Department of Laboratory Medicine & Pathology
(Medical Sciences Graduate Program)

GRADUATE PROGRAM HANDBOOK

Revised November 2016
Dear Applicants, Graduate Students, Faculty Members and Supervisors:

The Department of Laboratory Medicine & Pathology (LMP) graduate studies program is proud to offer its students a multidisciplinary research environment where collaborations between clinical and basic research faculty promotes creativity and a desire for excellence. This positive environment for scientific inquiry is supported by the modern research laboratories and state-of-the-art instrumentation and resources.

This Handbook brings together guidelines to assist current students as well as supervisors with the planning and management of graduate training in Laboratory Medicine & Pathology.

I hope the Handbook will serve as a valuable resource for you, but please do not hesitate to contact the LMP graduate studies office directly at any time should you have concerns or questions.

Sincerely,

Monika Keelan, PhD
Associate Professor
Graduate Studies Coordinator
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1 OVERVIEW

Our unique graduate program in the Department of Laboratory Medicine & Pathology offers students a multidisciplinary research environment that promotes creativity and leads to academic excellence. Often this takes form in collaborative thesis research between our innovative basic and clinical research faculty, thus creating opportunities for world class research that cannot be established elsewhere. This exciting environment for scientific inquiry is supported by modern research laboratories and state-of-the-art instrumentation and resources. This ensures that our graduates enter the workplace with highly relevant practical skills, in addition to cutting edge research abilities. Course requirements are flexible, allowing us to tailor our training to match the needs of our diverse applicants. A range of science and medical courses are available to our students, and our graduate courses include two distinctive courses that focus on providing students with everyday skills required to excel in the academic world, including scientific communication, experimental design, and research management.

Programs leading to the degree of Master of Science (MSc) or Doctor of Philosophy (PhD) in Medical Sciences are offered. The programs of students admitted before September 2013 and who have not transferred to the Laboratory Medicine & Pathology independent graduate program are jointly administered by the Department of Laboratory Medicine & Pathology and the Medical Sciences Graduate Program. The requirements for the degree include coursework, presentations and seminars, and an approved research project that culminates in a written thesis. Approved courses offered by other Departments may be included in the candidate’s program.

Research Areas

Research in the Department of Laboratory Medicine & Pathology is diverse, and well-funded research programs exist in a number of areas, including biochemical genetics, molecular anthropology, environmental and analytical toxicology, blood-brain barrier interactions, cytokine cascades, blood banking, development of assays for environmental monitoring, cryobiology and cryopreservation, skin cancer biology and streptococcal, N. meningitis, E. coli, VRE, MRSA, anthrax and fungal microbiology.

Research Facilities

The Department of Laboratory Medicine and & Pathology has ample modern research space in the Heritage Medical Research Centre, the Canadian Blood Services Centre, the Clinical Sciences Building, the Medical Sciences Building, the Walter C. Mackenzie Health Sciences Centre, the Katz Group Centre for Pharmacy and Health Research, Innovation, the Cross Cancer Institute, and the Li Ka Shing Centre for Health Research. The department is equipped for molecular biology, blood chemistry analysis, gas and high-pressure liquid chromatography, mass spectrometry, environmental analysis, fluorescence and electron microscopy, computerized image analysis and flow cytometry.
2 APPLICATION AND ADMISSION

Laboratory Medicine & Pathology's graduate program became independent in Fall (September) 2013, and consequently applications to the Medical Sciences – Laboratory Medicine and Pathology programs are no longer accepted.

Application, admission, and program information about the independent Laboratory Medicine and Pathology programs can be found in the independent program handbook.
3 GUIDELINES AND RESPONSIBILITIES

3.1 Graduate Students - Guidelines and Responsibilities

Graduate students are ultimately responsible for their own programs. They are expected to read the Calendar and any other relevant documents to become familiar with all regulations and deadlines relating to their program.

The student’s fundamental responsibilities include:

- ensuring their registration is accurate and does not lapse;
- submitting appropriate forms to the department for signature and processing; and
- paying all fees required by the deadline dates set out in the Calendar.

Graduate students should:

- make themselves aware of the contents of the graduate portions of the Calendar and take responsibility for their own programs in that the Calendar sets out the requirements for the various programs;
- be aware of possible scholarship opportunities, and seek advice and assistance from the department in making applications, etc;
- be aware of the supervisor’s and any departmental expectations
- inform the supervisor or advisor regularly about progress, and provide the supervisor with an annual report for distribution to the supervisory committee;
- maintain open communication with their supervisor or advisor and graduate coordinator concerning any problem; and in the event of a conflict in the supervisor-student or advisor-student relationship, discuss with the supervisor or advisor and graduate coordinator in a timely fashion (see Complaints and Conflicts for further information);
- make research results accessible (beyond their appearance in a thesis) to an appropriate audience;
- follow and meet the regulations and requirements of the Faculty of Graduate Studies and Research, (FGSR), and the Medical Sciences Graduate Program Committee (MSGPC). This includes interdisciplinary students whose home department is not in the Medical Sciences Graduate Program.

(FGSR Grad Program Manual Section 1.1 and MSGP Outline of Responsibilities)

3.2 Graduate Student Supervisors – Guidelines and Responsibilities

Supervisors undertaking supervision of a graduate student agree to abide by the principles outlined in this document.

3.2.1 Qualifications of Supervisor

In the Department of Laboratory Medicine & Pathology, the Graduate Studies Coordinator recommends to the Medical Sciences Graduate Program Committee:

- the suitability of individual Faculty members to act as graduate student supervisors; and
- the suitability of individual Faculty members to sit on Supervisory Committees.

FGSR requires that each of the following criteria must be met by at least one of the supervisors:
Supervisors who do not meet one of these criteria may be appointed provided that a departmental justification (with the proposed supervisor's CV) is put forward to the Vice-Dean, FGSR for approval. Such approval, if granted, remains valid for five years. For supervisors from outside the University of Alberta, there should be an indication of the means by which meaningful interaction can be maintained.

There must be no conflict of interest between supervisor and student. Any personal relationships that alter or affect this academic relationship may constitute a conflict of interest (e.g., familial or intimate relationship, business relationship). Compliance with the University of Alberta's Conflict Policy – Conflict of Interest and Commitment, and Institutional Conflict is mandatory.

The following are general guidelines which complement the FGSR guidelines. The prospective supervisor:

- should have a successful record of graduate supervision;
- must have adequate time to supervise each prospective graduate student;
- must be capable of supervising the number of graduate students proposed;
- is expected to have adequate research funding for the proposed project, of a type that ensures the academic freedom of graduate students;
- must have the necessary facilities and resources available for graduate student research and provide an appropriate academic environment.

The requirement of a second supervisor for any student is subject to the discretion of the Graduate Studies Coordinator or Department Chair.

### 3.2.2 Multiple Supervisors

#### For New Supervisors

For prospective supervisors lacking experience in graduate supervision, it is the policy of the Department of Laboratory Medicine & Pathology that there is a second supervisor who is an experienced faculty member. The primary supervisor is required to identify the second supervisor within the graduate student's first term and to notify the LMP Graduate Program Office. The Graduate Coordinator or Department Chair must approve the choice.

- A second supervisor must be appointed for any faculty member supervising his or her first graduate student for the duration of that student's program.
- A second supervisor must also be appointed for any faculty member supervising his or her first PhD student for the duration of that student's program.
- The appointed second supervisor must have graduated a student from the University of Alberta.
- The role of second supervisor is to provide an additional source of guidance and support to the student while also acting as a mentor to the new supervisor.
• As per FGSR guidelines, supervisors must be active in the general subject area of the student’s research; however, LMP suggests that the second supervisor’s role is not necessarily to direct the research. In that regard, it should be noted that a second supervisor is not automatically a co-author on publications associated with the student. As for all publications, co-authorship should reflect a significant intellectual contribution to the manuscript.

For Supervisors whose Primary Appointment is not LMP

• For faculty members whose primary appointment is not LMP but who are tenured, tenure-track, a retired faculty member, or a Faculty Service Officer, of the University of Alberta, the same guidelines apply as for LMP faculty.

• For faculty members who are external to the University of Alberta, it is LMP policy that there be a second supervisor who is primarily appointed to Laboratory Medicine & Pathology for the duration of the graduate student’s program.

3.2.3 Graduate Student Supervisor Responsibilities

The supervisor is directly responsible for the supervision of the graduate student’s program. In this capacity, the supervisor assists the graduate student in planning a program, ensures that the graduate student is aware of all program requirements, degree regulations, and general regulations of the department, the Medical Sciences Graduate Program and the Faculty of Graduate Studies and Research (FGSR), provides counsel on all aspects of the program, and stays informed about the student's research activities and progress.

The supervisor is also charged with ensuring that graduate students conduct their research in a manner that is as effective, safe, and productive as is possible.

The supervisor must prepare a program of studies for the graduate student, arrange for and attend all supervisory committee meetings and examinations, ensuring that these are scheduled and held in accordance with FGSR regulations, and must review the thesis both in draft and in final form.

Specifically, it is the responsibility of the graduate student supervisor to:

• evaluate the graduate student's previous academic experience, and recommend courses the graduate student should take to ensure a solid and appropriate academic background is in place for the research to be undertaken.

• provide an environment for the graduate student that is conducive to research, and in which the graduate student can grow intellectually:
  o graduate students need time to study for courses, prepare for candidacy exams, write papers and read the literature; and
  o graduate students should also be encouraged to participate in activities that enhance their academic experience such as attending seminars, meeting with seminar speakers, participating in the graduate student organizations, attending conferences, and developing their skills and experience in teaching and mentoring;

• considers a graduate student a junior colleague;
  o supervisors are reminded that graduate students are fellow academics and should be treated with respect;
  o graduate students should not be viewed as “a pair of hands” and supervised only on the technical aspects of their project;

• ensure that appropriate financial support for the graduate student’s stipend is in place, or that sources of funding are available for the graduate student to apply for where applicable. (See Graduate Student Financial Support)
• ensure that there are sufficient financial resources and materials for the research program of each graduate student being supervised.

• ensure that the graduate student is aware of his/her responsibilities (as listed previously) and, when necessary, assist the graduate student in meeting them.

• provides appropriate guidance to the student on the nature of research and the standard expected, and is accessible to give advice and constructive feedback; at the beginning of the supervisory relationship, the student should be made aware in writing of the expectations held by the supervisor and the department that are not already defined in the University Calendar and the FGSR Graduate Program Manual.

• establish, with the graduate student, a realistic timetable for completion of various phases of the program.

• establish, with input from the graduate student, a Supervisory Committee within one year of the graduate student starting the graduate program (LMP suggests addressing this within eight months of the start of program).

• ensure that the Supervisory Committee maintains contact and formally meets with the graduate student at least once a year.

• inform and communicate to the Graduate Studies Coordinator, student and Supervisory Committee members regarding all meetings, examinations and any circumstances that arise with regard to the student's graduate program.

• set up Committee meetings and examinations in consultation with the student, and with the graduate student's full knowledge.

• complete all relevant forms, including signatures, and submit them to the Graduate Studies Coordinator.

• if going on leave or absent for an extended period, advise the Graduate Studies Coordinator and Medical Sciences Graduate Program Committee (MSGPC) which member of the Supervisory Committee will be the acting supervisor.

• if a PhD proposal is not submitted within the recommended time frame (normally by the end of the second year of the PhD program), forward a written explanation and timeline for submission to the Graduate Coordinator and the Chair of the MSGPC This includes interdisciplinary students whose home department is not in the Medical Sciences Graduate Program.

• ensure, in consultation with the Graduate Studies Coordinator and the Chair of the MSGPC as required, that the subject matter of the student's PhD proposal falls within the broad context of the Medical Sciences Graduate program.

• ensure that all members of the Supervisory Committee have signed off and approved the PhD research proposal. Proposals submitted should be accompanied by a list of 5 potential reviewers outside of the Student's department in a sealed envelope.

• ensure that all a signed a statement approving the suitability of the thesis for examination is submitted to the Graduate Studies Coordinator prior to submission of the final oral examination form.

(FGSR Grad Program Manual Section 1.2 and MSGP Outline of Responsibilities)
3.3 Graduate Student Supervisory Committee - Guidelines and Responsibilities

It is recommended that the Supervisory Committees for both PhD and Master's students be established within eight months of the start of the student’s program, but must be established within one year to meet FGSR guidelines. The committee must have at least three members including the supervisor(s).

3.3.1 Qualification of Supervisory Committee Members

At a minimum, supervisory committee members must be qualified to serve as Examining Committee members as they are ex-officio members of the examining committee. It is suggested to consider the following when establishing a supervisory committee:

- **At least half** of the examiners on every examining committee must hold a degree which is equivalent to or higher than the degree being examined. (FRCP is considered the equivalent of a master's degree.)
- **At least half** of the examiners on every examining committee must meet the employment requirement: current or retired tenured or tenure-track Faculty, current or retired Faculty Service Officer, or current Special Continuing (Academic Staff Categories A1.1, A1.3, C1.1). Examiners with clinical appointments are permitted, but do not satisfy this employment requirement.

Members of a supervisory committee are to be sufficiently competent and experienced to serve at the required level. In forming a supervisory committee, consideration is given to the rank and experience of the prospective members, their publications and other demonstrations of competence in the subject area or field of specialization, and the prospective members’ experience in graduate supervision.

(Persons may not act as Supervisory Committee member for matters in which they have a conflict of interest. Any personal relationships that alter or affect this academic relationship may constitute a conflict of interest (e.g., familial or intimate relationship, business relationship). Compliance with the University of Alberta’s Conflict Policy – Conflict of Interest and Commitment, and Institutional Conflict is mandatory.

3.3.2 Graduate Student Supervisory Committee Responsibilities

- Is accessible to the graduate student for consultation;
- Provides guidance and advice to the graduate student based on their area of expertise;
- Participates in regular committee meetings;
- Recommends and approves courses for the graduate student;
- Approves the graduate student's PhD research proposal before submission;
- Signs a statement approving the suitability of a thesis for examination prior to submission of the final oral examination form; and
- Participates in candidacy and/or final oral examinations.

3.4 Graduate Studies Committee - Roles and Responsibilities

The role of the Graduate Studies Committee is to:

- promote and enhance graduate studies;
- set policy as defined in the LMP Graduate Program Handbook;
• review and make decisions as necessary regarding admissions, graduate student supervisors, and student awards;
• assist in monitoring graduate student progress; and
• assist in the informal appeals or grievance processes.

