



UNIVERSITY OF
ALBERTA

Department of Civil and Environmental Engineering
School of Mining and Petroleum Engineering

Graduate Studies Handbook

2020–2021

Note: *Some of the procedures and processes stated in this handbook may be modified due to the COVID-19 pandemic. Please consult with the Department Graduate Office if you have any questions or concerns regarding your program. We appreciate your understanding while we continue to work through the evolving nature of the current pandemic.*

Updated: November 6, 2020

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UNIVERSITY OF ALBERTA

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 the Canada to benefit from a true spirit of co-operation between engineering education and industry. The insight and knowledge shared between professors and students has inspired new ideas and resulted in greater research learning opportunities. On behalf of the department we hope your studies will be rewarding and wish you great success in your personal, academic, and professional life.



Natural Resources Engineering Facility (NREF)

1. Introduction

This handbook contains information specific to the graduate programs 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: <https://calendar.ualberta.ca/>
- FGSR Graduate Program Manual: <https://www.ualberta.ca/graduate-studies/about/graduate-program-manual>

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

2. Department Information

2.1. Graduate Program Contacts

<p>Graduate Program Advisors Ms. Ellie Kim – 7-209 ICE Ms. Arlene Figley – 7-211 ICE Ms. Trina Catral – 7-215 ICE Email: cgradvis@ualberta.ca</p> <p>Associate Chair, Graduate Studies Dr. Selma E Guigard Office: 7-237 ICE Email: selma.guigard@ualberta</p>	<p>Department Reception 7-203 ICE</p> <p>Department Contact Address: Department of Civil and Environmental Engineering School of Mining and Petroleum Engineering 7-207 Donadeo innovation Centre for Engineering Edmonton, Alberta CANADA T6G 1H9 780 492 4235 www.engineering.ualberta.ca/civil</p>

2.2. Group Graduate Coordinators

Individual research groups within the Department enjoy a certain level of autonomy in setting their own procedures; there may be variations between groups.

Construction Engineering and Management Dr. Ahmed Hammad – 6-308 ICE ahammad@ualberta.ca	Environmental Engineering Dr. Ian Buchanan – 7-271 ICE ian.buchanan@ualberta.ca
Geotechnical Engineering Dr. Michael Hendry – 6-226 ICE hendry@ualberta.ca	Mining Engineering Dr. Yashar Pourrahimian – 6-243 ICE pourrahi@ualberta.ca
Petroleum Engineering Dr. Japan Trivedi – 6-302 ICE jtrivedi@ualberta.ca	Structural Engineering Dr. Carlos Cruz-Noguez – 7-306 ICE cruznogu@ualberta.ca
Transportation Engineering Dr. Tae J Kwon – 6-285 ICE tjkwon@ualberta.ca	Water Resources Engineering Dr. Evan Davies – 7-261 ICE evan.davies@ualberta.ca

2.3. Subdisciplinary Studies Contacts

Biomechanics Engineering Dr. Samer Adeeb – 7-245 ICE adeeb@ualberta.ca	Building Engineering Construction Dr. Yuxiang Chen – 6-257 ICE ychen5@ualberta.ca
Cellulosic NanoMaterials Program Dr. Yaman Boluk – 7-273 ICE yaman.boluk@ualberta.ca	Pavement Engineering Dr. Ali Bayat – 7-243 ICE abayat@ualberta.ca
Underground Trenchless Construction Dr. Ali Bayat – 7-243 ICE abayat@ualberta.ca	

2.4. Desks and Offices

Graduate students will be assigned desks accordance with 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 in accordance with the policy. Graduate students in the MEng program are not eligible for office space in Donadeo ICE and may only be housed in research space.
- Graduate students may be housed in NREF if space is available; otherwise, space is available in designated areas on the 6th floor of Donadeo ICE (6-244, 6-361, 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.

