



DEPARTMENT OF
PHARMACOLOGY

HANDBOOK

for

GRADUATE STUDENTS

and

SUPERVISORS

2017-2018

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Chapter 1 Organization of the Department of Pharmacology Graduate Program

The Department of Pharmacology oversees the supervision of all graduate students enrolled in its programs and serves as the chief liaison with the Faculty of Graduate Studies and Research (FGSR). The Department is responsible for ensuring that the student receives proper supervision and that the regulations and requirements of the FGSR are met.

The Department of Pharmacology administers the graduate program through its Graduate Studies Executive Committee (GSEC) and the Graduate Program Administrator. The GSEC is composed of the Associate Chair (Graduate Studies) and three faculty members from the Department of Pharmacology selected by the Chair of the Department in consultation with the Associate Chair.

1.1 Responsibilities of the Associate Chair (Graduate Studies)

The Department's Associate Chair is the official representative of the Department to its graduate students. The Associate Chair has a duty to ensure that Departmental and Faculty rules are administered in a fair and equitable manner.

The following are specific responsibilities of the Associate Chair:

- acts as chair of the GSEC and oversee all duties and responsibilities of the GSEC;
- acts as an academic liaison between the FGSR and the Department of Pharmacology;
- acts as an advisor concerning any changes to a student's status or program;
- carries out the FGSR policies relating to graduate students;
- acts as an academic liaison between the Faculty of Medicine & Dentistry (FoMD) and the Department of Pharmacology in matters concerning graduate studies;
- monitors the academic progress of graduate students; and
- provides advice to graduate students on the rules and procedures of the FGSR and the Department.

1.2 Responsibilities of the Graduate Studies Executive Committee (GSEC)

The role of the GSEC is to monitor and administer the Department's graduate program. The duties and responsibilities of GSEC are:

- reviews student applications to the graduate program, and makes decisions regarding acceptability for admission;
- reviews and approves memberships of the supervisory committees, the candidacy examining committees and the final examining committees;
- reviews and approves the candidacy examination topics;
- a GSEC member chairs the examining committees;
- reviews and approves proposals of enrollment in graduate courses from other departments;
- reviews existing graduate courses, and proposals for new courses;
- adjudicates and makes nominations for graduate scholarships and awards;
- reviews and updates the Handbook for Graduate Students and Supervisors when necessary;
- reviews, and reports on, graduate student progress throughout the program;
- reviews the policies of the graduate program, and recommends changes to the Department;
- reviews and approves the annual graduate program budget in consultation with the Department Chair.

1.3 Role of the Graduate Program Administrator

The Graduate Program Administrator is responsible for the administration of the graduate program by providing administrative support to the Associate Chair.

The following are specific responsibilities of the Graduate Program Administrator:

- Responds to all enquiries from Canadian and international student applicants.
- Outlines the Department of Pharmacology program requirements and directs all students to the on-line application process.
- Processes graduate student applicants including preparing files, implementing admission decisions and advising applicants.
- At the direction of the Associate Chair, mails the Offer of Graduate Student Appointment letter and pertinent documentation.
- Provides international students with the appropriate letters to apply for their social insurance numbers (SIN) and Alberta Health Care coverage.
- Prepares payroll documents for continuing and new graduate students.
- Confirms fees to Campus Solutions and prepares fee remission documentation.
- Serves as a resource person for faculty, students and committees.
- Serves as an administrative liaison with the FGSR, the FoMD, the International Centre and other graduate administrators on campus.
- Oversees student registrations for completeness including ethics training, professional development activities and reports to the FGSR.

Chapter 2 The MSc Program

2.1 Program Content and Duration

Students who meet the entrance requirements of the Faculty of Graduate Studies and Research (FGSR) and the Department of Pharmacology are usually admitted initially into the MSc Program. The objective of the MSc Program is to lead the students in the development of critical scientific thinking and in the acquisition of solid knowledge of pharmacological principles both in general terms and in their specific area of research. At the end of the program, graduates must be able to formulate hypotheses and to propose experimental strategies to test them.

A maximum of four years between entering the graduate program and completing all requirements for the MSc is permitted by the FGSR. However, the Department expects that students will complete the MSc program in Pharmacology within two and one-half years.

The MSc Program consists of both course work and original research. Students who wish to enrol in courses extra to their formal degree program must seek permission from the GSEC (See the FGSR Regulations).

The objective of course work is to ensure that students have a broad background in pharmacology as a discipline, as well as insight into contemporary research in pharmacology and areas appropriate to their particular research interest. The particular program for each student will be determined by their supervisory committee and will be subject to approval by GSEC if required.

Pursuing an MSc degree is a full-time commitment. Laboratory work and classroom attendance should be commensurate with this. While 'working hours' are not prescribed *per se*, students will be expected to devote a full-time commitment to their work to maintain a high standard of academic excellence.

2.2 Registration

When registering as graduate students for the first time, incoming students will attend an orientation session and meet with the Department's Associate Chair. At the orientation session students will receive information on program organization, rules and expectations.

In order to keep their program active, MSc students must register each year in course work and/or thesis research. Registration will take place during the annual meeting with the Associate Chair, which may occur in the spring, prior to the annual Departmental teaching meeting, or during the summer, prior to the beginning of the Fall term. The Associate Chair or the Chair of the Department must sign the forms for course addition/deletion, which are then given to the Graduate Administrator. The Graduate Administrator will complete the registration and will select the appropriate thesis course for each student to fulfil the FGSR requirements.

2.3 Financial Assistance

a. Stipends and Tuition

Full-time graduate students receive a stipend guaranteed to be not less than a minimum determined annually by the Department based on the FGSR recommendations. The minimum stipend for 2017-2018 is \$26,000. The source of funds may be either from the Department, based on availability, and student's academic achievement and promise, from the supervisor, and/or from a funding agency external to the Department. In any case, the supervisor is responsible, together with his/her student, for making every attempt to secure external student financial support for the completion of the program. International students are also responsible for payment of the differential fee; some supervisors choose to contribute to the payment of this fee and international students should consult with their supervisor in this regard. It is a further responsibility of the student to maintain the highest possible standards of performance during the program of study in order to ensure continuing financial support.

Tuition and fees should be paid by the student directly to the University of Alberta, through the Office of the Registrar.

Determined on an annual basis and dependent on the availability of funds, the Department of Pharmacology may provide financial support (currently in the form of up to \$2000 tuition relief) to all eligible students in good standing, to cover part of the cost of domestic tuition and fees. Tuition relief may be offered for up to three years for students in the MSc program. Tuition relief will not be offered to students who have a total award income of greater than \$35,000 (not including awards from the Edwin Daniel fund, the Albert Yeung Fund or from the Susan Dunn fund). Where student income exceeds (\$35,000 - tuition relief amount) but is less than \$35,000, partial tuition relief may be offered such that total student income equals \$35,000.

The tuition relief payments will be processed by the Graduate Program Administrator.

b. Teaching Assistantships

There are currently no teaching assistantships within the Department of Pharmacology. However, all students are expected to contribute to teaching and/or assessment activities in the Department as part of the graduate training program.

2.4 Courses

a. Requirements

The minimum formal requirements are successful completion of a total of six credits (6*) of graded coursework which will include:

- a) PMCOL 508 or PMCOL 501
- b) At least one course from the following list: PMCOL 514, PMCOL 515, PMCOL 525, PMCOL 550, PMCOL 575, PMCOL 612.

This list may be updated at any time through removal of discontinued options or addition of new options.

Students with an undergraduate degree in Pharmacology may have the requirement of PMCOL 508 (or PMCOL 501) waived, in which case the minimum formal requirement is the successful completion of one 3* course from the above list. Substitution of other graduate-level courses is considered on an individual basis. Approval of the substitution must be specifically sought from the GSEC before registering.

Where a student's background in pharmacology or ancillary subjects is judged to be weak, the supervisory committee may recommend that appropriate undergraduate course work be incorporated into a student's program. Students must maintain a minimum average GPA of 3.3 (B+) in these courses. However, such course work is regarded as being of a "qualifying" nature, and will not be counted toward the fulfillment of graduate course requirements.

b. Minimum Passing Grade

In order to continue in the MSc Program, students must maintain a minimum GPA of 3.3 (B+), and a minimum grade of 3.3 (B+) in any pharmacology course. When students take a 500-level course outside the Department in order to meet their program requirement for a 500-level pharmacology course, they will be required to secure a grade of at least 3.3 or better in that course. Students failing narrowly to attain these standards may be allowed to demonstrate to the satisfaction of the GSEC and the Department of Pharmacology that course requirements have been met by retaking a course or by taking an approved, alternative course (consistent with the FGSR Policy), in order to be permitted to proceed in the program. The Department may recommend to the FGSR that students failing to attain these minimum standards be required to withdraw from the program.

2.5 Research Work and Expectations

a. Quality

Each student is expected to perform original research work under the direction of their supervisor(s), and the guidance of their supervisory committee. The work should be of a level of significance and quality acceptable for publication in refereed scientific journals.

b. Publications

There is an expectation of at least one original research paper submitted, in revision, accepted or published, to which the student has made a significant contribution.

c. Written Thesis

The thesis shall be prepared, presented and defended in accordance with the FGSR regulations.

