

GUIDELINES FOR PH.D. DEGREE CHEMISTRY

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I. Overview

The Ph.D. degree in Chemistry involves the successful completion of the following requirements:

- Formal coursework
- Comprehensive exam
- Prospectus exam
- 4th year seminar
- Dissertation research and preparation
- Final dissertation defense

This document will describe the requirements to obtain a PhD degree in chemistry at PSU, outline your responsibilities as a student, and provide strategies for successful completion of the degree. The information given here supplements statements of degree requirements published in the University Bulletin. Additional information may be obtained from the Graduate School and the Chemistry Department office.

II. General Requirements

A. Credit Requirements

The PhD degree requires a minimum of 81 credits. A combination of research credits and course credits are used to satisfy this requirement. A full-time graduate student will take 9 credits per term (fall/winter/spring). A student on a graduate assistantship will receive tuition remission for a maximum of 9 credits per term (see Sections IV.C. and V.A.). During the first two years in the program both research and course credits are taken in each term and in the third year and beyond only research/dissertation credits are taken (except for 1 credit of CH607: Seminar taken in the fourth year, see Section II.F.). Students should register for CH601 research credits beginning in the fall term of their first year until the end of the spring term of their second year. Students should register for CH603 during their third year and after completion of 27 credits (9 credits each term for three terms) of CH603 and successful advancement to candidacy (passing grade on the prospectus exam), students are eligible to register for CH603 CE. Course credits are described below.

B. Coursework

There are several courses required of students in the PhD program.

- CH610: Survey of Faculty Research (1 credit, fall term of 1st year)
- CH504: TA prep (2 credits, fall term of 1st year)
- CH610: Scientific Communication (2 credits, spring term of 1st year)
- CH610: Comprehensive exam (1 credit, fall term of 2nd year)
- CH607: Seminar presentation (1 credit, 4th year)

Students are also required to complete a minimum of 24 credits of formal graduate coursework in science. These courses must be at the 500/600 level. The two credits of CH610 (Scientific

Communication) and the one credit of CH610 (Comprehensive exam) count toward the 24-credit requirement. However, course credits such as: seminar, survey of faculty research, and research cannot be applied to the coursework requirement. Additional courses that will not be applicable towards the 24-credit requirement are: CH510 (Glassblowing), CH527 (Instrumental Analysis Lab), CH537 (Spectrometric Analysis Lab), CH544/5 (Physical Chemistry Lab), CH551 (Materials Lab), CH593 (Biochemistry Lab); students are generally discouraged from taking the laboratory component of graduate courses. The laboratory course CH525, Electronics & Instrumentation Laboratory is the exception to this rule, concurrent enrollment in CH524 and 525 is required. It is expected that the majority of coursework will be completed in the first two years in residence.

Due to the interdisciplinary nature of the departmental research programs, courses from outside chemistry will often be part of a student's curriculum. A maximum of two courses from other departments may be applied to the 24-credit course requirement, but must be relevant to chemistry and the student's research program. All courses taken outside the chemistry department must be approved in advance by the graduate adviser and the GAC.

When: Typically, by the end of the 2nd year in residence.

C. Transfer Coursework

Some students may have completed graduate level coursework prior to commencement of the PhD program. Some of this coursework may be used to satisfy part of the graduate coursework requirement set out above in II.B. Only coursework that is relevant to the program of study, has been completed at an accredited institution in the last seven years, taken at the graduate level, and graded B or above can be used to satisfy the graduate coursework requirement of the PhD program. A maximum of two courses (8 credits) can be transferred into the PhD program. Approval to transfer coursework into the PhD program is initiated by the students research adviser and therefore students wishing to do so must discuss this with and gain approval from their adviser.

When: Requests must be received before the student's first year meeting (see section III.E.) but will not be accepted until after the conclusion of Winter term of the student's first year in residence.

D. Comprehensive Examination

The comprehensive exam must be completed in the second year of the doctoral program. The purpose of the exam is two-fold:

- to test the student's knowledge of the specialty area of chemistry represented by their laboratory, including background knowledge
- to test the student's ability to propose a viable program of scientific research in this area.

The comprehensive exam is administered by the Initial Advisory Committee (IAC, Section III.C.).