2.5. Building Access and Keys

Some spaces in Donadeo Ice and NREF are accessible to authorized personnel, either by keys or by a Proximity One Card. Office and laboratory keys are available to graduate students with a mandatory \$20.00 refundable deposit. A key requisition form signed by your supervisor should be submitted to the receptionist at 7-203 Donadeo ICE. 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; and are not to be loaned to anyone including family members. In the event that keys are lost and new ones 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: <http://onecard.ualberta.ca/>

2.6. Personal Information

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

International students must submit a copy of their study permits to the Department, as well as to Human Resources

Human Resources
2-60 University Terrace
8303 112 Street NW
Edmonton, Alberta
Canada T6G 1K4

International students should also arrange to obtain a Social Insurance Number (SIN). SINs are required for all graduate students receiving financial assistance.

2.7. Mail Service

For a maximum of three (3) months you may have mail sent to you care of the following address:

(Your Name) c/o
International Centre
172 HUB International
University of Alberta
Edmonton, Alberta
CANADA T6G 2E1

Please make prior arrangements with this service at the International Centre located at 172 HUB Mall.

Personal Mail: Students must direct all personal mail to their home address or post office box. Any personal mail arriving in the main office (7-207 Donadeo ICE) will be labeled with a request to the students to make arrangements to have their mail sent directly to their home address.

Campus Mail: At this time a Graduate Student Mailbox for Department-specific mail is not available. Department mail for students will be held and you will be contacted via email to come and pick it up.

2.8. E-mail

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

Students can access their university email account at <http://www.ualberta.ca/gmail/>.

3. Funding and Financial Support

The Department may provide financial support to graduate students in a variety of ways, such as Graduate Teaching Assistantships (GTAs), Research Assistantships (RAs), and 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 complete the banking information on Bear Tracks.

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.

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

3.1.3. Graduate Research Fellowships (GRAF)

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

3.2. Awards and Scholarships

Detailed information of all available scholarships can be found on the FGSR website:

<https://www.ualberta.ca/graduate-studies/awards-and-funding/scholarships>

3.3. Fees

The University of Alberta's fees policies and procedures are stated in the *Fees Payment Guide* section of the Calendar: <https://calendar.ualberta.ca/content.php?catoid=29&navoid=7282>

Information on fees for graduate students is found in the *Graduate Instructional and Non-Instructional Fees* section in the Calendar:

<https://calendar.ualberta.ca/content.php?catoid=29&navoid=7282#graduate-instructional-and-non-instructional-fees>

Individuals seeking fees information should consult these sections or the FGSR website:

<https://www.ualberta.ca/graduate-studies>

4. Program Requirements

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

4.1. Registration

Although students are ultimately responsible for the accuracy and completeness of their own registration, it is the responsibility of the department and specifically the supervisor and/or supervisory committee to 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

For students in the MSc and PhD programs, supervisors are assigned at the time of admission. Supervisors are nominated by the Department to the Faculty of Graduate Studies and Research (FGSR) using the *Approval of Supervisor and Supervisory Committee* form.

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 to 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 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. First meeting reports and annual reports

Within one month of beginning their programs, all MSc and PhD students must meet with their supervisor(s) and complete the First Meeting report, which is designed to make new students aware of responsibilities, regulations and expectations. Students enrolled in the MEng program should meet with their Group Graduate Coordinator to complete this First Meeting Report.

4.4. Ethics and Academic Integrity Training (ENGG 600)

Ethics and academic integrity training is mandatory for all graduate students at the University of Alberta. All new graduate students are strongly encouraged to register for **ENGG 600** Engineering Ethics and

Integrity in their first semester. ENGG 600 is a one-day workshop offered in September and January, and students can register for this course on Bear Tracks.

More information on FGSR's academic integrity and ethics training requirements can be found on the FGSR website: <https://www.ualberta.ca/graduate-studies/current-students/academic-requirements/ethics>

4.5. Professional Development Requirement for Graduate Students

The University of Alberta considers professional development (PD) to be an important component of any graduate student's program of studies and **it is a mandatory requirement for all graduate students.**

The Professional Development (PD) requirement consists of two components:

1. **Individual Development Plan (IDP) workbook**
2. **Professional Development activities**

Although it is strongly suggested that students complete the PD requirement within the first year of their program, the Department's mandatory deadlines to complete the PD requirement and submit the necessary PD documents to the Graduate Program Office are the following:

- For MSc students: before scheduling the MSc defense
- For MEng students: before completing the program (and typically before completing the capstone project)
- For PhD students: before scheduling the PhD Candidacy exam

Engineering graduate students must complete the Professional Development (PD) requirement through two virtual courses available through eClass:

ENG GRAD PD 01 – Individual Development Plan (IDP) and four (4) hours of PD activities mandated by the Faculty of Engineering

ENG GRAD PD 02 – Eight (8) hours of PD activities mandated by FGSR.

