equivalent to one three-credit course (approximately 160 hours of work).

MEng students must register in the appropriate Directed Research Project (900-level)—please contact the Graduate Office to register. Directed Research Project (900-level) is restricted to students in course-based Master's programs.



# 5. Course Requirements

The following sections outline the course requirements for each of the degree options and different discipline areas offered in the Department of Civil and Environmental Engineering. Students must maintain a GPA of at least 2.7 to remain in the MSc and MEng program, or 3.0 to remain in the PhD program.

# 5.1 Construction Engineering and Management

Degree	Course credits
Master of Engineering	9 courses plus a Capstone project, in the sequence as follows:
Structured 2 years	<b>Term 1 (Fall 2022)</b> CIV E 602, CIV E 608 and CIV E 789 (Communications for Engineers)
	<b>Term 2 (Winter 2023)</b> CIV E 607, CIV E 709 (Sustainability) and CIV E 709 (Lean Construction)
	<b>Term 3 (Fall 2023)</b> General elective, CIV E 601, CIV E 779 (Smart Cities)
	<b>Term 4 (Winter 2024)</b> Capstone project (CIV E 900 Directed Research—Construction section)
	Any deviations from the structured program must be approved by the MEng Academic Coordinator and must meet the minimum requirements of the flexible program.
Flexible 1-4 years	<ul> <li>8 courses:</li> <li>3 Core Courses: CIV E 601, CIV E 602 and CIV E 709 (Lean Construction)</li> <li>3 Elective Courses related to discipline area from: CIV E 603, CIV E 605, CIV E 606, CIV E 607, CIV E 608, or CIV E 709 (Sustainable Construction)</li> <li>2 Elective Courses: any 500-, 600- or 700-level Engineering course, approved by the MEng Academic Coordinator.</li> <li>Plus a Capstone project (CIV E 900 Directed Research—General section).</li> </ul>
Master of Science	<ul> <li>6 courses:</li> <li>3 Core Courses: CIV E 601, CIV E 602, and CIV E 709 (Lean Construction)</li> <li>2 Elective Courses related to discipline area: CIV E 603, CIV E 605, CIV E 606, CIV E 607, CIV E 608 or CIV E 709 (Sustainable Construction)</li> <li>1 Elective Course: any 500-, 600- or 700-level Engineering course, approved by the supervisor.</li> <li>Plus a thesis.</li> </ul>
Doctor of Philosophy	10 courses beyond the Bachelor's Degree, with a minimum of 3 courses during the doctoral program at the University of Alberta:



<ul> <li>3 Core Courses: CIV E 601, CIV E 602, and CIV E 709 (Lean Construction)</li> <li>Electives as approved by the supervisor and the supervisory committee.</li> </ul>
Plus a thesis.

# 5.2 Environmental Engineering and Environmental Science

Degree	Course credits
Master of Engineering	8 courses:  4 Courses from: CIV E 620, CIV E 622, CIV E 624, CIV E 628 or CIV E 657.  4 Elective Courses: any 500-, 600- or 700-level, Engineering or Science courses, within the Environmental Engineering and Science or related field, approved by the MEng Academic Coordinator.  Plus a Capstone project (CIV E 900 Directed Research).
Master of Science	<ul> <li>6 courses:</li> <li>3 Courses from: CIV E 620, CIV E 622, CIV E 624, CIV E 628 or CIV E 657.</li> <li>3 Elective Courses: any 500-, 600- or 700-level, Engineering or Science courses, within the Environmental Engineering and Science or related field, approved by the supervisor.</li> <li>Plus a thesis.</li> </ul>
Doctor of Philosophy	<ul> <li>10 courses beyond the Bachelor's degree, with a minimum of 3 courses during the doctoral program at the University of Alberta: <ul> <li>3 Courses from: CIV E 620, CIV E 622, CIV E 624, CIV E 628 or CIV E 657.</li> <li>Electives: any 500-, 600- or 700- level, Engineering or Science course, within the Environmental Engineering and Science or related field, as approved by the supervisor and the supervisory committee.</li> </ul> </li> <li>Plus a thesis.</li> </ul>