The graduate program in Laboratory Medicine and Pathology is administered by the Graduate Studies Committee which normally consists of the Department Chair, the Graduate Studies Coordinator, the Director of the Pathologists’ Assistant program, at least 4 additional faculty members (where at least 50% must be actively supervising graduate students), and 1-2 graduate student representatives. All faculty members of the Graduate Studies Committee are appointed by the Department Chair for a defined term of service.

At least 3 faculty members plus the Graduate Studies Coordinator are required for quorum.

3.5 Graduate Studies Coordinator - Responsibilities

1. Acts as the official graduate program representative of the Department to the MSGPC and the FGSR.
2. Communicates relevant information from the MSGPC and the FGSR to students and faculty members in the Department.
3. Be accessible for consultation with students and faculty members in the Department.
4. Ensures that students in the Department receive proper supervision and that the regulations and requirements of the FGSR and the MSGPC are met.
5. Ensures that applications for graduate studies are complete, and that the applicants meet the admission criteria before forwarding the applications to MSGPC.
6. Ensures that a supervisor and a supervisory committee are set up within one year of the student starting the graduate program.
7. Ensures that the supervisor has arranged appropriate financial support for the Student's stipend and research project where applicable.
8. Ensures, in consultation with the supervisor and Chair of the MSGPC as required, that the subject matter of the student's PhD proposal falls within the broad context of Medical Sciences.
9. Reviews and approves the Student's PhD proposal prior to the package being sent to the MSGPC. The Graduate Coordinator also ensures that the proposal is submitted, normally by the end of the second year of the PhD Program. If the proposal is not submitted within this time frame, the Graduate Coordinator ensures that a written explanation and timeline for submission is received from the supervisor and forwarded to the Chair of the MSGPC (including interdisciplinary students whose home department is not in the Medical Sciences Graduate Program).
10. Recommends to the MSGPC that the supervisor and members of the Supervisory Committee:
   o have the appropriate background and experience to guide the Student;
   o have the expertise, time and ability to adequately supervise the Student;
   o demonstrate continuing scholarly or creative activity of an original nature;
   o hold a continuing faculty appointment in a department relevant to the field;
   o hold a degree equivalent to or higher than that for which the Student is a candidate.
11. Recommends the addition of a co-supervisor as required.
12. Monitors the progress of all students in the Department.
13. Informs the MSGPC of changes in Student status, courses or program.
14. Chairs the candidacy and final oral examinations or delegates the responsibility as necessary. The Chair of these examinations cannot be the supervisor.
15. At meetings of the MSGPC, summarizes proposal packages from all students in the Department.

Relationships between Graduate Studies Coordinators and the staff and graduate students in their program(s) should be academic. Any personal relationships that alter or affect this academic relationship may constitute a conflict of interest (e.g., familial or intimate relationship, business relationship). Compliance with the University of Alberta’s Conflict Policy – Conflict of Interest and Commitment, and Institutional Conflict is mandatory. Persons may not act as Graduate Studies Coordinator for matters in which they have a conflict of interest.

3.6 Medical Sciences Graduate Program Committee (MSGPC)

The Department of Laboratory Medicine & Pathology is a member department of the Medical Sciences Graduate Program.

The Medical Sciences Graduate Program Committee (MSGPC) :
1. Enhances the quality of graduate studies within member departments by facilitating excellence in all aspects of graduate education.
2. Acts as the official graduate program representative for member departments to the FGSR.
3. Sets policy for graduate programs in member Departments.
4. Establishes and updates strategic plans for continued improvement of the Medical Sciences graduate program.
5. Assesses the quality and appropriateness of the students’ graduate programs.
6. Ensures that the minimum admission requirements, course requirements, residency requirements, and length of program requirements are met.
7. Maximizes the opportunity for the students to succeed.
8. Assesses PhD program packages with one of the following outcomes: approval; approval with conditions; resubmission after revision or presentation to the MSGPC; rejection.
9. The Chair of the MSGPC
   - is accessible for consultation with students, supervisors and Graduate Coordinators;
   - is a member of the FGSR Council;
   - communicates relevant information from the FGSR to Committee Members;
   - approves applications for graduate studies before forwarding to the FGSR;
   - may attend candidacy and final oral examinations as an observer;
   - approves the appointment of supervisors, Supervisory Committees and Examining Committees before submission to the FGSR;
   - informs the Associate Dean (Research) on the status of the Medical Sciences graduate program, and on issues related to graduate studies.
3.7 Graduate Student Financial Support

It is the graduate student's responsibility to apply for appropriate external funding, and it is the supervisor's responsibility to facilitate those applications in a timely fashion. For further information regarding student awards, please see Student Awards and Funding.

Definitions for the purposes of student financial support:

**Financial support** or **funding level** = total amount of stipend, or award(s), or any combination of stipend and award(s)

**Stipend** = payment to student from an operating grant

**Award** = scholarship/fellowship or award; excludes travel awards (e.g. from LMP, FGSR, or the GSA) and prizes (e.g. Andrew Stewart Prize).

Note: Per FGSR, scholarships, fellowships and awards are intended to support future work; prizes recognize past accomplishments and are not intended to support future work.

**Major award** = an award or scholarship of $13,000 or greater (in agreement with FoMD guidelines)

**GRAF Minimum Stipend:** Graduate Research Assistantship Fellowship Minimum Stipend for Full Funding Support as defined in the Graduate Student Assistantship Collective Agreement.

For the period of Sept 1, 2016 - Aug 31, 2017 the funding minimum is:
- $23,617.44/year ($1,968.12/month) for MSc students
- $24,702.36/year ($2,058.53/month) for PhD students

While the department sets the funding policy, supervisors are responsible for the financial support of graduate students under their supervision according to the following:

- The supervisor must ensure that the student receives financial support in the form of a stipend, award(s), or combination of these which equals the GRAF Minimum Stipend. Specific guidelines follow.

- **Expected duration of funding:**
  - For master's students: 2.5 years minimum
  - For doctoral students: 5 years minimum
  - Student funding beyond the expected duration is subject to satisfactory performance and availability of funding.

- **Self-funding by students who are within the expected funding periods may not replace the required level of funding support.**

**Funding of students with no award(s):**
Supervisor ensures student receives a stipend which at least equals the GRAF Minimum Stipend.

**Funding of students earning major and minor awards:**
Major awards only:
Major awards are administered according to the rules of the awarding agency. However, if the student earns a **major award of a value less than the GRAF Minimum Stipend**, the supervisor must ensure that the student receives a stipend (top-up) which ensures an annual funding level **at least** equal to the GRAF Minimum Stipend for the duration of the major award.

**Minor awards only:**

For **each** minor award earned:

- If \((\text{value of the award} - 1,500)\) is \(\leq 0\), there is no change to the student's current stipend; student funding level increases by the value of the award for that year.

- If \((\text{value of the award} - 1,500)\) is \(> 0\), then the supervisor may opt to adjust the student's stipend as follows:

  \[
  \text{revised stipend} = \text{current stipend} - x (\text{value of award} - 1,500)
  \]

  where \(x = \text{percentage of reduction set by the supervisor}\)

  - \(x = 50\%\) is suggested so as to encourage students to apply for awards while also recognizing the needs of supervisors to fund laboratory activities in support of the student's research, but any percentage may be used.

  - \(0\% = \text{no reduction}\)

  - \(100\% = \text{reduction of all but 1,500}\)

  \[
  \text{revised funding level for that year} = \text{revised stipend} + \text{value of award}
  \]

- In all cases, the student's overall funding level increases.

**Major and minor awards:**

- If a student holding a major award subsequently earns a minor award, the student (1) keeps the entire value of the minor award(s) if permitted by both awarding agencies, and (2) there is no reduction to the stipend.

- If the student holding a minor award subsequently earns a major award, the student may keep the entire value of the minor award if permitted by both awarding agencies. If the student cannot keep the minor award due to awarding agency guidelines, then the “major awards only” guideline is followed.

For a student holding major and/or minor awards, **funding level may decrease the following year** if additional awards are not earned.

On the rare occasion that a supervisor has to let a graduate student go because of financial exigency, they are not permitted to take on a new graduate student for at least one calendar year. Supervisors must make students aware of their financial situation and their ability to support the graduate student during their graduate career.

### Complaints and Conflicts

#### 3.7.1 Coursework Complaints

Concerns regarding coursework or grades should be addressed first with the course instructor and, if that proves unsatisfactory, then with the chair of the department where the course is taught, and finally with the dean of the faculty in which the course is taught or that dean's designate (usually the associate dean).

For detailed guidelines of the informal and formal grade appeals process see the Faculty of Medicine and Dentistry’s Policy and Procedure on [Academic Appeals](#). Specific timelines apply.
Grades cannot be appealed beyond the Faculty level.
The Office of the Student Ombuds may be consulted for advice at any time.

3.7.2 Student/Supervisor Conflicts

The relationship between students and supervisors is normally close and long-lasting. At times, conflicts may arise between a student and the supervisor.

- The first step is to try to resolve the conflict or misunderstanding informally. The supervisor and student should discuss the problem together.
- If resolution is unsuccessful, the graduate coordinator should be notified as early as possible. It is the responsibility of the graduate coordinator to arrange for consultation and mediation.
- Assistance/advice of the supervisory committee or other appropriate resources may be requested.
- Finally, assistance of the FGSR may be requested.
- The Office of the Student Ombuds may be consulted for advice at any time.

(FGSR Grad Program Manual Section 8.1.6)
4 MASTER’S PROGRAM

4.1 Time Limits for Program Completion (MSc)

Laboratory Medicine & Pathology requires that thesis-based master's students complete all program requirements other than the thesis within two years of the commencement of their program.

The time limit for program completion as established by FGSR is four years from their start date. The minimum length of time is determined by registration requirements: students admitted before Fall 2011 must complete 24 units of course weight; students admitted Fall 2011 or later must pay the equivalent of at least one full year of program fees. Notwithstanding this, students are required to fulfill the department's program requirements; a minimum of two years is a realistic expectation for Master's students in LMP.

Any time spent as a qualifying graduate student is not counted in the time limit for completion.

FGSR Grad Program Manual Section 6.2 and Section 7.9
4.2 Registration Requirement

All students in Laboratory Medicine & Pathology graduate programs must be full time. It is also FGSR policy that Students who are admitted to any thesis-based degree program and who initially register as full-time students in these programs must register full-time for the remainder of their program.

To be considered full time, the following requirements must be met:

Master’s students admitted before Fall 2011:

- must register in 9 units of course weight (UCW) each Fall and Winter term of their programs and by doing so will be considered full time through the Spring and Summer terms; these 9 UCW may consist of a combination of courses and thesis research.
- are eligible to register in Thesis 919 (reduced-fee thesis) after one full year (two terms)

Master’s students admitted Fall 2011 or later:

- must register in 9 units of course weight (UCW) each Fall and Winter term of their programs; these 9 UCW may consist of a combination of courses and thesis research.
- must register in Thesis 906 for each of the Spring and Summer terms

If proof of registration is required, registration verification can be obtained from the Registrar’s Office.

4.3 Required Coursework (MSc)

LABMP 530 is mandatory for all students.

The minimum required coursework MSc students in Laboratory Medicine & Pathology is 9 units of course weight (UCW) of graded, graduate-level courses, or approved equivalent.

The supervisor and the Supervisory Committee will establish the required courses that a graduate student must complete during their program. Graduate students may be required to take more than the minimum number of courses in order to address deficiencies in their prior training, or to provide background training that is essential for the completion of their degree programs.

Any University of Alberta graduate level graded course may be taken if it has been approved by the student’s supervisor/supervisory committee. See MSGP's Approved Courses for Medical Sciences Programs for examples.

4.3.1 Academic Standing and Grades

- LMP graduate students must maintain a cumulative program GPA of 3.0
- The passing grade for graduate courses is C+ (2.3)
- If the cumulative grade point average falls between 2.3 and 3.0, departments may recommend termination of program or continuation in the program for a specified probationary period.
- Notwithstanding the above, a graduate student whose academic standing falls below a grade point average of 3.0 may be required to withdraw at any time.

4.4 Research and Thesis (MSc)

An experiment based research project is required and is the major component of the student's program. All candidates must present a thesis embodying the results of their research and the topic must be approved by the candidate’s supervisor and Supervisory Committee.

- A Master’s Thesis should reveal that the candidate is able to work in a scholarly manner and is acquainted with the printed works published on the subject of the thesis. As far as possible, it should be an original contribution. (FGSR Grad Program Manual Section 8.4.1)
For information on Thesis Preparation see the Guidelines for the Thesis and Final Examination and FGSR’s Thesis Requirement & Preparation.

4.4.1 Research Laboratory Safety

The University of Alberta undertakes regular safety audits and, in consideration of this, the department of Laboratory Medicine and Pathology asks that the graduate program track graduate student safety training, demonstrating due diligence in this important area. At a minimum, all students must complete three online laboratory safety training courses offered U Alberta’s Environment, Health & Safety: WHMIS, Laboratory Safety, and Concepts in Biosafety. In addition to these, lab specific training must be completed prior to performing any laboratory work. Students must complete the training and submit the Graduate Student Safety Training form to the LMP Graduate Program Office preferably within one month of beginning their programs but no later the end of the first term.

4.5 Ethics and Academic Integrity Training Requirement

Ethics and Academic Integrity Training is mandatory for all newly-admitted University of Alberta graduate students. Eight hours of training is required.

The Department of Laboratory Medicine & Pathology (LMP) Graduate Studies Committee has determined that the Ethics and Scientific Integrity (ESI) Day offered by the Faculty of Medicine and Dentistry is a mandatory component of this training for LMP students. The ESI Day supplies 5 hours training. The remaining three hours of training may be obtained by completing any one of the following:

1. Graduate Ethics Training (GET) via eClass
2. LABMP 530* or LABMP 535
3. Another graduate level university ethics course or course with ethics components (PHS 543, PHIL 550, MED 650, INT D 670, INT D 570 or others as approved by the LMP Graduate Studies Committee)
4. Submission of a completed ethics review application to an established Human or Animals Research Ethics board.
5. HSLAS (Health Sciences Laboratory Animal Services) training course
6. Tri-Council ethics tutorial

It is the responsibility of the graduate student to register for these sessions and to submit documentation of completion of these sessions to the Graduate Coordinator.

* Because LABMP 530 is mandatory, current MSc and PhD students meet the FGSR Ethics and Academic Integrity Training requirement by completing ESI Day and LABMP 530.

