

Non-Thesis MS Roadmap – Spring 2020

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Chemistry Administrative Assistant: Veronica Garcia

Chemistry Department Chair: Joshua Pak

Chemistry Graduate Program Committee (GPC): Andy Holland, John Kalivas, Kavita Sharma

Last modified April 10th 2020

Graduate Degrees in the Department of Chemistry

The Chemistry department offers three different graduate programs, each intended to serve a different type of student. Although these degrees all include the letters “MS” and all require 30 credits of graduate coursework including 15 6600-level credits focused in chemistry, each carries a unique set of privileges and expectations, and students should not expect to freely switch between them after starting one program. In particular, BS/MS students will be asked to reapply to the graduate school if they wish to move to either standalone MS program.

The **Thesis MS** is a two-year research-centered degree. While it requires significant coursework, this program emphasizes year-round laboratory research, including one summer, and culminates in the writing of an original thesis. At the close of the program, each student presents and defends their thesis. Thesis MS students are fully eligible to receive research or teaching assistantships to help compensate them for the program’s substantial time commitments.

The **Non-Thesis MS** is a two-year coursework-centered degree. This track requires a significantly larger number of traditional courses, and only 4 credits of research (and no thesis credits) may be counted towards its requirements. The program concludes with written and oral exams on selected coursework subjects. While Non-Thesis MS students may choose to take on teaching assignments on a course-by-course basis, they are less likely than Thesis MS students to receive full-time teaching assistantships.

The **BS/MS** is an accelerated three-year program enabling undergraduate students to earn MS degrees in one additional year beyond the undergraduate degree by pursuing full-time summer research for two summers and beginning MS coursework before completing their undergraduate degrees. This program is intended for ambitious students seeking to deepen their engagement with chemistry as undergraduates, and to quickly burnish their credentials for applying to jobs or competitive PhD programs. The program concludes with the composition and defense of a research paper similar to a thesis. BS/MS students are fully eligible, like Thesis MS students, to receive research and teaching assistantships during all three years of the program.

Funding

A limited number of teaching assistantships, which award a full tuition waiver and stipend to students fulfilling three teaching assignments each semester, are awarded for the following year each April. To apply for consideration, a student should submit a brief personal statement, their transcript, and letters of reference ideally from current teaching and research supervisors. Research assistantships may also be available by arrangement with individual faculty.

Department-funded MS students must obtain permission from the GPC to maintain a non-university job during the first semester in the program. Thereafter, permission must be obtained from a student’s research committee. Additional employment by the University also requires permission from the Dean of the Graduate School.

Introduction to the Non-Thesis MS Road Map

This document outlines the procedural steps required for successful completion of a non-thesis MS degree in chemistry. The road map also describes your obligations in the MS program and departmental expectations of your performance. It is your responsibility to ensure that you are meeting all deadlines as you progress through the program. A checklist is provided on page 9 of this document.

Please note that this is an advisory document that is meant to assist your planning, rather than to define official university policy. For the authoritative version of all official policy definitions please see the ISU Graduate Catalog.

The following is a brief overview of the steps required to earn your degree, which requires a minimum of 30 graduate credits. Additional credits may be required to maintain full-time status.

Year One:

Fall Form an advisory committee, devise an initial program of study, and satisfy any remaining undergraduate prerequisites and/or GRE requirements.

Spring Continue coursework.

Year Two:

Fall Submit the Final Program of Study to the Graduate School, and apply for graduation with a MS degree.

Spring Schedule written exams for at least four weeks prior to graduation. Students showing areas of significant weakness on written exams will be asked to follow up in an oral exam.