<https://www.ualberta.ca/graduate-studies/current-students/academic-requirements/thesis-requirement-and-preparation>

2.6 Supervisory Committee

a. Responsibilities of the Committee

The purpose of the supervisory committee is to provide a wider breadth of guidance for the student than would be available from the supervisor alone. The supervisory committee discusses with the student his/her research work, proposes alternatives and ideas, and monitors the student's research progress. The supervisory committee shall make recommendation regarding the timeline of the completion of the program and the arm's length examiner for the thesis defence. A further responsibility of the supervisory committee is to ensure that all forms of collaboration and assistance (technical, financial, etc.) are acknowledged by the student in all presentations and in the thesis.

b. Selecting a Committee

Under the aegis of the GSEC, the selection of the supervisory committee shall be made by the supervisor in consultation with the student and the GSEC. The committee will normally comprise the supervisor, a second member of the Department of Pharmacology and a faculty member from an academic department other than Pharmacology. At least one member of each supervisory committee shall be a primary appointee of the Department of Pharmacology. In certain instances, it may be appropriate for a student to be co-supervised. For example, two supervisors may provide complementary strengths or expertise. In all such instances, one supervisor (the "principal" supervisor) will assume administrative responsibility for the student's program. If one supervisor is from a department other than the Department of Pharmacology, the supervisor who holds an appointment in the Department of Pharmacology will be the "principal" supervisor.

To ensure sufficient breadth of the student's graduate experience, each supervisory committee shall include a member whose research is relevant to the thesis research project, but is independent of the research of the supervisor(s). Once selected, the names of the committee members shall be forwarded to the GSEC, who will review proposed committee membership on a case-by-case basis. Following approval from the GSEC, the names of supervisory committee members will be submitted to the FGSR. Although departmental Master's supervisory committees do not require approval from FGSR, it is normally expected that the student's supervisory committee will be part of the Master's final examining committee.

Committee members should be identified within eight months, prior to the first committee meeting (which should take place within nine months of the start of the program).

Membership of the supervisory committee should be internally reviewed during each formal meeting to identify if changes are required due to changes in the student's project development.

c. Committee Meetings (*frequency and format*)

The supervisory committee is recommended to meet with the student twice a year, **with at least one meeting being held just prior to the annual report deadline**. More frequent meetings may take place as necessary, or as requested by the student or supervisory committee members. It is the responsibility of the supervisor to ensure that a written report is provided to each committee member by the student no less than three days in advance of each formal meeting. At each meeting the student will make an oral presentation of their work and the student's progress will be reviewed. The committee will prepare and sign a written report form) and forward it to the student at the time of the meeting. The student will then provide their comments on their progress, supervision and supervisory committee on the same form. Within five working days of the committee meeting, the completed form shall be submitted by the student directly to the Associate Chair, who will review the report and arrange for copies to be sent to the student and to committee members. This report will remain as part of the student's departmental record.

2.7 Responsibilities of the Student

a. Standards and Academic Performance

It is important that students are aware of regulations related to their program of study, as outlined in this document, and in the FGSR Calendar. In addition to the required standards in course work, students will be required to maintain a level of research performance as specified by their respective supervisory committees. Furthermore, in recognition that critical information and ideas can arise from a variety of sources, students are expected to attend Departmental seminars presented by trainees, Department faculty members, and external invited speakers. Continuation in a program of study will depend upon satisfactory progress, as indicated in reports of supervisory committee meetings, at which the student has described their accomplishments in course work and research during the preceding term.

b. Teaching Experience

Graduate students in the Department may be required to assist in teaching or assessment activities, and are expected to assist with exam proctoring, regardless of their source of support. Their assistance may be solicited by the course coordinator(s) following consultation with the student's supervisor. Such experience will be beneficial to the graduate student, providing the opportunity to develop communication and teaching skills related to the overall subject of pharmacology.

c. Ethics and Scientific Integrity

All graduate students in this Department will include in their programs appropriate training in the ethical conduct of scientific investigation. During their degree program and prior to graduation, all graduate students must fulfill the FGSR requirements for academic integrity and ethics training.

The FGSR mandates that all graduate students complete the equivalent of at least eight hours of structured academic training in ethics and academic integrity prior to graduation. In the Department of Pharmacology the requirements are met by taking the following courses:

ESI (Ethics and Scientific Integrity Day) for five hours. This is offered twice a year, with limited on-line registration by the Faculty of Medicine & Dentistry (FoMD) at:
<https://www.ualberta.ca/medicine/research/graduate/esi/esiday/registration>

GET (Graduate Ethics Training) for five hours (Note that it takes much less than five hours to work through this course). This is offered on-line through the FGSR at: <https://www.ualberta.ca/graduate-studies/current-students/academic-requirements/ethics>

Several alternative opportunities to secure ethics credits are available, including completion of HSLAS training; Part 1: Ethical treatment of animals. Current opportunities are listed on the FGSR website, under *Ethics Training Resources*, at <https://www.ualberta.ca/graduate-studies/current-students/academic-requirements/ethics/resources>

Students are expected to complete ethics training within the first year of graduate studies under normal circumstances. The online GET program should be completed before attending either the fall or spring session of ESI Day. Completion of each ethics training component must be confirmed with the Graduate Program Administrator.

d. Professional Development

All graduate students enrolled on or after September 1, 2016 must fulfil the FGSR requirements for Professional Development which includes the submission of an Individual Development Plan (IDP) to the department and the completion of at least eight hours of professional development activities. The IDP should be submitted to the Associate Chair within 12 months of the commencement of the program. Students are expected to complete their professional activities within the first 18 months of the MSc program. Certificates of Professional Development activities should be submitted to the Graduate Program Administrator. Further information on the IDP and the Professional Development Activities are listed on the FGSR website at: <https://www.ualberta.ca/graduate-studies/professional-development/professional-development-requirement>

For a complete list of the Responsibilities of the Student see Appendix 1.

2.8 Responsibilities of the Supervisor

Supervisors of pharmacology MSc Students are normally primary appointees of the Department. Adjunct appointees who are established supervisors of MSc and/or PhD students in their home departments may also supervise pharmacology graduate students.

The supervisor is responsible for providing laboratory facilities and other necessary material for the completion of the student's research project. In addition, the supervisor (and the supervisory committee, where applicable) is expected to guide the student in the day-to-day determination and modification, if necessary, of the student's program of study and research. The supervisor must also ensure that the student is aware of all University of Alberta requirements and regulations relating to the program. For further details, see the FGSR Graduate Program Manual Section 1.2 (<https://www.ualberta.ca/graduate-studies/about/graduate-program-manual/section-1-areas-of-responsibilities/1-2-the-supervisor>). If a supervisor will be away from the University for more than two months, they must nominate, in writing, an appropriate interim supervisor who will agree to ensure satisfactory supervision during the period of leave. Upon approval by the GSEC and the student, a copy of the statement will then be forwarded to the FGSR.

The supervisor is responsible for organizing meetings of the supervisory committee and to require that the student prepare a written progress report for submission to the committee members at least three days prior to a formal meeting. For a complete list of the Responsibilities of the Supervisor, see Appendix III.

2.9 Annual Review

The progress of graduate students and the performance of their supervisory committees will be reviewed annually by the Department, usually in either May or June. To facilitate this process, an

annual report on student performance must be provided to the Department, bearing the signatures of both supervisor and student. The Associate Chair will conduct an interview with each student to discuss their progress in the program and set the registration for the following academic year.

The performance of each student is then evaluated by the GSEC. If serious concerns have been raised by members of the academic staff regarding any student's progress, that information will be communicated to the student by the Associate Chair and will be documented in a letter to the student and their supervisor(s). If the Associate Chair is the student's supervisor, the annual interview may be conducted by the Department Chair.

2.10 Dispute Resolution (*what to do if you have a problem*)

Students who have any difficulties or concerns with their program, including their supervision, should first express their concerns to their supervisor. If there is a disagreement between student and supervisor (or supervisory committee), the student should discuss the problem with the Associate Chair. The Associate Chair will arrange for necessary consultation and mediation when requested by the student or supervisor. The Associate Chair will listen in confidence, advise and do everything reasonable to achieve conflict resolution, including mediation on behalf of the student. If the issue cannot be resolved, the student should speak to the Department Chair, and then if necessary, the Associate Dean or Dean of the FGSR.

For further details see the FGSR Grad Program Manual, Section 9, Disputes and Resolutions:

<https://www.ualberta.ca/graduate-studies/about/graduate-program-manual/section-9-disputes-and-resolutions>

2.11 Termination of a Student's Program

Only the FGSR can terminate a graduate student's program. Students wishing to withdraw, or Department Chairs who wish to recommend the termination of a student's program, must do so in writing to the Associate Dean of the FGSR. Grounds for termination include failure to maintain adequate academic standing, including research progress; failure to meet requirements set out in conditional admission and expiry of program time limit. Students wishing to withdraw are strongly advised to consult their supervisor, the Associate Chair, and, if desired, the Associate Dean of the FGSR before submitting their request. A decision by the FGSR to terminate a program is subject to appeal via the FGSR academic appeals procedure.