4.6 Presentation/Seminar Attendance Requirement (MSc)

1. Master’s students are required to make one oral presentation to the department at LMP Rounds. Student LMP Rounds presentations are scheduled for 25 minutes, generally a 20 minute presentation followed by a short question period. Students are expected to present their own research data.

2. FGSR identifies the expected components of a graduate program to include “regular (eg, weekly) talks (or other events as appropriate) by faculty, students, visitors and invitees from other departments during fall and winter terms. Talks should provide varying perspectives and a range of topics.”

(FGSR Graduate Program Manual, Section 1.7)
To meet this program component, students are expected to attend all LMP Rounds presentations. Attendance at 60% of Rounds presentations each year for the first two years of the master’s program is required to ensure continuation in the student’s program. To record attendance, students are responsible for signing the log book that will be found in the seminar room. Failure to sign the logbook will not be accepted as a reason for failing to meet the attendance requirement.

4.7 Supervisory Committee

The Master’s Supervisory Committee is to be established within 8 months of the start of the student’s program in accordance with Graduate Student Supervisory Committee – Guidelines and Responsibilities. Supervisors should advise the LMP Graduate Coordinator and Program Advisor of the committee members, or submit an Appointment of Supervisor(s) and Supervisory Committee to the LMP Graduate Program office.

4.8 Supervisory Committee Meetings

It is ultimately the responsibility of the supervisor to ensure that the graduate student has annual supervisory committee meetings. Annual meetings are considered to be minimal and, if possible, more frequent meetings are encouraged.

See Supervisory Committee Meetings for guidelines.

4.9 Final Examination

After the completion of all program requirements, including an acceptable draft of the thesis, the final examination can be planned. See Final Examination and Program Completion for guidelines.
### 4.10 MSc Program Monitoring

#### 4.10.1 Timelines

<table>
<thead>
<tr>
<th>Event / Forms</th>
<th>SUPERVISOR</th>
<th>Department Timeline</th>
</tr>
</thead>
</table>
| Nominated supervisor: Appointment of Supervisor(s) and Supervisory Committee | | • Supervisor identified prior to offer of admission  
• Submit form after student has registered |

<table>
<thead>
<tr>
<th>Event / Forms</th>
<th>SUPERVISORY COMMITTEE</th>
<th>Department Timeline</th>
</tr>
</thead>
<tbody>
<tr>
<td>Nominated Supervisory Committee members: Appointment of Supervisor(s) and Supervisory Committee or memo</td>
<td></td>
<td>• Within the first 8 months and no later than the end of the first year</td>
</tr>
<tr>
<td>Supervisory Committee meets with student to review program and progress; submits Graduate Student Supervisory Committee Meeting Report</td>
<td></td>
<td>• Annually, or more often as deemed appropriate by the supervisor</td>
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</tbody>
</table>

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<thead>
<tr>
<th>Event / Forms</th>
<th>ETHICS AND ACADEMIC INTEGRITY TRAINING</th>
<th>Department Timeline</th>
</tr>
</thead>
<tbody>
<tr>
<td>Student must complete the equivalent of at least eight hours of structured academic activity</td>
<td></td>
<td>• Within first two years of program</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Event / Forms</th>
<th>FINAL ORAL EXAMINATION</th>
<th>Department Timeline</th>
</tr>
</thead>
<tbody>
<tr>
<td>Supervisory committee signs and submits the Departmental Acceptance of Thesis</td>
<td></td>
<td>• Prior to setting examination date and before the thesis is sent to the examiners</td>
</tr>
</tbody>
</table>
| Recommends Examining Committee and exam date: Notice of Examining Committee & Examination Date | | • Submit at least four weeks prior to examination  
• Copy of the Notice is sent to examiners and student |
| Thesis is submitted to the Examining Committee and Chair | | • At least four weeks prior to examination |
| If required: Request to Restrict Access to a Thesis | | • Request must be made prior to or at the same time as submission of the Thesis Approval / Program Completion form to FGSR, for a period of up to one year |
| Report examining committee’s decision on Thesis Approval / Program Completion form | | • Submit immediately after all signatures are obtained and within six months of the exam |
| Submit an electronic copy of the thesis to FGSR | | • Within six months of examination |

**NOTE:** All forms are to be submitted to the LMP Graduate Program Office in accordance with the indicated timelines. If you wish the assistance of the LMP Graduate Program Office in preparing the forms (recommended), please allow several extra days. All forms are sent first to MSGP and then to FGSR for approval.
### 4.10.2 Checklist

<table>
<thead>
<tr>
<th>Name</th>
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<tbody>
<tr>
<td>ID</td>
<td></td>
</tr>
<tr>
<td>Start date</td>
<td></td>
</tr>
<tr>
<td>Completion Deadline</td>
<td></td>
</tr>
<tr>
<td>Supervisor(s)</td>
<td></td>
</tr>
<tr>
<td>Supervisory Committee</td>
<td>[within first 8 months]</td>
</tr>
</tbody>
</table>

#### Required Coursework:

| LABMP 530 |  |
| Course #2 |  |
| Course #3 |  |
| Other courses |  |

#### Academic Integrity and Ethics Training:

| ESI Day |  |
| Other |  |

#### LMP Rounds Presentation

| LMP Rounds Attendance | [≥ 60% in year 1 and 2] |

#### Supervisory Committee Meetings

| Supervisory Committee Meeting #1 | [within first year] |
| Supervisory Committee Meeting #2 | [within second year] |
| Supervisory Committee Meeting #3 | [within third year] |
| Supervisory Committee Meeting #4 | [within fourth year] |

#### Final Oral Examination

| Examining Committee Members |  |

#### Awards

| Bell McLeod Travel |  |
| Other |  |

#### Notes

| Convocation Date |  |
5 Doctoral Program

PhD program
- 3-6 years

Year 1
- Coursework including mandatory course (LABMP 530)
- Ethics and Academic Integrity training
- Research
- LMP Rounds attendance
- Research Day attendance/presentation
- Supervisory Committee established
- Supervisory Committee meeting #1

Year 2
- Coursework as needed
- Research
- LMP Rounds attendance
- DRIvE Days attendance/presentation
- PhD Proposal
- Supervisory Committee meeting #2

Year 3
- Candidacy Exam
- Research
- LMP Rounds attendance
- LMP Rounds presentation
- DRIvE Days attendance/presentation
- Supervisory Committee meeting #3

Years 4 - 5
- Complete research
- DRIvE Days attendance/presentation
- Supervisory Committee meeting #4 & #5
- Write up thesis
- Final oral examination

Graduation / Convocation
5.1 Time Limits for Completing Programs (PhD)

Doctoral students are required to complete all program requirements other than the thesis within three years of the commencement of their program.

Doctoral degree students must complete all requirements within six years of the start of the first term in which the student registers in the doctoral degree. The minimum length of time is determined by registration requirements: students admitted before Fall 2011 must complete 36 units of course weight; students admitted Fall 2011 or later must pay the equivalent of at least three full year of program fees. Notwithstanding this, students are required to fulfill the department's thesis-based program requirements and a realistic expectation for doctoral students to complete their program in LMP is a minimum of four to six years.

Note: Master's students who are reclassified as doctoral program must complete all degree requirements within six (6) years from their first term of registration as a Master’s student.

Any time spent as a qualifying graduate student is not counted in the time limit for completion.

(FGSR Grad Program Manual Section 6.2 and Section 7.9)

5.2 Registration Requirement

All students in Laboratory Medicine & Pathology graduate programs must be full time. It is also FGSR policy that Students who are admitted to any thesis-based degree program and who initially register as full-time students in these programs must register full-time for the remainder of their program.

To be considered full time, the following requirements must be met:

Doctoral students admitted before Fall 2011:

- must register in 9 units of course weight (UCW) each Fall and Winter term of their programs and by doing so will be considered full time through the Spring and Summer terms; these 9 UCW may consist of a combination of courses and thesis research.
- are eligible to register in Thesis 919 (reduced-fee thesis) after two full years (four terms)

Doctoral students admitted Fall 2011 or later:

- must register in 9 units of course weight (UCW) each Fall and Winter term of their programs; these 9 UCW may consist of a combination of courses and thesis research.
- must register in Thesis 906 for each of the Spring and Summer terms

If proof of registration is required, registration verification can be obtained from the Registrar’s Office.

5.3 Required Coursework (PhD)

LABMP 530 is mandatory for all students.

The minimum required coursework for PhD students in Laboratory Medicine & Pathology is:

- at least 12 graded units of course weight (UCW) at the graduate level (typically 4 courses) for students who do not have a Master’s degree, or
- at least 6 graded UCW at the graduate level (typically 2 courses) for students who do have a Master’s degree.

The supervisor and the Supervisory Committee will establish the required courses that a graduate student must complete during their program. Graduate students may be required to take more than the minimum number of courses in order to address deficiencies in their prior training, or to provide background training that is essential for the completion of their degree programs.
Any University of Alberta graduate level graded course may be taken if it has been approved by the student’s supervisor/supervisory committee. See MSGP's Approved Courses for Medical Sciences Programs for examples.

5.3.1 **Academic Standing and Grades**

- LMP graduate students must maintain a cumulative program GPA of 3.0
- The passing grade for graduate courses is C+ (2.3)
- If the cumulative grade point average falls between 2.3 and 3.0, departments may recommend termination of program or continuation in the program for a specified probationary period.
- Notwithstanding the above, a graduate student whose academic standing falls below a grade point average of 3.0 may be required to withdraw at any time.

5.4 **Research and Thesis (PhD)**

An experiment based research project is required and is the major component of the student's program. All candidates must present a thesis embodying the results of their research and the topic must be approved by the candidate’s supervisor and Supervisory Committee.

- A Doctoral Thesis must embody the results of original investigations and analyses and be of such quality as to merit publication; furthermore, it must constitute a substantial contribution to the knowledge of the candidate’s field of study.

For further information on Thesis Preparation please see the Guidelines for the Thesis and Final Examination and FGSR's Thesis Requirement & Preparation.

5.4.1 **Research Laboratory Safety**

The University of Alberta undertakes regular safety audits and, in consideration of this, the department of Laboratory Medicine and Pathology asks that the graduate program track graduate student safety training, demonstrating due diligence in this important area. At a minimum, all students must complete three online laboratory safety training courses offered U Alberta’s Environment, Health & Safety: WHMIS, Laboratory Safety, and Concepts in Biosafety. In addition to these, lab specific training must be completed prior to performing any laboratory work. Students must complete the training and submit the Graduate Student Safety Training form to the LMP Graduate Program Office preferably within one month of beginning their programs but no later the end of the first term.

5.5 **Ethics and Academic Integrity Training Requirement**

Ethics and Academic Integrity Training is mandatory for all newly-admitted University of Alberta graduate students. Eight hours of training is required.

The Department of Laboratory Medicine & Pathology (LMP) Graduate Studies Committee has determined that the Ethics and Scientific Integrity (ESI) Day offered by the Faculty of Medicine and Dentistry is a mandatory component of this training for LMP students. The ESI Day supplies 5 hours training. The remaining three hours of training may be obtained by completing any one of the following:

1. **Graduate Ethics Training (GET)** via eClass
2. LABMP 530* or LABMP 535
3. Another graduate level university ethics course or course with ethics components (PHS 543, PHIL 550, MED 650, INT D 670, INT D 570 or others as approved by the LMP Graduate Studies Committee)
4. Submission of a completed ethics review application to an established Human or Animals Research Ethics board.

5. HSLAS (Health Sciences Laboratory Animal Services) training course

6. Tri-Council ethics tutorial

It is the responsibility of the graduate student to register for these sessions and to submit documentation of completion of these sessions to the Graduate Coordinator.

* Because LABMP 530 is mandatory, current MSc and PhD students meet the FGSR Ethics and Academic Integrity Training requirement by completing ESI Day and LABMP 530.

5.6 Presentation/Seminar Attendance Requirement (PhD)

1. PhD students, in addition to the public presentation which is part of their final exam, must make one oral presentation to the department at LMP Rounds. Student LMP Rounds presentations are scheduled for 25 minutes, generally a 20 minute presentation followed by a short question period. Students are expected to present their own research data.

2. FGSR identifies the expected components of a graduate program to include “regular (eg, weekly) talks (or other events as appropriate) by faculty, students, visitors and invitees from other departments during fall and winter terms. Talks should provide varying perspectives and a range of topics.”

   (FGSR Graduate Program Manual, Section 1.7)

To meet this program component, students are expected to attend all LMP Rounds presentations. Attendance at 60% of Rounds presentations each year for the first three years of the doctoral program is required to ensure continuation in the student’s program. To record their attendance, students are responsible for signing the log book that will be found in the seminar room. Failure to sign the logbook will not be accepted as a reason for failing to meet the attendance requirement.

5.7 Supervisory Committee

The PhD Supervisory Committee is to be established within 8 months of the start of the student’s program in accordance with Graduate Student Supervisory Committee – Guidelines and Responsibilities. Supervisors should advise the LMP Graduate Coordinator and Program Advisor of the committee members, or submit an Appointment of Supervisor(s) and Supervisory Committee to the LMP Graduate Program office.

5.8 Supervisory Committee Meetings

It is ultimately the responsibility of the supervisor to ensure that the graduate student has annual supervisory committee meetings.

Annual meetings are considered to be minimal and, if possible, more frequent meetings are encouraged.

See Supervisory Committee Meetings for guidelines.

5.9 PhD Proposal

5.9.1 PhD Proposal Requirements

The Medical Sciences Graduate Program strives for excellence in graduate studies, where graduate students are highly motivated to make original contributions in science and to complete their PhD program with peer-reviewed publications. As a member department of the Medical Sciences Graduate
Program, the Department of Laboratory Medicine & Pathology utilizes the expertise of this body to review and approve all proposals from PhD students registered in our program.

PhD students must submit a PhD Proposal package to the MSGPC following the completion of the majority of their course work and within the first 2 years of the start of their program. If the proposal is not submitted within this timeframe, a written explanation and timeline for submission should be forwarded to the Graduate Coordinator and the Chair of the MSGPC from the supervisor. (This includes interdisciplinary students whose home department is not in the Medical Sciences Graduate Program).

5.9.2 PhD Proposal

The proposal will contain:

- a review of the pertinent literature,
- the research hypothesis,
- the specific objectives of the research,
- a review of the relevant work done previously by the student or the research group on the subject,
- a detailed presentation of the planned experimental approach, and
- the significance of the anticipated results.

The planned experimental approach will present the actual work proposed by the student and will not contain work or anticipated work that will not be conducted by the student.

