



Master of Science (M.S.) in Chemistry
GRADUATE STUDENT GUIDE

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INTRODUCTION

The Western Washington University Chemistry Department welcomes you to the Master of Science program! We are pleased that you have accepted our offer of admission and hope you will find your stay at WWU and the Bellingham area to be professionally and personally rewarding.

The department has approximately 25 graduate students enrolled in its program, with interests covering a range of fields within the chemical sciences. These areas include analytical, organic, inorganic, physical, and computational chemistry, as well as biochemistry and materials science. Each year, in addition to the graduate students, the department serves more than 1500 undergraduates from a variety of B.A., B.S., and combined major programs. The department is strongly committed to quality instruction at both the undergraduate and graduate levels, and personal interaction with faculty will be an important component of your graduate education at WWU.

This guidebook is for graduate students in the Chemistry Department who are pursuing the Master of Science (M.S.) degree via a traditional thesis option, which includes upper level coursework and an original, independent research project. As you progress through this program, there will be certain departmental and Graduate School requirements that have to be met. The purpose of this guidebook is to help you understand and complete these requirements. As a complement to this guide, additional details, forms, and information can be found at the following links:

Department of Chemistry Graduate Program Homepage:
<https://chemistry.wvu.edu/>

Graduate School Homepage:
<https://gradschool.wvu.edu/>

Program Requirements and Electronic Forms for Current Graduate Students:
<https://gradschool.wvu.edu/program-requirements>

Degree Completion Deadlines:
<https://gradschool.wvu.edu/degree-completion>

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MASTER OF SCIENCE IN CHEMISTRY (THESIS OPTION)

GETTING STARTED

This section details some important initial steps to help you successfully begin your graduate studies. These include choosing a research advisor, enrolling in your first courses, and beginning to formulate plans for graduate research. In addition to the program specific information given below, you may also find useful details on the [New Student Checklist](#) available on the WWU Graduate School website.

Selecting a Research Advisor. A student's research advisor plays a critical role in their graduate school experience. Choosing an advisor is accomplished by contacting chemistry faculty whose research interests you and reaching a mutual agreement with the faculty member. When contacting chemistry faculty, students are encouraged to inquire about current research projects, as well as the availability of open research positions. It is recommended that students begin this process prior to the start of the M.S. program. Information about faculty research may be found on the Chemistry Department [website](#).

Financial Support. M.S. students may be eligible for financial support in the form of a graduate Teaching Assistantship (TA) or a graduate Research Assistantship (RA).

Candidates for TAs will have received *full admission* to the M.S. program. Students will typically hold a TA position for no more than 6 quarters of enrollment. To ensure continued eligibility for TA support, students must maintain a GPA of 3.0 during their graduate studies. The duties of a graduate TA include instruction, course/lab preparation, and grading in a variety of undergraduate laboratory courses. A typical teaching assignment consists of 20 hours per week (200 hours per quarter).

Individual chemistry faculty members may also have external research grants that include financial support for students in the form of RAs. Students interested in RAs should discuss this possibility with prospective faculty research advisors.

In some cases, admitted students who are not offered graduate assistantships may qualify for state or federal work-study funds. The Financial Aid Office distributes these funds on the basis of financial need. To receive financial aid at WWU, students must apply using the Free Application for Federal Student Aid (FAFSA). The FAFSA must be submitted annually. For more information, go to the WWU Financial Aid Office web page (<http://www.finaid.wvu.edu>).

Advising and Course Registration. Students are expected to make an appointment with the Graduate Program Advisor to review undergraduate preparation and to select courses for their plan of study. After this advising meeting, overrides will be processed so that students may register online using the WWU Web4U system. Registration instructions may be found on the WWU Registrar's [website](#).