# 5.3 Geoenvironmental Engineering

Degree	Course credits
Master of Engineering	<ul> <li>8 courses:</li> <li>3 Core Courses: CIV E 680, 682, and 695.</li> <li>3 Elective Courses related to discipline area from:     CIV E 681, CIV E 683, CIV E 684, CIV E 697, approved     by the group Graduate Coordinator.</li> <li>2 Elective courses: any 500-, 600-, 700- level     Engineering or Science course, approved by the MEng     Academic Coordinator.</li> <li>Plus a Capstone project (CIV E 900 Directed Research).</li> </ul>
Master of Science	6 courses:  • 3 Core Courses: CIV E 680, CIV E 682, and CIV E 695.  • 2 Elective Courses related to discipline area from: CIV E 681, 683, 684, and 697, approved by the supervisor  • 1 Elective Course: any 500-, 600- or 700-level Engineering or Science course, approved by the supervisor. Plus a thesis.
Doctor of Philosophy	<ul> <li>10 courses beyond the Bachelor's degree, with a minimum of 3 courses during the doctoral program at the University of Alberta:</li> <li>3 Core Courses: CIV E 680, CIV E 682, and CIV E 695.</li> <li>Electives, as approved by the supervisor and the supervisory committee.</li> <li>Plus a thesis.</li> </ul>



# 5.4 Geotechnical Engineering

Degree	Course credits
Master of Engineering Structured 2 years	9 courses plus a Capstone project, in the sequence as follows*:
	<b>Term 1 (Fall 2022)</b> CIV E 680, CIV E 697 and CIV E 789 (Communications for Engineers)
	<b>Term 2 (Winter 2023)</b> CIV E 690, CIV E 695, one of CIV E 609 or CIV E 689
	<b>Term 3 (Fall 2023)</b> CIV E 683, CIV E 684, one of CIV E 682 or CIV E 780 (Risk Management)
	Term 4 (Winter 2024) Capstone project (CIV E 900 Directed Research—Geotech section)
	Any deviations from the structured program must be approved by the MEng Academic Coordinator and must meet the minimum requirements of the flexible program.
Flexible 1-4 years	<ul> <li>8 courses:</li> <li>3 Core Courses: CIV E 680, CIV E 690, and CIV E 695.</li> <li>3 Elective courses related to discipline area from:     CIV E 664, CIV E 681, CIV E 683, CIV E 684, CIV E 697,     CIV E 799 (Rock Engineering), and CIV E 799     (Numerical Modelling), as approved by the MEng     Academic Coordinator.</li> <li>2 Elective Courses: any 500-, 600- or 700-level     Engineering or Science course, approved by the MEng     Academic Coordinator.</li> <li>Plus a Capstone project (CIV E 900 Directed Research—     General section).</li> </ul>
Master of Science	<ul> <li>6 courses:</li> <li>3 Core Courses: CIV E 680, CIV E 690, and CIV E 695.</li> <li>2 Elective Courses related to discipline area from:     CIV E 664, CIV E 681, CIV E 683, CIV E 684, CIV E 697,     CIV E 799 (Rock Engineering), CIV E 799 (Numerical Modelling), as approved by the supervisor.</li> <li>1 Elective Course: any 500-, 600- or 700-level Engineering or Science course, approved by the supervisor.</li> <li>Plus a thesis.</li> </ul>
Doctor of Philosophy	10 courses beyond the Bachelor's degree, with a minimum of 3 courses during the doctoral program at the University of Alberta:  • 3 Core Courses: CIV E 680, CIV E 690, and CIV E 695.  • Electives, as approved by the supervisor and the supervisory committee.  Plus a thesis.



# 5.5 Mining Engineering

Degree	Course credits
Master of Engineering	<ul> <li>8 courses: <ul> <li>1 Core Course: MIN E 610</li> <li>2 Courses: 600- level Mining courses, approved by the MEng Academic Coordinator.</li> <li>3 Elective Courses: 500-, 600- or 700- level, related to discipline area, as approved by the MEng Academic Coordinator.</li> <li>2 Elective Courses: any 500-, 600- or 700- level, Engineering or Science course, approved by the MEng Academic Coordinator.</li> </ul> </li> <li>Plus a Capstone project (MIN E 900 Directed Research).</li> </ul>
Master of Science	<ul> <li>6 courses:</li> <li>1 Core Course: MIN E 610</li> <li>2 Courses: 600- level Mining courses, approved by the supervisor.</li> <li>2 Elective Courses: 500-, 600- or 700- level, related to discipline area, approved by the supervisor</li> <li>1 Elective Course: any 500-, 600- or 700-level, approved by the supervisor.</li> <li>Plus a thesis.</li> </ul>
Doctor of Philosophy	<ul> <li>10 courses beyond the Bachelor's degree, with a minimum of 3 courses during the doctoral program at the University of Alberta: <ul> <li>1 Core Course: MIN E 610</li> <li>2 Courses: 600- level Mining courses, approved by the supervisor and the supervisory committee.</li> <li>Electives: approved by the supervisor and the supervisory committee.</li> </ul> </li> <li>Plus a thesis.</li> </ul>