Details about the Professional Development Requirements are summarized on the Department of Civil and Environmental website and are described briefly in the following section

4.5.1 Individual Development Plan (IDP)

Details concerning the completion of the IDP can be found on FGSR's Professional Development IDP website: <https://www.ualberta.ca/graduate-studies/professional-development/professional-development-requirement/individual-development-plan>.

As per University Calendar, "All graduate students at the University of Alberta are required to submit an IDP to the department for their program of studies within 12 months of the program's commencement for master's students and within 18 months of the program's commencement for doctoral students. The plan is a career and skills planning document that allows graduate students to consider their future careers in an organized way and to plan their participation in professional development activities in conjunction with their academic activities."

4.5.2 Professional Development (PD) Activities

The Professional Development Requirement includes the completion of twelve (12) hours of PD activities: four (4) hours mandated by the Faculty of Engineering and eight (8) hours mandated by FGSR.

Faculty of Engineering PD Requirements

The Faculty of Engineering requires four (4) hours of PD activities. A list of acceptable PD activities pre-approved by the Faculty of Engineering is available on the Faculty of Engineering website:

<https://www.ualberta.ca/engineering/student-services/academic-support/graduate-studies-professional-development>.

FGSR PD Requirements

FGSR requires eight (8) hours of PD activities. According to FGSR, PD activities fulfil the University of Alberta Professional Development Requirement if they contribute to the acquisition of skills, knowledge or mindset and includes all of the following components:

- Comprise of formal training or active learning with an assessment component (self-assessment, reflection, quiz, write-pair-share, evidence of knowledge application)
- Fall outside of research methods training, capstone project, thesis (or equivalent), and required practicum
- Support the career goals and/or seven skills/competencies identified in the IDP.

Eight hours of Professional Development Activities Guide is available on the FGSR's website:

<https://cloudfront.ualberta.ca/-/media/gradstudies/professional-development/pd-resources/2018-08-03-pdopportunititesguide.pdf>.

The following activities do NOT fulfil the PD requirements:

- Sessions used towards the Ethics and Academic Integrity Requirement
- Information sessions to highlight resources or programs
- Teaching Assistantships, Research Assistantships
- Presenting a talk or a poster
- Serving as a mentor
- Serving on a board or committee
- Graduate Student Safety Certificate

4.5.3 Completion of PD Requirements and Submission of Forms to the Department

Students must meet the PD requirement through the completion of two virtual courses available through eClass: ENG GRAD PD 01 and ENG GRAD PD 02. Please follow the steps below to meet the PD requirement.

Step 1: Complete ENGG GRAD PD 01 requirement – Individual Development Plan (IDP workbook) and 4 hours of PD activities as mandated by the Faculty of Engineering.

- ✓ Please self-enroll in the virtual course [ENG GRAD PD 01: IDP and 4hrs Engineering PD](#)
- ✓ Please complete [Individual Development Plan \(IDP workbook\)](#).
- ✓ Please complete 4 hours of PD activities mandated by the Faculty of Engineering and fill out the [ENG GRAD PD01 Completion form](#), available on the Department website.

Step 2: Complete ENGG GRAD PD 02 requirement – 8 hours of PD activities as mandated by FGSR.

- ✓ Please self-enroll in the virtual course [ENG GRAD PD 02: 8 hours PD for FGSR](#)
- ✓ Please complete 8 hours of PD activities mandated by FGSR and fill out the [ENG GRAD PD02 Completion Form](#), available on the Department website.

Step 3. Submit the PD documents to your Supervisor (for MSc and PhD) or the Group Graduate Coordinator (for MEng).