Further details on the termination procedure can be found in Section 7 of the FGSR Grad Program Manual at: <https://www.ualberta.ca/graduate-studies/about/graduate-program-manual/section-7-administration-of-graduate-programs/7-14-termination-of-a-students-program>

2.12 Transfer to the PhD Program

Students who are well-qualified and who are performing well in both research and course work may, with the agreement of their supervisory committee, present and defend a thesis proposal (see Section 2.13) that is acceptable to their supervisory committee in order to transfer from the MSc program to the PhD program without completion of an MSc thesis. Under these circumstances, courses completed and research work performed during the MSc program become part of the PhD program of study. After successfully defending a thesis proposal, the student's category will be changed to PhD student. This transfer will normally occur approximately 18 months after entry into the MSc program.

At this time it is recommended that the composition of the supervisory committee is reassessed, to ensure that it reflects the direction of the research project.

Note also that the course requirement for the PhD program is greater than for the MSc program; typically, students transferring to the PhD program will then be required to complete one further graduate level course, within 12 months of the date of transfer.

2.13 Defence of the PhD Thesis Proposal

a. Overview

Defence of a thesis proposal is not required for students in the MSc program who intend to complete and defend a MSc thesis. Students whose goal is to transfer to the PhD program are required to prepare and defend (before the examining committee) a PhD thesis proposal with the aim of demonstrating to their committee that their academic and research progress has been sufficient for them to transfer to the PhD program. The examining committee consists of members of the supervisory committee and is chaired by a member of the GSEC. For students in the MSc program, completion of this step represents the point of transfer to the PhD program.

The purpose of the PhD thesis proposal defence is to provide the student with an opportunity to demonstrate to their supervisory committee that the proposed work would be of a quality and quantity sufficient to constitute a PhD project, and that they have given significant critical thought to the hypotheses, experimental approaches and possible outcomes. The defence is also an opportunity to receive feedback from the supervisory committee on all aspects of the proposal.

b. Instructions for the student

- An informal outline of the proposed project should be formulated by the student after consultation with the supervisor and with other coworkers or collaborators.
- A written proposal should be prepared; this is a document, maximum 5 pages in length (not including references, figures or legends), written in 12 point font, single spaced. The document should provide a succinct overview of the subject area, a description of the aims and hypotheses, an outline of the approaches to be used and the major experiments to be completed, a summary of the anticipated results, and a brief commentary on how the proposed work will impact the research area. If preliminary data are available that demonstrate the feasibility of the project, these should also be shown. There is no limit to the number of references, figures or tables that may be included, but figure and table legends may not occupy in excess of three further pages.
- The proposal document should be provided to all members of the examining committee not less than one week prior to the scheduled thesis proposal defence meeting.

c. Examination Procedures

- At the start of the examination, the student will be excused briefly while the committee reviews the student's progress in research and course work. The student will then give a brief (~20 minute) oral summary of the proposal, with particular emphasis on the working hypotheses and proposed experiments. The student will then respond to questions from each member of the supervisory committee in a first round of questioning that normally lasts for 20 minutes for each examiner. There may be a second, briefer round of questioning in which examiners may test the student further, usually for a maximum of 10-15 minutes.

d. Nature of the PhD thesis proposal defence questions

- The **student** should be assessed on their knowledge and understanding of relevant background material, on their ability to formulate and justify appropriate hypotheses, and on their abilities to rationalise proposed experiments and discuss potential outcomes.
- The proposed **project** should be assessed in terms of the quality and quantity of the work described, with regard to the question, "Would the work described, if completed successfully, be of sufficient quality and quantity to constitute a body of work worthy of a PhD degree?"

- The thesis proposal defence meeting is also an opportunity for the supervisory committee to provide feedback and advice to the student on all aspects of the proposed work.

e. Possible outcomes

There are three possible outcomes of the PhD thesis proposal defence: PASS, ADJOURN, and FAIL.

- A decision of PASS is reached if the supervisory committee members are satisfied that the work described is generally of sufficient quality and quantity to constitute a PhD project and that the student is generally capable of carrying out the work in a critical and independent manner. A decision of PASS should still be reached if minor weaknesses or concerns are evident, where advice offered by the supervisory committee would address the concerns. Students transfer to the PhD program and the student's category is changed to PhD student.
- A decision of ADJOURN is reached if the proposed work is of insufficient quality or quantity to constitute a PhD project, or if significant flaws are identified that necessitate substantial revision of the proposal. A decision of ADJOURN may also be reached if the student fails to demonstrate an acceptable depth of knowledge of the topic, and/or fails to demonstrate critical thinking skills in their approach to the project, to the satisfaction of the committee. The student will then have one further opportunity to address the committee's concerns. A second thesis proposal defence should be scheduled for a date no more than 6 weeks following the initial meeting. The format of the second meeting will be identical to the first. The possible outcomes for the second meeting are either PASS or FAIL. In the event of an ADJOURN decision, the supervisory committee should provide a document to the student within five working days of the meeting that clearly outlines both the deficiencies of the initial proposal and the expectations for the second defence.
- A decision of FAIL is reached if the if the student fails to demonstrate an acceptable depth of knowledge of the topic, and/or fails to demonstrate critical thinking skills in their approach to the project, and the committee does not feel that the student is capable of demonstrating or developing the skills required to be an independent researcher at the PhD level. The student will then complete the Master's project and will write up and defend a Master's thesis.

PASS and ADJOURN decisions are made on a majority basis; in the event that the supervisory committee contains 4 members and a vote is split, the chair of the examining committee will adjudicate and will place the casting vote. A decision to FAIL the student must be unanimous; if the vote is not unanimous, an ADJOURN decision is recorded.

2.14 Final MSc Examination

a. Overview

- All MSc students shall present and orally defend a thesis embodying the results of their research.
- The topic of the thesis must have been approved by the student's supervisor.
- The thesis should show that the student is able to work in a scholarly manner and is familiar with the primary literature published on the subject of the thesis. As far as possible, it should be an original contribution.
- The examining committee shall conduct a final oral examination, based largely on the thesis.
- It is the responsibility of both the student and the supervisor to be aware of requirements from the FGSR and the Department of Pharmacology with respect to the student's thesis.
- It is the responsibility of the supervisor to ensure that proper arrangements are made for the candidate's examination and the examination is scheduled and held in accordance with the FGSR regulations. The candidate is not required to make these arrangements.

- The examining committee chair, student and all examiners should have a final draft of the thesis at the examination.
- The candidate will make a public presentation of research presented in the thesis, usually 45 - 50 minutes long immediately before the oral examination.
- Most questioning time will be allotted to the internal/external examiner and the least to the supervisor.
- At the close of the examination, before the student is asked to leave the room, the candidate will be asked if he/she wishes to make any final comments.
- For the adjudication, no final verdict should be rendered without each examiner having given an opinion. The overall decision is based on the acceptability of the thesis and the acceptability of the defence.
- For more details about MSc examination and program completion, refer to the FGSR Grad Program Manual.

<https://www.ualberta.ca/graduate-studies/about/graduate-program-manual/section-8-supervision-oral-examinations-and-program-completion>

b. Student Responsibilities

- Present a thesis plan to supervisory committee for acceptance.
 - Prepare the thesis in accordance with the FGSR and Department policies.
- <https://www.ualberta.ca/graduate-studies/about/graduate-program-manual/section-8-supervision-oral-examinations-and-program-completion/8-4-thesis-requirements>
- Provide a draft of the final, complete thesis to the supervisor for review at least 6 weeks before examination.
 - Submit the thesis electronically by email to members of the examining committee, and a hard copy if requested, at least three weeks before the examination.
 - Prepare seminar to present before final thesis defence.
 - Amend the thesis if necessary and submit to the FGSR within six months of completion of the final oral examination.

c. Supervisor Responsibilities

- Complete the Arm's Length Examiner Conflict of Interest Checklist and seek the GSEC approval of the arm's length examiner.
- Inform the Associate Chair and the Graduate Program Administrator of meeting time, place (usually 9-68 MSB), and Examining Committee members, at least four weeks before the examination.
- Book the room for the examination through the Graduate Program Administrator. All examinations will be held in room 9-68 MSB, whenever possible.
- Examine the amended thesis to confirm the completion of revisions recommended by the examining committee.
- Complete the "Thesis Approval / Program Completion" form (available from Graduate Program Administrator).

d. The Examining Committee

The Examining Committee is the supervisory committee and one arm's length examiner. As stated in the FGSR Graduate Program Manual (section 8.2.3.), 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). FoMD guidelines state that the arm's length examiners will not have collaborated with the student or the supervisor for the past six years. Collaboration is defined by having been co-investigators on research grants or co-authors on publications. Recent collaborations that have not yet resulted in joint grants or publications must also be declared. Exchange of reagents, protocols or sharing of equipment does not necessarily constitute collaboration. Arm's length examiners are encouraged to be from another department and may be from another faculty. A member of GSEC will chair the examination. Unless the chair is also an examiner, s/he will not vote on the outcome of the examination.

e. Format of the Examination

The final examination shall be immediately preceded with an open Departmental research seminar given by the candidate, with a question period, and lasting no more than one hour. Following the seminar, the examining committee and the candidate shall proceed to the oral component of the final examination, which will be held in a closed session and conducted in accordance with FGSR regulations.

f. Possible Outcomes

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'. Usually, the chair of the examining committee is not an examiner and does not vote. If the examining committee fails to reach a decision, the Department will refer the matter to the Dean of FGSR, who will determine an appropriate course of action.

