



# Department of Mechanical Engineering Graduate Handbook

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## Table of Contents

1	Document Overview .....	4
2	Contact Information.....	4
3	Academic Integrity .....	4
4	Intellectual Property .....	5
5	Degree Requirements, Procedures & Expected Timelines .....	5
5.1	<i>MEng Degree</i> .....	6
5.1.1	<i>Coursework</i> .....	6
5.1.2	<i>MECH 594</i> .....	6
5.1.3	<i>MECH 598</i> .....	6
5.1.4	<i>Timeline Expectations</i> .....	6
5.2	<i>MASc Degree</i> .....	6
5.2.1	<i>Coursework</i> .....	6
5.2.2	<i>MECH 595</i> .....	6
5.2.3	<i>MECH 599</i> .....	7
5.2.4	<i>Timeline Expectations</i> .....	7
5.3	<i>PhD Degree</i> .....	7
5.3.1	<i>Coursework</i> .....	7
5.3.2	<i>MECH 695</i> .....	7
5.3.3	<i>MECH 693 – Candidacy</i> .....	8
5.3.4	<i>MECH 699</i> .....	9
5.3.5	<i>Transfer from MASc to PhD Degree</i> .....	9
5.3.6	<i>Timeline Expectations</i> .....	10
6	Supervision .....	10
6.1	<i>(Co) Supervisor</i> .....	10
6.2	<i>Supervisory Committee</i> .....	11
6.3	<i>Supervisory Meeting Frequency</i> .....	11
6.3.1	<i>With Supervisor</i> .....	11
6.3.2	<i>With Supervisory Committee</i> .....	11
6.4	<i>Turn-around Times for Reviewing</i> .....	11
7	Co-op terms and Internships.....	11
8	Thesis Requirements.....	12
9	Funding Policies .....	12
9.1	<i>Graduate Stipends</i> .....	12
9.2	<i>Teaching Assistantships (TAs)</i> .....	12
9.3	<i>UVic Fellowships</i> .....	13

9.4	<i>UVic Donor Awards</i> .....	13
9.5	<i>External Awards and Fellowships</i> .....	13
9.6	<i>Termination of Awards</i> .....	13
9.7	<i>Notification of Award Competitions</i> .....	13
10	Formal review of student progress .....	14
10.1	<i>Procedures for Review</i> .....	14
10.2	<i>Review Outcome</i> .....	14
Appendix A. PhD Program Approved Core Courses .....		15
Appendix B. Progress Review Form .....		16
Appendix C. Rubric for Evaluating PhD Candidacy Examination .....		20

## 1 DOCUMENT OVERVIEW

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Faculty and students in the Department of Mechanical Engineering (MechE) are bound by the various policies set by the University of Victoria (UVic), the Faculty of Graduate Studies (FGS), and the Department of Mechanical Engineering (MechE).

FGS policies are given in the [UVic Calendar](#) and in policy documents found on the Faculty of Graduate Studies [website](#). In particular, students and faculty members should familiarize themselves with the [Graduate Supervision Policy](#), which outlines the rights and responsibilities of the supervisor-supervisee relationship.

This Graduate Handbook document for MechE should be considered supplementary to the FGS Handbook and the UVic Calendar, focused on documenting procedures and expectations specific to the Mechanical Engineering graduate programs leading to MEng, MASc, and PhD degrees. The intent is to clarify expectations for students and supervisors to ensure timely completion of degree programs and to in turn foster impactful research activities in the department. This document will be updated from time-to-time by the department. Where there is conflicting information, the most recent versions of the MechE Handbook shall be used. In case of conflict between this Handbook and the Graduate Supervision Policy, the Graduate Supervision Policy will be used.

## 2 CONTACT INFORMATION

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	Name	Office	E-mail
Chair	Dr. Brad Buckham	EOW 551	<a href="mailto:mech.chair@uvic.ca">mech.chair@uvic.ca</a>
Graduate Program Director	Dr. Keivan Ahmadi	EOW 507	<a href="mailto:mech.grad.director@uvic.ca">mech.grad.director@uvic.ca</a>
Graduate Secretary	Keri Jones	EOW 548	<a href="mailto:mech.grad@uvic.ca">mech.grad@uvic.ca</a>
Student representative	Maziyar Khadivi & Bernardo Leite		<a href="mailto:mech.grad.rep@uvic.ca">mech.grad.rep@uvic.ca</a>

The Graduate Secretary should be the first point of contact for administrative questions. The Graduate Program Director should be first point of contact for more detailed questions relating to the graduate program, conflict resolution, etc.

## 3 ACADEMIC INTEGRITY

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Graduate degrees involve numerous academic and public presentation formats from presentations, to reports, manuscripts and theses. In all cases, students must be extremely careful to avoid plagiarism of all kinds. Likewise, experimental and computational results must be truthfully recorded and presented at all times, in all formats. Zero tolerance will be given for infractions, as academic integrity is a key pillar of graduate degrees. Students must familiarize themselves with the [UVic Academic Integrity policy](#); feigning ignorance of that policy is unacceptable as careers can be quickly ruined for both student and supervisor.