# 5.6 Petroleum Engineering

Degree	Course credits
Master of Engineering Structured 2 years	9 courses plus a Capstone project, in the sequence as follows*:
Structureu 2 years	<b>Term 1 (Fall 2022)</b> PET E 631, CIV E 789 (Communications for Engineers), and one 500/600/700 level general elective
	<b>Term 2 (Winter 2023)</b> PET E 630, PET E 636, PET E 664
	<b>Term 3 (Fall 2023)</b> Choose three 500/600/700 general electives
	<b>Term 4 (Winter 2024)</b> Capstone project (PET E 900 Directed Research)
	Any deviations from the structured program must be approved by the MEng Academic Coordinator and must meet the minimum requirements of the flexible program.
Flexible 1-4 years	<ul> <li>8 courses:</li> <li>4 Core Courses: PET E 630, PET E 631, PET E 664, and either PET E 636 or PET E 649.</li> <li>4 Elective Courses: any 500-, 600- or 700-level, Science or Engineering course, (one of which must be a PET E course), as approved by the MEng Academic Coordinator.</li> </ul>
	Plus a Capstone project (PET E 900 Directed Research).
Master of Science	<ul> <li>6 courses.</li> <li>3 Core Courses from: PET E 630, PET E 631, PET E 664, PET E 636 or PET E 649.</li> <li>3 Elective Courses: any 500-, 600- or 700-level, Science or Engineering course, (one of which must be a PET E course), as approved by the supervisor.</li> </ul>
	Plus a thesis.
Doctor of Philosophy	<ul> <li>10 courses beyond the Bachelor's degree, with a minimum of 3 courses during the doctoral program at the University of Alberta:</li> <li>3 Courses from: PET E 630, PET E 631, PET E 664, PET E 636 or PET E 649.</li> <li>Electives, as approved by the supervisor and the supervisory committee.</li> <li>Plus a thesis.</li> </ul>



# 5.7 Structural Engineering

Degree	Course credits
Master of Engineering Structured 2 years	9 courses plus a Capstone project, in the sequence as follows*:
	<b>Term 1 (Fall 2022)</b> CIV E 660, CIV E 670 and CIV E 789 (Communications for Engineers)
	<b>Term 2 (Winter 2023)</b> CIV E 665, CIV E 672 and CIV E 676
	<b>Term 3 (Fall 2023)</b> CIV E 662 and two from either CIV E 779 (Machine Learning for Engineers), CIV E 779 (Smart Cities) or CIV E 661
	<b>Term 4 (Winter 2024)</b> Capstone project (CIV E 900 Directed Research—Structures section)
	Any deviations from the structured program must be approved by the MEng Academic Coordinator and must meet the minimum requirements of the flexible program.
Flexible 1-4 years	<ul> <li>8 courses:</li> <li>4 Core Courses: CIV E 660, CIV E 665, and two from CIV E 661, CIV E 670, or CIV E 672.</li> <li>4 Elective Courses: any 500-, 600- or 700-level, Science or Engineering course, as approved by the MEng Academic Coordinator.</li> <li>Plus a Capstone project (CIV E 900 Directed Research—General section).</li> </ul>
Master of Science	<ul> <li>6 courses:</li> <li>3 Core Courses: CIV E 660, CIV E 665, and either CIV E 670 or CIV E 672.</li> <li>3 Elective Courses: any 500-, 600- or 700-level, Science or Engineering course, as approved by the supervisor.</li> <li>Plus a thesis.</li> </ul>
Doctor of Philosophy	10 courses beyond the Bachelor's degree, with a minimum of 3 courses during the doctoral program at the University of Alberta:  • 6 Courses: CIV E 660, CIV E 661, CIV E 665, CIV E 664, and two design-based courses from: CIV E 662 (Timber Design) CIV E 670, CIV E 672, CIV E 678.  • Electives, as approved by the supervisor and the supervisory committee. Plus a thesis.