The thesis proposal is to be written by the student. The thesis proposal must be entirely the student's own creation, although she/he can utilize the supervisor's guidance and/or the expertise in the department or on campus to explore ideas and obtain specific background or technical information. Individuals external to the Supervisory Committee may also review the draft of the thesis proposal.

5.9.3 The PhD Proposal Package

The Medical Sciences Graduate Program Committee (MSGPC) requests each applicant's proposal package consists of the following information presented in the order in which it appears:

1. Student’s academic record, in the form of transcripts from the University of Alberta and other institution(s), if applicable.

2. The proposal form must be completed, stating:
   - Supervisory committee members
   - Project title
   - Student's completed and proposed coursework
   - Project's source of funding, including the name, duration and amount
   - Supervisor's source of funding, including the name, duration and amount
   - Student publications
   - Student honours and awards
   - Timeline of the PhD program, indicating supervisory committee meetings, proposed month of the candidacy examination and final oral examination

3. A written statement from the supervisor (maximum of 200 words) outlining the potential contribution to science of the student's PhD project.

4. A proposal outlining the scope of the research project:
o **A written proposal.** This must be completed independently by the student and should clearly and precisely outline his/her role in the research.
  - **Length:** Must not exceed four (4) pages, excluding appendices.
  - **Format:** single spaced with 1.0 inch (2.5 cm.) margins.
  - **Font:** Times New Roman, size 12.

o **Appendices.** These should be restricted to figures, legends, references, questionnaires and tables.

o **A sign-off page.** The signatures of the student’s supervisor, the supervisory committee members and the departmental graduate coordinator must be present to indicate approval of the proposal.

**Please Note:** Anything exceeding these guidelines will be returned to the student and not be included for review.

5. A Curriculum vitae from for the supervisor (and co-supervisor, where present) must be submitted in the common CV format, to a maximum of six pages.

6. Proposals must be accompanied by a list of **five potential reviewers** outside the student’s department in a sealed envelope. It is LMP policy that this information is to be supplied directly to the graduate coordinator from the student’s supervisor via email or delivered to the graduate coordinator by the student in a sealed and signed envelope. After confirming the reviewers, the graduate coordinator will return a sealed and signed envelope with the reviewer names to the student for submission to the MSGPC.

An original paper copy of the proposal package is submitted to the MSGPC, Office of Research, Faculty of Medicine & Dentistry.

**5.9.4 Assessment of the PhD Proposal Package**

To ensure the quality of a Student's graduate program, the Medical Sciences Graduate Program Committee will assess all PhD students using the following four key attributes of a successful graduate program:

- The graduate student's background and readiness.
- The supervisor and research environment.
- The Supervisory Committee and their contributions to the development of the graduate student.
- The scope, rigor and quality of the research project.

These four attributes are addressed in the PhD proposal package that the graduate student submits to MSGPC.

The Medical Sciences Graduate Programs Committee reviews the curriculum vitae information of the supervisor(s), and assesses whether they are appropriate to support the graduate student and his/her research, based on the recommendation of the Graduate Studies Coordinator of that Department.

The supervisor is also assessed carefully, giving special consideration to the research environment, funding, accessibility and all other aspects mentioned in **Graduate Student Supervisor Responsibilities.**

An expert subcommittee reviews the Graduate Student's PhD proposal, and assesses the quality, scope and its potential contribution to the advancement of knowledge in that area of research. This Subcommittee will consist of a member of the MSGPC and at least one external member with appropriate expertise.
If the Committee approves the proposal, the Graduate Coordinator, supervisor and student are notified in writing. If the Committee has concerns about any aspect of the proposal package, further clarification will be requested.

5.10 Candidacy Examination

Supervisors are expected to provide a minimum of two to three weeks protected time (away from lab work) prior to the candidacy examination date for students to make final preparations for this important examination. This is meant as a final preparation time only, as it is expected that students are studying well in advance of this period.

5.10.1 Purpose of Candidacy Examination

The candidacy examination is comprehensive and addresses the qualifications of the doctoral graduate student in terms of his/her ability to pursue and complete original research at an advanced level. The purpose of the exam is to assess the breadth of the candidate's knowledge in her/his general field of research, the candidate’s knowledge of the technical aspects of the proposed thesis research and the candidate’s reasoning and critical thinking abilities.

5.10.2 Timelines

Graduate students are eligible to take the candidacy examination after the Medical Sciences Graduate Committee approves their PhD Proposals. Doctoral students must submit their proposals to the MSGPC following the completion of the majority of their course work and within the first 2 years of their program (see PhD Proposal).

Graduate students must complete the candidacy examination within 6 months of their PhD proposals being approved by the MSGPC. If the proposal is not submitted within this timeframe, a written explanation and timeline for submission should be forwarded to the Graduate Coordinator. Normally, the candidacy examination will occur within the first 30 months of the student’s graduate program. Pursuant to FGSR policy, graduate students must complete the candidacy examination 6 months before their expected oral final examination.

Once the schedule for the examination is agreed upon by the supervisory committee, the following steps need to be taken:

a. A Candidacy Examining Committee and the Candidacy Examination Chair is recommended to the Graduate Program Coordinator by the supervisory committee;

b. The completed Notice of Examining Committee & Examination Date form must be submitted to the graduate program office at least 4 weeks prior to the proposed examination date. If you wish the assistance of the LMP Graduate Program Office in preparing the forms, please allow sufficient extra time. This form is sent to MSGP and FGSR for approval;

c. A copy of Instructions To Candidacy Examining Committee will be provided to all members of the Candidacy Examining Committee;

d. The Candidacy Exam document must be submitted to the Candidacy Examining Committee at least 2 weeks before the scheduled examination to allow for circulation to all committee members, including the examiner(s) external to the department; and

e. One week prior to the candidacy examination, it is the graduate student's responsibility to meet with the Examination Chair to review the logistics of the examination.

The Chair of the Examining Committee will submit the completed Report of Completion of Candidacy Examination form and his/her minutes of the examination to the Graduate Program Office within 7 days of the completion of the Candidacy Examination.
5.10.3 Composition and Roles of the Candidacy Examining Committee

The Graduate Studies Coordinator will consider the recommendation of the student’s Supervisory Committee when appointing the extra-supervisory committee members of the Candidacy Examination.

The Candidacy Examining Committee will consist of a minimum of five faculty members meeting the following requirements.

- The Supervisory Committee and normally the addition of two other faculty members
- There must be a minimum of two arm’s length members. An arm’s length examiner must not be (or have been) a member of the supervisory committee, or have been connected with the thesis research in a significant way. The examiner should not have been associated with the student, outside of usual contact in courses or other non-thesis activities within the University, nor be related to the student or supervisor(s). Except in special circumstances (fully justified in writing to the Vice-Dean, FGSR), an arm’s length examiner should not be a close collaborator of the supervisor(s) within the last six years. Arm’s length examiners who have served on a student’s Candidacy Examining Committee do not lose their arm’s length status as a result, and are eligible to serve as arm’s length examiners on the student’s doctoral final examination if the other conditions of being arm’s length remain unchanged.
- At least half of the examiners on every examining committee must hold a degree which is equivalent to or higher than the degree being examined. (FRCP is considered the equivalent of a master’s degree.)
- At least half of the examiners on every examining committee must meet the employment requirement: current or retired tenured or tenure-track Faculty, current or retired Faculty Service Officer, or current Special Continuing (Academic Staff Categories A1.1, A1.3, C1.1). Examiners with clinical appointments are permitted, but do not satisfy this employment requirement.
- Roles may be combined.
- Must be chaired by a faculty member in the Department of Laboratory Medicine & Pathology who is not the student’s supervisor.

The Chair of the Department of Laboratory Medicine & Pathology and/or the Chair of the Medical Sciences Graduate Program Committee, if not already members of the Candidacy Examining Committee, may participate in the exam as non-voting members. The Dean of FGSR or Pro-Dean (the Dean’s designate) may attend and participate fully in the examination.

The Examination Chair’s role is to moderate discussion, keep minutes of the examination, ensure that a fair examination occurs and file the necessary report concerning the outcome of the examination. If the chair is not a member of the examining committee (FGSR encourages this arrangement), the chair does not vote.

Examiners are full voting members of the examining committee. With the possible exception of the Pro Deans, FGSR, all examiners must be either active in the general subject area of the student’s research, or bring relevant expertise to the assessment of the thesis.

All members must attend the examination.

5.10.4 Candidacy Examination Document

To provide a foundation from which the Candidacy Examining Committee can frame their questions during the candidacy exam, the graduate student will prepare a written summary of his/her proposed thesis research. The Candidacy Examining Committee is to consider the thesis proposal as a starting point for the examination. The candidacy examination is not a defence of the thesis proposal, however the student’s understanding of the proposed research and experimental methods will be assessed.
The PhD proposal submitted to the MSGPC may be used as the basis for the candidacy examination thesis proposal. It is expected that the students will utilize the comments made during the external review of their MSGPC PhD Proposal to refine the thesis proposal that they will submit to the Candidacy Examining Committee. The main body of the document is to be no more than 5 pages (the 4 page MSGPC PhD Proposal plus 1 page to address comments from the MSGPC review) at single spacing (12 point Times New Roman font) with 1” or 2.5 cm margins. The student may include appendices containing questionnaires, legends, references, figures or tables. As per the guidelines in PhD Proposal, the proposal will contain:

- a review of the pertinent literature,
- the research hypothesis,
- the specific objectives of the research,
- a review of the relevant work done previously by the student or the research group on the subject,
- a detailed presentation of the planned experimental approach, and
- the significance of the anticipated results.

The planned experimental approach will present the actual work proposed by the student and will not contain work or anticipated work that will not be conducted by the student.

The Candidacy Examination thesis proposal is to be written by the student. This proposal must be entirely the student’s own creation, although she/he can utilize the supervisor’s guidance and/or the expertise in the department or on campus to explore ideas and obtain specific background or technical information. Individuals external to the Supervisory and Candidacy Examining Committees may also review the draft of the thesis proposal.

5.10.5 Format of Examination

The candidacy examination will normally last 2 to 4 hours, after which the voting members of the Candidacy Examining Committee will make a decision. Students will be given 20 minutes at the start of the examination to give an oral presentation that summarizes the thesis proposal. The oral presentation will be followed by questions from the Candidacy Examining Committee. See the recommended Candidacy Examination Protocol for details. Each member of the Candidacy Examining Committee should assess the student’s performance using the evaluation criteria in the following section.

5.10.6 Evaluation Criteria

FGSR stipulates that the graduate students must demonstrate “an adequate knowledge of the discipline and of the subject matter relevant to the thesis; and, the ability to pursue and complete original research at an advanced level.” Members of the Candidacy Examining Committee will evaluate the graduate student against the following four general criteria:

a. The graduate student has demonstrated effective written and verbal communication skills;
   For example,
   - The graduate student answered questions with confidence and authority;

b. The graduate student demonstrated an adequate knowledge of the scientific and technical concepts and principles in areas relevant to the proposed thesis;

c. The graduate student demonstrated the critical thinking skills required to conduct original research;
   For example,
• The graduate student demonstrated understanding of how experimental design can be used to test hypotheses;
• The graduate student demonstrated good problem-solving/reasoning skills;
  d. The graduate student demonstrated an understanding of the significance and relevance of their proposed research.

5.10.7 Candidacy Examination Protocol

The Department recommends the Examining Committee use the following protocol for the Candidacy Exam:

1. At the beginning of the exam, the Chair introduces the graduate student and the Candidacy Examining Committee members.

2. The candidate will then be asked to leave the room and the committee will review his/her undergraduate background and graduate coursework. The supervisor needs to supply all copies of all transcripts to all committee members to allow the committee to review the graduate student’s academic record.

   Note: There is no substantial input from the supervisor at this time, although the graduate student and supervisor will need to supply a 1-2 page CV for the student. The discussion of the graduate student’s research and progress to date will occur at the conclusion of the exam.

3. The Candidacy Examining Committee discusses and agrees upon how the exam will be run, specifying the sequence of the events including:
   a. The number of rounds of questioning (normally two),
   b. The order of questioning: Normally,
      i. the arm’s length members;
      ii. The Supervisory Committee members; and
      iii. The graduate student’s supervisor.
   c. The length of time of each examiner has for each questioning in each round (normally 15-20 minutes).

4. The graduate student is then asked to rejoin the committee, the exam format decided on in Step 3 is explained to the student, and the examination begins. The graduate student delivers his/her 20 minute presentation.

5. The agreed upon number of rounds of questioning (step 3) follows, after which the student is asked to leave the room.

6. The Chair poses two rounds of questions to the Examining Committee, the first being their opinion on the performance of the student during the examination and the quality of the written material (as per FGSR's evaluation criteria), and the second their recommendation for the outcome.

7. A general discussion ensues with the Chair recording observations that would be of help to the student.

8. A formal vote is conducted as to the outcome of the examination. The possible outcomes are Adjourned, Pass, Conditional Pass, or Fail (with several subsequent options). A majority of examiners must agree to an outcome of Adjourned, Conditional pass or Fail and repeat the candidacy. All or all but one of the examiners must agree to an outcome of Pass, Fail with a recommendation to terminate the doctoral program, or Fail with a recommendation to change of category to a Master’s program. If the Candidacy Committee fails to reach a decision, the department will refer the matter to the Vice-Dean, FGSR, who will determine an appropriate
course of action.

9. The graduate student is recalled and the decision explained and feedback given.

10. The Chair completes the required paperwork and submits it to the Graduate Program Office within 7 days of the examination.

5.10.8 Candidacy Examination Outcomes

One of the following outcomes of the candidacy is appropriate:

- Adjourned
- Pass
- Conditional pass
- Fail and repeat the candidacy
- Fail with a recommendation to terminate the doctoral program or for a change of category to a master's program.

A majority of examiners must agree to an outcome of Adjourned, Conditional pass or Fail and repeat the candidacy. All or all but one of the examiners must agree to an outcome of Pass, Fail with a recommendation to terminate the doctoral program, or Fail with a recommendation to change of category to a Master’s program. If the Candidacy Committee fails to reach a decision, the department will refer the matter to the Vice-Dean, FGSR, who will determine an appropriate course of action.

Adjourned: The candidacy examination should be adjourned in the event of compelling, extraordinary circumstances such as a sudden medical emergency taking place during the examination or possible offences under the Code of Student Behaviour.

Pass: If the student passes the candidacy examination, the department shall complete the Report of Completion of Candidacy Examination form and submit it to the FGSR. The form is available on the FGSR website (see Forms Cabinet). Upon receipt of the form, the FGSR will add a comment of "Doctoral Candidacy Examination Completed" to the student’s central academic record, which will be reflected on the student’s transcript.