## 4 INTELLECTUAL PROPERTY

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Graduate students should familiarize themselves with the [University's IP policy](#) that governs graduate research activities. Students and supervisors should also have open discussions, and ideally written agreement, at the outset of any research on expectations around IP arising from the research to avoid future conflict.

In general, graduate students work with their supervisors and others in their labs to jointly produce new knowledge in a collegial environment. In general terms, IP arising out of research at UVic is creator owned (typically jointly between students and supervisors), but specific grant and contract funding particulars, explicit IP agreements, etc. must be carefully understood. Generally, student work outputs accrue to the lab for future students to continue work on, and any commercial applications are pursued jointly between student and supervisor. UVic policy requires IP arising from research at UVic to be disclosed in the first instance to the UVic IP office; again, the particular arrangements for resources and funding that supported the work determine UVic's interests in the IP, and implications for commercial exploitation of the IP, spin-out company formation, etc.

## 5 DEGREE REQUIREMENTS, PROCEDURES & EXPECTED TIMELINES

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Refer to the UVic Calendar for detailed course requirements ([Graduate Studies: Program Requirements section for Mechanical Engineering](#)). This section is precis of those formal requirements for quick reference; the latest official UVic Calendar shall have precedence over the information here.

All program timelines (described 3 consecutive 4-month terms per calendar year) assume that students are devoting dedicated full-time work, year-round, to their academic coursework and research activities. To meet these expected timelines, students must fully engage with their research topics early on, and be wary of taking on other activities during the degree. Funding is normally formulated based on these timelines.

Ongoing discussions with supervisors about timeline expectations are important to ensure timely degree completion, funding, and engagement with opportunities that come up during the degree that may impact the timeline but enhance the graduate degree experience (e.g. internships, contract research, student side-projects). UVic has no formal residency or vacation policy for graduate students. Students should discuss with their supervisors, and if they are TAs the course instructor, any absences, travel arrangements, additional roles and side-projects that impact on time devoted to research and degree progress.

The procedures for the final thesis and oral defense are governed by FGS policies available in the UVic Calendar.

Consult the UVic Calendar for detailed coursework requirements and restrictions on courses outside the department, 4XX level courses, etc.

## 5.1 MENG DEGREE

The MEng degree is normally only offered to students wishing to gain some Canadian experience beyond an undergraduate degree. An MEng graduate will have gained additional technical skills useful in a professional environment, with more course emphasis and in an MASc degree. An MEng degree is not usually a path to a PhD in Canada; the MASc is the more typical route.

### 5.1.1 Coursework

Eight (8) graduate-level courses are required for the degree. MEng students must register every term for MECH 598 to maintain full-time student status. Students must also register for MECH 594 every term.

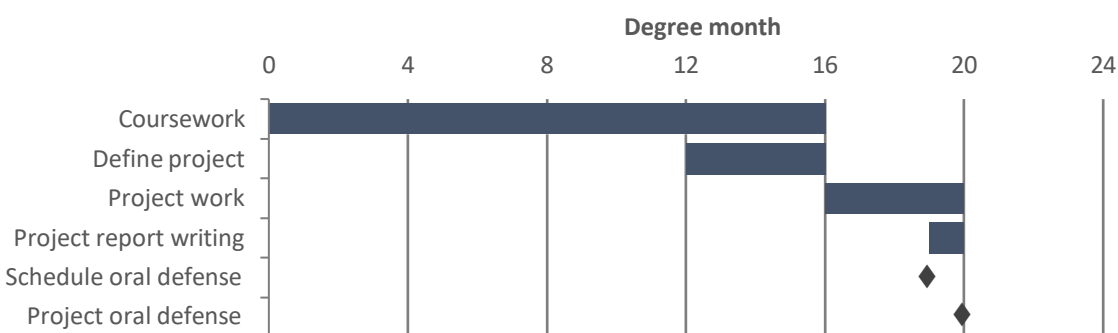
### 5.1.2 MECH 594

Students must attend the department graduate seminar, but are not required to present their work in the seminar.

### 5.1.3 MECH 598

The final project work is equivalent to two (2) taught courses. The project is defined in consultation with the supervisor, and should involve some original application of theory, modeling, experimentation, prototype development, etc. based on existing methods. The final deliverables are a report (~40 pages) detailing the work, and an oral defense of the work.

### 5.1.4 Timeline Expectations



## 5.2 MASc DEGREE

The MASc degree offers the opportunity to pursue advanced studies and carry out research and/or create design in mechanical engineering. The primary deliverable is a thesis documenting that work. The MASc can be a stepping stone to a PhD degree, or to gain additional skills beyond an undergraduate degree for use in an applied setting.

### 5.2.1 Coursework

Five (5) graduate-level courses are required for the degree. MASc students must register every term for MECH 599 to maintain full-time student status. Students must also register for MECH 595 every term.

