

Youngstown State University
Department of Chemical and Biological Sciences
Master's Degree in Chemistry, Graduate Student Handbook
2021-2022

Preface

The Master's program in chemistry at Youngstown State University (YSU) is intended to prepare students for a career in chemistry by providing the tools for the development of independent thinking and creativity within the chemical discipline. The skillset developed here will enable students to achieve their career goals in chemistry or related disciplines such as medicine, law, or other professional endeavors. In this program students are expected to excel in the three areas of coursework, teaching, and research. During the program, students will: (1) take courses both within and outside of their respective research disciplines, (2) teach undergraduate laboratory sections under the supervision of a laboratory coordinator, and (3) perform research under the supervision of a research mentor, prepare a written thesis, and present it to the department via oral presentation.

This Handbook is a guide for current and incoming graduate students as well as faculty on the expectations for students and faculty members participating in the Master's in Chemistry program at YSU. This document will be reviewed and revised annually by the graduate program director and graduate committee as needed. While the rules outlined in this handbook are not inflexible, any potential waiver of the requirements must be petitioned in writing to the graduate program director for review by them and/or the graduate committee.

In addition to the materials outlined in this handbook students and faculty members are referred to the [College of Graduate Studies at YSU](#).

The Department of Chemical and Biological Sciences and the Master's program in Chemistry strives to create an inclusive work and study environment for all individuals regardless of gender identity, race identity, sexual orientation, religious affiliation, political affiliation, or age. Such an environment is only possible if all parties (students and faculty) actively engage with each other to work towards this important goal.

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I. Coursework

Students are required to complete 35 semester hours (SH) of coursework for their master's degree. In order to stay in good standing in the program and remain eligible for an assistantship, students must maintain a GPA of at least 3.0.

Required Courses:

Students must take the four following courses:

CHEM 6975 (1 SH) Introduction to Teaching Chemistry (to be taken the first year)
CHEM 6980 (3SH) Introduction to Chemical Research (to be taken in the first year)
CHEM 6981 (1SH) Seminar 1 (to be taken in the second semester)
CHEM 6982 (1SH) Seminar 2 (to be taken in the student's last academic (non-summer) semester)

Note that CHEM 6975 is for students who are on an assistantship that requires departmental teaching.

Students must take at least two of the following core courses.

CHEM 6911 (3SH) Advanced Analytical Chemistry 1
CHEM 6921 (3SH) Advanced Biochemistry 1
CHEM 6931 (3SH) Advanced Inorganic Chemistry 1
CHEM 6941 (3SH) Advanced Organic Chemistry 1
CHEM 6951 (3SH) Advanced Physical Chemistry 1

Students must take an additional 9 SH of at the 5000 or 6000 level for a total of 15 content course hours. After the first semester courses should be chosen in consultation with the student's research advisor.

CHEM 6990 (14 SH) *Thesis Hours to be spread over the entirety of the master's curriculum*

Sample Curriculum:

Year 1 Fall Semester	Year 1 Spring Semester
CHEM 6975 (1 SH) CHEM 6980 (3 SH) CHEM 69XX (3 SH) CHEM 69XX (3 SH) <i>Teaching Practicum (2SH)</i>	CHEM 6981 (1 SH) CHEM 69XX (3 SH) CHEM 6990 (4 SH) <i>Teaching Practicum (2SH)</i>
Year 2 Fall Semester	Year 2 Spring Semester
CHEM 69XX (3 SH) CHEM 6990 (5 SH) <i>Teaching Practicum (2SH)</i>	CHEM 6982 (1SH) CHEM 69XX (3 SH) CHEM 6990 (5 SH) <i>Teaching Practicum (2SH)</i>

Note that the teaching practicum courses count towards the necessary credit hours to maintain full graduate student status (9 SH) for a given semester, but they do not count towards the 35 SH necessary for graduation.

Seminar

The Chemistry Division of the Department holds weekly seminars (Fridays at 3:00 pm). All graduate students are required to attend these weekly seminars, even if they are not enrolled in 6981 or 6982. This is a great opportunity for students to expand their chemical horizons beyond their current interests, as well as meet chemists from other universities and companies. These networking opportunities could help with admission into doctoral programs or future employment.

Academic Misconduct:

All graduate students are subject to uphold the principles and rules outlined in the [YSU student code of conduct](#). In addition to the code, the Master's program in Chemistry expects our students to conduct themselves with the utmost integrity both when they are in the classroom as students and when they are in front of the classroom as instructors.