Conditional Pass: If the candidacy examining committee agrees to a conditional pass for the student, the chair of the examining committee shall provide in writing within five working days to the Vice-Dean, FGSR, the graduate coordinator and the student:

- the reasons for this recommendation,
- the details of the conditions,
- the timeframe for the student to meet the conditions,
- the approval mechanism for meeting the conditions (e.g. approval of the committee chair or supervisor, or approval of the entire committee, or select members of the committee), and
- the supervision and assistance the student can be expected to receive from committee members.

Conditions are subject to final approval by the Vice-Dean, FGSR.

Conditions are met: If all the conditions have been met, the department shall complete the Report of Completion of Candidacy Examination form and submit it to the FGSR.

Upon receipt of the form, the FGSR will add a comment of “Doctoral Candidacy Examination Completed” to the student’s central academic record, which will be reflected on the student’s transcript.

Conditions are not met: If the student fails to meet all the conditions stipulated by the examining committee, the student has failed the candidacy. See below for options available to the examining committee. Note that the options are different after a failed second candidacy examination.
Fail: If the candidacy examining committee agrees that the student has failed, the committee chair shall provide the reasons for this recommendation and the department’s recommendation for the student’s program in writing to the Vice-Dean, FGSR, the graduate coordinator and to the student. For failed candidacy examinations, an Associate Dean, FGSR, normally arranges to meet with the student and with department representatives before acting upon any department recommendation. A decision of the FGSR which affects a student's academic standing (e.g. termination, also known as required to withdraw, or a change of category to a master's program) may be appealed by the student.

The following options are to be considered by the examining committee when the outcome of a student’s candidacy exam is “Fail:"

Repeat the Candidacy: If the student's first candidacy exam performance was inadequate but the student’s performance and work completed to date indicate that the student has the potential to perform at the doctoral level, the examining committee should consider the possibility of recommending that the student be given an opportunity to repeat the candidacy exam. Normally, the composition of the examining committee does not change for the repeat candidacy exam.

If the recommendation of a repeat candidacy is formulated by the examining committee and approved by the FGSR, the student and graduate coordinator are to be notified in writing of his or her exam deficiencies by the chair of the examining committee. The second candidacy exam is to be scheduled no later than six months from the date of the first candidacy. In the event that the student fails the second candidacy, the examining committee shall recommend one of the following two options:

Change of Category to a Master's Program: If the student’s candidacy exam performance was inadequate and the student’s performance and work completed to date indicates that the student has the potential to complete a master’s program, the examining committee should consider the possibility of recommending a change of category to a master's program or (if available) a postgraduate diploma program.

Termination of the Doctoral Program: If the student’s performance was inadequate and the work completed during the program is considered inadequate, the examining committee should recommend termination of the student’s program. (See “Termination of a Student's Program” in section 7 of the FGSR Graduate Program Manual concerning the Administration of Graduate Programs).

5.10.9 Candidacy Examination Tips & Strategies

Supervisors:

- It is the supervisor’s responsibility to organize the exam (choose examiners, date, time, location, arrange for paperwork) and provide refreshments.

- Supervisors are expected to provide a minimum of two to three weeks protected time (away from lab work) prior to the candidacy examination date for the student to make final preparations for this important examination.

Students:

- You need a very broad knowledge of topics related to your field.

- The purpose of the exam is to assess the breadth of your knowledge in your general field of research, your knowledge of the technical aspects of the proposed thesis research and your reasoning and critical thinking abilities.
The exam is NOT a defence of the thesis proposal, however your understanding of the proposed research and experimental methods will be assessed. It WILL focus on background theory, strategies for methods of investigation: be able to justify the rationale for your research.

- Although supervisors are expected to provide a *minimum of two to three weeks protected time* prior to the exam for your final preparations, it is expected that you are studying well in advance of this period.

- Prior to the exam, and after the committee is chosen, the date set, and the examination document has been distributed:
  - Make an appointment with each examiner regarding the scope of topic that they believe is relevant for your knowledge.
  - Look at each examiner’s recent/relevant publications to understand the perspective of the examiner (examiner questions may be guided by this).
  - For example, put yourself in your committee's shoes - what would you want to know about this project? Come up with a list of possible questions and how you would answer them.

- Be responsible for every word written in your proposal and be prepared to explain every concept, i.e. if it's there, it's testable.
  - Be prepared to discuss how your assays/experiments work. Know why you used a particular test over another, or at least be able to discuss the pros and cons of different approaches.

- Be familiar with the room and technology – try it out before the exam.

- Hold mock exam(s) in the weeks prior to the actual exam (with lab peers, and with the LMP Graduate Students’ Group – this is a service they offer).

- Exam strategies:
  - Take a deep breath, and don't panic!
  - Remember… as the student answering questions, you ARE in control: when you are answering questions, your answer may lead to an area where you are knowledgeable and this will generate questions in that area, so think about the direction you want to go.
  - Answer questions clearly but concisely – don’t go on and on – showcase what you know, and learn to know when to stop (practice exams/mock exams help with this).
  - You don't have to respond immediately; take time to think and formulate your answer.
  - Do not answer just “yes” or “no” – give explanations for your “yes” or “no.”
  - Remember that most committee members aren't trying to trick you - listen for clues in the ways they phrase their questions (e.g. word emphasis, examples provided, etc.).
  - If you don’t know the answer to a question, say so.
  - If you have an idea how to respond but aren’t certain, make it clear that you are speculating based on what you do know.
    - Accept that there will be questions where you won't know the answer - don't try to bluff your way through them, but try to offer a reasonable hypothesis based on what you do know.
  - Do NOT guess or pretend.
  - If you aren't certain what the examiner is asking:
    - Ask them to rephrase/repeat;
Paraphrase back to the examiner: “are you asking me….”;

These strategies give you more time to think and allow you to verify that you understand what’s been asked.

- If the examiner asks the same question after you've responded, this is an indication that you didn’t respond appropriately or didn’t understand the question.
- If you feel like you've given a wrong answer and your committee has realized this, and you feel like you’re going further and further down the wrong path, it’s okay to say that you have reconsidered your answer and that you’d like to amend it.
- When explaining concepts, use the whiteboard – demonstrates that you can teach the idea.
- If you feel you didn’t answer a question or explain a concept well, you will have an opportunity to do so again at the end of the exam.
- Try to think about the "bigger picture" when it comes to your work. What relevance does it have to current issues/events? How would you pitch this project if you were looking for funding?
- Be prepared for some big-picture questions that might not seem to have much to do with the project itself - the committee may want to know how well you can think of your research relating to the "real world”.
- Don't feel bad if you don't know all the answers. This is an exam to test the limits of your knowledge, so there are going to be things you don't know. Just do the best you can!

- At the end of the exam, you may also ask questions of the examiners to clarify any points raised during the exam.

5.11 Final Examination

After the completion of all program requirements, including an acceptable draft of the thesis, the final examination can be planned. See Final Examination and Program Completion for guidelines.
5.12 PhD Program Monitoring

5.12.1 Timelines

<table>
<thead>
<tr>
<th>Event / Forms</th>
<th>Department Timeline</th>
</tr>
</thead>
<tbody>
<tr>
<td>SUPERVISOR</td>
<td></td>
</tr>
<tr>
<td>Perform Nominate supervisor: Appointment of Supervisor(s) and Supervisory Committee</td>
<td>Supervisor identified prior to offer of admission, Submit form after student has registered</td>
</tr>
<tr>
<td>SUPERVISORY COMMITTEE</td>
<td></td>
</tr>
<tr>
<td>Perform Nominate supervisory committee: Appointment of Supervisor(s) and Supervisory Committee</td>
<td>Within the first 8 months and no later than the end of the first year</td>
</tr>
<tr>
<td>Supervisory Committee meets with student to review program and progress; submits Graduate Student Supervisory Committee Meeting Report</td>
<td>Annually, or more often as deemed appropriate by the supervisor</td>
</tr>
<tr>
<td>ETHICS AND ACADEMIC INTEGRITY TRAINING</td>
<td></td>
</tr>
<tr>
<td>Perform Student must complete the equivalent of at least eight hours of structured academic activity</td>
<td>Prior to program completion</td>
</tr>
<tr>
<td>PhD PROPOSAL TO MSGPC</td>
<td></td>
</tr>
<tr>
<td>Perform Student must submit a PhD proposal application to the MSGP</td>
<td>Within the first 2 years</td>
</tr>
<tr>
<td>CANDIDACY EXAMINATION</td>
<td></td>
</tr>
<tr>
<td>Perform Set date for candidacy examination</td>
<td>Department recommends a date within 6 months of acceptance of the PhD proposal, Must be not less than six months prior to final examination.</td>
</tr>
<tr>
<td>Perform Recommends Candidacy Examining Committee and exam date: Notice of Examining Committee &amp; Examination Date</td>
<td>Submit at least four weeks prior to exam, Copy of the Notice and Instructions to Candidacy Examining Committee is sent to examiners and student</td>
</tr>
<tr>
<td>Perform Submit Candidacy Exam document (i.e. the MSGP proposal with any revisions) to the Examining Committee</td>
<td>At least two weeks prior to the exam</td>
</tr>
<tr>
<td>Perform After successful examination, submit Report of Completion of Candidacy Examination form</td>
<td>Within 7 days</td>
</tr>
<tr>
<td>Perform After an unsuccessful examination, department recommends course of action in writing to MSGPC / FGSR</td>
<td>Within 7 days</td>
</tr>
</tbody>
</table>
## FINAL ORAL EXAMINATION

<table>
<thead>
<tr>
<th>Event / Forms</th>
<th>Department Timeline</th>
</tr>
</thead>
<tbody>
<tr>
<td>All Supervisory Committee members declare in writing that the thesis is adequate to proceed to the final oral examination by signing the Departmental Acceptance of Thesis</td>
<td>• Submit prior to setting examination date and before the thesis is sent to the external examiners</td>
</tr>
<tr>
<td>Supervisor should make contact with a potential External Examiner to gauge willingness to participate and determine availability. Tentative date(s) should be established and agreed upon by the external and the supervisory committee. Thought should be given to the composition of the rest of the examining committee, and their availability also established.</td>
<td>• Approximately three months prior to examination</td>
</tr>
<tr>
<td>Department submits Approve External Reader or Examiner for Final Doctoral Oral Examination form and examiner's CV to the Faculty of Medicine &amp; Dentistry (Assoc Dean, Graduate Studies). LMP invites external examiner after approval by FoMD.</td>
<td>• Submit form at least 8-10 weeks prior to exam</td>
</tr>
<tr>
<td>Supervisor can apply to FGSR for funds to support External Examiner’s travel (Request for Funds for External Examiner Travel)</td>
<td>• Submit at the same time as the Request to Invite External Examiner</td>
</tr>
<tr>
<td>Recommends Examining Committee and exam date: Notice of Examining Committee &amp; Examination Date</td>
<td>• Submit Notice at least four weeks prior to examination</td>
</tr>
<tr>
<td>Ensure that the External Examiner or Reader and Examining Committee and Chair receive the thesis</td>
<td>• At least four weeks prior to examination</td>
</tr>
<tr>
<td>If required: Request to Restrict Access to a Thesis</td>
<td>• Request must be made prior to or at the same time as submission of the Thesis Approval / Program Completion form to FGSR, for a period of up to one year</td>
</tr>
<tr>
<td>Report examining committee’s decision on Thesis Approval / Program Completion form</td>
<td>• Submit form immediately after all signatures are obtained and within six months of the exam</td>
</tr>
<tr>
<td>Student must submit an electronic copy of the thesis to FGSR</td>
<td>• Within six months of examination</td>
</tr>
</tbody>
</table>

**NOTE:** All forms are to be submitted to the LMP Graduate Program Office in accordance with the indicated timelines. If you wish the assistance of the LMP Graduate Program Office in preparing the forms (recommended), please allow several extra days. Forms are sent first to MSGP and then to FGSR for approval.
### 5.12.2 Checklist

<table>
<thead>
<tr>
<th>Name</th>
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<tbody>
<tr>
<td>ID</td>
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<tr>
<td>Start date</td>
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<tr>
<td>Completion Deadline</td>
<td></td>
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<tr>
<td>Supervisor(s)</td>
<td></td>
</tr>
<tr>
<td>Supervisory Committee</td>
<td>[within first 8 months]</td>
</tr>
<tr>
<td><strong>Required Coursework:</strong></td>
<td></td>
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<tr>
<td>LABMP 530</td>
<td></td>
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<tr>
<td>Course #2</td>
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<tr>
<td>Course #3</td>
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<tr>
<td>Course #4</td>
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<tr>
<td>Other courses</td>
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<tr>
<td><strong>Academic Integrity and Ethics Training:</strong></td>
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<tr>
<td>ESI Day</td>
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<tr>
<td>Other</td>
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<tr>
<td><strong>LMP Rounds Presentation</strong></td>
<td></td>
</tr>
<tr>
<td><strong>LMP Rounds Attendance</strong></td>
<td>[≥60% in year 1, 2, and 3]</td>
</tr>
<tr>
<td><strong>Supervisory Committee</strong></td>
<td></td>
</tr>
<tr>
<td>Meeting #1</td>
<td>[within first year]</td>
</tr>
<tr>
<td>Meeting #2</td>
<td>[within second year]</td>
</tr>
<tr>
<td>Meeting #3</td>
<td>[within third year]</td>
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<tr>
<td>Meeting #4</td>
<td>[within fourth year]</td>
</tr>
<tr>
<td>Meeting #5</td>
<td>[within fifth year]</td>
</tr>
<tr>
<td><strong>PhD Proposal to MSGPC</strong></td>
<td>[within 24 months]</td>
</tr>
<tr>
<td><strong>Candidacy Exam</strong></td>
<td>[within 24-30 months]</td>
</tr>
<tr>
<td>Candidacy Exam Committee Members</td>
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<tr>
<td><strong>Final Oral Examination</strong></td>
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<tr>
<td>Examining Committee Members</td>
<td></td>
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<tr>
<td><strong>Awards</strong></td>
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<tr>
<td>Bell McLeod Travel</td>
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<tr>
<td>Bell McLeod Travel</td>
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</tr>
<tr>
<td>Other</td>
<td></td>
</tr>
<tr>
<td><strong>Notes</strong></td>
<td></td>
</tr>
<tr>
<td>Convocation Date</td>
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</tbody>
</table>
6 Supervisory Committee Meetings

It is ultimately the responsibility of the supervisor to ensure that the graduate student has annual supervisory committee meetings.

Annual meetings are considered to be minimal and if possible, more frequent meetings are encouraged.

Supervisory committee meetings are to be chaired by the supervisor; however, a request can be made to the LMP Graduate Studies Coordinator to select a Chairperson for the Supervisory Committee Meeting other than the supervisor. Such requests can be made by the graduate student, Graduate Studies Coordinator, supervisor, Supervisory Committee members, or the Chair of the Department of LMP. It shall be at the discretion of the Graduate Studies Coordinator if this request is to be granted after consultation with the necessary individuals.

The supervisor and student must work together to complete the LMP Graduate Student Supervisory Committee Meeting Report form. Electronic copies of this completed form, an updated CV, and the student’s progress report/slide presentation must be submitted to lmpgrad@ualberta.ca within 7 days of the meeting. This package will then be forwarded by the Graduate Program Office to all Supervisory Committee members, and the Graduate Studies Coordinator, for a final approval period. Minor edits or corrections can be made by the student or supervisory committee at this time. After the approval period, the completed report will become official and will be included in the student’s permanent file.

The Report is particularly important when decisions such as when to write the thesis are made. Filling out the form can save the supervisor and graduate student from potential conflicts later.

The graduate student should be made aware at each supervisory committee meeting whether they are making satisfactory or unsatisfactory progress.

6.1 Recommended Format

1. Seven days prior to the meeting the student will provide all members of the supervisory committee with a short Progress Report. This report should be approximately four pages in length and deal succinctly with the following issues:
   - Background
   - Project objective
   - Hypotheses being tested since the last meeting
   - Summary of research progress
   - Difficulties or issues that have impeded progress (if any)
   - Hypotheses to be tested in next 6-12 months
   - Append list of courses taken (or being taken with grade attained)
   - Copies of title page and abstract of any published papers, submitted manuscripts or abstracts written since last meeting.

2. The meeting format should generally follow the format described below:
   - Brief overview of graduate student’s progress by the supervisor (~5 minutes)
   - Graduate student’s presentation of research results (~20 minutes)
   - Questions and answers
- Graduate student presentation of hypothesis to be tested in the following 6-12 months
- Discussion of the objectives and proposed approaches
- Graduate student presentation of proposed difficulties
- Discussion of how best to deal with the issues raised above.

3. The objectives of the meeting are:
- Keep committee members apprised of progress
- Assess the project results and progress
- Define problems in the project and, in a positive fashion, find creative solutions
- Review the project objectives and focus.
7 Professional Development and Career Guidance

FGSR recognizes that professional development (PD) for graduate students is becoming an increasingly important factor to funding agencies and future employers. Many valuable resources for students can be found on its Professional Development site.

To facilitate professional development in our students, Laboratory Medicine & Pathology includes PD as an important part of its program. Because students have varied backgrounds and needs, PD has not been made a formal element of the program. However, a PD section is included in the Supervisory Committee meeting report form and it is expected that a professional development plan will be developed by each student. This plan will be reviewed annually as part of the supervisory committee meeting process.

Professional Development activities include but are not limited to:
- Attendance at professional development sessions
- Development and maintenance of a CV or resume
- Development of a Research Dossier
- Development of a Teaching Dossier
- Participation in community service and volunteer activities
- Exploring and tracking career opportunities
- Compilation of reference letters or a reference contact list

Students may take advantage of opportunities to develop their teaching skills by participating in the Graduate Teaching and Learning Program.

The mandatory course LABMP 530 contains a module on professional development that will introduce the students to methods of tracking their activities beyond the traditional CV. Each student will be required to develop a PD plan that will support their career goals.

7.1 DRiVE Days

Our department holds DRiVE Days (Discovery, Research, InnoVation and Education) annually in conjunction with the Dr. John W. Macgregor Memorial Lecture and the Dr. RE Bell Memorial Lecture. All trainees (graduate and undergraduate students, residents, and postdoctoral fellows) as well as laboratory staff are invited to make either oral or poster presentations. Various prizes are awarded in the Research & Discovery category as well as the Innovation category.

There is an expectation that graduate students will attend (for at least part of the day and the dinner) even if they are not giving an oral or a poster presentation.

7.2 Teaching

The Graduate Teaching and Learning Program is open to all graduate students.

The new multi-tier program – a collaboration of the Faculty of Graduate Studies and Research, departments and faculties, and the Office of the Vice-Provost (Academic Programs) – will deliver new and exciting opportunities for training in university instruction.

Level One is intended to provide an overview of skills and concepts required for teaching at a post-secondary level.

Graduate students completing Level Two will gain perspective of student learning and depth to their teaching experiences.
Level Three sees students enroll in a post-baccalaureate Certificate Program in Teaching and Learning which would provide students an opportunity to explore the deeper relationships of pedagogy with student learning.

7.3 Career guidance
- Supervisors are often the primary source
- Campus resources include: CAPS and FGSR Professional Development
- LABMP 535 offers career investigation
- DRIvE Days – potential career investigation workshops

7.4 Careers
A degree is an entry point to broader opportunities and so it is important to keep options open. Career options include (but aren’t limited to):

<table>
<thead>
<tr>
<th>PhD</th>
<th>MSc</th>
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</thead>
<tbody>
<tr>
<td><strong>Academia</strong></td>
<td><strong>Research associate</strong></td>
</tr>
<tr>
<td>• Postdoctoral fellowship –</td>
<td>• Research associate</td>
</tr>
<tr>
<td>potentially leading to faculty</td>
<td>• Professor/instructor</td>
</tr>
<tr>
<td>positions (research and/or</td>
<td></td>
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<tr>
<td>teaching)</td>
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<tr>
<td>• Professor/instructor</td>
<td></td>
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<tr>
<td>• Project management</td>
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<tr>
<td><strong>Government</strong></td>
<td><strong>Scientific position</strong></td>
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<tr>
<td>• Scientific position/researcher</td>
<td>• Disease surveillance</td>
</tr>
<tr>
<td>• Disease surveillance</td>
<td>• Project management</td>
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<tr>
<td>• Project management</td>
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<tr>
<td><strong>Industry</strong></td>
<td><strong>Research associate</strong></td>
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<tr>
<td>• Lead researcher</td>
<td>• Project management</td>
</tr>
<tr>
<td>• Research associate</td>
<td></td>
</tr>
<tr>
<td>• Project management</td>
<td></td>
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<tr>
<td><strong>Health Care</strong></td>
<td><strong>Disease surveillance</strong></td>
</tr>
<tr>
<td>• Clinical fellowship: clinical</td>
<td>• Research associate</td>
</tr>
<tr>
<td>biochemistry, clinical</td>
<td>• Project management</td>
</tr>
<tr>
<td>microbiology, clinical</td>
<td></td>
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<tr>
<td>cytogenetics</td>
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<tr>
<td>• Disease surveillance</td>
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<tr>
<td>• Administrative role</td>
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<tr>
<td><strong>Health Foundations</strong></td>
<td><strong>Administrative role</strong></td>
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<tr>
<td>• Administrative role</td>
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<td><strong>Health Professional</strong></td>
<td><strong>Administrative role</strong></td>
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<tr>
<td>Organizations</td>
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<tr>
<td>• Administrative role</td>
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<tr>
<td><strong>Scientific Journals</strong></td>
<td><strong>Writer/editor</strong></td>
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<td>• Administrative role</td>
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<tr>
<td><strong>Writer</strong></td>
<td><strong>Freelance writer</strong></td>
</tr>
<tr>
<td>• Freelance writer</td>
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</tr>
</tbody>
</table>
8 Student Awards and Funding

8.1 Faculty of Graduate Studies and Research
See Awards and Funding for information on FGSR administered awards.

8.2 Laboratory Medicine and Pathology
See LMP Awards and Funding for information pertinent to LMP students.

8.3 Other Awards
Internal awards to consider include (but are not limited to) those from the Faculty of Medicine and Dentistry:

Research Awards

External Awards to consider include (but are not limited to) those from:

Alberta Cancer Foundation (ACF)
Alberta Innovates Health Solutions (AIHS)
Alberta Innovates Technology Futures (AITF)
Canadian Institutes of Health Research (CIHR)
Natural Sciences and Engineering Research Council (NSERC)
Women & Children’s Health Research Institute (WCHRI)
9 FINAL EXAMINATIONS AND PROGRAM COMPLETION

When a graduate student has completed the research project and has developed a body of publishable data, the graduate student should, after explicit approval by the Supervisory Committee, begin writing the thesis.

Doctoral students are strongly encouraged to have at least three publications before completion of their degree. At a minimum, one of these publications should be a first author paper in press prior to the final examination. Publication of thesis work is not a requirement for graduation.

There are two general formats available for a thesis: the traditional and the paper format. See FGSR’s Format your thesis for required thesis specifications (structure of the thesis, paper, margins, etc.).

The following should be noted regarding a graduate student’s thesis:

- Only work done by the graduate student can be included in the thesis.
- Since many papers have multiple authors, the graduate student’s contribution to each paper must be delineated.
- All collaborative efforts and technical assistance must be acknowledged in the thesis.

The final examination can be planned after completing an acceptable draft of the thesis.
9.1 Guidelines for Thesis Preparation

Students often underestimate the time and effort required to write a thesis. A first draft typically takes approximately 3 months, and several rounds of revisions are common before the supervisory committee approves the thesis to be ready for defence at the final oral examination. There is often confusion about writing style, what to include (unpublished work, published work) and how to organize it. The following offers guidance on these matters based on questions commonly asked by students and comments frequently made by thesis examiners.

9.1.1 Writing style

Use of the active voice in your writing is more engaging for the reader than the passive voice. Writing in the third person provides an objective presentation of the work. Writing in the first person singular (I) is used to distinguish the work performed by you. The use of first person plural (we) is not appropriate in your thesis because it does not permit the examiners to clearly evaluate your specific contributions to your thesis research. Accordingly, it is critically important to clearly state what you did versus what was done by others because the final oral examination evaluates your work towards meeting the requirements of your degree - not the contributions of your collaborators.

9.1.2 What to include in your thesis

Unpublished work

Your thesis is the place to explain the rationale used in your investigations, and an opportunity to describe all the work that was done – even strategies that were unsuccessful. This includes the methods for approaches that were attempted that failed or were inconclusive, as well as methods that were successful. It is also the place to describe the troubleshooting that was performed to overcome difficulties. Much of this type of information would never appear in a publication due to page constraints, but it is important to document in your thesis to demonstrate the amount of work you carried out and your critical thinking skills. This information also serves as an important resource to your supervisor’s lab about the specifics of work that was completed by you.

Published work

Students are encouraged to publish throughout their graduate program. The inclusion of published work (research or review article) in a thesis raises issues that must be considered and managed appropriately. These issues refer to work published by others as well as work published by students during their graduate program.

Consider the following if your work has been accepted or published in a peer-reviewed journal:

- **Multiple author articles:** All multiple author articles require a statement about the specific contributions by each author, an assessment of the relative contribution of each author to the article, and the complete article citation (See Preface section). The supervisory committee obtains feedback from the co-authors about their relative contributions, and arrives at a consensus. Generally, the student is the first author of an article. If the student is a co-first author of an article, only one of the students can include the article in his/her thesis, as an article can only be used for credit towards one degree. Work from a second author publication may be appropriate for inclusion in the thesis if the student’s contribution to the article was significant and essential to the development of his/her thesis. The determination to allow inclusion of a second author publication is made by the supervisory committee members.

- **Published article content:** A publication cannot simply be inserted as a chapter in a paper format thesis for a number of reasons. Some content in your publications may need to be reorganized or removed for inclusion in your thesis, while additional content may need to be inserted for your thesis. Examples of what might be removed from a publication include the abstract, work done by others that is not essential to the development of your thesis, writing by the co-authors, etc.
Examples of what might be added to the published content include information that is important/useful for inclusion in your thesis but excluded due to publication page limitations (method details, more specific clarification of work performed by others), the introduction may be insufficient (clarification of the rationale for the work in relation to your thesis hypothesis is needed), work should refer or relate to other chapters in the thesis, etc.

- **Writing style:** Since you are the author of your thesis and you are being evaluated on your work, the use of “we” is not appropriate in your thesis. However, you cannot simply substitute "I" for "we" as it appears in the published version of your work. Consider writing in the third person to provide an objective style in your research writing. Use "I" to highlight your specific contributions, and link the name of the individual with their contributions to your research.

You must demonstrate compliance with copyright law by providing evidence that permission has been obtained from the copyright holder(s) for the inclusion of any accepted/published work, whether it is your work or another author’s work. You must determine who has copyright and obtain permission for publishing information from the article (even your own publications!). Be sure you know who holds the copyright – some publications may require permission from each co-author. Contact the publisher or copyright office to address questions about copyright.

### 9.1.3 How to organize your thesis

Students should consult their supervisory committee about which thesis format is appropriate for their work. In general, master’s students are strongly encouraged to use the traditional format for their thesis. Although some of the investigations conducted in a master’s project may be sufficient to generate a publication, there is often other data that does not stand on its own as a separate chapter in the thesis. This results in the problem of how to include this data in a paper format thesis to demonstrate the scope of work carried out by the student. A traditional format thesis easily allows the inclusion of all the work conducted by the student in a single Results chapter. Doctoral students are strongly encouraged to use the paper format for their thesis, keeping in mind that publications cannot simply be directly inserted as a chapter in the thesis (see previous section about published work).

*Always refer to current FGSR Thesis Formatting Guidelines* for what sections must be included and how they are to be formatted. Examiners frequently comment on errors in formatting (text, use of italics/capitals for scientific words/names, section numbering, etc.), layout and legibility of tables/figures, figure text legends, spelling, syntax and grammar.

Please note that any draft that you provide to your supervisory committee for review should include the Table of Contents to provide them with an overview of the organization of your thesis. This is particularly useful for Chapter 1.

### 9.1.4 Thesis Components

**Title Page:** The title should reflect the specific topic of your research inquiry.

**Abstract:** There is one abstract for the entire thesis, so write this last, after the rest of the thesis is completed. It is a concise summary of your research findings, what is novel, and its significance.

**Preface:** The names of all individuals that participated/contributed to your accepted and published work must be stated here, as well as the nature of their contributions. The complete journal article citations must also be stated and in which chapter(s) the work is located.

Evidence of the required ethics approval for your research must be stated here (obtain this from your supervisor(s)). Any work performed on humans or animals, or on samples obtained from humans or animals must have ethics approval from the ethics board where the work was performed as well as from the University of Alberta.

**Dedication** (optional)
Acknowledgements: Here you can thank those who provided guidance, those who impacted your graduate school experience, colleagues, friends and family, as well the sources of financial support received during your program.

Table of Contents: Use the word processing software to automatically generate/update the list of chapter/section headings and page numbers.

List of Tables, List of Figures: These lists are useful for the reader to quickly find data.

List of Abbreviations: This list defines the abbreviations that appear in your thesis, and is a useful reference to the reader who may not easily find an abbreviation where it was first defined in the thesis text.

Glossary (optional): This list of term definitions is useful to the reader when the terms are uncommon and specialized to a specific field.

Body of Thesis: Traditional Format and Paper Format Theses are permitted in LMP. Use numbered headings and subheadings to organize each section in either format.

9.1.5 Traditional Format Thesis

Chapter 1 Literature Review: Allow 3-4 weeks to prepare the first draft. You have been reading the relevant scientific literature throughout your graduate program, and preparing small reviews along the way for lab group meetings, presentations, supervisory committee meetings, journal publications, etc.; some students may have published a review article. An updated literature review is needed for the thesis. Write the literature review using language for the non-expert reader. Define abbreviations where they are first used in the thesis text.

The introductory chapter begins with a general overview of your area of research (1-2 pages), which serves as the framework for the literature review of the topics required to understand your thesis research. Consider what concepts are essential to understanding your research; start broadly and gradually become more specific to your research, finally leading to the last section of your literature review: “Rationale for thesis research”. This section reviews the key concepts/evidence and gaps in knowledge that led to your research questions and the development of your hypothesis. Then clearly state your hypothesis – it encapsulates your research question(s) and why it is important. Remember your hypothesis should be concise, specific and falsifiable. Lastly, state the objectives that will allow you to test your hypothesis. A thesis may have more than one hypothesis.

Chapter 2 Materials & Methods: Allow 1 week to prepare the first draft. This chapter includes the details regarding sources of samples (human, animal, microbiological, environmental, etc.) and any required ethics approvals from the relevant ethics boards, materials (company, location) and equipment (model, company, location) used, the principle of the methods (including those of commercial kits, company, location), the rationale for your choice of methods, statistical analysis (software, company, location) etc. Indicate the designated registered trademark ® or ™ for commercial products (e.g. kits, equipment, instruments).

Your thesis documents your contributions to your supervisor’s research activities, and should include sufficient details so it is possible for others (e.g. future students) to reproduce your work. It is not enough to simply cite another publication for method details because there are typically some modifications to optimize the procedure for your application or lab environment. Similarly it is not enough to just cite the use of a commercial kit method because these may be discontinued in the future and therefore the principle of the method would be unavailable, and therefore prohibit the ability to reproduce the results. A flow chart figure may be useful illustrate a complex method, or the flow of sample processing and analysis. Your thesis provides the opportunity to describe all the work that was done (and not necessarily published) and to explain the rationale used in your investigations. Include the methods that were attempted and failed or resulted in inconclusive data, not just the methods that were successful. Clearly state which work was done by you and what others did. Keep in mind that for...
each method outlined in Chapter 2, there is a corresponding result described in Chapter 3.

**Chapter 3 Results:** Allow 2 weeks to prepare the first draft. You have already reported most of the data to your supervisory committee in your committee meeting reports. In this chapter you state the facts and describe the data and compare relative changes among different data groups, how results from one experiment led you to other experiments, and troubleshooting that was performed to overcome difficulties. Do not interpret the significance of the findings here – this is reserved for the Discussion section.

Provide summarized data, not raw data, in tables and figures. Make sure that all tables and figures provided are referred to in the text of the Results chapter. The legends under each table or figure state how the data were obtained and define any symbols/legends to allow the reader to interpret the data, but do not include a description of your interpretation of the data. This promotes readers to compare their interpretation of your data with your interpretation in the chapter text. Tables and figures can appear within the text or after the list of references at the end of the chapter.

**Chapter 4 Discussion:** Allow 2 weeks to prepare the first draft. This chapter compares and contrasts your findings with what has been reported in the literature. Discuss how your findings allow you to test your research questions and hypothesis/hypotheses. Clearly state conclusions and interpret the significance of your findings. Also consider alternative interpretations of your findings. Highlight your novel contributions to knowledge in your area of research, but be careful not to overstate their impact on the field of research. Describe the gaps in knowledge that remain, as this provides a natural connection to Chapter 5.

**Chapter 5 Future Directions:** Allow 1-2 weeks to prepare the first draft. This chapter discusses suggestions for future experiments/investigations arising from your research findings to address outstanding gaps in knowledge in your field. The proposed experiments should describe the rationale and sufficient method detail to understand how the work would be carried out and explain how the results would contribute to your field of research.

**References/Bibliography:** References are cited in the order of appearance in the thesis. There is only one numbered list of references at the end of the thesis. Use of a reference management program is strongly recommended, but students are responsible for the accuracy of the information and consistency of the format. LMP recommends the format described at: www.icmje.org/

"International Committee of Medical Journal Editors (ICMJE) Recommendations for the Conduct, Reporting, Editing and Publication of Scholarly Work in Medical Journals: Sample References"

**Appendices** (optional): Supplemental (non-essential) information/data that is referred to in your thesis text is placed here.

**9.1.6 Paper Format Thesis**

Published journal articles require some modifications when included as a thesis chapter (see previous section on Published work). References are cited in the order of appearance, with the numbered list of references at the end of each chapter.

**Chapter 1 Introduction:** Same content as for the traditional format thesis. In addition, it is helpful to refer to the relevant chapter # in brackets at the end of each objective listed at the end of the chapter text.

**Chapters 2 to x Individual Studies:** Each chapter contains its own Introduction, Materials & Methods, Results, Discussion and References, but no Abstract. Page limitations imposed on published articles limit the amount of information provided in the article. Your thesis must expand on the details, especially the connection to the thesis hypothesis and objectives, and the details in the methods section. Additional results may also be included that were not essential to the published article. Your thesis
should provide the rationale and findings for different approaches used during your research that failed or were inconclusive, as well as those that led you to the approach that was successful and included in the publication.

Chapter # Title: Title should reflect the topic and outcome. If the chapter work is published, the chapter title is linked to a footnote at the bottom of the page that states the complete article citation and author affiliations.

#.1 Introduction: Includes a brief background on the topic, the rationale for the research, the hypothesis/objectives and why the research is important. Do not include a summary of your findings and conclusions in the introduction section. It is helpful to the reader if there is a link to the previous paper chapter – e.g. Chapter 3 introduction links back to the content in Chapter 2.

#.2 Materials and Methods: Same as for Traditional Format Thesis, but include only the materials and methods used in the study. There is no need to duplicate information already described in a previous chapter; simply cross-reference the relevant section of the previous chapter (e.g. see Chapter 2.2.3).

#.3 Results: Same as for Traditional Format Thesis. Figures in a thesis are usually not presented in the compressed format often used for publication. Consider breaking them up into several different figures so that they can be enlarged and clearly reviewed without the congestion of the other figures on the same page. Text font must be clearly legible in tables and axes of figures. Tables and figures can appear within the text or after the list of references at the end of the chapter.

2.4 Discussion: Same as for Traditional Format Thesis. It is helpful to the reader if there is a link to the content in the previous chapter, and a link to the content addressed in the following chapter.

2.5 References: Cited in order of appearance, and a list of references is located at the end of each chapter.

Chapter x+1 Summarizing Discussion: This chapter should connect the key findings presented in Chapters 2 to x. See Discussion in the Traditional Format Thesis.

Chapter x+2 Future Directions for Research: Same as for the Traditional Format Thesis

Bibliography: All sources cited in the thesis are listed here in un-numbered alphabetical order (by first author’s last name) using the same format as for the Traditional Format Thesis.

Appendices (optional): Supplemental information/data that is referred to in your thesis text is placed here. This information/data should be non-essential for the continuity of the thesis content. Qualify why it’s in the appendices and not part of the thesis proper.

9.2 Master’s Final Examination

9.2.1 MSc Final Examination Timelines

The timeline for convening the final Examining Committee meeting of thesis defense is long and it is important to consider the following points:

- After the completion of an acceptable draft of the thesis (normally determined by the graduate student’s supervisor but in exceptional circumstances by the Chair of the Department of Laboratory Medicine & Pathology or the Dean of the Faculty of Graduate Studies and Research), the thesis is then submitted to the other members of the Supervisory Committee for their review (normally allow 1 to 2 weeks for the review of the thesis).

- The supervisor and all members of the Supervisory Committee must then certify in writing that they believe that the thesis is of sufficient quality to proceed to a thesis examination by signing the Departmental Acceptance of Thesis before the examination can be scheduled.
• Upon acceptance of the thesis, the Examining Committee should be appointed: the signed Notice of Examining Committee & Examination Date must be submitted to the LMP graduate program office at least 4 weeks prior to the proposed examination date. If you wish the assistance of the LMP Graduate Program Office in preparing the forms and obtaining signatures, please allow sufficient extra time. The completed form is sent to MSGP and FGSR for approval.

• Members of the Examining Committee, including the chair, must receive the thesis 4 weeks prior to the examination.

• The graduate student should be aware of deadlines to be met for submitting the final document to the Faculty of Graduate Studies and Research for spring or fall convocations.

9.2.2 MSc Final Examining Committee

In Laboratory Medicine & Pathology, the MSc Examining Committee has a minimum of four examiners who must all attend the examination, and consists of the graduate student’s Supervisory Committee plus an additional arm’s length examiner.

• At least half of the examiners on every examining committee must hold a degree which is equivalent to or higher than the degree being examined. (FRCP is considered the equivalent of a master’s degree.)

• At least half of the examiners on every examining committee must meet the employment requirement: current or retired tenured or tenure-track Faculty, current or retired Faculty Service Officer, or current Special Continuing (Academic Staff Categories A1.1, A1.3, C1.1). Examiners with clinical appointments are permitted, but do not satisfy this employment requirement.

• An arm’s length examiner must not be (or have been) a member of the supervisory committee, or have been connected with the thesis research in a significant way. The examiner should not have been associated with the student, outside of usual contact in courses or other non-thesis activities within the University, nor be related to the student or supervisor(s). Except in special circumstances (fully justified in writing to the Vice-Dean, FGSR), an arm’s length examiner should not be a close collaborator of the supervisor(s) within the last six years.

• The exam must be chaired by a LMP faculty member who is not the student’s supervisor.

• Roles may be combined.

9.2.3 MSc Final Examination Guidelines

• The MSc final exam (thesis defence) normally involves an initial 20-30 minute presentation by the graduate student of their thesis work followed by two rounds of questions.

• The role of the Chair of Examining Committee is to:
  o Moderate the proceedings;
  o Ensure that a fair examination occurs; and
  o Report the results to the Graduate Studies Committee.

• If the chair is not a member of the examining committee, the chair does not vote.

• Exam questions usually are concerned with the thesis, but not exclusively so.

• The questions are set to enable the Examining Committee to form an opinion on the quality
of the candidate’s thesis work as well as his/her capability to comprehend its significance in the context of the field.

- Thus, both the document and the candidate are being examined.
- The Chair of the Department and the Chair of the Medical Sciences Graduate Program Committee, if not already members of the Examining Committee, may attend the final exam as observers.
- With the exception of the Dean, FGSR, or a Pro Dean (Dean’s representative), who may participate fully in the examination, persons other than the examiners may attend only with the prior approval of the Dean, FGSR, or the chair of the examining committee. With the possible exception of the Pro Deans, all examiners must be either active in the general subject area of the student’s research, or bring relevant expertise to the assessment of the thesis.
- Visitors may not participate in the committee's discussion concerning its decision on the student's performance and must withdraw before such discussion commences.

9.3 PhD Final Examination

9.3.1 PhD Final Examination Timelines

The timeline for convening the final Examining Committee meeting of final examination (thesis defence) is long and it is important to consider the following points:

- After the completion of an acceptable draft of the thesis (normally determined by the graduate student’s supervisor but in exceptional circumstances by the Chair of the Department of Laboratory Medicine & Pathology or the Dean of the Faculty of Graduate Studies and Research), the thesis is then submitted to the other members of the Supervisory Committee for their review (normally allow 1 to 2 weeks for the review of the thesis).
- Students are encouraged to use the Thesis Preparation Checklist and submit a copy of the checklist to their supervisory committee.
- The supervisor and all members of the Supervisory Committee must then certify in writing that they believe that the thesis is of sufficient quality to proceed to a thesis examination by signing the Departmental Acceptance of Thesis before the examination can be scheduled. The Faculty of Graduate Studies and Research requires this certification and it should be done before an external examiner or reader is selected or a date for the exam is set.
  - The interpretation endorsed by the Department of Laboratory Medicine & Pathology is that the thesis is of a textual quality equivalent to that of a manuscript being submitted for publication to a high quality journal and that the committee members are comfortable with the scientific content of the thesis.
  - If the committee does not unanimously approve the thesis, the graduate student may appeal that decision to the department’s Graduate Studies Committee.
- Once the thesis has been approved by the Supervisory Committee, an External Examiner or Reader can be identified.
  - The External Examiner or Reader is initially identified by the graduate student and supervisor, the supervisor then contacts the potential examiner to determine whether they would be prepared to act as an examiner for this thesis and determine approximate dates for the exam.
  - It is important that there is no direct contact between the graduate student and External
Examiner or Reader between the time that the External is identified and the exam.

- The External Examiner or Reader is nominated by submitting the Approve External Reader or Examiner for Final Doctoral Oral Examination. The nomination requires the potential examiner’s CV which documents and examines research competence and experience in supervising graduate students at the PhD level. The Faculty of Medicine and Dentistry approves the nomination; the LMP Graduate Studies Coordinator sends the letter of invitation. The nomination requires the potential examiner’s CV that documents and examines research competence and experience in supervising graduate students at the PhD level.

- A lead-time of two months before the exam date should be allowed for the approval a prospective External Reader or Examiner.
  
  - After approval of the external examiner or reader has been received, the Examining Committee should be appointed: the signed Notice of Examining Committee & Examination Date must be submitted to the LMP graduate program office at least 4 weeks prior to the proposed examination date. If you wish the assistance of the LMP Graduate Program Office in preparing the forms and obtaining signatures, please allow sufficient extra time. The completed form is sent to MSGP and FGSR for approval.
  
  - The Examining Committee, including the chair, must receive the thesis 4 weeks prior to the examination.
  