# 5.8 Transportation Engineering

Degree	Course credits
Master of Engineering Structured 2 years	9 courses plus a capstone project, in the sequence as follows*:
	<b>Term 1 (Fall 2022)</b> CIV E 614, Elective (Any CIV MEC 500/600/700 course) and CIV E 789 (Communications for Engineers)
	<b>Term 2 (Winter 2023)</b> CIV E 616, CIV E 719 (Resilient Transportation), CIV E 719 (Pavement)
	<b>Term 3 (Fall 2023)</b> CIV E 612, CIV E 779 (Machine Learning), CIV E 779 (Smart Cities)
	<b>Term 4 (Winter 2024)</b> Capstone project (CIV E 900 Directed Research—Transportation section)
	Any deviations from the structured program must be approved by the MEng Academic Coordinator and must meet the minimum requirements of the flexible program.
Flexible 1-4 years	<ul> <li>8 courses:</li> <li>3 Core Courses: CIV E 612, CIV E 614 and CIV E 616</li> <li>3 Elective Courses related to the discipline area, such as: CIV E 719 (Sustainable/Resilient Transportation), CIV E 719 (Geomatics), CIV E 719 (Pavement), CIV E 779 (Machine Learning), CIV E 779 (Smart Cities) as approved by the MEng Academic Coordinator.</li> <li>2 Elective Courses: any 500-, 600- or 700-level, Engineering or Science course, as approved by the MEng Academic Coordinator.</li> </ul>
	Plus a Capstone project (CIV E 900 Directed Research—General section).
Master of Science	<ul> <li>6 courses:</li> <li>3 Core Courses: CIV E 612, CIV E 614, and CIV E 616.</li> <li>2 Elective Courses related to the discipline area, as approved by the supervisor.</li> <li>1 Elective Course: any 500-, 600- or 700-level, Engineering or Science course, as approved by the supervisor.</li> </ul>
Do stoy of Philosoghy	Plus a thesis.  10 courses beyond the Bachelor's degree, with a minimum of
Doctor of Philosophy	3 courses during the doctoral program at the University of Alberta:
	<ul> <li>3 Core Courses: CIV E 612, CIV E 614, and CIV E 616.</li> <li>Electives, as approved by the supervisor and the supervisory committee.</li> <li>Plus a thesis.</li> </ul>



# 5.9 Water Resources Engineering

Degree	Course credits
Master of Engineering	<ul> <li>8 courses:</li> <li>4 Courses from: CIV E 631, CIV E 636, CIV E 641, CIV E 645, or CIV E 739.</li> <li>4 Elective Courses: any 500-, 600- or 700-level, Engineering or Science course, as approved by the MEng Academic Coordinator.</li> <li>Plus a Capstone project (CIV E 900 Directed research).</li> </ul>
Master of Science	<ul> <li>6 courses:</li> <li>4 Courses from: CIV E 631, CIV E 636, CIV E 641, CIV E 645, or CIV E 739.</li> <li>2 Elective Courses: any 500-, 600- or 700-level, Engineering or Science course, as approved by the supervisor.</li> <li>Plus a thesis.</li> </ul>
Doctor of Philosophy	<ul> <li>10 courses beyond the Bachelor's degree, with a minimum of 3 courses during the doctoral program at the University of Alberta:</li> <li>3 Courses from: CIV E 631, CIV E 636, CIV E 641, CIV E 645, or CIV E 739.</li> <li>Electives, as approved by the supervisor and the supervisory committee.</li> <li>Plus a thesis.</li> </ul>