The following documents and forms must be submitted to your Supervisor or the Group Graduate Coordinator:

- ✓ Individual Development Plan (IDP workbook)
- ✓ ENG GRAD PD 01 Completion form
- ✓ ENG GRAD PD 02 Completion form
- ✓ Proof of all PD activities you have completed (eg., certificate of completion, confirmation of attendance, etc.) *Note: The Department prefers an email confirmation of attendance or completion as a proof since FGSR is no longer signing the paper copy of the Declaration of Attendance. For PD sessions/workshops no email confirmation is given, we still accept a paper copy of the Department's Declaration of Attendance (available on the Department website) as proof of attendance or completion.

Step 4: Submit all completed and signed documents and forms to the Graduate Program Office for the Graduate Associate Chair's approval.

Once the ENG GRAD PD 01 and 02 forms are signed off by the Graduate Associate Chair, the Graduate Program Office will send you a scanned copy of the forms and you would have to upload them to eClass.

Additional details and helpful links to forms and PD sessions are provided on the Department website. Please note the following important information:

- It is student's responsibility to identify available PD sessions/workshops and accumulate PD hours. The Department is NOT designating students to attend a certain session/workshop for the PD requirement. Graduate students often receive email communications on available PD opportunities from FGSR, Faculty of Engineering, the department, etc.
- The Department grants a maximum of 2 hours towards an online session/workshop and a maximum of 4 hours toward an in-person session/workshop.
- If students are unsure whether a session/workshop will be considered towards PD hours students should check with the department BEFORE attending.
- The following activities do NOT fulfil the PD requirements:
 - Sessions used towards the Ethics and Academic Integrity Requirement
 - Information sessions to highlight resources or programs
 - Teaching Assistantships, Research Assistantships
 - Presenting a talk or a poster
 - Serving as a mentor
 - Serving on a board or committee
 - Graduate Student Safety Certificate
- 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 in accepting and recognizing the PD requirement and a sessions/workshop accepted as PD by one department may not be accepted by another department.

4.6 Degrees offered

The Department offers MEng, MSc, and PhD degrees in eight research disciplines and five subdisciplines. The specific course requirements for each discipline or subdiscipline area 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. The residency requirement provides students with significant contact with the University of Alberta through time spent on campus and through interactions with faculty members and other graduate students. It educates the student to be an independent researcher and scholar in an academic discipline, through coursework, seminar participation, teaching, faculty interaction and faculty-directed research.

The course requirements for the PhD vary by research discipline (Section 5); however, all PhD students must complete a minimum of ten (10) courses beyond their Bachelor's degree (3 of which must be during your PhD program), ENGG 600 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 final examination. All program requirements, other than the thesis, must be completed within 36 months of the commencement of a student's program.

Five (5) weeks prior to the examination, the supervisor completes the on-line (Google) form to propose 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 the 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 completing the "*Preliminary Thesis Acceptance Form*".

Timeline:

- 3 months prior to examination, the supervisor nominates an external examiner by completing the on-line (Google) form.
- 2 months prior to examination, the Department nominates an external examiner to the FGSR and completes a Request to Invite External Reader or Examiner for Final Doctoral Oral Examination form. The Department invites the external examiner.
- 5 weeks prior to examination: The supervisor completes the on-line (Google) form to propose a date for the examination, the composition of the rest of the examining committee and to submit both the thesis and the Preliminary Acceptance of the thesis form. The Department recommends the examining committee to the 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 a copy of the thesis to them. **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 the FGSR of the committee's decision on a Thesis Approval / Program Completion form.
- Within six (6) months of Final Oral examination, the student must submit their thesis for review and approval by the 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)), ENGG 600 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.

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).

4.6.3 Final Oral Examination

A minimum of 5 weeks prior to the exam, the supervisor completes the on-line (Google) form to propose a date for the examination, the composition of the examining committee and to submit the thesis. The Department recommends the examining committee members to the 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 the FGSR of the examining committee's decision, on the Thesis Approval / Program Completion form.

Within six (6) months of examination, the student must submit their thesis for review and approval by the Faculty of Graduate Studies and Research.

4.6.4 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, up to the maximum time of four years from the date of first registration.