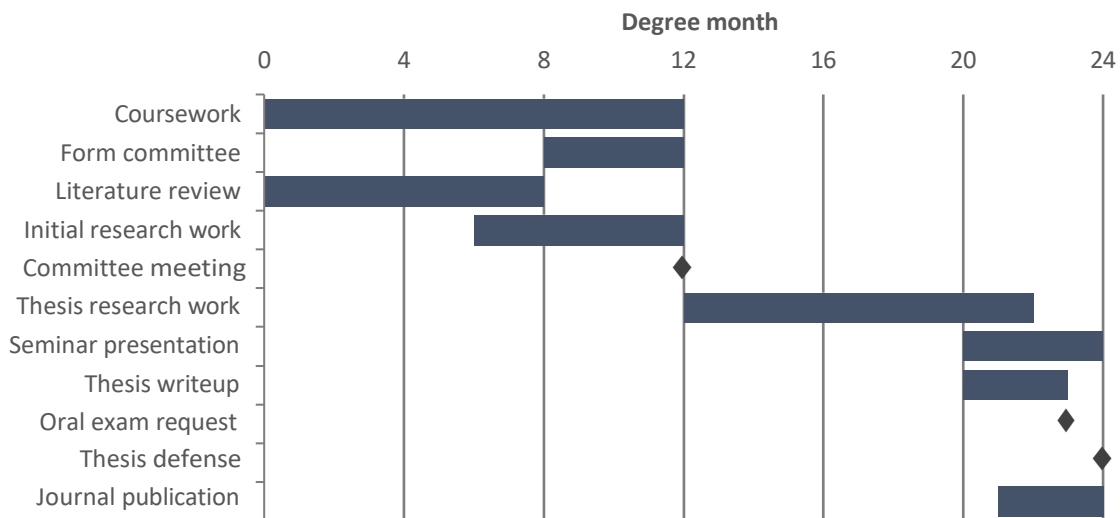
### 5.2.2 MECH 595

Students must attend the department graduate seminar, and are required to present their work once (1) in the seminar.

### 5.2.3 MECH 599

The thesis documents the research work undertaken, and is roughly equivalent to six (6) courses. The thesis may be a stand-alone document, or written up as a collection of manuscripts (conference or journal, that are any stage of submitted, under-review or published); the usual length is 50-100 pages depending on format and topic. The general expectation is that a defensible MASc should document contributions worthy of at least one journal publication. The thesis is defended in an oral examination before the supervisory committee and examiner from (normally) outside the department but from within UVic.

### 5.2.4 Timeline Expectations



## 5.3 PHD DEGREE

The hallmark of the PhD degree is the demonstration of an independent, significant contribution to the state-of-the-art in mechanical engineering. The primary deliverable is a thesis documenting that work. The PhD degree can lead to an academic career, although the majority of PhD graduates are employed in a wide range of applied settings.

### 5.3.1 Coursework

Four (4) graduate-level courses are required for the degree. One of the courses must be a 'core course' as approved and defined by the department graduate program committee. Currently approved core courses are listed in Appendix A. PhD students must register every term for MECH 693 (before Candidacy) or MECH 699 (after Candidacy) to maintain full-time student status. Students must also register for MECH 695 every term.

### 5.3.2 MECH 695

Students must attend the department graduate seminar, and are required to present their work twice (2) in the seminar. Normally the first presentation is around the time of candidacy, and the second time near the final PhD defense.

### 5.3.3 MECH 693 – Candidacy

The candidacy exam is meant to assess the student's aptitude for a PhD degree prior to completing the research work. As such, it is nominally timed for after coursework is done and some time available for familiarization with existing literature and formulation of a research plan, but prior to extensive independent research being carried out. The candidacy exam is an oral exam before the supervisory committee, comprised of two parts: background knowledge, and the proposed research plan. The student is assessed on both these components and whether sufficient progress and aptitude is present to reasonably expect completion of the final PhD thesis.

The candidacy exam is a multi-step process, including the following steps:

**Step 1:** The supervisor arranges a date for the oral exam component with the committee and student.

**Step 2:** At least 10 working days prior to the candidacy oral exam date, the student will prepare and deliver to the committee a report detailing the proposed thesis topic. The report can be a maximum of 40 pages in length. The report should include the following elements:

1. A background and motivation for the research topic
2. Overview of the relevant literature in the topic area, to show in some detail how the research will build on and advance the state of the art. Properly cited references should be included in a bibliography.
3. An outline of the proposed research work, including a research plan (methods, tools, etc.) with rough timeline and expected milestones
4. A listing of key contributions expected to arise from the research that will constitute the novel contribution to the state of the art required for a PhD. The report may also include a list of anticipated journal manuscript titles

**Step 3:** At least 5 working days prior to the candidacy oral exam date, each member of the committee will provide the student with a written question based on each committee member's specialized area and the broad engineering knowledge the student should have to successfully complete a PhD thesis in the proposed topic area. The questions will provide the student the flavor of the topic area(s) each committee member may focus on during the first round of questions in the oral exam.