# 5.10 Cross-Disciplinary Study with Degree in Civil and Environmental Engineering

Degree	Course credits
Master of Engineering	8 courses:  • 6 courses: 600- or 700-level CIV E, MIN E, or PET E courses, as approved by the MEng Academic Advisor.  • 2 Elective courses: 500-, 600- or 700-level, Engineering or Science courses, as approved by the MEng Academic Advisor.  Plus a Capstone project (CIV E 900 Directed Research).
Master of Science	<ul> <li>6 courses:</li> <li>4 courses: 600- or 700-level CIV E, MIN E, or PET E courses, as approved by the supervisor.</li> <li>2 Elective courses: 500-, 600- or 700-level, Engineering or Science courses, as approved by the supervisor.</li> <li>Plus a thesis.</li> </ul>
Doctor of Philosophy	10 courses beyond the Bachelor's degree, with a minimum of 3 CIV E, MIN E, or PET E courses during the doctoral program at the University of Alberta:  • Courses, as approved by the supervisor and the supervisory committee. Plus a thesis.

Certain streams within the cross-disciplinary area have specific courses as shown in the following tables.



# 5.10.1 Building Engineering Program

Degree	Course credits
Master of Engineering	<ul> <li>8 courses:         <ul> <li>5 courses from: CIV E 605, CIV E 662 (Structural Timber Design), CIV E 676, CIV E 709 (BIM Project Management), CIV E 709 (Lean Construction), CIV E 709 (Robotics in Construction), CIV E 779 (Fundamentals of Building Science), CIV E 779 Machine Learning for Engineers), ENG M 558 (Ergonomics and Work Station), ENG M 607 (Lean Manufacturing)</li> <li>3 Elective Courses: any 500-, 600- or 700-level course, as approved by the MEng Academic Coordinator.</li> </ul> </li> <li>Plus a Capstone project (CIV E 900 Directed Research).</li> </ul>
Master of Science	6 courses:
Doctor of Philosophy	10 courses beyond the Bachelor's degree, with a minimum of 3 courses during the doctoral program at the University of Alberta:  • 4 courses from: CIV E 605, CIV E 662 (Structural Timber Design), CIV E 676, CIV E 709 (BIM Project Management), CIV E 709 (Lean Construction), CIV E 709 (Robotics in Construction), CIV E 779 (Fundamentals of Building Science), CIV E 779 (Machine Learning for Engineers), ENG M 558 (Ergonomics and Work Station), ENG 607 (Lean Manufacturing)  • Electives; as approved by the supervisor and the supervisory committee.  Plus a thesis.



# 5.10.2 Cellulosic Nanomaterials Program

Degree	Course credits
Master of Engineering	<ul> <li>8 courses:</li> <li>4 Courses from: CIV E 622, CIV E 631, CH E 512, CH E 611, CH E 617, MEC E 633, MEC E 637, MEC E 662 or MEC E 682.</li> <li>4 Elective courses: any 500-, 600- or 700-level course, as approved by the MEng Academic Coordinator.</li> <li>Plus a Capstone project (CIV E 900 Directed Research).</li> </ul>
Master of Science	6 courses:  4 Courses from: CIV E 622, CIV E 631, CH E 512, CH E 611, CH E 617, MEC E 633, MEC E 637, MEC E 662 or MEC E 682.  2 Elective courses: any 500-, 600- or 700-level course, as approved by the supervisor.  Plus a thesis.
Doctor of Philosophy	<ul> <li>10 courses beyond the Bachelor's degree, with a minimum of 3 courses during the doctoral program at the University of Alberta:</li> <li>4 Courses from: CIV E 622, CIV E 631, CH E 512, CH E 611, CH E 617, MEC E 633, MEC E 637, MEC E 662 or MEC E 682.</li> <li>Electives, as approved by the supervisor and the supervisory committee.</li> <li>Plus a thesis.</li> </ul>



# 5.10.3 Pavement Engineering Program

Degree	Course credits
Master of Engineering	<ul> <li>8 courses:</li> <li>2 Courses from: CIV E 601, CIV E 602, CIV E 664, CIV E 680, CIV E 681, CIV E 690, CIV E 695, CIV E 697 or CIV E 799.</li> <li>6 Elective courses: any 500-, 600- or 700-level course, as approved by the MEng Academic Coordinator.</li> <li>Plus a Capstone project (CIV E 900 Directed Research).</li> </ul>
Master of Science	<ul> <li>6 courses:</li> <li>2 Courses from: CIV E 601, CIV E 602, CIV E 664, CIV E 680, CIV E 681, CIV E 690, CIV E 695, CIV E 697 or CIV E 799.</li> <li>4 Elective courses: any 500-, 600- or 700-level course, as approved by the supervisor.</li> <li>Plus a thesis.</li> </ul>
Doctor of Philosophy	<ul> <li>10 courses beyond the Bachelor's degree, with a minimum of 3 courses during the doctoral program at the University of Alberta:</li> <li>2 Courses from: CIV E 601, CIV E 602, CIV E 664, CIV E 680, CIV E 681, CIV E 690, CIV E 695, CIV E 697 or CIV E 799.</li> <li>Electives, as approved by the supervisor and the supervisory committee.</li> <li>Plus a thesis.</li> </ul>