The MEng requires completion of eight (8) graduate courses and a Research Project (900 level), as well as ENGG 600 and the Faculty of Engineering Professional Development requirements. The research project is the work-equivalent of one course (approximately 160 hours of work). MEng students must make arrangements with a professor in the proposed project area to act as a supervisor for their research project. The research project is not defended but it must be approved first by the supervisor and then submitted to the Department for approval by the Associate Chair of Graduate Studies.

MEng students must be registered in Research Project (900-level) in the term they complete their research project. It is the student's responsibility to submit their research project well in advance of the end of the term to ensure that both the project supervisor and the Associate Chair have enough time to evaluate the report. 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 in the PhD program. Students must seek approval from the Department to take courses offered by other departments, and not listed in the program course requirements.

5.1 Construction Engineering and Management

Degree	Course Credits
Master of Engineering	<p>8 courses:</p> <ul style="list-style-type: none"> • 2 Core Courses: CIV E 601 and 602 • 2 Elective Courses: CIV E 603, 605, 606 or 654 • 3 Elective Courses: CIV E 607, 608, 709 (Lean Construction) or 709 (Sustainable Construction) • 1 Elective Course of any 500-, 600- or 700-level Engineering course, approved by the group Graduate Coordinator. <p>Plus a research project (CIV E 900).</p>
Master of Science	<p>6 courses:</p> <ul style="list-style-type: none"> • 4 Core Courses: CIV E 601, 602, 603 and 709 (Lean Construction) • 1 Elective Course: CIV E 605, 606 or 654 • 1 Elective Course: CIV E 607, 608, 709 (Sustainable Construction) or any 500-, 600- or 700-level Engineering course, approved by the supervisor. <p>Plus a thesis.</p>
Doctor of Philosophy	<p>10 courses beyond the Bachelor's degree, with a minimum of 3 courses during the doctoral program at the University of Alberta:</p> <ul style="list-style-type: none"> • 4 Core Courses: CIVE 601, 602, 603 and 709 (Lean Construction) • 2 Elective Courses: CIVE 605, 606, or 654 • 3 Elective Courses: CIVE 607, 608, 709 (Sustainable Construction) or any 500-, 600- or 700-level Engineering course, approved by the supervisor and the supervisory committee. <p>Plus a thesis.</p>

5.2 Environmental Engineering and Environmental Science

Degree	Course Credits
Master of Engineering	<p>8 courses:</p> <ul style="list-style-type: none"> • 4 Courses from: CIV E 526, 620, 622, 623, 624, 628 or 657. • 4 Elective Courses: any 500-, 600- or 700-level course, approved by the group Graduate Coordinator. <p>Plus a research project (CIV E 900).</p>
Master of Science	<p>6 courses:</p> <ul style="list-style-type: none"> • 3 Courses from: CIV E 526, 620, 622, 623, 624, 628 or 657. • 3 Elective Courses: any 500-, 600- or 700-level courses, approved by the supervisor. <p>Plus a thesis.</p>
Doctor of Philosophy	<p>10 courses beyond the Bachelor's degree, with a minimum of 3 courses during the doctoral program at the University of Alberta:</p> <ul style="list-style-type: none"> • 3 Courses from: CIV E 526, 620, 622, 623, 624, 628 or 657. • Electives, as approved by the supervisor and the supervisory committee. <p>Plus a thesis.</p>

5.3 Geoenvironmental Engineering

Degree	Course Credits
Master of Engineering	<p>8 courses:</p> <ul style="list-style-type: none"> • 5 Core Courses: CIV E 680, 681, 682, 683 and 695. Students are required to attend all of the laboratory and seminar components of these courses. • 3 Elective Courses: any 500-, 600- or 700-level course, approved by the group Graduate Coordinator. <p>Plus a research project (CIV E 900).</p>
Master of Science	<p>6 courses:</p> <ul style="list-style-type: none"> • 5 Core Courses: CIV E 680, 681, 682, 683 and 695. Students are required to attend all of the laboratory and seminar components of these courses. • 1 Elective Course: any 500-, 600- or 700-level course, approved by the supervisor. <p>Plus thesis.</p>
Doctor of Philosophy	<p>10 courses beyond the Bachelor's degree, with a minimum of 3 courses during the doctoral program at the University of Alberta:</p> <ul style="list-style-type: none"> • 5 Core Courses: CIV E 680, 681, 682, 683 and 695. Students are required to attend all of the laboratory and seminar components of these courses. • Electives, as approved by the supervisor and the supervisory committee. <p>Plus thesis.</p>