If a graduate student is caught committing any act of academic misconduct, they should be given an automatic failing grade for the course, be compelled to complete a single-spaced paper no less than 5 pages detailing their particular act of misconduct and the effect it has on the scientific enterprise as a whole.

If a graduate student is caught committing a second act of academic misconduct, regardless of the severity of the second act, they may be dismissed from the program, without the conferring of a degree, at the completion of the academic semester. Any dismissed student is eligible for readmission. Readmission applications must be in writing to the GPD who will render a readmission decision in consultation with the graduate admissions committee. Note readmission into the program does not guarantee reinstatement of the assistantship.

If the initial act is so egregious then it is at the discretion of the Department to take additional actions against the student including, but not limited to the revocation of a teaching assistantship and all forms of departmental financial support.

II. Teaching

Students on assistantship from the department/graduate school will be required to teach laboratory sections.

Over the course of a given semester a (teaching or graduate) assistant will typically be assigned 2-3 laboratory sections. The sum total of sections over a four-semester period (two academic years) shall not exceed 10-12 laboratory sections, but not be less than 8 sections. Under select circumstances an assistant may be granted teaching credit for performing laboratory preparation work that goes beyond the standard requirements of a given assignment. Additionally, students may be supported by grants from their research advisor or a university Cushwa fellowship. In these instances, the maximum and minimum teaching duties will be pro-rated for the amount of semesters the student was under assistantship.

It is the graduate student's responsibility to:

- 1) Maintain a safe teaching environment including but not limited to: ensuring that everyone in the lab is wearing proper personal protective equipment (PPE)
- 2) Maintain an inclusive teaching environment free from discrimination and harassment.
- 3) Show up on time and be prepared for class.
- 4) Show up on time and be prepared for meetings with the assigned laboratory coordinator.
- 5) Handback graded material in a timely manner within one week of receipt of the assignment.
- 6) Submit final laboratory grades on time (as determined by the laboratory coordinator)
- 7) Schedule (and maintain weekly office hours (two hours a week). These can be administered either in person or via an appropriate digital platform (Webex, Zoom, etc.)

Graduate students are prohibited from pursuing personal (both romantic and platonic) relationships with students in their courses while they are their instructors. If a graduate student is already has a personal relationship with one of the students in their class, then it is the graduate student's responsibility to notify the laboratory coordinator, graduate program director, and the department chair immediately.

In addition to these responsibilities, individual laboratory coordinators may impose additional responsibilities/requirements necessary for effective teaching of their laboratory courses.

If a student fails to meet the responsibilities outlined above, then they can be subject to disciplinary actions (see below), revocation of their assistantship, or expulsion from the program.

Disciplinary actions will be metered out in the form of a point system. The awarding of disciplinary points must be communicated in writing to the disciplined graduate student, the graduate program director, the department chair, and the laboratory coordinator (if necessary). If a student receives enough points (see below) this can result in revoking of an assistantship or dismissal from the program.

If a student at any time is late for a teaching assignment (definition of lateness is 5 minutes past the start time), they will receive one point. If they fail to show for a given class (defined as being 30 minutes late) without arranging for an appropriate replacement and getting approval from the supervising laboratory coordinator they will receive four points. Additionally, failure to comply with basic laboratory safety protocols can result in the receipt of points, the magnitude of which is dependent on the offense.

If a student at any time is late for assigned office hours (definition of lateness is 5 minutes past the start time), they will receive one point. If they fail to show (defined as being 30 minutes late) without arranging for an appropriate replacement or getting approval from the supervising laboratory coordinator, they will receive 4 points

Students who receive an accumulated 10 points across multiple semesters or 5 points in a single semester may have their assistantship revoked at the conclusion of the current semester. Students who have their assistantships revoked can have it restored, but this is not guaranteed and is dependent on student behavior and availability.

III. Research

Conducting research is an integral component of the master's program at YSU. Students are required to choose an advisor, conduct research, organize a thesis committee, undergo a pre-thesis review, write a thesis, and present that thesis via oral presentation to the department.

Choosing a research advisor.

Choosing a research advisor may be the most important decision a student makes during their graduate program. As such, all graduate students are required to meet with at least three faculty members to discuss potential research opportunities in the advisor's lab. At the end of these meetings if both the student and potential advisor agree, then the student can join that lab.