# 5.10.5 Underground Trenchless Construction Program

Degree	Course credits
Master of Engineering	<ul> <li>8 courses:</li> <li>1 Core Courses- CIV E 609, and two from CIV E 601, CIV E 602, CIV E 664, CIV E 680, CIV E 681, CIV E 690, CIV E 695 or CIV E 697.</li> <li>5 Elective courses: any 500-, 600- or 700-level course, as approved by the MEng Academic Coordinator.</li> <li>Plus a Capstone project (CIV E 900 Directed Research).</li> </ul>
Master of Science	<ul> <li>6 courses:</li> <li>1 Core Courses- CIV E 609, and two from CIV E 601, CIV E 602, CIV E 664, CIV E 680, CIV E 681, CIV E 690, CIV E 695 or CIV E 697.</li> <li>3 Elective courses: any 500-, 600- or 700-level course, as approved by the supervisor.</li> <li>Plus a thesis.</li> </ul>
Doctor of Philosophy	<ul> <li>10 courses beyond the Bachelor's degree, with a minimum of 3 courses during the doctoral program at the University of Alberta:</li> <li>3 Core Courses: CIV E 601, CIV E 602 and CIV E 609</li> <li>2 Elective Courses: CIV E 664, CIV E 680, CIV E 681, CIV E 690, CIV E 695 or CIV E 697.</li> <li>Electives, as approved by the supervisor and the supervisory committee.</li> <li>Plus a thesis.</li> </ul>



# 6. Course Exemption

Graduate students can request exemptions for *no more than two* courses taken at another institution or in another program.

In seeking a course exemption for a course in a graduate program in the Department, the student must present detailed course material to the CEE course instructor (not his/her supervisor and not the Graduate Coordinator). The CEE instructor will review the course material from the other institution/program in detail and make sure that the student has learned the material that is covered in the required CEE graduate course.

Note that the student must have obtained a minimum grade of B (or equivalent) or higher in the course(s) from another university/program.

#### The process is as follows:

1	The student identifies the appropriate course in the Department and provides all the course material from another university/program to the CEE course instructor.
2	<ul> <li>The course material must include</li> <li>The transcript showing the course title, description, grade and year taken</li> <li>The official course outline as provided by the institution or instructor of the course</li> <li>If needed, the CEE instructor may request additional course material from the other institution/program, such as notes, assignments, exams, etc.</li> </ul>
3	The CEE instructor will decide if the material presented by the student covers the majority (i.e. more than 80%) of the equivalent CEE course.
4	If the CEE instructor is satisfied with the course(s) completed in another university/program, and if the student is not required to take the course, the instructor will send an email outlining the reasons for granting the exemption to the Group Graduate Coordinator.
5	The Group Graduate Coordinator will review the recommendation from the instructor and send an email to the Graduate Program office, advising of the outcome.
6	Final approval will be made by the Associate Dean—Graduate Studies of the Department.

#### Important notes

If a student is granted exemption to a required course, it does not mean that he/she will be given credit for the course. The course will not appear on the student's transcript. The only time a course appears on the transcript is a course completed at the University of Alberta or under an official exchange agreement, such as the Western Dean's Agreement.

MSc and MEng students must complete a minimum of 6 and 8 courses, respectively, regardless of the number of courses being exempted. If a core course is exempted, the student must take another approved graduate course to meet the minimum course requirement.



# **Revision History**

25-Aug-22	Original
4-Oct-22	Revision 1:
	Page 10. Completion of Supervisor-Student Guidelines form link
	Page 22 Structural MSc requirements - we added the words "and either" right before CIVE
	670 or CIVE 672.