5.4 Geotechnical Engineering

Degree	Course Credits
Master of Engineering	<p>8 courses:</p> <ul style="list-style-type: none"> • 6 Core Courses: CIV E 680, 681, 683, 690, 695 and 697. Students are required to attend all of the laboratory and seminar components of these courses. • Two Elective Courses: any 500-, 600- or 700-level course, approved by the group Graduate Coordinator. <p>Plus a research project (CIV E 900).</p>
Master of Science	<p>8 courses:</p> <ul style="list-style-type: none"> • 7 Core Courses: CIV E 664, 680, 681, 683, 690, 695 and 697. Students are required to attend all of the laboratory and seminar components of these courses. • One Elective Course: any 500-, 600- or 700-level course, approved by the supervisor. <p>Plus thesis.</p>
Doctor of Philosophy	<p>10 courses beyond the Bachelor's degree, with a minimum of 3 courses during the doctoral program at the University of Alberta:</p> <ul style="list-style-type: none"> • 6 Core Courses: CIV E 680, 681, 683, 690, 695 and 697. Students are required to attend all of the laboratory and seminar components of these courses. • Electives, as approved by the supervisor and the supervisory committee <p>Plus thesis.</p>

5.5 Mining Engineering

Degree	Course Credits
Master of Engineering	<p>8 courses:</p> <ul style="list-style-type: none"> any 500-, 600- or 700-level course, as approved by the group Graduate Coordinator. <p>Plus a research project (MIN E 900).</p>
Master of Science	<p>6 courses:</p> <ul style="list-style-type: none"> any 500-, 600- or 700-level course, as approved by the supervisor. <p>Plus a thesis.</p>
Doctor of Philosophy	<p>10 courses beyond the Bachelor's degree, with a minimum of 3 courses during the doctoral program at the University of Alberta:</p> <ul style="list-style-type: none"> any 500-, 600- or 700-level course, as approved by the supervisor and the supervisory committee. <p>Plus thesis.</p>

5.6 Petroleum Engineering

Degree	Course Credits
Master of Engineering	<p>8 courses:</p> <ul style="list-style-type: none"> 4 Core Courses: PET E 630, 631, 664, and either PET E 636 or 649. 4 Elective Courses: any 500-, 600- or 700-level course (one of which must be a PET E course), as approved by the group Graduate Coordinator. <p>Plus a research project (PET E 900).</p>
Master of Science	<p>6 courses.</p> <ul style="list-style-type: none"> 3 Courses from: PET E 630, 631, 664, 636 or 649. 3 Elective Courses: any 500-, 600- or 700-level course (one of which must be a PET E course), as approved by the supervisor. <p>Plus thesis.</p>
Doctor of Philosophy	<p>10 courses beyond the Bachelor's degree, with a minimum of 4 courses during the doctoral program at the University of Alberta:</p> <ul style="list-style-type: none"> 3 Courses from: PET E 630, 631, 664, 636 or 649. Electives, as approved by the supervisor and the supervisory committee. <p>Plus thesis.</p>

5.7 Structural Engineering

Degree	Course Credits
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Master of Engineering	<p>8 courses:</p> <ul style="list-style-type: none"> • 5 Core Courses: CIVE 660, 661, 665, 670 and 672. • 3 Elective Courses: any 500-, 600- or 700-level course, as approved by the group Graduate Coordinator. <p>Plus a research project (CIV E 900).</p>
Master of Science	<p>6 courses:</p> <ul style="list-style-type: none"> • 3 Core Courses: CIVE 660, 665, 670 or 672. • 3 Elective Courses: any 500-, 600- or 700-level course, as approved by the supervisor. <p>Plus a thesis.</p>
Doctor of Philosophy	<p>10 courses beyond the Bachelor’s degree, with a minimum of 3 courses during the doctoral program at the University of Alberta:</p> <ul style="list-style-type: none"> • 5 Core Courses: CIVE 660, 661, 665, 670 and 672. • Electives, as approved by the supervisor and the supervisory committee. <p>Plus thesis.</p>

5.8 Transportation Engineering

Degree	Course Credits
Master of Engineering	<p>8 courses:</p> <ul style="list-style-type: none"> • 2 Core Courses: CIV E 612 and 614 • 2 Elective Courses: any 600- or 700- level course in the Transportation Engineering program • 4 Elective Courses: any 500-, 600- or 700-level course, as approved by the group Graduate Coordinator. <p>Plus a research project (CIV E 900).</p>
Master of Science	<p>6 courses:</p> <ul style="list-style-type: none"> • 2 Core Courses: CIV E 612 and 614. • 2 Elective Courses: any 600- or 700- level course in the Transportation Engineering program. • 2 Elective Courses: any 500-, 600- or 700-level course, as approved by the supervisor. <p>Plus a thesis.</p>
Doctor of Philosophy	<p>10 courses beyond the Bachelor's degree, with a minimum of 3 courses during the doctoral program at the University of Alberta:</p> <ul style="list-style-type: none"> • 2 Core Courses: CIV E 612 and 614. • Electives, as approved by the supervisor and the supervisory committee. <p>Plus thesis.</p>

5.9 Water Resources Engineering

Degree	Course Credits
Master of Engineering	<p>8 courses:</p> <ul style="list-style-type: none"> • 4 Core Courses: CIV E 631, 641, 645, 649 or 739. • 4 Elective Courses: any 500-, 600- or 700-level course, as approved by the group Graduate Coordinator. <p>Plus a research project (CIV E 900).</p>
Master of Science	<p>6 courses:</p> <ul style="list-style-type: none"> • 4 Core Courses: CIV E 631, 641, 645, 649 or 739. • 2 Elective Courses: any 500-, 600- or 700-level course, as approved by the supervisor. <p>Plus thesis.</p>
Doctor of Philosophy	<p>10 courses beyond the Bachelor's degree, with a minimum of 3 courses during the doctoral program at the University of Alberta:</p> <ul style="list-style-type: none"> • 4 Core Courses: CIV E 631, 641, 645, 649 or 739. • Electives, as approved by the supervisor and the supervisory committee. <p>Plus thesis.</p>

5.10 Course Requirements for Subdisciplinary Studies with Degree in Civil and Environmental Engineering

5.10.1 Biomechanics Engineering Program

Degree	Course Credits
Master of Engineering	<p>8 courses:</p> <ul style="list-style-type: none"> • 8 courses: 500-, 600- or 700-level courses, as approved by the group Graduate Coordinator. <p>Plus a research project (CIV E 900).</p>
Master of Science	<p>6 courses:</p> <ul style="list-style-type: none"> • 8 courses: 500-, 600- or 700-level courses, as approved by the supervisor. <p>Plus a thesis.</p>
Doctor of Philosophy	<p>10 courses beyond the Bachelor's degree, with a minimum of 3 courses during the doctoral program at the University of Alberta:</p> <ul style="list-style-type: none"> • Courses, as approved by the supervisor and the supervisory committee. <p>Plus thesis.</p>

5.10.2 Building Engineering Program

Degree	Course Credits
Master of Engineering	<p>8 courses:</p> <ul style="list-style-type: none"> • 1 Core Courses: CIV E 779A (Building Science) • 5 Elective Courses: CIV E 779 3A (Structural Timber Design), CIV E 676 Masonry Structure; ENG M 558 (Ergonomics and Work Design); ENG M 607; CIV E 709-Automation and Robotics for Construction; MEC E 651; CIV E 605; CIVE 709 Building Information Modeling Project Management • 2 Elective Courses: any 500-, 600- or 700-level course, as approved by the group Graduate Coordinator. <p>Plus a research project (CIV E 900).</p>
Master of Science	<p>6 courses:</p> <ul style="list-style-type: none"> • 1 Core Courses: CIV E 779A (Building Science) • 4 Courses: CIV E 779 3A (Structural Timber Design), CIV E 676 Masonry Structure; ENG M 558 (Ergonomics and Work Design); ENG M 607; CIV E 709-Automation and Robotics for Construction; MEC E 651; CIV E 605; CIVE 709 Building Information Modeling Project Management • 1 Elective Course: any 500-, 600- or 700-level course, as approved by the supervisor. <p>Plus a thesis.</p>
Doctor of Philosophy	<p>10 courses beyond the Bachelor's degree, with a minimum of 3 courses during the doctoral program at the University of Alberta:</p> <ul style="list-style-type: none"> • 1 Core Courses: CIV E 779A (Building Science) • Electives, as approved by the supervisor and the supervisory committee. <p>Plus thesis.</p>