**Step 4:** The candidacy oral exam itself is to be conducted in camera, with only the student and supervisory committee present. The supervisor normally serves as the chair of the candidacy exam. The Graduate Program Director may attend at the request of the student or supervisor/supervisory committee and may serve as the chair, but is not normally present. The candidacy exam normally lasts between one and two hours. The procedure to be followed is:

1. The chair of the oral exam (normally supervisor) gives the student and committee an overview of the exam process
2. The student will give a 10-15 minute presentation overviewing their proposed research
3. A first round of questions, proceeding from committee members outside the department through to the supervisor(s), will focus on general engineering background knowledge that can reasonably be expected the student is familiar with, based on the proposed general research area. This round will focus on the student's breadth of knowledge in the relevant areas and understanding of the fundamental concepts involved.



4. A second round of questions, proceeding from committee members outside the department through to the supervisor(s), will focus on the specific proposed research. Questions will be on familiarity with background literature, proposed methods, expected challenges, and the likelihood of achieving and novelty of the expected contributions.
5. The student will then leave the room after the questioning is complete, or the exam adjourned.
6. The committee will each individually grade the student's performance and note comments according to the rubric in [Appendix C](#), on individual forms per committee member, prior to any committee discussions.
7. The committee members will then confer with each other as to the outcome of the exam, guided by their rubric evaluations and written comments. Written comments and overall evaluations from the committee-discussion will be unified by the examination Chair and provided to the student upon request. The committee will make a determination on the final outcome of the exam, either an overall pass or fail, according to consensus on the student's ability to successfully complete the PhD as based on the rubric metrics and documented comments.
8. The student will be invited back into the room, and informed of the final pass/fail outcome and general comments on the oral exam.

If the first candidacy exam attempt results in a failure, the student will be permitted one additional attempt to be completed within 4 months of the original attempt. If either attempt results in a failure, the supervisory committee may permit the student to change to an MEng or MASc degree instead or withdraw from the graduate program altogether. This decision is at the discretion of the committee, if the committee feels that the student is capable of completing a master's degree, and if the topic is such that it would not violate University rules on non-granting of degrees in a topic area previously studied by the student (at any institution).

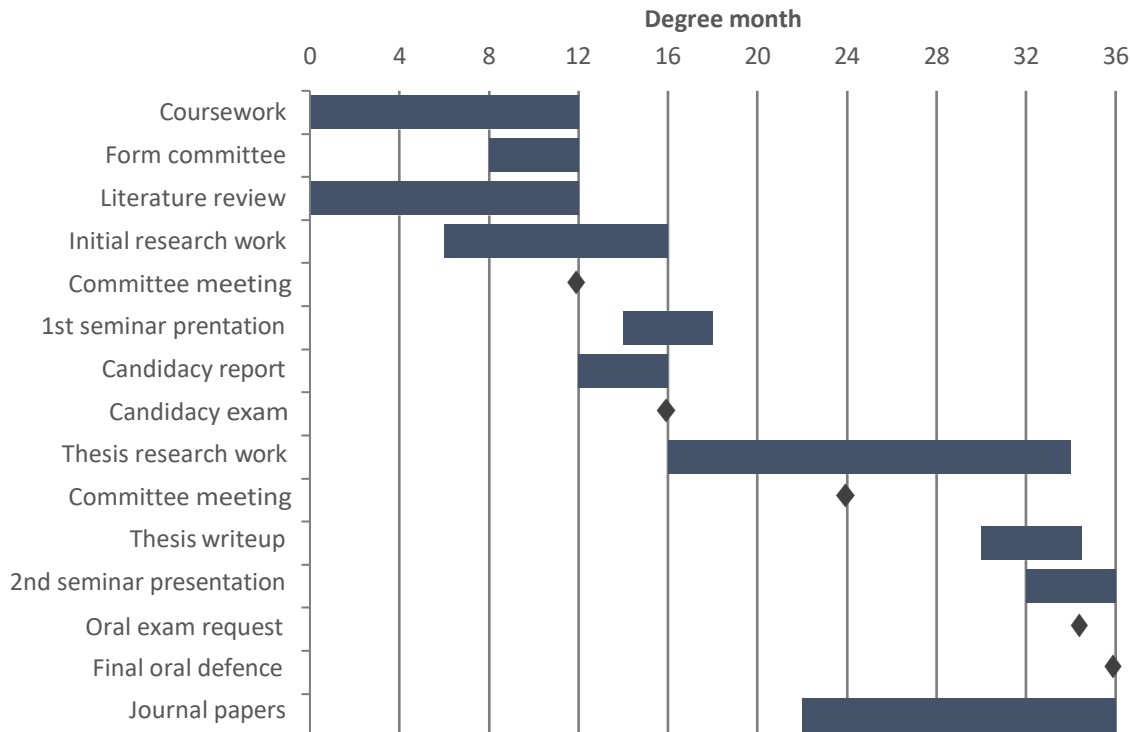
#### 5.3.4 MECH 699

The thesis documents the research work undertaken, and is roughly equivalent to eighteen (18) courses. The thesis may be a stand-alone document, or written up as a collection of manuscripts (conference or journal, that are any stage of submitted, under-review or published); the usual length is 100-200 pages depending on format and topic. Three to four journal-quality publications are good benchmark for demonstrating the contribution expected of PhD-level research. The thesis is defended in an oral examination before the supervisory committee with an arms-length examiner from outside UVic.