The comprehensive exam is made up of a written and an oral portion. Both the written and oral portions of the examination test only the student's scientific knowledge. A description of the student's research progress and/or preliminary data is/are not permitted in either portion (written or oral) of the exam. The written and oral comprehensive exams will be assessed independently on a P/NP basis – each may be passed without reference to the other. The student will have one opportunity to retake either or both portions of the exam in the event of an NP grade on either portion.

Both exams should present a research proposal. The only requirement is that both the substantive questions and methodology proposed fall reasonably (but not strictly) within the expertise of the laboratory with which the student is affiliated. There could be complete, large, small, or even no overlap with the envisioned and still-developing dissertation plan. Any questions about whether proposed projects are appropriate should be directed to the research adviser.

Formal Requirements: To pass the comprehensive exam the student must pass both the written and oral components. All prospective doctoral students must register for 1 credit (P/NP) of CH610 Comprehensive Exam in the Fall term of their second year. This course is to assist students in the preparation of their written comprehensive exam and does count towards the coursework requirement of the program (Section II.B.). A pass in CH610 Comprehensive Exam is not equivalent to passing the Written Exam, but merely indicates successful submission of written exam.

Written Exam: Students will prepare a written document, a maximum of 12 pages in length (not

including literature cited), using the provided template available on the department website (<https://www.pdx.edu/chemistry/phdinfo>). The written document will be in the form of a research proposal that demonstrates that the student has a strong grounding in their specialty area of chemistry or biochemistry. Particular attention should be paid to the recent research literature in the specialty area, outstanding questions that remain unsolved and should provide a clearly defined scientific approach to address a subset of these questions. The adviser should offer general guidance and advice, but not detailed input to, or review of, the Written Proposal.

Evaluation: The Initial Advisory Committee will assess the written exam. The written exam will be evaluated on the basis of:

- (i) adherence to these guidelines
- (ii) identification and thorough justification of original lines of investigation in the research area
- (iii) clear explanation of the suitability of the methodologies chosen to carry out the investigation
- (iv) consideration of alternative lines of experimentation or hypotheses to address and if needed, explanation of why these approaches were not chosen

An evaluation of the written exam will be provided in writing to the student by the IAC at the conclusion of the oral examination meeting. A copy of this evaluation will be provided to the Department Manager. In the event that the student does not pass, the written evaluation will include detailed comments on which aspects of the proposal were insufficient. In this event the chair of the IAC will be available to the student for consultation. If the student does not pass the written exam they may retake the exam, in which case the student should address the feedback provided in the evaluation.

When: The written exam must be submitted to the Department Manager by 5 PM on the Thursday of finals week of Fall term of the 2nd year.

Retake: In the event of a NP on the written exam, the student must make the necessary corrections and submit the revised written document to the IAC by the Thursday of Finals week of the Winter term of the 2nd year.

Oral Exam: Students will prepare a PowerPoint (or similar software) presentation, with a maximum length of 20 minutes, that outlines the contents of their written document. The oral exam will include the student presentation followed by questions from the IAC on the contents of the presentation and related concepts from the student's specialty area of chemistry or biochemistry. There is no limit to the length of the question period, though the entire oral exam is scheduled for 2 hours.

Evaluation: The Initial Advisory Committee will assess the oral exam. The oral exam will be evaluated on the basis of:

- (i) the student's ability to demonstrate scientific knowledge by explaining the content of the written proposal
- (ii) the student's knowledge of background material
- (iii) the quality of the presentation.

The IAC will verbally inform the student of the result of both the written and oral exams at the conclusion of the meeting. Written feedback on the oral exam will be provided to the student within 7 calendar days of the exam. A copy of this evaluation will be provided to the Department Manager. In the event that the student does not pass, the written evaluation will include detailed comments on which aspects were insufficient. In this event the chair of the IAC will be available to the student for consultation. If the student does not pass the oral exam they may retake the exam, in which case the student should take on board the feedback provided in the evaluation. The oral exam may be retaken no earlier than 3 months after the first attempt, and will occur in the subsequent term.

When: The oral exam must be taken in week 3 or 4 of the Winter term of the 2nd year and will be scheduled by the GAC.