This process must be completed by the end of the student's first semester. However, it is highly encouraged that this process be completed within the first six weeks of the student beginning the program. Two years is not a long time to conduct research and it is in the student and the advisor's best interest to begin that process as soon as possible.

Conducting Research

Research projects will be conducted under the supervision of the research advisor. Scope and appropriateness of the project is up to the discretion of the advisor.

Organizing a Thesis Committee

At the conclusion of the student's first full year in the program they are to organize a thesis committee. The committee must include a minimum of three members (including the research advisor). The committee should be comprised of at least one faculty member from inside the research advisor's own sub-division and at least one member from outside the sub-division. The five sub-divisions are defined as: organic, biochemistry, physical, analytical chemistry, and inorganic/materials.

It is the research advisor's responsibility to organize the pre-defense meeting (see below). Committee members can be any full-time departmental faculty member.

Outside the department/university members can serve on thesis committees with consent of the graduate program director and department chair.

Pre-defense Examination

- (a) At the beginning of the student's fourth semester the student's thesis committee will call the student to submit a draft of their thesis to the thesis committee. This should be submitted one week prior to the pre-defense oral exam (see below).

The written document should include drafts of the following sections: introduction, results/discussion, and experimental (approximately 20 total pages double spaced). These sections need not be complete, but should demonstrate that the student is working towards an acceptable (as deemed by the committee) thesis.

The introduction should include relevant literature with proper citations focusing on why the conducted research is important and what the student was hoping to accomplish during their research.

The results/discussion section should include any significant findings the student observed. If the student has none, then that should be stated AND explained.

The experimental section should include experimental write-ups of all experiments performed in the style required by the discipline. Full characterization of compounds should be included. Raw data can be included (but won't count towards the page count) if the student and mentor believe it is appropriate.

Each section can be about five pages and end abruptly since they are incomplete. The committee is only ensuring the student is on an appropriate and timely path to graduate.

(b) By the third week of the student's fourth semester, the student's thesis committee will call the student to present in a closed session to the assembled thesis committee a 20-30 minute presentation outlining the following:

- 1) The research question being asked
- 2) The significance of their research
- 3) The data and experiments undertaken to answer the research question
- 4) The experiments needed to finish prior to the proposed defense date

After completion of the presentation and answering the questions of the committee, the student will leave the presentation room, allowing the committee to deliberate its recommendations at which time the student will be given a grade of Go/No go.

(c) Go/No Go Decision:

The committee will make the Go/No go decision based on following criteria: Note this decision is made based on both the written AND the oral presentations.

- 1) Has the student done enough work to warrant a Master's degree within the proposed window of graduation (end of fourth semester, middle of summer, perhaps a fifth semester)?
- 2) Does the student understand their research to a level consistent with the degree?

If a student earns a Go then they can move forward and the committee and the research mentor will propose a defense date. If a student earns a No go they will be given recommendations by the committee that must be completed and discussed at a

second data meeting (at a time to be determined by the committee) before the student can move forward with planning a defense.

Written and Oral Thesis Defense.

(a) Written Thesis

The student's written thesis should be in compliance with the guidelines outlined by the YSU College of Graduate Studies. While the writing should conform to the standards of their discipline, written theses should include an introductory section, a results and discussion section, and experimental section (complete with relevant experimental details, spectra, characterization, etc., and a conclusion section).

Copies of the 'finalized' form of the thesis must be submitted to the committee at least one week in advanced of the oral defense.

At the oral defense (or prior to) the committee members will present the student with comments and/or edits for the student to address prior to the committee member signing their thesis.

(b) Oral Defense

The oral defense will consist of two portions. First, a publicly held AND advertised presentation on the student's research. It is incumbent on the student to advertise (or to arrange for advertising) both via email and flyer for their defense a minimum of 48 hours in advance. Second, a closed portion consisting of the student and the committee members will immediately follow the public portion, in which the committee members will question and discuss the student's work in private.

(c) Passing and Failing a Thesis Defense

A student passes their thesis defense if and when all members of the committee award the student a passing grade by 'signing the thesis'.

If a student fails to receive a passing grade on either their written or oral thesis, then the student must repeat the entirety of the defense process. Each student will be given a maximum of one additional attempt to pass their thesis defense as determined by the committee. If a student fails their defense in either written or oral form, they cannot disband the original committee and reform a new committee without expressed consent from the original committee members.