#### 5.3.5 Transfer from MASc to PhD Degree

As per the UVic Calendar details, exceptionally strong students may transfer from the MASc degree to PhD without completing and defending an MASc thesis. Students should be aware that bypassing the MASc degree carries some degree of risk, in that if the PhD degree is not completed, there may be no formal degree awarded after many years of effort. Careful discussion between student and supervisor should consider the relative merits of academic path options carefully in this respect.

### 5.3.6 Timeline Expectations



## 6 SUPERVISION

### 6.1 (CO) SUPERVISOR

All graduate students in MechE are admitted to the program under a supervisor or co-supervisors. Typically, supervisors will admit a student under a set of pre-conditions before entry, and expectation of performance during the program. In many cases, the supervisor will serve as both an academic mentor through the program as well as funding the student (see §9). This dual-role should be appreciated for the differing pressures and expectations involved (e.g. mentoring, funding deliverables, project organization, academic progress and contributions, etc.). In the case of co-supervisor relationships, the joint supervision is meant to enhance the quality of the academic and research work based on supervisor expertise.

Supervisors and students are both expecting to maintain a healthy working relationship through the student's degree program and participation in funded research programs. All parties should discuss and agree on scholarly contribution attributions, arising IP arrangements (commensurate with funding contracts and [UVic IP policy](#)) and general working relationship principles (see [Graduate Supervision Policy](#)) prior to embarking on work together.

## 6.2 SUPERVISORY COMMITTEE

The supervisory committee must be formed and meet composition requirement during the first year of the student's program for MEng, MASc and PhD programs as per the [UVic Calendar](#). The supervisor will normally coordinate the formation of the committee, including contacting potential committee members, in consultation with the student. The examiner (additional to the supervisory committee members) for the MASc and PhD theses is normally determined approximately a month prior to submission of the thesis document.

## 6.3 SUPERVISORY MEETING FREQUENCY

### 6.3.1 With Supervisor

Normally students will meet with their supervisors at least monthly, and ideally weekly. The frequency and format (in-person, via e-mail/messaging, tele-/video-conference) of meetings should be arranged between student and supervisor. Delays owing to business travel, vacation, sick leave, etc. should be taken into consideration in scheduling and missed meetings. The program stage will also dictate meeting frequency; e.g. monthly during intensive course-work terms, daily or weekly in research-intensive terms, and weekly to monthly while writing-up. Supervisor meetings are typically informal, but can benefit from a student-led agenda to make best use of time.

### 6.3.2 With Supervisory Committee

The UVic [Graduate Supervision Policy](#) requires at least annual supervisory committee meetings. Bi-annual committee meetings are encouraged to inject a wide range of inputs into the student's developing research work. See §10 for details of progress reporting during annual meetings. Annual and ad-hoc committee meetings are normally scheduled by the supervisor; both are intended to give students a wide spread of viewpoints on academic and research progression and ideas to ensure timely degree completion and excellence of research results.

## 6.4 TURN-AROUND TIMES FOR REVIEWING

As per the UVic [Graduate Supervision Policy](#), supervisors will make best efforts to turn around submitted theses, reports and manuscripts within 20 working days. This timeline may be impacted by other workload deadlines, sick leave, travel, etc. Students should normally ensure grammatical and formatting editing is complete prior to submission to the supervisor to avoid delays.

# 7 CO-OP TERMS AND INTERNSHIPS

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MEng students are typically unfunded by the department and supervisor, and therefore normally free to participate in the graduate co-op program to gain industrial experience. MEng students still require supervisor permission, and the internship should have relevance to the graduate degree focus area.

MASc and PhD students are typically funded through research grants, with defined deliverables and timelines. Co-op terms are therefore not normally part of those degree programs, but may be carried out in special cases with agreement of the supervisor. More typically, MASc and PhD students participate in grant-funded internships.

MEng, MASc, and PhD students may all participate in internships (e.g. MITACS Accelerate), which are typically arranged by the supervisors with industrial sponsors. These internships are therefore typically in-line with the research work that is part of the degree, and therefore typically better aligned that co-op terms in terms of contributing to the degree work and output.

## 8 THESIS REQUIREMENTS

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All students must comply with [UVic rules](#) for thesis preparation. Both stand-alone document and manuscript-assembly formats are acceptable in the Department. The student's format should be decided on in consultation and agreement with their supervisor(s). In all cases, copyright rules must be respected both for text and figures included in thesis documents. In particular manuscript-based theses must carefully check publisher copyright rules. Manuscript-based theses containing papers with multiple paper authors (other than the student and supervisor) must clearly spell out the student's contribution to the paper, so as to judge the individual's contribution in the context of a graduate thesis contribution.

## 9 FUNDING POLICIES

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Graduate students receive funding from many different sources, including: fellowships, scholarships, teaching assistantships, research assistantships, and stipends. UVic has policies and guidelines for each of these funding sources, and academic units may also have distinct policies for graduate funding. Graduate students should ensure they are aware of the policies governing their funding. Written offer letters and agreements between supervisor and student are beneficial in achieving clarity for all parties.