REQUIREMENTS FOR THE M.S. DEGREE (THESIS OPTION)

Graduate Plan of Study. An official Plan of Study must be filed with the Graduate School by the end of the first quarter of enrollment. The Plan of Study outlines the schedule of courses for the entire graduate program, and serves as a means for the Graduate School to determine whether all requirements for the M.S. degree have been satisfied. The plan must account for at least 45 total credits, and will include the following required courses:

- CHEM 595 (student presentations), 2 credits (2 x 1 credit/quarter)
- CHEM 596 (seminar attendance), 3 credits (3 x 1 credit/quarter)
- CHEM 597G (thesis writing), 1 credit
- CHEM 690 (thesis writing credits), 12 credits (usually 2 x 6 credits/quarter)

Additional courses are selected under the advisement of the Chemistry Department Graduate Advisor. Under normal circumstances, each student is expected to take 2-3 upper division lecture courses at the 500-level. Additional courses will include credits for independent research and may include coursework specific to those students holding Tas (CHEM 502, teaching practicum).

The maximum academic load for graduate students is 20 credits per quarter, however a typical course load for chemistry graduate students is 8 credits per quarter. Students enrolled in 8 credits are considered *full time* for purposes of financial aid and eligibility for veteran's benefits. In most cases, enrollment in 8 credits is also required for TA eligibility. Some flexibility in this policy is possible for students at the end of their graduate program whose only remaining requirement is completion of the thesis. Questions about this situation should be directed to the Graduate Program Advisor.

A draft of the Plan of Study will be developed with the Graduate Program Advisor during the initial advising meeting. Students are strongly encouraged to discuss this plan with their Research Thesis Advisor. The Plan of Study will be completed with the Graduate Program Advisor in Degree Works using the Plans function. Changes to the Plan of Study may be made after approval of the Graduate Program Advisor.

Seminar Attendance (CHEM 596). All graduate students are required to attend the weekly Chemistry Department seminars, and must register for CHEM 596 *at least 3 times* during their graduate studies. Seminars provide an ideal opportunity to learn about current research outside the department. Attending seminars is also instructive on how to give technical seminars.

Department seminars are held on Fridays at 3:15 PM, though occasionally special seminars will be held at other days/times. The seminar schedule may be found on the Chemistry Department web page. Written summaries (~1 page typed) of seminars are typically required and must be submitted to the Faculty Seminar Coordinator (listed as that quarter's CHEM 595 and 596 instructor). The number of written summaries required for a 'satisfactory grade' will be determined by the Faculty Seminar Coordinator.

Selecting the Thesis Committee. The Research Advisor will serve as the chairperson of their student's thesis committee. Two additional faculty members must be selected to complete the thesis committee. At least one of the two additional members must be tenure track faculty from the Chemistry

Department. The final committee member may come from any appropriate academic unit within the university, and may hold a tenure track or non-tenure track position. Committee members must be carefully selected, as it is expected that the composition of the committee will not change. The members of the thesis committee must be finalized before the student's proposal presentation.

Preliminary Proposal (1st credit of CHEM 595). Each graduate student must give two presentations, the first of which is termed a *Preliminary Proposal*. This presentation will be closed to the public and is attended by faculty only. It is mandatory that all members of the Thesis Committee (see above) are present, though it is permissible that other interested faculty attend. The purpose of this meeting is to allow discussion of the student's research goals for the remainder of their graduate program, for the committee to ensure that these goals are reasonable and of sufficient merit, and to ensure that the student is on track toward completing their degree. During the quarter in which the proposal is given, students will enroll in one credit of CHEM 595. *Normally, the proposal will be given by the end of the third quarter of study unless permission for a later date has been obtained from the Graduate Program Advisor.* It is the student's responsibility to arrange a date with all members of the Thesis Committee as soon as possible, but no later than two weeks prior to the start of the quarter in which the proposal is to be given.

When developing the Preliminary Proposal, it is important that students work closely with their Research Advisor. The presentation itself should be approximately 20-30 minutes in length, however students should expect an interactive question/answer format. To accommodate extended discussion, students should reserve a 1 hour time block for completion of the Preliminary Proposal. Topics may include primary literature review of the specific thesis topic and an overview of the research plan—what problem/question is being investigated, and what research methods will be used. It is also expected that preliminary research results obtained by the student will be presented.

Successful completion of the Preliminary Proposal is required for Advancement to Candidacy (see below), and failure to satisfactorily complete this step may result in dismissal from the MS program. In the event that a student's proposal presentation is deemed unsatisfactory, the Thesis Committee has the option to assign a grade of 'K' and should then develop a plan with the student for correcting aspects of the proposal that were deemed insufficient.