Retake: In the event of a NP on the oral exam the student will have the opportunity to retake the oral exam during week 5 or 6 of the Spring term of the 2nd year (scheduled by the GAC). The student should consider the feedback from the IAC and make necessary changes to the presentation and/or review the specialty area curriculum and/or literature to increase foundational knowledge in the area.

To pass the comprehensive exam the student must pass both the written and oral exams. Failure to complete either the written and/or oral exam by the stated deadline(s) will result in a No-Pass. Students who receive a NP on either exam after all retake opportunities will be dismissed from the doctoral program.

E. Prospectus Examination

The prospectus exam is a combination of written and oral examinations, similar in format to the comprehensive exams, but more narrowly focused on the student's individual research project. The prospectus exam focuses on a detailed research plan, based on the student's current research progress, and how this plan will lead directly to the production of a satisfactory Ph.D. dissertation. The purpose of the exam is to ensure the success of students in the Ph.D program, by examining both their research history and future plans.

The prospectus exam cannot be undertaken until a GO-16D form has been submitted to, and approved by, the Graduate School formally forming a DAC (see section III.D.)

Written Exam: The student will prepare a report of their research progress in the program to date and their research plans for the remainder of their time in the program, including how their work will lead them to a successful dissertation. The report should be a maximum of 20 pages, not including literature cited. It should use the same template as the comprehensive exam document and should provide the following information:

- Specific aims that will make up the chapters of the dissertation (these may be the same or different from the Aims in the comprehensive exam)
- a clear picture of the background required to conduct the work (maybe similar to the background provided in the comprehensive exam)
- a clear description of the student's research accomplishments to date
- the student's future research plans

The report should briefly and clearly provide a road map of how the student plans to address outstanding research questions in their chosen research area and how this will lead them to a successful Ph.D.

When: the written portion of the comprehensive exam is due to the DAC 14 days prior to the oral exam in the Winter term of the 3rd year.

Oral Exam: Students will prepare a PowerPoint (or similar software) presentation, with a maximum length of 40 minutes, that outlines the contents of their written document. The format of the oral prospectus exam is similar to that of the oral comprehensive exam. The oral exam will include the student presentation, followed by a question period.

When: During week 7 and 8 of the Winter term of the 3rd year in residence. The oral exam will be scheduled by the GAC.

Evaluation: The DAC will assess the written and oral exams and inform the student of the result (P/NP) at the conclusion of the oral exam. Each portion will be evaluated without reference to the other and a student may be asked to revise their prospectus and/or research plans prior to advancing to candidacy.

Retake: If needed, the retake of the oral exam will occur during week 9 and 10 of the Spring term of the 3rd year in residence and will be scheduled by the GAC. If needed, the revised written portion will be due to the GAC 14 days before the retake of the oral exam or by the Thursday of week 10 of the Spring term of the 3rd year.

Once the DAC is satisfied that the student's research is on track, the student will be recommended for advancement to candidacy. Students who have advanced to candidacy, and have completed 27 credits of CH603 are permitted to register for CH603CE credits (see II.A.).

F. Departmental Seminar

Students must attend the weekly chemistry departmental seminar at 3:15 PM on Friday afternoon. Participation in the departmental seminar is an important part of a student's development as a research scientist.

During the 4th year in residence, all students must present a seminar on research progress to the entire department. The purpose of this seminar is to afford the student the experience of presenting to a large audience before they present their dissertation defense, but also provides edification for

the department of the research being undertaken by the student. The student should bear in mind that they are presenting to a large and diverse audience not versed in their niche research area and so the seminar should therefore be broadly understandable. The seminar should be ~ 15 minutes in length leaving ~ 5 minutes for a question period from the audience. The student will enroll in CH607 *Seminar Presentation* in the term in which they are presenting their seminar. Seminar presentations are graded as P/NP.

When: Mandatory attendance throughout the time in residence and presentation during the 4th year in residence, scheduled by the Chair of the Seminar and Communications Committee

G. Dissertation

Upon completion of the approved research plan (see II, D. Prospectus Examination, above) the candidate will prepare a dissertation describing the results of the course of study. The dissertation must be prepared according to the ETD Formatting Requirements, available at <https://www.pdx.edu/gradschool/thesis-and-dissertation-information>. Electronic copies of the dissertation will be sent via email to members of the DAC at least 14 days before the oral exam. Following receipt of the dissertation by the DAC, the dissertation will be orally presented and defended by the candidate. The examination committee will be the student's Dissertation Advisory Committee (see III. D. Dissertation Advisory Committee, below). The dissertation defense will have two parts. In the first part of the defense the student will present a public seminar on the dissertation research, followed by questions from the non-DAC members of the audience. This will be followed by a private oral examination by the DAC covering the subject area of the thesis. A dissertation defense has two possible outcomes: pass and fail. In the event that a student fails the defense, the student may (at the discretion of the DAC) be afforded a second opportunity to defend their dissertation no less than three months after the initial defense exam. Students may be asked to make revisions to their dissertation by the DAC even after passing their dissertation defense. Successful completion of the oral examination and the revisions to the dissertation requested by the examination committee will be required for completion of the degree.

The DAC will provide the student with a clear list of dissertation revisions that must be completed prior to submission of their final dissertation. Students should present revisions in such a way that

they can be easily tracked by the committee member. Students should also provide each DAC member with sufficient time to review and approve dissertation corrections.

When:

Dissertations should be submitted in the 4th or 5th year in residence.

Students are directed to the Graduate School for dissertation submission and applications for graduation deadlines (<https://www.pdx.edu/gradschool/graduate-candidate-deadlines>).

III. Student Advising

At the time of entry into the Ph.D. program the Graduate Affairs Committee (GAC) is responsible for advising the graduate student and is the resource to which any graduate student problems should be taken first.

After selection of the Research Adviser the primary responsibility for the student's progress will pass from the GAC to the Research Adviser. The Research Adviser has the major responsibility for monitoring the progress of the student, even in cases where the research is performed in collaboration with another laboratory. The Research Adviser will provide advice on and preliminary approval of the program of study.

At the same time the research adviser is selected, an initial advisory committee (IAC, see Section II.C.) will be appointed for each student. The primary purpose of this committee is to examine the student's comprehensive exam, but this committee will also assist the adviser in monitoring the student's progress through the first two years in the program.

Once a student has completed their comprehensive exams they must form a Dissertation Advisory Committee (DAC, see Section II.D.) that replaces the IAC and continues to serve in an advisory capacity to the graduate student.

One of the important roles played by each of these advisory committees is to be a first resource for students when they are uncomfortable discussing issues with their adviser. Students seeking support are encouraged to reach out to either their entire committee or individual members with whom they feel comfortable. The committee and/or its members will work to assist the student, but may need to reach out to others in order to help.

A. Graduate Affairs Committee (GAC)

The Graduate Affairs Committee (GAC) has purview over all aspects of graduate programs in the Department of Chemistry. This includes, but is not limited to, admissions and advising, adviser assignments, conflict resolution and review of graduate student progress, and awards. The primary role of the GAC is to support graduate students as they progress through the PhD program and

should be the first point of contact for resolving issues pertaining to graduate students.

B. Research Adviser

Each doctoral student will be assigned a research adviser by no later than the end of the fall term of their first year in residence. There are two mechanisms for students to be paired with a research adviser. The primary mechanism involves the following steps:

- The student will register for CH610 *Survey of Faculty Research* in the fall term of their admission, and view the recorded faculty research presentations on the CH610 Canvas page.
- The student will select three faculty members' labs in which they will complete a short (2 week) rotation. These choices will be indicated to the Chair of the GAC via the form provided on the CH610 Canvas page.
- Students may discuss fields of interest and potential research projects with as many other faculty members as they wish.
- The student ranks the top **three** preferences for adviser (1 = first choice, 2 = second choice...) and submits their choices to the GAC chair via the form provided on the CH610 Canvas page.
- The GAC will review all students' adviser choices.
- The GAC and department chair will determine whether the faculty member preferred by the student is willing to accept the student. If not, then the GAC and department chair will move on to the student's next preference.

In the event that a student is not paired with an adviser during this process, the department chair will assist the student in making another suitable selection. Students must be assigned to a research adviser by the end of the third academic quarter of their first year in residence; failure to do so will result in cancellation of admission to the program.

A secondary mechanism to obtain a research adviser is by a direct admission into a specific research group. This occurs in some cases based on clear research interest and/or funding.

Students are required to have a research adviser throughout their time in the program. If at any point after the first term a student does not have a research adviser – for any reason – the student will be permitted three academic quarters to find a new research adviser. Failure to place with a new research adviser within three academic quarters will result in cancellation of their admission to the program.

When: Typically, during the first term in the program, but must occur by the end of the third academic quarter of the student's first year in residence.

C. Initial Advisory Committee (IAC)

The IAC is assigned by the GAC after the student has been paired with an adviser. The IAC will advise and examine a student's progress through the first two years of the program. The purpose of this committee is to provide additional oversight, assist in monitoring the student's progress, and examine the student's comprehensive exam. This committee should meet with the student at least twice: once in the spring term of the 1st year and once in the winter term of the 2nd year to examine the comprehensive exam. This committee, like the DAC (see below), is intended as a first resort for students and advisers seeking advice with regard to their research progress. That notwithstanding, the GAC is always available as an advising resource to students throughout their time in the program.

D. Dissertation Advisory Committee (DAC)

The DAC will advise and examine a student's progress through the program from completion of the comprehensive exam to final defense. As soon as a student has passed their comprehensive exam the process of forming their DAC should be completed. Students should discuss the composition of the DAC with their adviser. After completion of the comprehensive exam the department manager will electronically circulate the GO-16D form to collect all the pertinent information about the program of study, including dissertation title, estimated date of defense, and DAC committee members. Once complete, the department will submit this form to the graduate school for processing. It is advisable to have a committee that will understand the technical aspects of your research and provide constructive comments that will help improve the quality of the

research. The DAC may vary in size from four to six faculty members. Students should keep in mind that more committee members can make scheduling meetings more difficult. The DAC is comprised of:

- The student's research adviser; the adviser serves as chair of the DAC.
- At least three tenured or tenure-track faculty members from within the chemistry department at Portland State University (including the adviser).

The DAC may be augmented with faculty members from outside the department to increase relevant expertise on the DAC. This should be discussed with the research adviser before proceeding. All members of the DAC must hold doctoral degrees. The Graduate School will require *curriculum vitae* for any faculty members from outside Portland State University. University approval of the DAC is required prior to the prospectus exam which must be completed in the student's third year.

The DAC plays an oversight role, ensuring adequate student progress. The DAC will conduct an annual review of the student's progress, based on a meeting with the student. Additional meetings may be scheduled at the discretion of the student, Research Adviser, Department Chair, or any member of the DAC, but must be at least once per academic year. The DAC is also responsible for final approval of the research prospectus / recommendation for Advancement to Candidacy and the Dissertation. In addition, the DAC administers the candidate's oral prospectus exam, and final oral exam. Note: the Dissertation Advisory Committee fulfills the roles of both the Advisory Committee and the Dissertation Committee (specified in the University Bulletin) for Ph.D. students in Chemistry.

When: The DAC should be formed soon after the comprehensive exams have been passed, no later than the end of 2nd year in residence year.

E. Committee Meetings

Students must meet with their advisory committee a minimum of once per academic year. This is to ensure that the student is continuing to make satisfactory academic progress. The schedule for meetings should be as follows:

Year	Purpose	Committee
1 (spring term)	Assess progress	IAC
2 (winter term)	Comprehensive exam	IAC
2 (spring term)	Assess progress	DAC
3 (winter term)	Prospectus exam	DAC
4 (spring term)	Assess progress	DAC
5	Dissertation defense	DAC

For committee meetings that are not formal examinations (*i.e.* not comprehensive exams, proposal or dissertation defenses), students need only prepare slides to present their results and future plans, much as they might be expected to do for a research group meeting (~ 15-20 minutes in length). No written document is required unless requested by the committee. Students may meet with their committee as frequently as needed, however, one meeting in each academic year must be designated *in advance* as the “annual committee meeting”. In that meeting, if the student’s academic progress is deemed unsatisfactory, the student will be informed in writing and required to hold a second meeting with their full committee in the following academic term. If academic progress at the subsequent meeting is again deemed unsatisfactory, the student will be dismissed from the program.

When: The annual committee meeting in the first year must occur before the end of Spring term of the student’s first year in residence.

IV. Status in the Program

A. Advancement to Candidacy

A student is nominated for advancement to candidacy by the student's approved DAC with the approval of the Department Chair after the student has satisfactorily completed all coursework, the comprehensive exam, and the oral prospectus exam. This should occur no later than the end of the 3rd year of a student's degree program. The nomination is made on form GO-23, which is initiated and submitted to the graduate school by the department. The student will be informed by the Dean of Graduate Studies of advancement to candidacy. Note that advancement to candidacy includes an increase in GA stipend.

B. Maintenance of Enrollment in Program

Students must maintain a minimum 3.0 cumulative graduate-level grade point average (GPA) and be enrolled for credit each term of the academic year (unless the student has obtained a leave of absence). After completion of 9 *graded* credit hours, if a student's cumulative graduate GPA falls below 3.0, the Graduate School will place the student on ACADEMIC PROBATION. ACADEMIC PROBATION means that the student is not eligible to hold a graduate assistantship, have a dissertation committee appointed (*i.e.* have a GO-16D approved), or advance to candidacy. The student has until the completion of a further 9 graded credit hours to raise their cumulative graduate GPA back to 3.0 or above. A student on ACADEMIC PROBATION who fails to raise their cumulative graduate GPA to 3.0 within 9 graded credit hours OR allows their cumulative graduate GPA to fall below 3.0 a second time will have their admission to the program canceled.

Students must be registered every term (Fall, Winter and Spring) during the academic year (minimum 1 credit) while working on any phase of the dissertation (research, writing, and revision). Students must also register in Summer term (minimum 1 credit) if the student is going to complete a milestone in that term: *i.e.* comprehensive exam, prospectus exam, dissertation defense, however this is strongly discouraged. After advancement to candidacy students must be continuously registered for a minimum of 1 graduate credit per term (excluding Summer) through to graduation.

Additionally, students must continually make satisfactory academic progress towards their Ph.D. Progress will be judged on an annual basis by the relevant advisory committee at meetings held with the student (Section III.E.). In the student's third year, academic progress will be assessed during the prospectus exam. The student's academic progress will be graded either "satisfactory" or "unsatisfactory" and recorded on the Chemistry Graduate Student Progress Form. This form will be completed at the conclusion of every committee meeting. The student will be provided with a copy of this form which will contain specific feedback for the student, including areas of concern. In cases where a student's academic progress has been deemed unsatisfactory by the committee the Chemistry Graduate Student Progress Form will include specific items that need to be addressed by the student prior to the next committee meeting. Unsatisfactory academic progress will result in a second meeting of the student with the relevant committee in the following term (no earlier than three months). During this meeting the student is afforded an opportunity to respond to the committee's feedback but should address all feedback provided in the Chemistry Graduate Student Progress Form and demonstrate adequate academic progress. If academic progress is still deemed unsatisfactory as determined by the advisory committee, the student's admission to the program will be canceled after departmental review. In some cases, students dismissed from the Ph.D. program will be granted admission to either the M.S. or M.A. programs. A copy of this recommendation will be transmitted to the student.

C. Maintenance of Graduate Assistantship

To be eligible for a graduate assistantship a graduate student must be in good academic standing and have made satisfactory academic progress over the past year. Academic progress is determined on an annual basis at the student's annual meeting (see above). The student must have their academic progress assessed by their committee each academic year that they are in the program in order to maintain eligibility for a graduate assistantship. Failure to hold an annual committee meeting will result in the loss of eligibility to hold a graduate assistantship. Students on academic probation are ineligible to hold a graduate assistantship, either TA or RA. To be eligible for a graduate assistantship, students must also enroll in and successfully complete 9 graduate level credits each term. A student may register for more than 9 credits but the tuition remission granted by the department covers only 9 credits and the student will need to pay the extra tuition costs out-of-pocket. Graduate assistants are expected to devote full time to their studies, teaching, and

research duties. Students are strongly discouraged to hold any outside employment while on assistantships (RA or TA) and any outside employment opportunities should be discussed with the research adviser, graduate program director and Department Chair. In addition, students expecting a graduate assistantship in the form of a TA must perform teaching duties satisfactorily each term in order to qualify for reappointment by the Department Chair; failure to do so may lead to the loss of a teaching assistantship. Ph.D. students in good standing will only be supported on assistantships for a maximum of five (5) years. GA support beyond 5 years will only be granted on a case-by-case basis if there are available assistantships.

D. Residency Requirement

Students must meet the university's residency requirements, which is most commonly achieved by at least three consecutive terms in full-time (at 9 credits per term) residence at Portland State University after admission to the doctoral degree program. A minimum of three years in graduate study is also required.

E. Leave of Absence

Under special circumstances, including parental leave, requests for a leave of absence of up to one year may be approved by the Department Chair in consultation with the student's Research Adviser or the GAC. Such applications must be filed with the Graduate School no later than the last day to register for classes in the term in which the request is made. No more than two leaves of absence will be approved. Only students in good academic standing can be granted a leave of absence. Leaves of absence are included in all university time limits for progress through the Ph.D. program, *i.e.* they do not stop clocks.

F. Withdrawal / Change to the M.S. Program

Any student who ceases to be enrolled for more than one academic term without formal leave of absence will be assumed to have withdrawn from the degree program and have their admission to the program canceled by the Chemistry Department. The student may be readmitted only with the consent of the GAC. This provision does not include the summer term.

Students wishing to change to the M.S. degree program should file an M.S. degree program admission application with the GAC and consult with the GAC or Department Chair. The two-year time limit for assistantship support for the M.S. degree would also include any time spent on support in the Ph.D. program.

Form: <https://www.pdx.edu/gradschool/request-change-program-go-19-form>

Ph.D. students have the option of preparing and defending an M.S. thesis during the progress toward their Ph.D. dissertation, with the Research Adviser's consent, however the student must inform the GAC of this intention by the time of their first taking of the Ph.D. comprehensive exam. Attainment of a M.S. degree concomitant with the Ph.D. requires the following:

- Completion of the 24 credit formal course requirement (these same courses can also be used for the Ph.D. requirements)
- Completion of a literature-based seminar (this is *distinct* from the research-based seminar required for the Ph.D.)
- Formation of a Thesis Advisory Committee (can be the same as the DAC, but a GO-16M is required)
- Completion of research that is formally distinct from that used for the Ph.D.
- Preparation of a properly formatted and approved M.S. thesis
- Oral defense of this research work
- 6 credits of CH503 in the term of their M.S. thesis defense, which must be completed successfully by the end of the Winter term of their third year.

The concomitant attainment of an M.A. degree while pursuing a Ph.D. degree is not allowed.

G. Completion of Program

The awarding of a degree during a specific term involves the following steps, which must be met by certain deadlines.

- Apply for graduation by the term deadline (<https://www.pdx.edu/gradschool/graduate-candidate-deadlines>).
- Submission of the completed dissertation to the DAC at least two weeks prior to the defense.
- Passing the dissertation defense before the deadline for the term deadline.
- Completing all revisions to the satisfaction of the DAC prior to the term deadline.
- Ensuring that you have met all Ph.D. degree requirements.
- Complete the Electronic Dissertation formatting and submission process.

Exact due dates are posted by the Graduate School but it is advisable for the student to finish the requirements well ahead of the deadline to allow leeway for unexpected delays. All forms should be turned in to the Chemistry Department Office for routing to the Graduate School by the posted deadlines. Any Incomplete or In Progress grades (except CH603) must be removed no later than two weeks before graduation.

H. Expectations and Strategies for Success

The expectations to successfully complete the chemistry PhD program at PSU are described in detail above. In summary, a student must complete 24 credits of formal course work, 27 credits of CH603CE after advancing to candidacy, a minimum of 81 total credits (including research credits), a passing grade on the Comprehensive and Prospectus exams, a 4th year departmental seminar and a passing grade on the final dissertation defense. A timeline of these milestones is provided in the appendix below (Section V.A.). The culminating event for the PhD degree is the dissertation defense in which the student describes the findings and conclusions of the original research conducted during the program of study. Therefore, the primary activity of the graduate student during the 5-year timeline outlined below is *research*.

A key part of success in research is time management. Other aspects of the degree program will require the students time (i.e., course work, comprehensive and prospectus exams) as will TAing.

Therefore, it is imperative that students manage their time accordingly and prioritize conducting research on a daily basis. Except in special cases (i.e., computational chemistry or chemistry education), the primary location of research is in a laboratory with specialized equipment. As a result of requiring specialized equipment on a daily basis, working from home is rarely, if ever, appropriate. Students should always discuss with their research adviser if working from home is appropriate for them. When students are not in class or TAing they should plan to spend the remainder of their time in the laboratory conducting experiments or in their research group office analyzing the results of said experiments. A consistent schedule is helpful for time management and so, to train for their career after the PhD, students should plan to spend the “work day” (i.e., 9-5 as a minimum) at PSU and in the lab whenever physically possible. Each area of chemistry is unique and the research adviser is the best resource for planning your research and they may have more specific recommendations for how much time is needed to conduct the research in the subspecialty. Much like undergraduate studies, there is a correlation between the grade obtained (success) and the time spent on studying (research).

In addition to time management, there are several other strategies for success in research. 1) Read the literature. 2) Use SMART goals to plan research experiments. 3) Discuss research plans with the research adviser and actively seek their feedback. 4) Keep careful notes of all experiments in the lab notebook. 5) Summarize groups of experiments to gain more insight into a line of research. 6) Communicate the results of research clearly and often (daily or weekly) to the research adviser; even negative results are important data points. 7) At the end of each term, summarize results in a word document or power point presentation so that you can see the progress made and set goals for the next term; this will make writing the prospectus and dissertation documents much easier.

A final aspect of success in graduate school pertains to mental health. Original research is challenging and the answers are not easy to find. It requires hard and sustained effort and deep intellectual insight to uncover new chemical phenomena. There will be times during the course of a PhD in which a student will be “stuck” and experience immense intellectual frustration. It is therefore important to have activities (e.g., rock climbing, yoga, birding, reading, role playing games, etc) that allow the student to take a mental break from their research, and that students engage in these activities on a regular basis (daily to weekly). Longer breaks are also important so

that students can rejuvenate and reset. Vacation time must not interfere with scheduled duties of a graduate assistantship and should be discussed with and approved by the research advisor.

V. Appendix

A. Project Timeline Summary

The following is the expected 5-year Ph.D. degree program

- Fall term, year 1:
 - Formal coursework (1 or 2 classes)
 - Survey of Faculty Research and adviser selection
 - TA training
 - TAing
 - Winter term, year 1:
 - Formal coursework (1 or 2 classes)
 - Research (CH601)
 - TAing
 - Spring term, year 1:
 - Formal coursework (1 class + CH610 *Scientific Communication*)
 - Research (CH601)
 - TAing
 - Committee meeting with IAC
-
- Fall term, year 2:
 - Formal coursework (1 class+CH610 *Comprehensive Exam*)
 - Research (CH601)
 - TAing (if applicable)
 - Winter term, year 2:
 - Formal coursework (1 class)
 - Research (CH601)
 - Oral Comprehensive exam
 - TAing (if applicable)
 - Spring term, year 2:
 - Formal coursework (1 class)
 - Research (CH601)
 - Retake of written/oral parts of Comprehensive Exam (if needed)
 - Committee meeting with DAC
 - TAing (if applicable)
-
- Fall term, year 3:
 - Research (CH603)

- TAing (if applicable)
 - Winter term, year 3:
 - Research (CH603)
 - Prospectus exam
 - TAing (if applicable)
 - Spring term, year 3:
 - Research (CH603)
 - Retake of written/oral parts of Prospectus Exam (if needed)
 - TAing (if applicable)
-

- Fall term, year 4:
 - Research (CH603CE)
 - 4th year seminar
 - TAing (if applicable)
 - Winter term, year 4:
 - Research (CH603CE)
 - 4th year seminar (if not completed in fall)
 - TAing (if applicable)
 - Spring term, year 4:
 - Research (CH603CE)
 - 4th year seminar (if not completed in fall or winter)
 - Dissertation defense (if ready) or committee meeting
 - TAing (if applicable)
-

- Fall term, year 5:
 - Research (CH603CE)
 - Dissertation defense (if ready)
 - TAing (if applicable)
- Winter term, year 5:
 - Research (CH603CE)
 - Dissertation defense (if ready)
 - TAing (if applicable)
- Spring term, year 5:
 - Research (CH603CE)
 - Dissertation defense
 - TAing (if applicable)

B. List of Abbreviations

DAC – Dissertation Advisory Committee

GAC – Graduate Affairs Committee

IAC – Initial Advisory Committee

NP – No pass

P – Pass

PSU – Portland State University