### 9.1 GRADUATE STIPEND

Graduate stipends are paid by the supervisor and are tax-free in Canada. Funding comes from supervisor research grants and may include firm deliverables and timelines as required by the granting agency. Students are expected to be familiar with these requirements and make their best efforts to support meeting the requirements of these funding sources. Funding sources can be variable, so the duration of funding offers is commensurately of variable length. Funding may also be terminated for poor performance academically or in research. Stipend offers are typically not guaranteed beyond a year at a time, subject to funding constraints and timely academic progression of the student. You will be formally notified of any adjustment to your funding at least four months before the renewal. Stipends can be terminated immediately if you are no longer available to actively participate in the supervisor's research program (e.g. co-op terms, leaves of absence, withdrawal from the program, discontinuity of registration).

### 9.2 TEACHING ASSISTANTSHIPS (TAs)

Available TA positions as well as description of the duties and responsibilities are posted [here](#). TA positions are allocated based on a termly application process. The process reflects TA union rules (seniority), student experience and preferences, and specific instructor requests. Students should therefore not count on TA position, especially early in their degree program, but may receive a TA

position in all three terms. TA positions are incremental to the baseline academic (course) and research activities expected in the timelines of §5, and should be treated as such in terms of time budgeting. TAs are also expected to commit to the TA role in terms of being available for the entire term applied for; unexcused absences and poor performance will likely result in future TA applications being rejected.

### 9.3 UVIC FELLOWSHIPS

The Department allocates its fellowship pool from the Faculty of Graduate Studies every admission term. All incoming students and student not considered in the prior year's pool are evaluated in June of each year. Equal fellowship amounts for each of MASc and PhD students (no MEng students are considered) are allocated based on numbers of applicants in a given year, and the requirement of FGS fellowship rules. In some cases, students receive more than the average (e.g. NSERC scholars) to respect those rules. Department fellowship allocations are for one year only; i.e. a graduate student will receive at maximum one year of funding, per degree. Supervisors may include these fellowships as part of their funding offer (i.e. as part of the total amount stipend + fellowship), or additional to any other funds promised.

### 9.4 UVIC DONOR AWARDS

Donor Awards are based on the supervisor's recommendation of a student. The process begins in the Summer term; you will receive an email from the graduate secretary letting you know that the faculty has been sent a list of Donor Awards and their requirements. Donor Awards come from funds donated to the University to support graduate students. UVic Donor Awards are awarded based on the academic excellence of the recipient and are decoupled from your stipend.

### 9.5 EXTERNAL AWARDS AND FELLOWSHIPS

A list of external funding opportunities can be found on the [FGS website](#). In addition, the graduate secretary will forward any other opportunities.

Receipt of a major external scholarship (e.g. NSERC, VANIER, CIHR, BCGS) can lead to an adjustment of the stipend provided by the supervisor. The department expects that any reduction in the stipend will not exceed half of the external scholarship value. After adjustment, the total funding (stipend plus external funding) is expected to saturate at \$45k for PhD and \$35k for MASc students. This limit can be adjusted based on prior agreement with the supervisor.

### 9.6 TERMINATION OF AWARDS

Academic and/or research misconduct, or failure to achieve academic progression are grounds for termination of funding.

### 9.7 NOTIFICATION OF AWARD COMPETITIONS

The Department Graduate Secretary will inform students of funding opportunities as they arise from time-to-time. Some require direct student/supervisor actions to pursue.

## 10 FORMAL REVIEW OF STUDENT PROGRESS

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MEng students are not formally reviewed by their supervisor or committee, apart from their final project oral defense.

MASc and PhD students are reviewed at least annually by their supervisory committee. The committee and/or student may request for more frequent review of student progress. The supervisor will arrange dates/location of the review meetings with the student and committee.

### 10.1 PROCEDURES FOR REVIEW

The form in Appendix A details the metrics that will be used to assess student progress as part of the review process. The procedure for a formal review is as follows:

1. Student completes the Part A self-report section of the form and provides it to the committee at least 5 working days prior to the review meeting.
2. During the review meeting (conducted in camera with only student and committee), the student gives a 5-10 minute presentation of progress, etc. to the committee.
3. The committee asks questions of the student on progress, research approach, future plans, etc. based on the self-report and presentation. The student then leaves the room, the committee discusses progress, and the supervisor records comments and feedback on the form in Part B. The student returns to room, and is given feedback orally on the outcome of the review. The supervisor(s), committee members and the student sign the form.
4. The supervisor gives the signed form to the Graduate Secretary, who makes a copy and gives it to the student, and inserts the original signed form into student's academic file. In the case of 'Unsatisfactory' ratings as described in §10.2, the Graduate Secretary shall inform the MechE Graduate Program Director.

### 10.2 REVIEW OUTCOME

The review should make clear to the student the expectations of the committee coming out of the meeting, in terms of academic and research progress and milestones to be achieved before the next review. The tentative date of the next review meeting will also be scheduled.