Advancement to Candidacy. Advancement to candidacy is a formal recognition that students have demonstrated satisfactory performance during their first year of graduate study. Satisfactory performance includes maintaining a 3.0 GPA in at least 12 credits of graduate work and successful completion of the Preliminary Proposal. Once these activities have been completed, the Thesis Topic Approval electronic form should be filed with the Graduate School. This form is available in the [Thesis](#) section of the Graduate School website. The form will include the names of the thesis committee members as well as a brief abstract (~200 words) summarizing the motivation and methods for the student's research project.

The Thesis Topic Approval form needs to be approved by all thesis committee members, the Chemistry Department chair, and the Graduate School. After the form has been approved, students will receive a notification from the Dean of the Graduate School. In most cases, students will be eligible for advancement to candidacy, and therefore should file the Thesis Topic Approval form, by the end of the first year of graduate study.

Writing the Thesis (CHEM 597G and 690). In the fall of their second year, students that have been advanced to candidacy must enroll in CHEM 597G Thesis Writing. This one credit seminar style course gets students started on the process of writing their thesis. Once students have completed a sufficient body of work, they may register for CHEM 690 (Thesis). Students may register for 2-6 credits of CHEM 690 per quarter for a total of 12 credits. Typically, students will enroll in 6 credits per quarter of CHEM 690 during their final two quarters of enrollment. Initially, a grade of "K" (incomplete) will be given for CHEM 690 until the final thesis has been accepted by the thesis committee. At this time, the thesis committee chairperson will assign a final grade using the Degree Recommendation (Thesis) electronic form available in the [Degree Completion](#) section of the Graduate School website. Further details regarding this step are provided on page 5.

It is critical to recognize that writing the thesis is a substantial undertaking and students must allocate a large amount of time to complete the process. As a rule of thumb, a first draft should be completed prior to the quarter in which a student plans to graduate. In writing the thesis, material must be organized into a series of logically arranged sections that lead from one topic to the next. It is usually possible to find several ways to organize the presentation, and it is important for students to consult with their Research Advisor to establish proper organization.

In addition to the guidance provided by the Research Advisor, the actual format of the thesis must follow the [Thesis Manuscript Guidelines](#) found on the Graduate School website. Students may also wish to consult the *ACS Style Guide, A Manual for Authors and Editors* for discipline-specific formatting guidelines. Other good resources include *The Art of Scientific Writing* by Ebel, Bliefert, and Russey and *How to Write a Successful Science Thesis: The Concise Guide for Students*, by Russey, Ebel, and Bliefert. Finally, writing support for graduate students is offered by the WWU Hacherl Research-Writing Studio (<http://library.wvu.edu/rws/graduate-students>).

Research Advisors should receive a first draft of the thesis with sufficient time for review prior to the defense. Based on the advisor's recommendations, appropriate changes should then be made. After the thesis has undergone sufficient revisions, the penultimate draft of the thesis is circulated to the entire thesis committee for comments and approval. Rewriting should be anticipated at each stage of this review process. *The committee must have at least two weeks to read the thesis before the student is scheduled to defend it.* Upon receipt of the thesis committee's recommendations for changes, students should make the final revisions and prepare the thesis in the final form. It is possible that the thesis committee may insist upon more than one opportunity to review the thesis draft. In no case should the final thesis be submitted to a committee member who has not seen previous drafts. In most cases, the final version of the thesis is completed, approved, and submitted to the Graduate School shortly after the student has completed their thesis defense. It is critical that all deadlines related to thesis preparation and submission are followed for the quarter in which a student intends to graduate (<https://gradschool.wvu.edu/degree-completion>).

Application for the M.S. Degree. In the *quarter prior* to the quarter in which graduation is planned, students must submit the Application for Degree electronic form found in the [Degree Completion](#) section of the Graduate School website. Approval should be obtained from the student's Research Advisor before submitting this application. It is critical that all relevant deadlines are met for submission of the degree application (<https://gradschool.wvu.edu/degree-completion>).