5.10.3 Cellulosic NanoMaterials Program

Degree	Course Credits
Master of Engineering	<p>8 courses:</p> <ul style="list-style-type: none"> • 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. • 4 Elective courses: any 500-, 600- or 700-level course, as approved by the group Graduate Coordinator. <p>Plus a research project. (CIV E 900).</p>
Master of Science	<p>6 courses:</p> <ul style="list-style-type: none"> • 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. <p>Plus thesis.</p>
Doctor of Philosophy	<p>10 courses beyond the Bachelor's degree, with a minimum of 3 courses during the doctoral program at the University of Alberta:</p> <ul style="list-style-type: none"> • 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. • Electives, as approved by the supervisor and the supervisory committee. <p>Plus thesis.</p>

5.10.4 Pavement Engineering Program

Degree	Course Credits
Master of Engineering	<p>8 courses:</p> <ul style="list-style-type: none"> • 2 Courses from: CIV E 601, 602, 664, 680, 681, 690, 695, 697 or 799. • 6 Elective courses: any 500-, 600- or 700-level course, as approved by the group Graduate Coordinator. <p>Plus a research project. (CIV E 900).</p>
Master of Science	<p>6 courses:</p> <ul style="list-style-type: none"> • 2 Courses from: CIV E 601, 602, 664, 680, 681, 690, 695, 697 or 799. • 4 Elective courses: any 500-, 600- or 700-level course, as approved by the supervisor. <p>Plus thesis.</p>
Doctor of Philosophy	<p>10 courses beyond the Bachelor's degree, with a minimum of 3 courses during the doctoral program at the University of Alberta:</p> <ul style="list-style-type: none"> • 2 Courses from: CIV E 601, 602, 664, 680, 681, 690, 695, 697 or 799. • Electives, as approved by the supervisor and the supervisory committee. <p>Plus thesis.</p>

5.10.5 Underground Trenchless Construction Program

Degree	Course Credits
Master of Engineering	<p>8 courses:</p> <ul style="list-style-type: none"> • 1 Core Courses- CIVE 609, and two from CIV E 601, 602, 664, 680, 681, 690, 695 or 697. • 5 Elective courses: any 500-, 600- or 700-level course, as approved by the group Graduate Coordinator. <p>Plus research project (CIV E 900).</p>
Master of Science	<p>6 courses:</p> <ul style="list-style-type: none"> • 1 Core Courses- CIVE 609, and two from CIV E 601, 602, 664, 680, 681, 690, 695 or 697. • 3 Elective courses: any 500-, 600- or 700-level course, as approved by the supervisor. <p>Plus thesis.</p>
Doctor of Philosophy	<p>10 courses beyond the Bachelor's degree, with a minimum of 3 courses during the doctoral program at the University of Alberta:</p> <ul style="list-style-type: none"> • 3 Core Courses: CIV E 601, 602 and 609 • 2 Elective Courses: 664, 680, 681, 690, 695 or 697. • Electives, as approved by the supervisor and the supervisory committee. <p>Plus thesis.</p>

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 (hereafter referred to as CEE), 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. The course material must include
 - a. The transcript showing the course title, description, grade and year taken
 - b. The official course outline as provided by the institution or instructor of the course
 - c. If needed, the CEE instructor may request additional course material from the other institution/program, such as notes, assignments, exams, etc.
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 recommendation from instructor and send an email to the Graduate Program office, advising of the outcome.
6. Final approval will be made by the Associate Chair of Graduate Studies of the Department.

Please note the following:

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