In the case of a determination of overall 'Unsatisfactory' progress on a formal assessment, another review meeting will be scheduled not less than 8 weeks and not more than 16 weeks after the first meeting. In the case of an 'Unsatisfactory' finding at the second meeting, the committee will make a written recommendation as to whether or not to request the MechE Graduate Program Director to make an application to the Dean of Graduate Studies to withdraw the student for "failure to meet academic standards," as described in the UVic Calendar. The committee may also require additional meetings going forward to continue to closely monitor and guide student progress, and after any subsequent meetings again finding 'Unsatisfactory' progress, may similarly make a recommendation for withdrawing the student.

## Appendix A. PhD PROGRAM APPROVED CORE COURSES

This list may be updated from time to time by the department.

1. MECH 601
2. MECH 602 (previously 501)

## Appendix B. PROGRESS REVIEW FORM

This form is to be used for graduate student progress review meetings. Procedures to be followed in relation to this form are given in the body of the Department of Mechanical Engineering Graduate Handbook.

Attached additional pages if space is required for individual item responses.

### PART A

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Student name	
UVic V00 number	
Degree program (MAsc, PhD)	
Primary supervisor(s)	
Committee members	
Program start date	
Most recent previous review meeting date	
Meeting date	

**Courses completed:**

**Outstanding program requirements & planned coursework (with anticipated dates):**



**Seminar series attendance and presentations:**

**Comments on working environment** (e.g. lab space, lab group meetings, lab-mates, supervisor(s), meeting frequency, etc.):

**List timeline goals to end of degree:**

**Current working title for thesis:**

**Report on any challenges or barriers to research progress encountered:**

**Report on research progress since previous review against previously defined objectives:**

**Report on progress towards committee recommendations from previous review** (Address specific recommendations):

**List research objectives for next 6 months:**

**List projected research contributions for final thesis** (List already completed and future planned):

## PART B COMMITTEE EVALUATION

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### Committee evaluation rubrics

Criteria	Excellent	Very Good	Satisfactory	Needs Improvement <sup>1</sup>	Unsatisfactory <sup>1</sup>
Academic (course) progress					
Continuously updated literature review to inform research					
Acquisition of necessary knowledge/skills for research area					
Research objectives (re)definition					
Research plan					
Progress towards final thesis & publications					
Overall <sup>2</sup>					

<sup>1</sup> Ratings of 'Needs Improvement' or 'Unsatisfactory' in any criteria require written feedback comments from the committee to stating the deficiencies and strategies for the student to mitigate or rectify the deficit.

<sup>2</sup> An overall rating of 'Unsatisfactory' requires further action as detailed in §10.2 of the MechE Graduate Handbook.

### Feedback comments on progress, objectives and work plan

Student Name	Signature	Date
Supervisor Name	Signature	Date
Co-Supervisor Name	Signature	Date
Committee Member Name	Signature	Date
Committee Member Name	Signature	Date
Committee Member Name	Signature	Date
Graduate Program Director <sup>1</sup>	Signature	Date

<sup>1</sup> Graduate Director signs only in case of 'Unsatisfactory' evaluation to acknowledge any recommendations and actions proposed by the committee.

**Students Name:**

**Student's Graduate Program: Mechanical Engineering**

## Appendix C. **RUBRIC FOR EVALUATING PhD CANDIDACY EXAMINATION**

Committee Members and Students are responsible for being aware of the evaluation rubric in advance of the examination.

**Date of Exam:**

**Student Name:**

**Student Number:**

**PhD Candidacy examination committee members:**

### Examination Procedure

- Candidate presents a brief (~20 minute) summary of the work
- Examining committee asks at least two rounds of questions. The set of question should address the attributes in this rubric. In particular, questions must assess the candidate's
  - Understanding of the subject matter and associate literature.
  - Breath of knowledge in the relevant areas.
  - Understanding of the fundamental concepts and methodology.
- When questioning is completed, the candidate is asked to leave the room
- Each committee member must complete the attached response sheets **separately and prior to the post-oral discussion**.
- For each attribute that a committee member feels is somewhat or very deficient, a short explanation should be provided. Confidential Comment sections at the bottom of the rubric are provided for explanations.
- The committee conducts post-oral discussion in camera. The discussion and decision of the examining committee should be based on the completed rubrics.
- The committee choose an outcome.

Completed forms are to be treated as **confidential** and are to be **turned in to the graduate program director**.

Completed by:

**Students Name:**

**Student's Graduate Program: Mechanical Engineering**

Attribute for Written	Does Not Meet Expectations	Meets Expectations	Exceeds Expectations
Quality of writing	<ul style="list-style-type: none"><li>• Writing is weak</li><li>• Numerous grammatical and spelling errors apparent</li><li>• Organization is poor</li><li>• Documentation is poor</li></ul>	<ul style="list-style-type: none"><li>• Writing is adequate</li><li>• Some grammatical and spelling errors apparent</li><li>• Organization is acceptable</li><li>• Documentation is adequate</li></ul>	<ul style="list-style-type: none"><li>• Writing is high quality</li><li>• No grammatical and spelling errors apparent</li><li>• Organization is excellent</li><li>• Documentation is excellent</li></ul>
Quality of formatting	<ul style="list-style-type: none"><li>• Formatting is inconsistent</li><li>• Equations are not clear or not coherent</li><li>• Figures are difficult to read or not relevant</li><li>• Captions/legends are not clear</li></ul>	<ul style="list-style-type: none"><li>• Formatting is consistent</li><li>• Equations are clear and logical</li><li>• Figures clear to read and relevant</li><li>• Captions/legends are clear</li></ul>	<ul style="list-style-type: none"><li>• Formatting is excellent</li><li>• Equations are excellent</li><li>• Figures are excellent</li><li>• Captions/legends are excellent</li></ul>
Overall assessment	<ul style="list-style-type: none"><li>• Does not meet expectation</li></ul>	<ul style="list-style-type: none"><li>• Meets expectation</li></ul>	<ul style="list-style-type: none"><li>• Exceeds expectation</li></ul>