For further details on examination outcomes, consult Section 8 of the FGSR Grad Program Manual.

<https://www.ualberta.ca/graduate-studies/about/graduate-program-manual/section-8-supervision-oral-examinations-and-program-completion>

2.15 Submission of Approved Thesis

It is the responsibility of the student to complete revisions of the thesis requested by the examining committee and to ensure that the revised thesis meets the FGSR guidelines. Once the thesis revisions are completed and approved by the supervisor, the supervisor signs the "Thesis Approval/Program Completion" form. The form is then completed by the Associate Chair or the Department Chair for submission with the thesis to the FGSR.

The student must submit the thesis to the FGSR electronically using a PDF-A (archive) format. In

addition, the Department of Pharmacology requires one bound copy, accompanied by high quality CD/DVD(s) of multimedia files if appropriate. Students should note that it is customary for a bound copy of the thesis in its final form to be given to the supervisor. There are strict FGSR requirements regarding the format and layout of the thesis. Details are available at:

<https://www.ualberta.ca/graduate-studies/about/graduate-program-manual/section-8-supervision-oral-examinations-and-program-completion/8-4-thesis-requirements>

Theses approved by examining committees **must be submitted to the FGSR within six months of the date of the final oral examination.** Please note that there are also submission deadlines for each convocation period and registration requirements to consider when submitting your thesis.

N.B. If the thesis is not submitted to the FGSR within the six-month time limit, the candidate will be considered to have withdrawn from the program. After this time, the candidate must reapply and be readmitted to the FGSR before the thesis can be accepted.

Chapter 3 The PhD Program

3.1 Program Content and Duration

The objective of the PhD program is to form the next generation of scientists in pharmacological and biomedical sciences. PhD students are involved in cutting-edge scientific research and develop critical thinking as well as communication and problem-solving skills. Upon completion of the PhD program, students should be able to perform scientific research independently.

Students may be admitted directly into the PhD program if, in addition to meeting the minimum admission requirements, they possess one of the following:

- A recognized MSc degree in pharmacology or a companion discipline.
- Exceptional qualifications in pharmacology or a related discipline at the undergraduate level, as demonstrated by GPA, awards, publications and/or strong letters of reference.

Students initially admitted to the MSc program in Pharmacology may transfer to the PhD program as outlined in section "Transfer to the PhD Program".

The minimum duration of the PhD program is 30 months. A maximum of six years between entering the graduate program and completing all requirements for the PhD is permitted by the FGSR. The expected duration of the PhD program in Pharmacology is four and one-half years. This is the case, regardless of whether students are admitted initially to the MSc program or to the PhD program; the duration of the PhD program is similar, regardless of the path taken.

The PhD Program consists of both course work and original research. Students who wish to enroll in courses extra to their formal degree program must seek permission from the GSEC (see the FGSR regulations).

The objective of course work is to ensure that students have a broad background in pharmacology as a discipline, as well as insight into contemporary research in pharmacology and areas appropriate to their particular research interest. The particular program for each student will be determined by their supervisory committee and will be subject to approval by the GSEC if required.

Pursuing a PhD degree is a full-time commitment. Laboratory work and classroom attendance should be commensurate with this. While 'working hours' are not prescribed *per se*, students will be expected to devote a full-time commitment to their work to maintain a high standard of academic excellence.

3.2 Registration

When registering as graduate students for the first time, incoming students will attend an orientation session and meet with the Associate Chair. At the orientation session students will receive information on program organization, rules and expectations.

In order to keep their program active, PhD students must register each year in course work and/or thesis research. Registration will take place during the annual meeting with the Associate Chair, which may occur in the spring, prior to the annual Departmental teaching meeting, or during the summer, prior to the beginning of Fall term. The Associate Chair or the Department Chair must sign the forms for course addition/deletion, which are then given to the Graduate Administrator. The Graduate Administrator will complete the registration and will select the appropriate thesis course for each student to achieve the FGSR requirements.

3.3 Financial Assistance

a. Stipends and Tuition

Full-time graduate students receive a stipend guaranteed to be not less than a minimum determined yearly by the Department based on the FGSR recommendations. The minimum stipend for 2017-2018 is \$26,000. The source of funds may be from the Department, based on availability and student's academic achievement and promise, from the supervisor, and/or from a funding agency external to the Department. In any case, the supervisor is responsible, together with their student, for making every attempt to secure external student financial support for the completion of the program. International students are also responsible for payment of the differential fee; some supervisors choose to contribute to the payment of this fee and international students should consult with their supervisor in this regard. It is a further responsibility of the student to maintain the highest possible standards of performance during the program of study in order to ensure continuing financial support.

Tuition and fees should be paid by the student directly to the University of Alberta, through the Office of the Registrar.

Determined on an annual basis and dependent on the availability of funds, the Department of Pharmacology may provide financial support (currently in the form of up to \$2000 tuition relief) to all eligible students in good standing, to cover part of the cost of domestic tuition and fees. Tuition relief may be offered for up to five years for students in the PhD program. Tuition relief will not be offered to students who have a total award income of greater than \$35,000 (not including awards from the Edwin Daniel fund, the Albert Yeung Fund or from the Susan Dunn fund). Where student income exceeds (\$35,000 - tuition relief amount) but is less than \$35,000, partial tuition relief may be offered such that total student income equals \$35,000.

The tuition relief payments will be processed by the Graduate Program Administrator.

b. Teaching Assistantships

There are currently no teaching assistantships within the Department of Pharmacology. However, all students are expected to contribute to teaching and/or assessment activities in the Department as part of the graduate training program.

3.4 Courses

a. Requirements

The minimum formal requirements are successful completion of a total of nine credits (9*) of graded coursework which will include:

1. PMCOL 508 or PMCOL 501, and
2. At least two courses from the following list: PMCOL 514, PMCOL 515, PMCOL 525, PMCOL 550, PMCOL 575, PMCOL 612.

This list may be updated at any time through removal of discontinued options or addition of new options.

Students with an undergraduate degree in Pharmacology may have the requirement of PMCOL 508 (or PMCOL 501) waived, in which case the minimum formal requirement is the successful completion of two 3* courses from the above list. Substitution of other graduate-level courses is considered on individual basis. Approval of the substitution must be specifically sought from the GSEC before registering.

Courses completed while students are registered for the MSc degree may be credited towards meeting the requirements of the PhD program of those students who transfer.

b. Minimum Passing Grade

In order to continue in the PhD Program, students must maintain a minimum GPA of 3.3 (B+), and a minimum grade of 3.3 (B+) in any pharmacology course. When a student takes a 500-level course outside the Department in order to meet their program requirement for a 500-level pharmacology course, they will be required to secure a grade of at least 3.3 or better in that course. Students failing narrowly to attain these standards may be allowed to demonstrate to the satisfaction of the GSEC and the Department of Pharmacology that course requirements have been met by retaking a course or by taking an approved, alternative course (consistent with the FGSR Policy), in order to be permitted to proceed in the program. The Department may recommend to the FGSR that students failing to attain these minimum standards be required to withdraw from the program.

3.5 Research Work and Expectations

a. Quality

Each student is expected to perform original research work under the direction of their supervisor(s), and the guidance of their supervisory committee. The work should establish new areas of knowledge and be of a level of significance and quality acceptable for publication in refereed scientific journals.

b. Publications

There is an expectation of a minimum of two original research papers as first or co-first author, at least one of which is accepted for publication and at least one other submitted, in revision, accepted or published.

c. Written Thesis

The thesis shall be prepared, presented and defended in accordance with the FGSR regulations.

<https://www.ualberta.ca/graduate-studies/about/graduate-program-manual/section-8-supervision-oral-examinations-and-program-completion>

3.6 Supervisory Committee

a. Responsibilities of the Committee

The purpose of the supervisory committee is to provide a wider breadth of guidance for the student than would be available from the supervisor alone. The supervisory committee discusses with the student their research work, proposes alternatives and ideas, and monitors the student's research progress. The supervisory committee shall make recommendation regarding the timeline of the completion of the program and the arm's length examiners for examinations. It is the further responsibility of the supervisory committee to ensure that all forms of collaboration and assistance (technical, financial, etc.) are acknowledged by the student in all presentations and in the thesis.

b. Selecting a Committee

Under the aegis of the GSEC, the selection of the supervisory committee shall be made by the supervisor in consultation with the student and the GSEC. The committee will normally comprise the supervisor, a second member of the Department of Pharmacology and a faculty member from an academic department other than Pharmacology. At least one member of each supervisory committee shall be a primary appointee of the Department of Pharmacology. In certain instances, it may be appropriate for a student to be co-supervised. For example, two supervisors may provide complementary strengths or expertise. In all such instances, one supervisor (the "principal" supervisor)

will assume administrative responsibility for the student's program. If one supervisor is from a department other than the Department of Pharmacology, the supervisor who holds an appointment in the Department of Pharmacology will be the "principal" supervisor.

To ensure sufficient breadth of the student's graduate experience, each supervisory committee shall include a member whose research is relevant to the thesis research project, but is independent of the research of the supervisor(s). Once selected, the names of the committee members shall be forwarded to GSEC, who will review proposed committee membership on a case-by-case basis. Following approval from the GSEC, the names of supervisory committee members will be submitted to the FGSR. Although Departmental PhD supervisory committees do not require the FGSR approval it is normally expected that the student's supervisory committee will be part of the PhD final examining committee.

Committee members should be identified within eight months, prior to the first committee meeting (which should take place within nine months of the start of the program).

Membership of the supervisory committee should be internally reviewed during each formal meeting to identify if changes are required due to changes in the student's project development.

c. Committee Meetings (*frequency and format*)

The supervisory committee is recommended to meet with the student twice a year, with **at least one meeting being held just prior to the annual report deadline**. More frequent meetings may take place as necessary, or as requested by the student or supervisory committee members. It is the responsibility of the supervisor to ensure that a written report is provided to each committee member by the student no less than three days in advance of each formal meeting. At each meeting the student will make an oral presentation of their work and the student's progress will be reviewed. The committee will prepare and sign a written report and give it to the student at the time of the meeting. The student will then provide their comments on their progress, supervision and supervisory committee on the same form. Within five working days of the committee meeting, the completed form shall be submitted by the student directly to the Associate Chair, who will review the report and arrange for copies to be sent to the student and to committee members. This report will remain as part of the student's Departmental record.

3.7 Responsibilities of the Student

a. Standards and Academic Performance

It is important that students are aware of regulations related to their program of study, as outlined in this document, and in the FGSR Calendar. In addition to the required standards in course work, students will be required to maintain a level of research performance as specified by their respective supervisory committees. Furthermore, in recognition that critical information and ideas can arise from a variety of sources, students are expected to attend Departmental seminars presented by trainees, Department faculty members, and external invited speakers. Continuation in a program of study will depend upon satisfactory progress, as indicated in reports of supervisory committee meetings, at which the student has described his/her accomplishments in course work and research during the preceding term.

b. Teaching Experience

Graduate students in the Department may be required to assist in teaching or assessment activities, and are expected to assist with exam proctoring, regardless of their source of support. Their assistance may be solicited by the course coordinator(s) following consultation with the student's supervisor. Such experience will be beneficial to the graduate student providing the opportunity to develop communication and teaching skills related to the overall subject of pharmacology.

c. Ethics and Scientific Integrity

All graduate students in this Department will include in their programs appropriate training in the ethical conduct of scientific investigation. During their degree program and prior to graduation, all graduate students must fulfill the FGSR requirements for academic integrity and ethics training.

The FGSR mandates that all graduate students complete the equivalent of at least eight hours of structured academic training in ethics and academic integrity prior to graduation. In the Department of Pharmacology the requirements are met by taking the following courses:

ESI (Ethics and Scientific Integrity Day) for five hours. This is offered twice a year, with limited on-line registration by the Faculty of Medicine & Dentistry (FoMD) at:

<https://www.ualberta.ca/medicine/research/graduate/esi/esiday/registration>

GET (Graduate Ethics Training) for five hours (Note that it takes much less than five hours to work through this course). This is offered on-line through the FGSR at:

<https://www.ualberta.ca/graduate-studies/current-students/academic-requirements/ethics>

Several alternative opportunities to secure ethics credits are available, including completion of HSLAS training; Part 1: Ethical treatment of animals. Current opportunities are listed on the FGSR website, under *Ethics Resources*, at <https://www.ualberta.ca/graduate-studies/current-students/academic-requirements/ethics/resources>

Students are expected to complete ethics training within the first year of graduate studies under normal circumstances. The online GET program should be completed before attending either the fall or spring session of ESI Day. Completion of each ethics training component must be confirmed with the Graduate Program Administrator.

d. Professional Development

All graduate students enrolled on or after September 2016 must fulfil the FGSR requirements for Professional Development which includes an Individual Development Plan (IDP) and the completion of at least eight hours of professional development activities. The IDP should be submitted to the Associate Chair within 18 months of the commencement of the program. Students are expected to complete their professional activities within the first 24 months of the PhD program. Certificates of Professional Development activities should be submitted to the Graduate Program Administrator. Further information on the IDP and the Professional Development Activities are listed on the FGSR website at: <https://www.ualberta.ca/graduate-studies/professional-development/professional-development-requirement>

For a complete list of Responsibilities of the Student see Appendix II.

3.8 Responsibilities of the Supervisor

Supervisors of pharmacology PhD students are normally primary appointees of the Department. Adjunct appointees who are established supervisors of MSc and/or PhD students in their home departments may also supervise Pharmacology graduate students.

The supervisor is responsible for providing laboratory facilities and other necessary material for the completion of the student's research project. In addition, the supervisor (and the supervisory committee, where applicable) is expected to guide the student in the day-to-day determination and modification, if necessary, of the student's program of study and research. The supervisor must also ensure that the student is aware of all University of Alberta requirements and regulations relating to the program. For further details see the FGSR Graduate Program Manual Section 1.2 (<https://www.ualberta.ca/graduate-studies/about/graduate-program-manual/section-1-areas-of-responsibilities/1-2-the-supervisor>). If a supervisor will be away from the University for more than two

months, she/he must nominate, in writing, an appropriate interim supervisor who will agree to ensure satisfactory supervision during the period of leave. Upon approval by the GSEC and the student, a copy of the statement will then be forwarded to the FGSR.

The supervisor is responsible for organizing meetings of the supervisory committee and to require that the student prepare a written progress report for submission to the committee members at least three days prior to a formal meeting. For a complete list of the Responsibilities of the Supervisor see Appendix III.

3.9 Annual Review

The progress of graduate students and the performance of their supervisory committees will be reviewed annually by the Department, usually in either May or June. To facilitate this process, an annual report on student performance must be provided to the Department, bearing the signatures of both supervisor and student. The Associate Chair will conduct an interview with each student to discuss their progress in the program and set the registration for the following academic year.

The performance of each individual student is then evaluated by the GSEC. If serious concerns have been raised by members of the academic staff regarding any student's progress, that information will be communicated to the student by the Associate Chair and will be documented in a letter to the student and his/her supervisor(s). If the Associate Chair is the student's supervisor, the annual interview may be conducted by the Department Chair.

3.10 Dispute Resolution (*what to do if you have a problem*)

Students who have any difficulties or concerns with their program, including their supervision, should first express their concerns to their supervisor. If there is a disagreement between a student and supervisor (or supervisory committee), the student should discuss the problem with the Associate Chair. The Associate Chair will arrange for necessary consultation and mediation when requested by the student or supervisor. The Associate Chair will listen in confidence, advise and do everything reasonable to achieve conflict resolution, including mediation on behalf of the student. If the issue cannot be resolved, the student should speak to the Department Chair, and then if necessary, the Associate Dean or Dean of the FGSR.

For further details see the FGSR Grad Program Manual, Section 9, Disputes and Resolutions at:

<https://www.ualberta.ca/graduate-studies/about/graduate-program-manual/section-9-disputes-and-resolutions>

3.11 Termination of a Student's Program

Only the FGSR can terminate a graduate student's program. Students wishing to withdraw, or Department Chairs who wish to recommend the termination of a student's program, must do so in writing to the Associate Dean of the FGSR. Grounds for termination include failure to maintain adequate academic standing, including research progress; failure to meet requirements set out in conditional admission and expiry of program time limit. Students wishing to withdraw are strongly advised to consult their supervisor, the Associate Chair, and, if desired, the Associate Dean of the FGSR before submitting their request. A decision by the FGSR to terminate a program is subject to appeal via the FGSR academic appeals procedure.

Further details on the termination procedure can be found in Section 7 of the FGSR Grad Program Manual at: <https://www.ualberta.ca/graduate-studies/about/graduate-program-manual/section-7-administration-of-graduate-programs/7-14-termination-of-a-students-program>

3.12 Defence of the PhD Thesis Proposal

a. Overview

No later than 18 months after entering the PhD program, students are required to prepare and defend (before the examining committee) a PhD thesis proposal with the aim of demonstrating to their committee that their academic and research progress has been sufficient for them to continue in the PhD program. The examining committee consists of members of the supervisory committee and is chaired by a member of GSEC.

The purpose of the PhD thesis proposal defence is to provide the student with an opportunity to demonstrate to their supervisory committee that the proposed work would be of a quality and quantity sufficient to constitute a PhD project, and that they have given significant critical thought to the hypotheses, experimental approaches and possible outcomes. The defence is also an opportunity to receive feedback from the supervisory committee on all aspects of the proposal.

b. Instructions for the student

- An informal outline of the proposed project should be formulated by the student after consultation with the supervisor and with other coworkers or collaborators.
- A written proposal should be prepared; this is a document, maximum 5 pages in length (not including references, figures or legends), written in 12 point font, single spaced. The document should provide a succinct overview of the subject area, a description of the aims and hypotheses, an outline of the approaches to be used and the major experiments to be completed, a summary of the anticipated results, and a brief commentary on how the proposed work will impact the research area. If preliminary data are available that demonstrate the feasibility of the project, these should also be shown. There is no limit to the number of references, figures or tables that may be included, but figure and table legends may not occupy in excess of three further pages.
- The proposal document should be provided to all members of the examining committee not less than one week prior to the scheduled thesis proposal defence meeting.

c. Examination Procedures

- At the start of the examination, the student will be excused briefly while the committee reviews the student's progress in research and course work. The student will then give a brief (~20 minute) oral summary of the proposal, with particular emphasis on the working hypotheses and proposed experiments. The student will then respond to questions from each member of the supervisory committee in a first round of questioning that normally lasts for 20 minutes for each examiner. There may be a second, briefer round of questioning in which examiners may test the student further, usually for a maximum of 10-15 minutes.

d. Nature of the PhD thesis proposal defence questions

- The **student** should be assessed on their knowledge and understanding of relevant background material, on their ability to formulate and justify appropriate hypotheses, and on their abilities to rationalise proposed experiments and discuss potential outcomes.
- The proposed **project** should be assessed in terms of the quality and quantity of the work described, with regard to the question, "Would the work described, if completed successfully, be of sufficient quality and quantity to constitute a body of work worthy of a PhD degree?"
- The thesis proposal defence meeting is also an opportunity for the supervisory committee to provide feedback and advice to the student on all aspects of the proposed work.

e. Possible outcomes

There are three possible outcomes of the PhD thesis proposal defence: PASS, ADJOURN, and FAIL.

- A decision of PASS is reached if the supervisory committee members are satisfied that the work described is generally of sufficient quality and quantity to constitute a PhD project and that the student is generally capable of carrying out the work in a critical and independent manner. A decision of PASS should still be reached if minor weaknesses or concerns are evident, where advice offered by the supervisory committee would address the concerns.
- A decision of ADJOURN is reached if the proposed work is of insufficient quality or quantity to constitute a PhD project, or if significant flaws are identified that necessitate substantial revision of the proposal. A decision of ADJOURN may also be reached if the student fails to demonstrate an acceptable depth of knowledge of the topic, and/or fails to demonstrate critical thinking skills in their approach to the project, to the satisfaction of the committee. The student will then have one further opportunity to address the committee's concerns. A second thesis proposal defence should be scheduled for a date no more than 6 weeks following the initial meeting. The format of the second meeting will be identical to the first. The possible outcomes for the second meeting are either PASS or FAIL. In the event of an ADJOURN decision, the supervisory committee should provide a document to the student within five working days of the meeting that clearly outlines both the deficiencies of the initial proposal and the expectations for the second defence.
- A decision of FAIL is reached if the if the student fails to demonstrate an acceptable depth of knowledge of the topic, and/or fails to demonstrate critical thinking skills in their approach to the project, and the committee does not feel that the student is capable of demonstrating or developing the skills required to be an independent researcher at the PhD level. The student will then complete the Master's project and will write up and defend a Master's thesis.

PASS and ADJOURN decisions are made on a majority basis; in the event that the supervisory committee contains 4 members and a vote is split, the chair of the examining committee will adjudicate and will place the casting vote. A decision to FAIL the student must be unanimous; if the vote is not unanimous, an ADJOURN decision is recorded.

3.13 Candidacy Examination

Before the candidacy examination can be scheduled, students must successfully defend a PhD thesis proposal within the first 18 months of entry into the program (see Section 3.12). The candidacy examination must be completed within 28 months of entry into the program.

a. Purpose

The purpose of the candidacy examination is to test the student's ability to pursue and complete original scientific research at an advanced level. The student will be assessed on different aspects including formulation of ideas and hypotheses, experiment planning, critical analysis of data, and development of rational conclusions.

b. Format

The candidacy examination will be conducted in the "grant proposal" format. This comprises the preparation of a candidacy examination document that follows the style of a Canadian Institutes of Health Research (CIHR) Operating Grant Proposal, and an oral examination conducted by an examining committee. The student should select two topics that address research questions different from those addressed both in their thesis project and in any other project currently being conducted in the laboratory where the student is carrying out the research. In all cases the relevance of the proposed research to pharmacology must be highlighted in the preliminary summary and in the final proposal.

c. Procedure to Follow in Preparation of the Candidacy Examination

- The student will provide members of their supervisory committee with the **titles and summaries of two potential topics**, in the (single page) format of a CIHR Operating Grant summary. The summaries must include the hypothesis to be tested and the anticipated experimental approaches. At this time the student should inform their supervisory committee of any conflict with potential examiners. All the timelines provided below are considered from the date the supervisory committee receives the summaries from the student. *The supervisory committee must ensure that the topic selected does not overlap with the student's or supervisor's research.* If the majority of the supervisory committee members agree that one or both chosen topics are unsuitable, the student will be asked to provide the committee with replacement topic(s).
- **Within two weeks, the supervisory committee will select one of these topics as their preference and propose two arm's length examiners and the date of the candidacy examination.** *The committee should not indicate their preferred topic to the student.* The supervisor should send the summaries of both topics, identifying the topic chosen by the supervisory committee, along with details of the proposed examining committee and the completed Arm's Length Examiner Conflict of Interest Checklists to the Associate Chair for approval from the GSEC. The examination should be scheduled for a date no less than eight weeks and not more than 10 weeks from the date the summaries have been received by the supervisory committee. The supervisor should ensure that all members of the examining committee would be available on the proposed date prior to forwarding the proposals to the GSEC.
- **The GSEC will review the topics, and the preferred topic, and the examining committee membership for final approval and will inform the supervisor of the outcome.** Although the GSEC would normally be expected to approve the preferred topic, it is possible that the preferred topic may be deemed unsuitable and the second topic might be preferred by the GSEC. In this event, the supervisor would be informed and an opportunity would be provided to propose an alternative examining committee, if necessary. It is also possible that the GSEC would not approve either topic, in which case the student would be asked to provide two further topics and summaries to their supervisory committee. On approval of a candidacy topic, the Associate Chair will submit the "Notice of Approval of Examining Committee and Examination Date" form to the FGSR.
- **Within one week** the Associate Chair will inform the student of the topic selected for the candidacy proposal (this is within three weeks from the date the student has provided the summaries). At that time, the Associate Chair will also inform the student of the **deadline for submission of the completed proposal, which will be at noon on the 28th day following notification of the student.** Saturdays, Sundays and holidays will be included in the 28 day period allowed to develop the proposal.
- The student will develop the grant proposal and will provide electronic copies of the proposal to members of the candidacy examining committee, no later than noon on the day of the deadline. Electronic copies of the proposal should also be sent by e-mail to the Associate Chair and to the Graduate Administrator at this time, prior to the noon deadline. Failure to meet this deadline may jeopardise the integrity of the candidacy process. If this occurs, a note will be added to the student's file which may negatively impact the student's likelihood of success in securing future internal studentship support.

d. Candidacy Examining Committee

It is the responsibility of the supervisor to ensure that proper arrangements are made for the candidate's examination. The candidate is not required to make any of these arrangements.

In the absence of the supervisor, the Associate Chair or designate shall be responsible for these arrangements.

The supervisor, in consultation with the supervisory committee, proposes two arm's length examiners for the candidacy examining committee after selection of the topic of the proposal. Efforts should be made to include experts in the field of the topic selected. The composition of the examining committee must be reviewed by the GSEC, who will then forward the information to the FGSR.

Before nominating the candidacy examining committee, the GSEC will ensure that eligibility criteria, conflict of interest, and teleconferencing guidelines have been met.

The candidacy examining committee will consist of a minimum of six faculty members:

- The supervisory committee, the chair and the addition of two arm's length examiners who come new to the examination.
- The chair will be a member of the GSEC who is not the supervisor, co-supervisor or member of the supervisory committee. The chair does not vote.

All members must attend the examination.

* As stated in the FGSR Graduate Program Manual (section 8.2.3.), 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). FoMD guidelines state that the arm's length examiners will not have collaborated with the student or the supervisor for the past six years. Collaboration is defined by having been co-investigators on research grants or co-authors on publications. Recent collaborations that have not yet resulted in joint grants or publications must also be declared. Exchange of reagents, protocols or sharing of equipment does not necessarily constitute collaboration. An arm's length examiner may come from the Department of Pharmacology, or from another department; they may act as an examiner at both the candidacy and thesis defence examinations.

e. Assistance with Preparation of the Proposal

Neither the supervisor, nor any other member of the examining committee, may provide assistance in the preparation of the proposal. Rather, students are encouraged to consult with other members of the academic community, namely their peers or faculty members who are not part of their examining committee.

The student should be the exclusive author of the proposal; therefore, external assistance should not imply the provision of ideas or other intellectual input to an extent that compromises authorship. Under no circumstances should anyone other than the student provide direct input into the writing of the proposal.

Students may also want to obtain copies of actual successful CIHR grant proposals from their supervisor or other faculty members, to use as examples of organization, style, etc. The student should abstain from obtaining or reading proposals related to the subject matter of their own proposal.

f. Research Proposal

The written proposal shall follow the format of a CIHR Operating Grant proposal and will consist of a one page Summary of Research Proposal and a Proposed Research section limited to 11 pages of text.

We encourage students to formulate original hypotheses, to set creative goals and to propose novel applications of existing methods. Students should include their most innovative ideas in their proposals.

g. Oral Examination Procedure

An oral defence of the proposal by the student will be held approximately two weeks after the submission of the written document.

At the start of the examination, the student will be excused briefly while the examiners review the student's progress in research and course work. The student will then give a brief (~20 minute) oral summary of the proposal, with particular emphasis on the working hypotheses and proposed experiments. The student will then respond to questions from each examiner in a first round of questioning that normally lasts for 20 minutes for each examiner. Usually the most 'external' examiner starts the questioning, followed by departmental and supervisory committee examiners. The supervisor may also participate in the questioning. There may be a second, briefer round of questioning in which examiners may test the student further, usually for a maximum of 10-15 minutes.

h. Nature of Oral Examination Questions

Although most questions from examiners will be related to the grant proposal, the examination is not necessarily limited to that subject.

In general, questions should be designed so that they meet the objectives of the candidacy examination; all questions should seek to establish the candidate's ability to carry out research at an advanced level and may include questions on basic knowledge related to the scientific basis and rationale for the experimental approaches outlined in the proposal. Questions and answers will therefore involve theoretical, practical and philosophical components. The students will be expected to understand the strengths and limitations as well as potential sources of error of the proposed methods and strategies.

It is important to note that the candidacy examination should not be focused on testing absolute knowledge but rather on testing the thought process that the student applies to address the examiners' questions. Candidates should not become discouraged if they feel they are failing to provide correct answers because i) the examiners are constantly trying to find the limit of the student's ability and ii) there may not be a 'right' or 'wrong' answer for some types of questions. Examiners are interested in the student's opinion and in the thought process by which they reached that opinion.

i. Possible Outcomes

The outcome of the examination will be based on both the quality of the proposal and the student's performance at the examination. The standards used by the examining committee will take into consideration the relationship of the student's proposal to their training and background. It is not an expectation that the grant proposal would be in the fundable range in an actual CIHR competition.

The outcome may be one of the following:

- **Adjourned:** agreed by a majority of examiners that the examination 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 Behavior after the examination has started.
- **Pass:** agreed by all or all but one of the examiners that the student's performance was excellent/good. The student becomes a PhD candidate.

The chair of the examining committee will submit the completed "Report of Completion of Candidacy Examination" to the Associate Chair. The date of completion of the candidacy examination will be recorded at the date that the student completed the examination.

- **Conditional pass:** agreed by a majority of examiners that the student's performance was generally acceptable but was deemed deficient in one or more areas.

The examining committee will set specific conditions to be met by the student to continue with their program. Conditions may include extensive rewriting of the proposal or meeting a second time with the examining committee to discuss specific areas of identified deficiencies.

The chair of the examining committee shall provide in writing to the Associate Dean of FGSR, the Associate Chair and the student:

- the reasons for this recommendation;
- details of the conditions;
- timeframe for the student to meet the conditions;
- the approval mechanism for meeting the conditions, *i.e.*, 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 the final approval by FGSR. At the deadline specified for meeting the conditions, two outcomes are possible:

- All the conditions have been met. In this case, the Associate Chair shall complete the “Report of Completion of Candidacy Examination” form and submit it to the FGSR; or
- Some of the conditions have not been met. In this case, the outcome of the candidacy examination is a **Fail**, and the options below are available to the examining committee.
- **Fail:** the student’s performance was inadequate.

The examining committee must select one of the following options:

1. **Repeat the candidacy examination:** If a majority of the examiners agreed that the student’s candidacy examination 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 recommend that the student be given an opportunity to repeat the candidacy examination. This might include writing a new proposal on the same or related topic.

If the recommendation of a repeat candidacy examination is formulated by the examining committee and approved by the FGSR, the student is to be notified in writing of their examination deficiencies by the chair of the examining committee. The second candidacy examination is to be scheduled no later than six months from the date of the first candidacy examination. In the event that the student fails the second candidacy examination, the examining committee shall recommend options two or three indicated below.

2. **Change of Category to a Master’s Program:** If all or all but one of the examiners agreed that the student’s candidacy examination 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 recommend a change of category to a Master’s program.
3. **Termination of the Doctoral Program:** If all or all but one of the examiners agreed that 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,” at <https://www.ualberta.ca/graduate-studies/about/graduate-program-manual/section-7-administration-of-graduate-programs/7-14-termination-of-a-students-program>)

For failed candidacy examinations, an Associate Dean from FGSR normally arranges to meet with the student and others as required before acting upon any department recommendation. Regardless of the outcome of the examination, students are encouraged to consult with their examiners in the weeks after

the examination because this affords an opportunity for students to obtain useful advice on their strengths and weaknesses which will be of use to them in their thesis defence and perhaps in their future research careers.

3.14. Final PhD Examination

a. Overview

- All PhD students shall present and orally defend a thesis embodying the results of their research.
- A doctoral thesis must embody the results of original investigations and analyses and be of such quality as to merit publication, meeting the standards of reputable scholarly publications. It must constitute a substantial contribution to the knowledge in the student's field of study.
- The examining committee shall conduct a final oral examination, based largely on the thesis.
- It is the responsibility of both the student and the supervisor to be aware of requirements from the FGSR and the Department of Pharmacology with respect to the student's thesis.
- It is the responsibility of the supervisor to ensure that proper arrangements are made for the candidate's examination and that the examination is scheduled and held in accordance with the FGSR regulations. The candidate is not required to make these arrangements.
- The examining committee chair, student and all examiners should have a final draft of the thesis at the examination.
- The candidate should make a public presentation about the thesis, usually no more than 50 minutes long, immediately before the oral examination.
- It is customary for the candidate to leave the examining room while procedures are determined and explained.
- Most of the time available for questions should be allotted to the internal/external examiner and the least to the supervisor.
- At the close of the examination, before the student is asked to withdraw from the room, the candidate will be given an opportunity to make any final comments.
- For the adjudication, no final verdict should be rendered without each examiner having given an opinion.
- The overall decision is based on the acceptability of the thesis and the acceptability of the defence.

For more details about PhD examination and program completion refer to the FGSR Graduate Program Manual at: <https://www.ualberta.ca/graduate-studies/about/graduate-program-manual/section-8-supervision-oral-examinations-and-program-completion>

b. Student Responsibilities

- Present a thesis plan to the supervisory committee for acceptance a minimum of three months before examination.
- Prepare thesis in accordance with the FGSR and Departmental policies.
<https://www.ualberta.ca/graduate-studies/about/graduate-program-manual/section-8-supervision-oral-examinations-and-program-completion/8-4-thesis-requirements>
- Provide the thesis to the supervisor for review at least six weeks before examination.
- Submit the thesis electronically by email to members of the examining committee, and a hard

copy if requested.

- Prepare a seminar to present before the final thesis defence.
- Amend thesis if necessary and submit it to the FGSR within six months of completion of the final oral examination.

c. Supervisor Responsibilities

- Provide the Associate Chair, the “Supervisory Committee Report” signed by all supervisory committee members indicating that the student has been approved to proceed to the thesis defence, at least 10 weeks prior to the examination.
- Suggest an External Examiner from outside the University of Alberta (who by definition is an arm’s length examiner) to the GSEC at least nine weeks prior to the examination. The supervisor shall write a letter to the Associate Chair explaining why the external examiner is appropriate and complete the Arm’s Length Examiner Conflict of Interest Checklist. The external examiner’s CV should be attached to the letter.
- Suggest an arm’s length examiner who is preferably from another department or another faculty to the GSEC at least a minimum of six weeks before the examination. The supervisor shall complete the Arm’s Length Examiner Conflict of Interest Checklist.
- Circulate the thesis to the supervisory committee and complete a “Preliminary Acceptance of Thesis” form a minimum of four weeks before the examination. This is a Departmental form and is available from the Graduate Program Administrator.
- Supply the external examiner with a copy of the thesis at least four weeks before the examination.
- Provide information to the Graduate Program Administrator in order to complete “Notice of Examining Committee and Examination Date” form a minimum of four weeks before examination.
- Examine amended thesis to confirm completion of revisions recommended by the examining committee.
- Confirm that the “Thesis Approval / Program Completion” form (available from Graduate Program Administrator) is completed.

d. Associate Chair – Responsibilities

- Complete and forward the “Invite External Reader or Examiner for Final Doctoral Oral Examination” form, and required documentation regarding the proposed external examiner to the Department Chair and the Associate Dean Research/Graduate Program, FoMD for approval.
- Forward the completed “Invite External Reader or Examiner for Final Doctoral Oral Examination” form to the FGSR.
- Chair or assign a member of GSEC to chair the examination.
- Complete the “Thesis Approval / Program Completion” form signed by the supervisor and examining committee members.

e. The Examining Committee

In accordance with the FGSR regulations, the final examining committee shall consist of a minimum of five examiners, and includes the student’s supervisory committee, one arm's length examiner (who is

preferably from another department or another faculty), and one external examiner from outside the University. A member of the GSEC will act as a non-examining Chair of the committee.

It is the responsibility of the Department Chair to approve an external examiner after considering the proposal of the student's supervisor, and the Associate Chair's recommendation. The "Invite External Reader or Examiner for Final Doctoral Oral Examination" form and documentation are then submitted to the Associate Dean Research/Graduate Program, FoMD for approval.

As stated in the FGSR Graduate Program Manual (section 8.3.4.), the external examiner shall be a recognised authority in the specific field of research of the student's thesis, and will be experienced in evaluating doctoral area work. The proposed external examiner must be in a position to review the thesis objectively and to provide a critical analysis of the work and the presentation. It is therefore essential that the external examiner not have an association with the student, the supervisor, or the department, within the last six years as this could hinder objective analysis. The external examiner is by definition an arm's length examiner. As stated in the FGSR Graduate Program Manual (section 8.2.3.), 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). FoMD guidelines state that the arm's length examiners will not have collaborated with the student or the supervisor for the past six years. Collaboration is defined by having been co-investigators on research grants or co-authors on publications. Recent collaborations that have not yet resulted in joint grants or publications must also be declared. Exchange of reagents, protocols or sharing of equipment does not necessarily constitute collaboration. Under normal circumstances the same person will not be used as an external examiner at the University of Alberta if that external examiner has served in the same capacity in the same department at this University within the preceding two years; this does not preclude an external examiner serving in another department.

f. Format of the Examination

The final exam shall be immediately preceded by an open Departmental research seminar given by the candidate, lasting no longer than 50 minutes, followed by a brief question period. Immediately following the seminar, the examining committee and the candidate shall proceed to the oral component of the final exam, which will be held in a closed session and conducted in accordance with the FGSR regulations.

g. Possible Outcomes

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 of FGSR, who will determine an appropriate course of action.

For further details on examination outcomes consult Section 8 of the FGSR Graduate Program Manual at: <https://www.ualberta.ca/graduate-studies/about/graduate-program-manual/section-8-supervision-oral-examinations-and-program-completion>

3.15 Submission of Approved Thesis

It is the responsibility of the student to complete revisions of the thesis requested by the examining committee and to ensure that the revised thesis meets the FGSR guidelines. Once the thesis revisions are completed and approved by the supervisor, the supervisor signs the “Thesis Approval / Program Completion” form. The form is then completed by the Associate Chair or the Department Chair for submission with the thesis to the FGSR.

The student must submit the thesis to the FGSR electronically using a PDF-A (archive) format. In addition, the Department of Pharmacology requires one bound copy, accompanied by a high quality CD/DVD or multimedia files (if appropriate). Students should note that it is customary for a bound copy of the thesis in its final form to be given to the supervisor. There are strict FGSR requirements regarding the format and layout of the thesis. Details are available at: <https://www.ualberta.ca/graduate-studies/about/graduate-program-manual/section-8-supervision-oral-examinations-and-program-completion/8-4-thesis-requirements>

Theses approved by examining committees **must be submitted to the FGSR within six months of the date of the final oral examination.** Please note that there are also submission deadlines for each convocation period and registration requirements to consider when submitting the thesis.

N.B. If the thesis is not submitted to the FGSR within the six month time limit, the candidate will be considered to have withdrawn from the program. After this time, the candidate must reapply and be readmitted to the FGSR before the thesis can be accepted.

Appendix I: MSc Student's Responsibilities

- Ensure that requirements of FGSR are met.
- Be aware of the program of study regulations.
- Maintain satisfactory academic standing.
- Maintain detailed and accurate lab notes.
- Maintain attendance at Department of Pharmacology seminars.
- Contribute to examination proctoring and outreach activities.
- For further details, see the FGSR Graduate Program Manual Section 1.1 (<https://www.ualberta.ca/graduate-studies/about/graduate-program-manual/section-1-areas-of-responsibilities/1-1-the-graduate-student>).

Year 1

- Meet with the Associate Chair to discuss courses and proceed to registration.
- Participate in the selection of the supervisory committee.
- May: attend supervisory committee meeting.
- May-June: Complete and submit "Graduate Student Annual Report" and meet with the Associate Chair to discuss progress in the program and proceed for registration for following academic year.
- May-July: Present work progress at Annual Research Day.
- Complete the ethics training.
- Complete the IDP (12 months after start of the program).
- Complete most or all of eight hours of Professional Development activities.
- Complete most or all of the coursework.

Year 2

- February (for students starting in September and wishing to transfer to the PhD program): Prepare and present the PhD thesis proposal.
- May: attend supervisory committee meeting and discuss timelines for completion of thesis.
- May- June: Complete and submit the "Graduate Student Annual Report" and meet with the Associate Chair to discuss progress in the program and proceed for registration for following academic year.
- May-July: Present work progress at the Pharmacology Annual Research Day.
- Complete any outstanding coursework.

Year 3

- Attend the final supervisory committee meeting and present the thesis plan.
- Prepare for the Master's thesis and final oral examination.

Appendix II: PhD Student's Responsibilities

- Ensure that requirements of the FGSR are met.
- Be aware of the program of study regulations.
- Maintain satisfactory academic standing.
- Maintain detailed and accurate laboratory notes.
- Maintain attendance at Department of Pharmacology seminars.
- Contribute to examination proctoring and outreach activities.
- For further details, see the FGSR Graduate Program Manual Section 1.1 (<https://www.ualberta.ca/graduate-studies/about/graduate-program-manual/section-1-areas-of-responsibilities/1-1-the-graduate-student>).

Year 1

- Meet with the Associate Chair to discuss courses and proceed to registration.
- Participate in the selection of the supervisory committee.
- May: Attend supervisory committee meeting.
- May- June: Complete and submit the “Graduate Student Annual Report” and meet with the Associate Chair to discuss progress in the program and proceed for registration for following academic year.
- May-July: Present work progress at the Pharmacology Annual Research Day.
- Complete the ethics training.
- Complete some or all of coursework.

Year 2

- Complete the IDP (18 months after start of the program)
- Complete most or all of eight hours of Professional Development activities.
- Prepare and present the PhD thesis proposal (before 18 months of entering into the PhD program).
- May: Attend supervisory committee meeting.
- May- June: Complete and submit the “Graduate Student Annual Report” and meet with the Associate Chair to discuss progress in the program and proceed for registration for following academic year.
- May-July: Present work progress at the Pharmacology Annual Research Day.
- Schedule the candidacy examination (before 28 months of entering into the PhD program).
- Complete any outstanding coursework.

Year 3

- May: Attend supervisory committee meeting.
- May- June: Complete and submit the “Graduate Student Annual Report” and meet with the Associate Chair to discuss progress in the program and proceed for registration for following academic year.
- May-July: Present work progress at the Pharmacology Annual Research Day.

Year 4

- May: Attend supervisory committee meeting and discuss timelines for completion of thesis.
- May- June: Complete and submit the “Graduate Student Annual Report” and meet with the Associate Chair to discuss progress in the program and proceed for registration for following academic year.
- May-July: Present work progress at the Pharmacology Annual Research Day.

Year 5

- Attend supervisory committee meeting and present the thesis plan.
- Prepare for the thesis and final oral examination.

Appendix III: MSc/PhD Supervisor’s Responsibilities

Year 1

- Advise student on coursework. Courses from programs other than Pharmacology require approval from the GSEC.
- Six to 8 months: Set up supervisory committee and send email to the Associate Chair seeking approval from the GSEC.
- Arrange the first supervisory committee meeting eight to nine months into the program.
- May- June: Complete and submit the “Graduate Student Annual Report”.

- Complete the IDP with the student (12 months after starting the MSc program or 18 months after starting the PhD program).

Year 2

- Arrange supervisory committee meeting.

PhD student or MSc student wishing to transfer to PhD:

- Organize the PhD thesis proposal defence.

MSc student:

- May-July: Complete and submit the “Graduate Student Annual Report”.
- Discuss timelines for completion of thesis with the student and the supervisory committee.
- Suggest the arm’s length examiner in the Master’s final oral examination committee to the GSEC for approval and complete the Arm’s Length Examiner Conflict of Interest Checklist.
- Forward the Master’s thesis to the Examination committee members.
- Arrange for the Master’s final oral examination.

Year 3 PhD student

- Arrange supervisory committee meeting.
- Organize the candidacy examination.
- May-July: Complete and submit the “Graduate Student Annual Report”.

Year 4 PhD student

- Arrange supervisory committee meeting and discuss timelines for completion of thesis.
- May-July: Complete and submit the “Graduate Student Annual Report”.

Year 5 PhD student

- Arrange supervisory committee meeting to discuss the student’s thesis plan.
- Suggest the two arm’s length examiners (including the External Examiner) in the PhD final Examination committee to the GSEC for approval and complete the Arm’s Length Examiner Conflict of Interest Checklists.
- Arrange for the final oral examination.
- Review the thesis and circulate it to the Examining Committee members.

General:

- Arrange the proper academic program.
- Provide a supportive environment for academic experience.
- Encourage the student to participate in Departmental activities (e.g. social events, outreach events, etc.) and ensure student is attending Departmental seminars.
- Ensure that the student is aware of all University of Alberta requirements and regulations related to the program.
- Make adequate provisions for supervision when on leave.
- For further details, see the FGSR Graduate Program Manual Section 1.2 (<https://www.ualberta.ca/graduate-studies/about/graduate-program-manual/section-1-areas-of-responsibilities/1-2-the-supervisor>).