Thesis Defense – Seminar (2nd credit of CHEM 595) and Oral Examination. The thesis defense consists of both a public seminar and a private oral examination. A seminar date must be arranged with the faculty member in charge of the seminar program (the CHEM 595 instructor) as soon as possible but no later than two weeks prior to the start of the quarter in which the seminar is to be given. After choosing a suitable date, official scheduling of the thesis defense is accomplished by submitting the Oral Defense Schedule electronic form available in the [Oral Defense](#) section of the Graduate School website. Students must also ensure that the date of the defense seminar meets the deadline stipulated by the Graduate School (<https://gradschool.wvu.edu/degree-completion>) for the quarter in which they intend to graduate.

The seminar portion of the defense is a presentation of the final data, scientific analyses, logic, and conclusions that have been presented in the written thesis. This presentation, including time for questions, should be confined to a 50-minute period. It is important that students work closely with their Research Advisor in developing their final seminar. This seminar also fulfills the second required credit of CHEM 595, and therefore students should enroll in one credit of CHEM 595 for this quarter.

Immediately following the research seminar, the student will participate in a private oral examination administered by their full thesis committee. There are two purposes for holding a private oral thesis defense. First, it provides a demonstration that the student is capable of orally defending the research and conclusions of their thesis project. Second, it allows the faculty to determine the scientific merit of the methods used, the adequacy of the data, and the validity of the conclusions presented in the defense seminar and the thesis document. In addition to the thesis committee, the Graduate Dean may appoint a member of the Graduate Council as a representative to attend this portion of the thesis defense. In those cases, a copy of the thesis should be available for the Graduate Council representative 10 days prior to the oral presentation. The Graduate Council representative attends the final examination in part to judge whether the examination has been conducted fairly. The Graduate Council representative may also ask questions during the oral examination.

In the event that a student does not satisfactorily complete any portion of the thesis defense, they may be given a second opportunity after a time interval determined by the thesis committee. This will include sufficient time to allow for the correction of any deficiencies and errors.

Final Steps for Thesis Submission. Once the final thesis revisions have been completed, it is ready for submission to the Graduate School. This is achieved electronically following the instructions provided in the [Thesis Submission](#) section of the Graduate School website. *Be sure to carefully follow all instructions to avoid delays.* While the majority of the thesis is submitted electronically, a hard copy of the committee signature page that has been signed by each of your committee members must also be provided. Thesis submission must also meet the appropriate deadline stipulated by the Graduate School (<https://gradschool.wvu.edu/degree-completion>) for the quarter in which graduation is planned.

Degree Recommendation. The final requirement is submission of the Degree Recommendation (Thesis) electronic form available in the [Degree Completion](#) section of the Graduate School website. This form must be approved by the entire thesis committee and the Graduate Program Advisor, and must be received by the Graduate School by the dates given on the Graduate School website (<https://gradschool.wvu.edu/degree-completion>).

Graduate Student Checklist (Master of Science in Chemistry – Thesis Option)

The following checklist is provided as means to monitor progress through your graduate program. Additional details for all items have been provided in the preceding sections, including specific dates, access to electronic forms, and other information. Students should visit the following web address for specific dates regarding degree completion: <https://gradschool.wvu.edu/degree-completion>

Prior to the first quarter

1. Schedule/attend an advising meeting with the Graduate Program Advisor _____

Prior to / During the first quarter

2. Select a Research Advisor _____

Before the end of the first quarter

3. Submit a **Graduate Plan of Study** _____

Before the end of year one

4. Select a Thesis Committee _____
5. Give the Preliminary Proposal presentation _____
6. Schedule/attend a post-seminar advising meeting with the thesis committee _____
7. Advance to candidacy / submit the **Thesis Topic Approval** form _____

Two quarters prior to graduation

7. Register for CHEM 597G and begin thesis writing process _____

One quarter prior to graduation

8. Submit the **Application for Degree** form _____
9. Schedule the thesis defense and submit the **Oral Defense Schedule** form _____

During the final quarter

10. Submit advanced thesis draft to thesis committee two weeks prior to thesis defense _____
11. Submit **Oral Defense Form** _____
12. Complete the thesis defense (seminar and oral examination) _____
13. Submit the final version of the thesis to the Graduate School _____
14. Submit the **Degree Recommendation (Thesis)** form _____