Confidential Comments:

**Students Name:**

**Student's Graduate Program: Mechanical Engineering**

Attribute for Oral	Does Not Meet Expectations	Meets Expectations	Exceeds Expectations
Quality of presentation	<ul style="list-style-type: none"><li>• Poorly organized</li><li>• Poor presentation</li><li>• Poor communication skills</li></ul>	<ul style="list-style-type: none"><li>• Clearly organized</li><li>• Clear presentation</li><li>• Good communication skills</li></ul>	<ul style="list-style-type: none"><li>• Well organized</li><li>• Professional presentation</li><li>• Excellent communication skills</li></ul>
Overall breadth of knowledge	<ul style="list-style-type: none"><li>• Presentation reveals critical weaknesses in depth of knowledge</li><li>• Presentation does not reflect well developed critical thinking</li><li>• Presentation is narrow in scope</li></ul>	<ul style="list-style-type: none"><li>• Presentation reveals some depth of knowledge</li><li>• Presentation reveals adequate critical thinking skill</li><li>• Presentation reveals the ability to draw from broad knowledge</li></ul>	<ul style="list-style-type: none"><li>• Presentation reveals excellent depth of knowledge</li><li>• Presentation reveals well developed critical thinking skill</li><li>• Presentation reveals the ability to interconnect and extend knowledge from multiple disciplines</li></ul>
Quality of response to questions	<ul style="list-style-type: none"><li>• Responses are incomplete or require prompting</li><li>• Arguments are poorly presented</li><li>• Respondent exhibits lack of knowledge</li><li>• Responses do not meet level of expectation</li></ul>	<ul style="list-style-type: none"><li>• Responses are complete</li><li>• Arguments are well presented</li><li>• Respondent exhibits adequate knowledge</li><li>• Responses meet level of expectation</li></ul>	<ul style="list-style-type: none"><li>• Responses are eloquent</li><li>• Arguments are skillfully presented</li><li>• Respondent exhibits excellent knowledge</li><li>• Responses exceed level of expectation</li></ul>
Overall assessment	<ul style="list-style-type: none"><li>• Does not meet expectation</li></ul>	<ul style="list-style-type: none"><li>• Meets expectation</li></ul>	<ul style="list-style-type: none"><li>• Exceeds expectation</li></ul>

Confidential Comments:

**Students Name:**

**Student's Graduate Program: Mechanical Engineering**

Attribute for Research	Does Not Meet Expectations	Meets Expectations	Exceeds Expectations
Overall Quality of Science	<ul style="list-style-type: none"><li>• Arguments are incorrect, incoherent or flawed</li><li>• Objectives are poorly defined</li><li>• Demonstrates rudimentary critical thinking</li><li>• Does not reflect understanding of subject matter and associated literature</li><li>• Demonstrates poor understanding of theoretical concepts</li><li>• Displays limited creativity and insight</li></ul>	<ul style="list-style-type: none"><li>• Arguments are coherent and clear</li><li>• Objectives are clear</li><li>• Demonstrates adequate critical thinking skills</li><li>• Reflects understanding of subject matter and associated literature</li><li>• Demonstrates understanding of theoretical concepts</li><li>• Displays creativity and insight</li></ul>	<ul style="list-style-type: none"><li>• Arguments are superior</li><li>• Objectives are well defined</li><li>• Demonstrates mature critical thinking skills</li><li>• Exhibits mastery of subject matter and associated literature</li><li>• Demonstrates mastery of theoretical concepts</li><li>• Displays exceptional creativity and insight</li></ul>
Contribution to discipline	<ul style="list-style-type: none"><li>• Limited evidence of potential discovery</li><li>• Limited expansion upon previous research</li><li>• Limited potential of theoretical or applied significance</li></ul>	<ul style="list-style-type: none"><li>• Some evidence of potential discovery</li><li>• Builds upon previous research</li><li>• Reasonable potential of theoretical or applied significance</li></ul>	<ul style="list-style-type: none"><li>• Exceptional evidence of potential discovery</li><li>• Greatly extends previous research</li><li>• Exceptional potential of theoretical or applied significance</li></ul>
Overall assessment	<ul style="list-style-type: none"><li>• Does not meet expectation</li></ul>	<ul style="list-style-type: none"><li>• Meets expectation</li></ul>	<ul style="list-style-type: none"><li>• Exceeds expectation</li></ul>

Confidential Comments: