DEPARTMENT OF CHEMISTRY

INFORMATION AND ACADEMIC REQUIREMENTS FOR GRADUATE STUDENTS

2024-2025

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Resources and Information

The rules and guidelines listed in the following pages are intended to complement the regulations given in the Faculty of Graduate & Postdoctoral Studies (GPS) Graduate Program Manual. This document can be found at: https://www.ualberta.ca/graduate-studies/about/graduate-program-manual. Students are strongly encouraged to become very familiar with the Graduate Program Manual.

For additional information on tuition and fees, awards, policies, thesis preparation, ownership of research results, etc. students are encouraged to look at the GPS website: https://www.ualberta.ca/graduate-studies.

The Graduate Students' Association (GSA) is established under Alberta's *Post-Secondary Learning Act* as the representative body for graduate students at the University of Alberta. See: http://www.gsa.ualberta.ca/.

The funding of graduate students through Graduate Teaching Assistantship (GTA), Graduate Research Assistantship (GRA) and Graduate Research Assistantship Fellowship (GRAF) is governed under the Graduate Student Assistantship Collective Agreement. See: https://www.ualberta.ca/graduate-students-association/media-library/collectiveagreement/final-ca-2022-2024.pdf

Administration of the Graduate Program in the Department of Chemistry

The Associate Dean, Graduate Studies (Dr. Michael Serpe) along with the Graduate Program Administrator (Connor Part, Chemistry E3-44) manages all aspects of the graduate program. Connor manages the non-academic issues such as registration, award applications, oral exam scheduling and records. Dr. Serpe manages all aspects related to academic matters of the Graduate Program. Students should consult either of these individuals when questions or problems arise. **Initial inquiries should be directed to Connor Part (in person or via email at chemgrad@ualberta.ca).**

Several Departmental Committees manage the general aspects of the program: Graduate Advisory, Graduate Curriculum, Chemistry 502 and Graduate Awards. These committees (see Appendix A) are coordinated by the Associate Dean, Graduate Studies who directs specific issues to the committees as appropriate. Overall responsibility of the Graduate Program and the Department lies with the Department Chair; Dr. Alexander Brown.

Responsibilities and Expectations of Students and Supervisors

(Excerpted and modified from the GPS Graduate Program Manual)

Responsibilities of Graduate Students

Graduate students are responsible for their own program.

Graduate students are expected to become familiar with all regulations and deadlines relating to their program. They must ensure that their registration is current and accurate, that all fees are paid, and that all required forms and documents are completed, signed and submitted by the due dates as detailed in the relevant sections of the U of A Calendar http://calendar.ualberta.ca/ and the GPS Graduate Program Manual https://www.ualberta.ca/graduate-studies/about/graduate-program-manual.

International students are responsible for ensuring that their immigration and related documents are valid, and that they (and members of their family who are in Canada) are living, working and/or studying in conformity with Canadian laws, and to inform the Graduate Program Administrator; Connor Part, about their immigration status on an annual basis, or more frequently should changes occur (e.g., becoming a Permanent Resident or Canadian Citizen or if the Study Permit is extended).

Students who are assigned a Graduate Teaching Assistantship (GTA) are expected to perform their teaching duties satisfactorily, as specified by the course instructor and/or laboratory coordinator. Failure to perform GTA duties at a satisfactory level will result in a verbal and written letter of reprimand (first offense) followed by action to terminate further GTA appointments (any subsequent offense). Moreover, GTA's are expected to be present at all required meetings during the entirety of the term (from start of classes to end of examination period) in which they are assigned to teach, unless prior arrangements have been made with the course instructor and/or laboratory coordinator. Requests for travel during a teaching term must be made at least 4 weeks prior to the travel date by using the appropriate Graduate Teaching Assistant Travel Approval form located in the Forms cabinet on the Chemistry website. https://www.ualberta.ca/chemistry/

Graduate students are expected to:

- Maintain open communication with their Supervisor and the Associate Dean, Graduate Studies and seek their advice as soon as possible when problems arise.

- Inform their Supervisor regularly about progress, via the mechanism required by their Supervisor, and to prepare an annual Progress Report for distribution to their Supervisory Committee.
- Endeavour to meet program deadlines in order to complete all program requirements within the prescribed time limit set by the Department and GPS..
- Meet deadlines for any scholarship applications and seek assistance from the Department in the application process.

Responsibilities of Supervisors

The Supervisor is responsible for the supervision of the student's program. In this capacity, the supervisor will assist the student in planning their research program and in selecting courses that meet program requirements. The supervisor also ensures that the student is aware of the regulations of the Department and GPS, provides advice in all aspects of the program, and keeps informed of the student's research activities and progress. The Supervisor ensures that the student conducts research in a safe, effective and productive manner, ensures that examinations are scheduled and held in accordance with regulations, assists the student in preparing for the CHEM 502 seminar and candidacy examination, and reviews the thesis both in draft and final forms.

The Supervisor, with assistance from the Department when appropriate, is expected to:

- Treat the student as a "junior colleague in research" and provide an environment in which the student can grow intellectually.
- Ensure that the student is aware of expectations of the Supervisor and the Department at the beginning of the supervisory relationship, and provide guidance in research and set standards expected and be accessible to give advice and constructive feedback.
- Work with the student to establish a Supervisory Committee as soon as possible after the start of the program, and ensure that it maintains contact with the student and reviews the annual Progress Report.
- Establish, with the student, a realistic timetable for completion of the various phases of the degree program.
- Ensure that sufficient funding, Departmental, and supervisory resources are provided for each student under their supervision.
- When going on leave, or on an extended period of absence, ensure that the student has an acting supervisor who is a member of the Supervisory Committee.
- In consultation with the student, set up degree examination committees and dates.

What to Expect as a Graduate Student

- Challenging, relevant, and up-to-date graduate courses offered by knowledgeable, research-active professors.
- A dynamic and interactive atmosphere, conducive to a productive research experience.
- An accessible and helpful research Supervisor who is interested in assisting the student achieve their career goals.
- Access to a safe research environment, with the materials and tools necessary for their research.
- Opportunity to report the results of their research outside of the University, and assistance in preparing manuscripts and presentations.
- Financial support throughout the period of "normal progress" toward the degree, including summer GRAF support from the supervisor, assuming satisfactory academic, research and teaching (if appropriate) performance is maintained.

What Supervisors Expect of Graduate Students

- Enthusiasm, curiosity, and a willingness to learn new things.
- Commitment to achieve high academic performance in courses taken.
- Dedication, hard work, and ownership of their research program.
- Commitment to meet program deadlines and to discuss difficulties and problems when they arise.
- Open communication about challenges the student is facing.
- Professional conduct in their research, teaching and other scholarly activities.

New Students, Check-In Procedure

Connor Part and the Chair of the Graduate Advising Committee will provide a brief orientation to the Department for new graduate students when they arrive. In the Fall term this normally takes place during the first week of classes. The orientation schedule will be provided separately. All entering graduate students are expected to attend the orientation. Graduate students admitted in the winter term will also have an orientation in early January.

During the orientation session, all entering graduate students meet with the Graduate Advisory Committee. Because students have not necessarily chosen research supervisors at this stage, the Committee advises students on the selection of courses for the first year, and the process for selecting a research supervisor. Prior to choosing a research supervisor, the Graduate Advisory Committee also acts as "surrogate supervisor" to the first year graduate students. Students should feel

free to consult the appropriate member of the Committee with academic, course related concerns and/or problems.

All students will need to obtain a University ID, called a "ONEcard". Please note that an ONEcard cannot be issued, or a lost card replaced, unless a student is registered in at least one course, or thesis credit.

Proficiency at the Undergraduate Level

The Graduate Admissions Committee may determine that, under certain circumstances and/or for certain reasons, admission to the graduate program in Chemistry is contingent upon demonstrating undergraduate proficiency in certain area(s) of Chemistry. The condition(s) for admission would have been clearly communicated to the student and also detailed in the Official Letter of Admission from GPS.

If a condition of admission was taking remedial undergraduate course(s), the course(s) must be taken as soon as they are offered and must be completed in the first year of the program (or as outlined in your offer letter). Please note that no graduate credit is given for remedial undergraduate course(s); however, the grades of all courses (graduate and remedial undergraduate) appear on the University transcript, and that all grades will be used in calculating the student's grade point average (GPA). Students may be required to provide final degree certificates and/or transcripts. Graduate students who have been admitted with these condition(s) must satisfy the condition(s) of their admission as prescribed by the Faculty of Graduate Studies and Research by the end of their first term.

Regular Registration

During the orientation, all new graduate students will obtain an *Internal Program Form*. With due regard for admission conditions, and with the guidance of the Graduate Advisory Committee, students will select the courses to be taken in both Fall and Winter terms of their first year. These courses are entered on the *Internal Program Form*, which is then signed by a member of the Graduate Advisory Committee. Students should make a copy of this form for their own records.

Students in their second and subsequent years should discuss their registration with their research supervisor and then proceed to register. Students who enroll only in Thesis credits (e.g., THES 909) do not need to communicate this information with Connor Part. However, those students taking other classes should notify Connor of the courses to be taken.

All graduate students must register in at least nine course weights per term (three courses) for fall and winter and six course weights per term (THES 906) in spring and summer. GPS will automatically enroll students in THES 906 for spring and summer terms. In addition, all students must register for CHEM 502 and INT D 710, which have zero course weights. Registration in CHEM 502 is required for fall and winter terms for Master's (M.Sc.) students in years 1-2 and Doctoral (Ph.D.) students in years 1-3 of their program. INT D 710 is the new ethics course that must be completed in the first semester.

Newly arrived students in the Chemical Biology program and the Chemical Physics program must obtain approval from the Graduate Advisory Committee for all courses taken outside of the Chemistry Department. Once a Chemical Biology or Chemical Physics student has chosen a research supervisor, the student's Supervisory Committee must approve all courses taken outside the department.

Details on tuition and fees can be found here:
https://www.ualberta.ca/en/graduate-studies/fees-funding/tuition-fees/index.html

The total fee balance is broken down into 1/3 fall, 1/3 winter, 1/6 spring and 1/6 summer. Students that receive a Graduate Teaching Assistantship (GTA) or Graduate Research Assistantship Fellowship (GRAF) will have their tuition deducted from their pay cheque in six equal installments in the fall and winter, and three equal installments in each the spring and summer. Students that are funded by scholarship alone do not have their tuition automatically deducted and must make the necessary arrangements to pay the tuition and fees themselves by the fee payment deadline in each term.

Changes in Registration

All changes in registration must be approved by the student's supervisor, and in cases that require a Course Audit or Withdrawal form, by the Associate Dean (Graduate Studies) and GPS. Course Audit and Withdrawal forms are found in the GPS website forms cabinet. Students should consult the calendar (http://calendar.ualberta.ca/) for the deadline dates for adding a course, withdrawing from a course, and changing their status between Credit and Audit in a course.

Space Allocation

Temporary office space is provided to each graduate student until they have selected a research supervisor. Office and laboratory space in their research supervisor's laboratories is then assigned. The Chemistry General Office E3-44 issues keys for individual offices and laboratories. There is a $40 cash only deposit fee for keys, which is refunded after the checkout procedure is complete.

Choosing a Research Supervisor

Preamble

Choosing a research supervisor is the most important decision students make in their graduate career and hence the process must be approached with seriousness, care and diligence. Indeed, students are making a commitment to work under the supervision of a faculty member for the duration of their graduate career in the Department.

In selecting a supervisor, students should not only meet with faculty, but also with graduate students in the group. This will ensure that they will get a complete picture of expectations, research atmosphere and supervisor-student interaction in the group.

The Process

Entering graduate students must select a supervisor during their first term in the graduate program, preferably by the end of October (or February for January arrivals). New graduate students will be given a list of Faculty. Each student should not make a commitment to work under a particular staff member until at least four faculty plus all Assistant Professors in the student's research area have been interviewed and signed the Faculty Interview Sheet.

After selecting a research supervisor, students should present the signed Faculty Interview sheet to Connor Part in E3-44, and inform Connor of the supervisor selected and research division. A deadline for completing this sheet will be communicated to all first-year students by Connor Part. It is strongly advised that students obtain the required signatures well in advance of the deadline.

The Supervisor

As detailed before, the Supervisor is directly responsible for supervision of the student's program. In this capacity the supervisor, in collaboration with the student's Supervisory Committee (where appropriate) assists the student in planning their research and academic program, provides counsel in all aspects of the program and stays informed about the student's research and academic progress.

General Program Requirements For All Graduate Students

Selection of a Supervisory Committee

Students in the M.Sc. program will select a two-member Supervisory Committee composed of the Research Supervisor (acting as Chair of the committee), and one other faculty member. Students in the Ph.D. program will select a three-member Supervisory Committee composed of the Research Supervisor (acting as Chair of the committee), and two other faculty members. Usually, the other members of the committee are chosen from inside the Department of Chemistry but one of these can be a faculty member in another Department at the University (e.g., a research collaborator). The committee is established by the student, in consultation with the supervisor, soon after a choice of supervisor is made, but no later than the end of November (March for January arrivals) of the first year of the student's program.

The role of the Supervisory Committee is to monitor the student's degree program, and to provide support and guidance when needed. Students should feel free to consult with Committee members and to ask for a meeting of the Committee if the need for such should arise.

Chem 502 and Other Seminars

All graduate students are required to enroll in Chem 502 and attend Chem 502 seminars given by Ph.D. students for the period of time required in the program (see below). Students are also strongly urged to attend the lectures given in the Department by visiting speakers, especially those in the student's research area. Attendance at research group meetings arranged by the research supervisor is also mandatory.

Notice of all seminars, special lectures and other events in the Department are listed on the department website https://www.ualberta.ca/chemistry/news-and-events/events and are posted on the bulletin boards throughout the Chemistry Building. Seminars are also announced by the Department Twitter account (@ualbertachem). It is also possible to subscribe to a Google calendar (ualberta.chemistry@gmail.com) so that all seminars will automatically appear in your electronic calendar.

Graduate Ethics Training

A mandatory requirement of the Faculty of Graduate & Postdoctoral Studies (GPS) is that all graduate students are required to complete ethics and academic citizenship training.

- Both M.Sc. and Ph.D. students are required to enroll and complete course INT D 710 (Ethics and Academic Citizenship) in their first semester. Ph.D. students are additionally required to enroll and complete course INT D 720 (Advanced Ethics and Academic Citizenship) in their first semester.

- M.Sc. students that change category to the Ph.D. program are required to enroll and complete course INT D 720 in the semester the change of category is effective.

These courses provide foundational knowledge of ethical principles and relevant university policies, including: academic integrity, plagiarism, introduction to research ethics, conflict of interest, and workplace ethics and self-care. GPS will block future registration in the program for students that do not complete these courses within the above-mentioned timelines.

Information on the ethics requirement and resources is found here: https://www.ualberta.ca/graduate-studies/professional-development/ethics/index.html

Professional Development Requirement

All graduate students are required to prepare an Individual Development Plan (IDP) for their program of studies within 12 months of the program's commencement for M.Sc. students and within 18 months of the program's commencement for Ph.D. students. The plan is a career and skills planning document that allows graduate students to consider their future careers in an organized way and to plan their participation in professional development activities in conjunction with their academic activities. *A template for the IDP is available on the GPS website.*

In addition to the IDP, it is required that all graduate students complete at least 8 hours of professional development activities. Graduate students can only complete 4 hours of professional development per year. The Department will provide, when offered, a listing of suggested professional development opportunities that will count toward the required 8 hours. Suggestions for other professional development activities are found on the GPS website.

All graduate students must submit evidence of the completion of this requirement to their department.

- At time of degree completion for M.Sc. students
- Within the first three years for all Ph.D. students

For information on Professional Development options and events, please see: https://www.ualberta.ca/en/graduate-studies/training-events/required-professional-development/index.html

Annual Progress Report

All graduate students are required to prepare and submit an annual progress report that is distributed, and managed, by GPS. The report is provided to the Supervisory Committee for approval by the last working day in July each year. Along with the GPS administered annual report, all graduate students need to submit a 1-3 page summary of research to the supervisory committee; at this point this must be

emailed separately to the supervisory committee members. It is the department's expectation that supervisory committees conduct meetings with students in August (as needed) to be able to sign off on the report before the first day of fall classes.

Master's students in their first year must prepare and submit their Progress Report to the Supervisory Committee as noted above, however, the summary of research document is submitted to the supervisory committee at least **one week** prior to the first year meeting as described below.

Specific Requirements for the Thesis-Based Masters and Doctoral Programs

Masters Program

The M.Sc. program requirements are:

Enrollment in and passing three (3) one-term graduate level courses. M.Sc. students will not be given transfer credit or course exemption for courses taken prior to admission to the Chemistry graduate program. Students must obtain a GPA of 2.7/4.0 (B-) or greater in their first year, and must maintain a cumulative GPA of 2.7 or greater in their second and subsequent years in order to remain in the graduate program. The GPA referred to here is the cumulative GPA on ALL courses taken while registered in the Chemistry graduate program. The passing grade for all courses taken by a graduate student, whether the course is for graduate credit or not, is C+.

Courses taken that are not relevant to the degree should be discussed with and approved by the research supervisor to ensure they do not interfere with progress to the degree and/or research. These courses should be marked as extra to the degree on the transcript and this notation should be made at the time the course is taken. The required paperwork is submitted to GPS before the registration deadline each semester.

a) M.Sc. candidates in Organic Chemistry are normally expected to take all three graduate courses in Organic Chemistry, but may petition the Division of Organic Chemistry for permission to take one course in another area.
b) M.Sc. candidates in Analytical Chemistry are normally expected to take four half-course modules in the fall semester of their first year.
c) M.Sc. candidates in Chemical Biology may include one (1) one-term approved graduate course in the Department of Biological Sciences, Faculty of Medicine or Faculty of Pharmacy as part of the required courses.

d) M.Sc. candidates in Chemical Physics may include up to two (2) one-term approved courses in Physics and Mathematics as part of their required courses.

M.Sc. students must select a supervisor and conduct research under that supervisor's direction. A student may have multiple supervisors if appropriate for the research program. A student without a supervisor cannot remain in the program.

M.Sc. students must register in Chem 502 and attend the required number of seminars for two years (see below).

M.Sc. students are required to schedule and attend a meeting with their Supervisory Committee after the first year in the program. For students that began their program in the fall term, this meeting should be scheduled anytime between September 1 and November 30 in the second year. For students starting in the winter term, the meeting should be scheduled anytime between January 1 and March 31 in the second year. One week before the meeting, the student should provide the committee a copy of the Annual Progress Report (see above) – importantly, the 1-3 page summary of research needs to be sent. The meeting should be no more than 50 minutes in length. The meeting will start with a brief review of the student's Progress Report. Following this, the student should review the progress of the research and present a clear timeline for completion of the program in a 15 to 20 min presentation. The committee will focus their attention on this later part of the presentation. We want our M.Sc. students to have thought carefully about their path to complete the program in the next year or so following the meeting.

The student is not evaluated at this meeting. That is, there is no "pass" or "fail". The student should expect some questions on their results but this is **not** analogous to the candidacy exam for Ph.D. students. The purpose of the meeting is for the committee to see the progress and the plan to complete the program. The committee will also provide some scientific input if appropriate. The outcome of the meeting will be for the student to receive some input on the research progress and a clear path to an efficient completion of the M.Sc. program within 2 years and 4 months of starting the program.

M.Sc. students must prepare and submit a M.Sc. thesis to an examining committee and attend and pass an oral M.Sc. Final Exam. The supervisor should schedule the date and time of the exam but the student may also have input. The examining committee must consist of the research supervisor, one member of the Supervisory Committee, and one other faculty member outside the Supervisory Committee, i.e. a University examiner. This third member can be from within or outside the Department of Chemistry. The examining committee should receive the thesis at least 3 weeks prior to the exam. During the examination, students are expected to give a brief oral presentation (20 minutes) of their research, and to demonstrate an appropriate level of knowledge of their thesis subject and related areas.

The M.Sc. thesis must be prepared in accordance to the requirements set by GPS, https://www.ualberta.ca/en/graduate-studies/resources/graduate-students/thesis-preparation.html Instructions for electronic submission of the final document can also be found in the above link.

At least nine-months before a student expects to defend their thesis, they should refer to the Chemistry website to obtain a checklist of items that must be completed before the defense can be scheduled.

Doctoral Program

The Ph.D. program requirements are:

Enrollment in and passing four (4) one-term graduate courses (12 credits total).

a) Ph.D. candidates in Analytical Chemistry must include at least 9 credits of chemistry graduate courses are part of the required 12 credits. Ph.D. candidates in Analytical Chemistry are normally expected to take four half-course modules (CHEM 512, 514, 516, 518) in the fall semester of their first year.
b) Ph.D. candidates in Chemical Biology may include up to two (2) one-term approved graduate courses in the Department of Biological Sciences, Faculty of Medicine or Faculty of Pharmacy as part of the required four (4) courses.
c) Ph.D. candidates in Chemical Physics may include up to three (3) one-term approved courses in Physics and Mathematics as part of the required four (4) courses.
d) Ph.D. candidates in Inorganic Chemistry must normally include at least three (3) one-term inorganic/materials chemistry graduate courses as part of the required four (4) courses.
e) Ph.D. candidates in Organic Chemistry are normally required to enroll in and pass four (4) one-term graduate courses, one of which may be a graduate course in another area of chemistry.
f) Ph.D. candidates in Physical Chemistry may include up to two (2) one-term approved courses in Physics and/or Mathematics as part of the required four (4) courses.
g) Transfer Credit for certain courses may be granted by GPS, provided that the courses have not counted toward a previous degree or program and were not used to satisfy admission requirements of GPS. The maximum number of transfer credits is two (2) one-term courses. For further information concerning requirements and procedure to obtain Transfer Credit see Connor Part in Chemistry E3-44.

Students must achieve a GPA of 2.7/4.0 (B-) or greater in all courses taken in the first year, and must maintain a cumulative GPA of 3.0 (B) or greater in the second and subsequent years. The GPA referred to here is the cumulative GPA on ALL courses taken while registered in the Chemistry graduate program.

Courses taken that are not relevant to the degree should be discussed with and approved by the research supervisor to ensure they do not interfere with progress to the degree and/or research. These courses should be marked as extra to the degree on the transcript and this notation should be made at the time the course is taken. The required paperwork is submitted to GPS before the registration deadline each semester.

Change of supervisor. If a graduate student has completed the graduate course requirements for a particular Program or Division, and wishes to transfer to another Program or Division, they must find a Supervisor who will accept them. A new Supervisory Committee will be assigned, as per the requirements of the new Program or Division, and a meeting will be held between the student, the new Supervisor, and the new Supervisory Committee to determine what course requirements (if any) the student must fulfill in order to transfer.

Ph.D. students must select a supervisor and conduct research under that supervisor's direction. A student may have multiple supervisors if appropriate for the research program. A student without a supervisor cannot remain in the program.

Graduate Seminar, Chemistry 502

All graduate students must register in CHEM 502 in the fall and winter terms in years 1-2 for M.Sc. students and years 1-3 for Ph.D. students. Students must attend a minimum number of 502 seminars, and submit evaluations of these, to receive credit for the course. The minimum attendance is 8 seminars over two terms, or one third of the total number presented that year (rounded to the nearest even number), whichever is less. This will typically be 4 over each term. Students should refer to the CHEM 502 course syllabus for details. If the student will be away for an extended period in a single term (e.g. research exchange or internship), they must contact the CHEM 502 chair to obtain an excused absence. Seminars should be scheduled within the academic term and avoid the final exam and reading-week periods where possible.

All Ph.D. students are required to present a seminar to the Department on a subject other than their research topic. Faculty present at the seminar grade the student's performance, and the appropriate representative on the Graduate Seminar Committee gives the student an overall rating (Pass or Fail) on the seminar. Students who receive a Fail rating have the opportunity to present a second seminar in an effort to complete the requirement. However, if the student also receives a Fail rating on this second attempt, they will be required to transfer to the M.Sc. program.

The Graduate Seminar Committee, with faculty members from each Division and a representative of the Chemical Physics programs, is responsible for the approval of seminar topics, scheduling of seminars, and grading the student's performance.

Students should consult with the appropriate member of the Graduate Seminar Committee before preparing their seminar.

The Format of a 502 Seminar

A successful 502 seminar is an approximately 40 minute (not more than 45 minutes) public lecture in which a student presents a body of currently relevant research at a level that is both educational and engaging to an audience of Chemistry graduate students, postdocs, and faculty members that have a broad range of backgrounds and expertise. In addition, the student is expected to demonstrate that they have a thorough understanding of the body of research presented, as demonstrated by their ability to expertly answer questions from the audience in a 20-minute question period.

Exactly what constitutes a "body of currently relevant research" is not strictly defined in terms of a set number of papers. At one extreme a 502 seminar could place a primary focus on a single paper, with several additional papers discussed in less detail. At the other extreme a 502 seminar could focus on a specific topic or research trend that requires as many as five or more papers to be given equal attention. Final decisions about which topic and format is most appropriate should be made on a case-by-case basis by each student in close consultation with their research supervisor and their 502 coordinator.

The Goals of a 502 Seminar

The format suggested here is designed to direct students toward satisfying the goals of the 502 seminar. These goals include:

1) Providing the speaker with an opportunity to gain experience in public speaking and the formal communication of scientific concepts to a general chemistry audience.
2) Gaining first-hand experience in how to prepare a presentation that is similar in style and format to presentations that the student will later give during their candidacy, their Ph.D. defense, interviews, and at conferences.
3) Gaining familiarity with the handling of questions, which will help to prepare students for their future candidacy and defense exams.
4) Learning how to critically analyze a body of scientific work.
5) Refining of teaching skills through the preparation of a seminar that will be educational to colleagues that were previously unfamiliar with the topic.
6) Providing peers and faculty members with an up-to-date summary of a recent hot paper, currently relevant topic, or trend in a particular research field.

The Regulations of a 502 Seminar

Graduate students normally present seminars during their second year of graduate study, and must do so before the end of March of their third year.

The Chemistry 502 Committee will prepare a schedule, based on the preferences of the students, for the up-coming year in the preceding summer. Third year students will be given priority for earlier time slots.

The seminar topic must be outside the scope of the research being done in the student's research group except for students in Physical Chemistry where the seminar can be on any topic in Physical Chemistry (subject to approval as follows). The topic must be approved by the student's research supervisor and by the Chemistry 502 Committee at least 6 weeks prior to the scheduled 502 date. Students should consult the list of previous seminars to ensure that their selected topic has not been covered in the past five years. This list is available on the Chemistry 502 eClass site.

Students must prepare a 200 word abstract that outlines the background and principal ideas to be presented. This abstract must be approved by the student's supervisor and, if required by their Division, and the appropriate Chemistry 502 Committee member. The abstract is to be submitted to the department at least one week before the seminar so that it can be distributed to faculty and students.

The seminar should be approximately 40 minutes long, to allow time for discussion. The maximum time permitted for the seminar presentation is 45 minutes.

The seminar should include:

(1) Discussion of relevant background material to introduce the topic and put it into perspective. Some of this material may be at the level of a text for a graduate course. (Not more than 20 minutes).
(2) Where appropriate, students are encouraged to include “classic” papers or examples that may illustrate central ideas or provide important historical context.
(3) Presentation of the most recent significant developments in the field. If the topic has been the subject of a recent review, the presentation must include significant material that has not been cited in the review literature.
(4) Any figures or graphics used in the presentation or abstract not generated by the student must be clearly cited. Where possible, students are encouraged to generate their own graphics, chemical structures, and schematics to best illustrate the topic of discussion.
(5) Students are evaluated both on the quality of the seminar given, and the responses to questions posed by members of the audience. If the performance of the question period is deemed to be unacceptable, students may receive a failing grade for the 502 seminar, despite the quality of their presentation.
(6) After completing a 502 presentation, students will provide the slides used as a PDF file to the relevant 502 coordinator to be made available on the eClass site.

Oral Candidacy Examination

Graduate students in the Ph.D. program must pass an oral examination in subjects relevant to their field of research. At the candidacy examination, students must demonstrate to the satisfaction of the examining committee that they possess (a) an adequate knowledge of their discipline and of the subject matter relevant to their thesis, and (b) the ability to pursue and complete original research at an advanced level. The oral examination will be held when all of the requirements above are completed and the thesis research has been started and well defined.

The candidacy examination will normally be held no later than the end of May of the third year. It is essential that a Ph.D. student demonstrates proficiency in their research midway through their degree program, as the Department of Chemistry is restricted on how long it can guarantee financial assistance. Students and supervisors who allow too much time to lapse before scheduling a Candidacy Exam run the risk of having their program cut short later on.

It is a requirement that all provisional Ph.D. students provide the following material to the Ph.D. candidacy exam committee at least 3 days before the exam:

1. Presentation slides.
2. The student's most recent annual progress report.
3. Any reprints or preprints of journal articles co-authored by the student during their program, if applicable.

The material should be provided electronically by email or via Google docs.

If the committee does not receive the materials by the stated deadline, the candidacy exam may be rescheduled at the discretion of the exam committee chair.

Three Year Ph.D. Program Requirements

Ph.D. students must complete all program requirements, other than the thesis, within three years from the start of their program. For the Department of Chemistry this includes the completion of the following:

- Four (3 credit) courses
- CHEM 502 seminar
- Ph.D. candidacy exam
- Ethics training requirement
- Professional Development requirement

Thesis Defense and Final Oral Examination

Ph.D. students must do research work under the direction of a Departmental faculty member, and must submit the results of this research in the form of a Ph.D. thesis to a committee consisting of the research supervisor, the supervisory committee, one

University examiner (formerly known as Arm's Length examiner), and one external examiner who is a recognized expert in the area of the thesis research.

At least nine-months before a student expects to defend their thesis, they should contact Connor Part to obtain a checklist of items that must be completed before the defense can be scheduled.

The research supervisor and supervisory committee must make a detailed preliminary examination of the thesis before the thesis may be circulated to other members of the Committee. It is important to recognize that this preliminary examination of the thesis may require one to two weeks, and that one must allow the external examiner at least four weeks to examine the thesis before the Ph.D. oral examination. At the Ph.D. oral examination, candidates are expected to give an oral presentation of their research (approximately 20-30 minutes), and to demonstrate a high level of knowledge of their thesis subject and related areas.

The Ph.D. thesis must be prepared in accordance to the requirements set by GPS: https://www.ualberta.ca/en/graduate-studies/resources/graduate-students/thesis-preparation.html

Instructions for electronic submission of the final document can also be found in the above link.

Ph.D. Seminar

Ph.D. students must present their thesis work to the Department in a seminar. This seminar may have either of two formats:
(a) An entirely *in-camera* exam with the committee consisting of a 20-25 minute presentation on their research followed by 2 rounds of questions by the committee. This exam format *must* be followed up at some point by an ~40 min public PhD departmental seminar. Importantly, the PhD public seminar is a degree requirement, and the Thesis Approval/Program Completion form cannot be submitted to GPS until this requirement is complete.
(b) The student delivers a ~40 min public PhD departmental seminar followed by an *in-camera* question period with the exam committee. The supervisor introduces the student before the seminar and also chairs the public questions on the seminar. The committee does not ask questions immediately after the seminar. The supervisor will then direct the members of the public to leave the room while the student and exam committee members remain. The exam chair then coordinates the rest of the exam details, including the 2 rounds of questions.

Withdrawal From Program

As mentioned above, in order to remain in good standing, all students must have a minimum 2.7 GPA by the end of their first year. Students entering the Ph.D. program must have a minimum 3.0 GPA by the end of their second year. Any student who

fails to meet these performance requirements will be required to withdraw from the program. For M.Sc. students a cumulative GPA of 2.7 is required to complete the program; for Ph.D. students a cumulative GPA of 3.0 is required.

Change of Category

Candidates for the M.Sc. degree may be changed to the Ph.D. program, provided that they meet the academic performance requirements for the Ph.D. degree (a cumulative GPA of 3.3), the admission requirements have been met, and the change of category is requested by the student and approved by the student's research supervisor and supervisory committee. Signing the "Request for Change of Category" form does this.

Students admitted to the Chemistry graduate program as Qualifying Students will normally be changed to Candidates for the M.Sc. degree at the end of the qualifying period provided that they have met the requirements stated in the student's letter of appointment.

Continuous Registration Requirement

For full details consult the U of A Calendar:
https://calendar.ualberta.ca/

Students who are admitted to any thesis-based degree program (excluding cost-recovery programs), and who initially register as full-time students in these programs must register full-time for the remainder of their program.

To keep their program active, students must register in a minimum of 9 credits in the fall and winter terms, and a minimum of 6 credits in the spring and summer terms for the length of their program. This registration entitles the students to the use of university facilities and assistance from their supervisor for a twelve-month period. Details on the registration process can be found in the "Regular Registration" section above.

The Department of Chemistry strongly discourages students from leaving the University before submitting the final version of their thesis to GPS.

Scheduling of Oral Examinations

The research supervisor through Connor Part must schedule Ph.D. candidacy and M.Sc. final oral examinations at least FOUR weeks prior to the examination date.

The research supervisor must schedule the Ph.D. final oral examination through Connor Part at least FOUR weeks prior to the examination date. Application for approval of the external examiner by the Dean of Science Office must be submitted to Connor at least EIGHT weeks prior to the examination date. Please note that GPS

requires the external examiner to have the thesis at least FOUR weeks before the date of the final oral examination.

Application for Degree

Graduate students expecting to receive a degree at either spring or Fall Convocation must apply to graduate using Bear Tracks. Thesis based students should apply before submitting their final thesis to GPS. All students must apply for convocation in order to be eligible for the convocation list.

Theses must be submitted to GPS within 6 months of the date of the defense, or by the spring or fall thesis submission deadlines, whichever comes first, in order for a degree to be conferred at Convocation. Submission is in electronic format. Further information can be found at the GPS website:
https://www.ualberta.ca/graduate-studies

Appendix A

Graduate Affairs Committees 2024-2025

ALL GRADUATE AFFAIRS COMMITTEES ARE SUBJECT TO CHANGE

Chair: Dr. Alexander Brown

Associate Dean Graduate Studies: Dr. Michael Serpe

Graduate Services Contact: Connor Part (Chemistry E3-44)

Division Chairs: Analytical - Dr. Harynuk

Inorganic – Dr. Mar

Chemical Biology – Dr. Mahal

Organic – Dr. Vederas

Physical – Dr. Hanna

Graduate Advisory: Dr. Bergens, Dr. Li, Dr. Clive, ChemBio Rep (TBD), Dr. Klobukowski

Chemistry 502: Dr. Hall, Dr. Hall, Dr. Derda, Dr. Li, Dr. Bergens, Dr. Michaelis

Graduate Curriculum: Dr. Harynuk, ChemBio Rep (TBD), Dr. Hall, Dr. Rivard, Dr. Xu

Graduate Awards: Dr. Klassen, Dr. Chalifoux, Dr. Lundgren

Appendix B

Summary of Graduate Program Timelines

Ph.D. Program

Supervisory Committee: Soon after choice of supervisor, but not later than the end of November (March for January arrivals), of the first year.

Chemistry 502 Seminar: Preferably during the second year of graduate study, but not later than the end of March of the third year.

Candidacy Oral Examination: Not later than the end of May of the third year.

Thesis and Ph.D. Oral Examination:

- Appointment of External Examiner: EIGHT weeks before the Ph.D. final exam (application form to Graduate Services Contact).
- Preliminary acceptance of Ph.D. thesis: completed Ph.D. thesis to Supervisory Committee at least one-two weeks before thesis is to be sent to External Examiner.
- Thesis to External Examiner: four weeks before the date of the Ph.D. final.
- Notice/Approval of Final Ph.D. /Final Oral Examining Committee: submit to the Faculty of Graduate & Postdoctoral Studies four weeks before the date of final exam.

M.Sc. Program

Supervisory Committee: Soon after choice of supervisor, and preferably not later than the end of November (March for January arrivals), of the first year.

Thesis and M.Sc. Oral Examination:
Notice and Approval of M.Sc. Final Oral Examining Committee: submit to the Faculty of Graduate & Postdoctoral Studies four weeks before the date of final exam.

Appendix C

Structure of Examining Committees

M.Sc. Final Exam

- Non-Examining Chair
- Examiner 1 - Supervisor
- Examiner 2 - Supervisory Committee Member 1 (second member of the supervisory committee is not required for a M.Sc. defense)
- Examiner 3 - University Examiner 1

Ph.D. Candidacy Exam

- Non-Examining Chair
- Examiner 1 - Supervisor
- Examiner 2 - Supervisory Committee Member 1
- Examiner 3 - Supervisory Committee Member 2
- Examiner 4 - University Examiner 1

Ph.D. Final Exam

- Non-Examining Chair
- Examiner 1 - Supervisor
- Examiner 2 - Supervisory Committee Member 1
- Examiner 3 - Supervisory Committee Member 2
- Examiner 4 - University Examiner 1
- Examiner 5 - External Examiner 1