  - The graduate student should be aware of deadlines to be met for submitting the final document to the Faculty of Graduate Studies and Research for spring or fall convocations.

### 9.3.2 PhD Final Examining Committee

According to FGSR policy, the PhD final Examining Committee will consist of the Supervisory Committee (ex-officio examiners), to which at least two arm’s length members are added, for a minimum of five.

- Of these five (or more) examiners, one of the arm’s length examiners must be an External Examiner (a member from outside the University who attends the exam in person or via teleconference) or an External Reader (a member from outside the University who does not attend the exam but provides a written evaluation of the thesis to the Exam committee).

- An arm’s length examiner must not be (or have been) a member of the supervisory committee, or have been connected with the thesis research in a significant way. The examiner should not have been associated with the student, outside of usual contact in courses or other non-thesis activities within the University, nor be related to the student or supervisor(s). Except in special circumstances (fully justified in writing to the Vice-Dean, FGSR), an arm’s length examiner should not be a close collaborator of the supervisor(s) within the last six years.

- It is generally recognized that the active participation of an External Examiner during the doctoral final exam is preferable to the function of an External Reader. If an External Reader is chosen, an additional Faculty member approved by the Faculty of Graduate Studies and Research must attend the exam.

- The exam must be chaired by a LMP faculty member who is not the student’s supervisor. If this chair is not a member of the examining committee (FGSR strongly recommends this arrangement), the chair does not vote.

- At least half of the examiners on every examining committee must hold a degree which is equivalent to or higher than the degree being examined. (FRCP is considered the equivalent of a master’s degree.)
- **At least half** of the examiners on every examining committee must meet the employment requirement: current or retired tenured or tenure-track Faculty, current or retired Faculty Service Officer, or current Special Continuing (Academic Staff Categories A1.1, A1.3, C1.1). Examiners with clinical appointments are permitted, but do not satisfy this employment requirement.
- Roles may be combined.  

(FGSR Grad Program Manual Section 8.2 and FGSR Grad Program Manual Section 8.3.4)

### 9.3.3 PhD Final Examination Guidelines

- The candidate is required to present a public seminar based on the thesis, usually just prior to the final exam.
  - Members of the examining committee must attend the public seminar and any member of the University community is free to attend the seminar and question the candidate on any aspect of the presented research during the question period following the seminar.
  - The Chair of the examination will moderate the question period so that it does not result in the discussion of material that is more appropriate for the examination.
  - The presentation plus questions is generally approximately one hour long.
  - Members of the examining committee (including the supervisor) must refrain from questions and comments during the presentation and question period.
  - Immediately after the seminar, the Examining Committee convenes for the examination, which typically lasts 2 hours.
- Exam questions usually are concerned with the thesis but do not need to deal exclusively with the thesis.
  - The questions are set to enable the committee to form an opinion on the quality of the candidate’s thesis work as well as his/her capability to comprehend its significance in the context of the field;
  - Thus, both the document and the candidate are being examined.
- The role of the Chair of Examining Committee is to
  - Moderate the proceedings;
  - Ensure that a fair examination occurs; and
  - Report the results to the Graduate Studies Committee.
- The Chair of the Department and the Chair of the Medical Sciences Graduate Program Committee, if not already members of the Examining Committee, may attend the final exam as observers.
- Faculty members of the student's home department as well as members of FGSR Council (or their alternates) have the right to attend doctoral examinations but should notify the chair of the examining committee. Other persons may attend the examination only with special permission of the Dean, FGSR, or the chair of the examining committee. Except for the Dean, FGSR, (or Vice-Dean or Associate Dean or Pro Dean) who may participate fully in the examination, persons who are not members of the examining committee: (a) may participate in the questioning only by permission of the chair of the committee and (b) are not permitted to participate in the discussion of the student's performance and must withdraw before such discussion commences.
9.4 Teleconferencing and Attendance of Examiners at the Final Examination

- All Examiners must be present at the final examination (for both the MSc and PhD exams)
- If they are unable to attend the exam, the exam cannot proceed and must be deferred until such time as the examiners can be present.
- The presence of all Examiners “in person” is, however, not necessary. Prior arrangements may be made to allow an examiner (frequently the External Examiner in the case of PhD final exams) to participate through teleconferencing, recognizing that the teleconferencing examiner does not have the opportunity to visually inspect diagrams or documents that are produced during the examination. The term 'teleconferencing' is used here generically to include all forms of distance conference facilitation including telephone, video and electronic communication. Examiners participating in examinations by this means are considered to be in attendance.

9.5 Outcomes of MSc and PhD Final Examinations

The decision of the examining committee will be based both on the content of the thesis and on the student's ability to defend it. One of the following outcomes of the final examination is appropriate:

- Adjourned
- Pass
- Pass subject to revisions
- Fail

There is no provision for a final examination to be “passed subject to major revisions”.

A majority of examiners must agree to an outcome of Adjourned. All or all but one of the examiners must agree to an outcome of Pass, Pass subject to revisions, or Fail.

If the Examining Committee fails to reach a decision, the department will refer the matter to the Dean, FGSR, who will determine an appropriate course of action.

**Adjourned:** If the examination is adjourned, no member of the examining committee signs the Thesis Approval/Completion form. The final examination should be adjourned in the following situations:

- The revisions to the thesis are sufficiently substantial that it will require further research or experimentation or major reworking of sections are required, or if the committee is not satisfied with the general presentation of the thesis (that it will require a reconvening of the examining committee). In such circumstances, the committee shall not propose that the student has passed, rather the committee shall adjourn the examination.
- The committee is dissatisfied with the student's oral presentation and defence of the thesis, even if the thesis itself is acceptable with or without minor revisions.
- Compelling, extraordinary circumstances such as a sudden medical emergency during the examination.
- Discovery of possible offences under the Code of Student Behaviour.

If the examination is adjourned, the committee should:

- Specify in writing to the student, with as much precision as possible, the nature of the deficiencies and, in the case of revisions to the thesis, the extent of the revisions required. Where the oral defence is unsatisfactory, it may be necessary to arrange some discussion periods with the student prior to reconvening the examination.
- Decide upon a date to reconvene. If the date of the reconvened examination depends upon the completion of a research task or a series of discussions, it should be made clear which committee members will decide on the appropriate date to reconvene. The final date set for reconvening shall be no later than six months from the date of the examination. A final decision of the examining committee must be made within six months of the initial examination.
• Make it clear to the student what will be required by way of approval before the examination is reconvened (e.g. approval of the committee chair or supervisor, approval of the entire committee, or of select members of the committee).
• Specify the supervision and assistance the student may expect from the committee members in meeting the necessary revisions.
• Advise the Dean, FGSR in writing of the adjournment and the conditions (in the points above).
• When the date is set for the adjourned final examination, the department will notify the FGSR (and in the case of a doctoral final exam, the the Dean of the department's Faculty). Normally a Pro Dean attends the examination.

Pass: If the student passes the examination, the department shall submit a completed Thesis Approval/Program Completion form to the FGSR. If one of the examiners fails the student, that examiner does not have to sign the Thesis Approval/Program Completion form. The form is available on the FGSR website (see Forms Cabinet).

Pass subject to revisions: All or all but one of the examiners must agree to an outcome of Pass subject to revisions. The student has satisfactorily defended the thesis but the revisions to the thesis are sufficiently minor that it will not require a reconvening of the examining committee.

If the examining committee agrees to a "Pass subject to revisions" for the student, the chair of the examining committee must provide in writing, within five working days of the examination, to the Dean, FGSR, the graduate coordinator and the student:

• the reasons for this outcome,
• the details of the required revisions,
• the approval mechanism for meeting the requirement for revisions (e.g., approval of the examining committee chair or supervisor, or approval of the entire examining committee, or select members of the committee), and
• the supervision and assistance the student can expect to receive from committee members.

The student must make the revisions within six months of the date of the final examination. Once the required revisions have been made and approved, the department shall submit a completed Thesis Approval/Program Completion form to the FGSR indicating "pass subject to revisions". If one of the examiners fails the student that examiner does not have to sign the form. If the required revisions have not been made and approved by the end of the six months deadline, the outcome of the examination is a Fail.

Fail: All or all but one of the examiners must agree to an outcome of Fail. If the examination result is a Fail, no member of the examining committee signs the Thesis Approval/Completion form. When the outcome is a Fail, the committee chair will provide the reasons for this decision to the department. The department will then provide this report, together with its recommendation for the student's program, to the Dean, FGSR, and to the student. An Associate Dean, FGSR will normally arrange to meet with the student, the graduate coordinator, and others if needed, before acting upon any departmental recommendation that affects the student's academic standing.

A decision of the FGSR which affects a student's academic standing (e.g. termination, also known as "required to withdraw") may be appealed by the student.

(FGSR Grad Program Manual Section 8.3)
9.6  Final Examination Protocol

*For Master's final examinations*, there is no requirement for a public presentation of their research. MSc students deliver a brief presentation of their research during the closed examination.

*For PhD final examinations*, a public presentation is required and precedes the closed portion of the examination.

LMP recommends the following protocol for the Final Examination:

1. At the beginning of the exam, the Chair introduces the graduate student and the Examining Committee members.
   
   a. PhD students deliver their public presentation at this time (~45 min). Only members of the public are invited to ask questions at the end of the presentation. After the question period, they are asked to leave the room.

2. The student is then asked to leave the room. Copies of the student’s CV are distributed, and the committee reviews his/her undergraduate background and graduate program.

3. The Examining Committee discusses and agrees upon the examination format, specifying the sequence of the events including:
   
   a. the order of questioning (usually, the most external to least external):
      
      i. the arm’s length members,
      
      ii. the Supervisory Committee members, and
      
      iii. the graduate student’s supervisor(s).

      The supervisor does not usually ask questions except for the purpose of clarification.

      The Chair primarily moderates the examination process, but may ask questions as well.

   b. the number of rounds of questioning and the length of each round:

      Usually two rounds of questions, with 15 minutes per examiner for the first round and 5 minutes for the second round. Additional rounds of questions are optional. There will be a brief break (5-10 min) after the first round of questions.

      The committee also determines whether interruptions by other examiners will be permitted. If yes: when a pertinent point arises, another examiner may interrupt with a question/brief comment. This time will count as part of that examiner’s time allotment.

4. The graduate student is then asked to rejoin the Examining Committee, the examination format is explained to the student, and the examination begins.
   
   a. MSc students then deliver their research presentation (20-30 min).

   b. For PhD students, questioning begins immediately following the explanation of the examination format.

5. The agreed upon number of rounds of questioning follows (with the Chair keeping a record of the questions asked), after which the student may ask questions and offer comments or clarifications regarding the examination.

6. The student is asked to leave the room.

7. The Chair poses two rounds of questions to the Examining Committee:
a. First round: What is the opinion of each examiner (strengths and weaknesses) on the quality of
   the thesis, the oral presentation, and the defence?

b. Second round: What is the recommendation of each examiner for the outcome?

8. A formal vote is conducted as to the outcome of the examination. (The Chair does not vote if not a
   member of the Examining Committee.) The possible outcomes are Adjourned, Pass, Pass with
   revisions, or Fail (with several subsequent options).

   a. If the outcome is Adjourned, the majority of examiners must be in agreement.

   b. If the outcome is Pass, Pass subject to revisions, or Fail, all or all but one of the examiners must
      be in agreement.

9. The graduate student is recalled and given the outcome and feedback on the examination.

10. The Chair completes the required paperwork and submits it to the LMP Graduate Program Office
    within 7 days of the examination.

    A more detailed protocol for the Chair is available from the LMP Graduate Program Office.
9.7 Program Completion Procedures

Throughout this program completion period, the student is reminded to watch for pertinent deadlines, both those relating to registration/tuition costs, and those relating to convocation.

Subsequent to a successful final examination:

- The LMP Grad Program office will provide the student with a copy of the final exam report and minutes.
- When the exam outcome is “Pass”, the Thesis Approval/Program Completion form is signed by all committee members at the time of the exam and submitted to the LMP Graduate Program Office immediately thereafter.
- When the exam outcome is “Pass subject to revisions”, the student completes the final thesis revisions as discussed at the exam.
When final thesis revisions have been approved by the supervisor(s) and any other committee member who withheld signature at the time of the exam, obtain the required signature(s) on the Thesis Approval/Program Completion form and submit the form to the LMP Graduate Program Office. (The Thesis Approval/Program Completion form is held at the grad program office until needed for signatures.)

- **Thesis Approval/Program Completion form** is forwarded to MSGP for signature. MSGP will send the form to FGSR or the student may arrange to pick the form up from MSGP to deliver to FGSR in person.

- If there is a need to restrict access to the thesis, the Request to Restrict Access to a Thesis (signed by LMP and MSGP) must be submitted prior to or at the same time as the Thesis Approval/Program Completion form.

- Apply to graduate in Bear Tracks (before submission of thesis).

- Once the Thesis Approval/Program Completion form has reached FGSR, the student may submit the University of Alberta Thesis/Dissertation Non-Exclusive License form to FGSR. Alternatively, the student may choose to take the Thesis Approval/Program Completion form, the Request to Restrict Access to a Thesis form (if needed), and the non-exclusive license form to FGSR in person at the same time, after which the thesis can be submitted.

- After submission of all forms to FGSR, the thesis can be submitted to Thesis Deposit. If FGSR requires revisions to the thesis (typically formatting issues), the student will receive an email with instructions for modifications and re-submission.

- Once approved, the thesis will be published in ERA (Education & Research Archive--the University of Alberta Libraries' digital repository)

During this program completion period (often when the Thesis Approval/Program Completion form is submitted), the LMP Graduate Program will ask the student to fill out and submit the LMP Graduate Studies Exit Survey. The purpose of this voluntary survey is to collect information that will be helpful for assessing the strengths and weaknesses of our thesis-based graduate program. The data will be used to identify strategic areas that can be enhanced, with the goal of enhancing the graduate student experience. Changes that are currently on the horizon need to be done carefully to ensure that the quality of administrative support, academic training, research, and mentorship remains high. All responses will remain anonymous. The data in the attached form will be compiled once a year and submitted to the LMP Graduate Studies Committee for careful consideration. Participation is strongly encouraged and much appreciated.

Students are encouraged to attend the Convocation ceremony held in their honour. The student’s degree is conferred at this ceremony. The parchment (the official documentation of the student’s academic credential containing the student’s name, degree/specialization and academic honors if applicable) is given at this time. Students unable to attend Convocation may pick up their parchment in person during specified dates following the ceremony; if it is not picked up, it will be mailed to the current address on the student record.