Performance Expectations

You are required to maintain *good academic standing* in the MS program. This is accomplished by meeting Departmental, University, and Graduate School requirements as outlined below and in the Graduate Catalog. Specifically, the requirements for good standing include but are not limited to:

- Maintaining a minimum **overall** graduate GPA of 3.0
- Receiving no more than two grades below B– in graduate courses
- Submitting required paperwork in a timely manner
- Meeting all responsibilities of any teaching assignments
- Attending department seminars and local symposia when possible

Failure to maintain good standing may result in dismissal from the MS program or revocation of any departmental funding. These consequences are imposed at the discretion of the Chemistry Department Chair upon recommendation from the Graduate Programs Committee (GPC). If you are receiving funding, that funding is typically guaranteed only upon satisfactory progress and good standing, and only for the term initially indicated (usually one or two years). A degree will be awarded after that time only if satisfactory coursework has been completed. Continuation after that time will be subject to the approval of the GPC.

You are expected to attend all seminars sponsored by the Chemistry Department whether or not you are enrolled in the seminar course. Chemistry seminars are generally held on Friday afternoons at 1:00 PM. If you have unavoidable course or teaching assignment conflicts, you are excused.

You may request and receive various paid teaching assignments including laboratory supervision and grading. You are expected to meet all obligations of your assigned duties, including:

- Being present, punctual, and prepared at all meetings scheduled by your teaching supervisor.
- Completing grading on the schedule set by your supervisor.
- Delivering laboratory instruction and performing grading according to the standards set by your supervisor, prioritizing student safety and learning.
- Being professional and respectful in all interactions with students.

Getting Started

1. If you've taken on any teaching responsibilities or received other funding support, you must go to the personnel office in the Administration Building and fill out a few forms when you arrive on campus for the start of the fall semester. You may contact the chemistry administrative assistant for details. Be sure to contact the instructor to whom you are assigned, and to make fulfillment of these responsibilities your highest priority.
2. Form an advisory committee composed of an advisor in the Chemistry Department, a second member from Chemistry or an allied department, and the Chemistry Department chair. You may also opt to include a Graduate Faculty Representative (GFR) from outside your area of study, but are not required to do so. All committee members must be members of the ISU Graduate Faculty, all of whom are listed on the web page of the Graduate School.
3. With the aid of your advisory committee, devise an **initial program of study** that satisfies the requirements below. This program should include prompt fulfillment of any preconditions on your admission, such as completion of pre-requisite courses or satisfactory performance on the GRE.

Courses Required for Admission to the MS Program

You are expected to have completed the following courses before beginning the MS program. If you are missing any of them, you should discuss this with the chemistry department chair or your research advisor as soon as possible, and plan to complete them as early as possible in your program.

CHEM 1111,1112	General Chemistry I and II	9 cr
CHEM 2211,2213	Inorganic Chemistry I and Lab	4 cr
CHEM 2232,2234	Quantitative Analysis and Lab	4 cr
CHEM 3301,3302	Organic Chemistry I and II	6 cr
CHEM 3303,3304	Organic Chemistry Laboratory I and II	2 cr
CHEM 3351,3352	Physical Chemistry	6 cr
MATH 1170	Calculus I	4 cr
MATH 1175	Calculus II	4 cr
PHYS 2211,2212	Engineering Physics I and II	8 cr
PHYS 2213,2214	Engineering Physics I and II Laboratory	2 cr

If you have been granted conditional admittance without fulfilling the Graduate School's GRE requirement, you should seek to do so as soon as possible after you begin the program.

Requirements for Completion of the MS Program

The core curriculum of the non-thesis MS program is composed of the four graduate level advanced chemistry courses (CHEM 6609, CHEM 6630, CHEM 6655, and CHEM 6671). Note that only one of these courses is offered each semester, so you will only have one opportunity to take each class in a two-year schedule. Additionally, some of these courses have prerequisites in addition to the admission requirements listed above, which must be completed but might not themselves count toward graduate elective requirements – consider this when planning your schedule. While you are not required to take all of these courses, you must complete a total of at least 15 credits in 6600-level CHEM courses. The balance of coursework requirements will comprise seminar (CHEM 6601), and graduate electives that may be in chemistry or in related disciplines specific to your focus of study. The non-thesis degree concludes with a multi-part written exam administered by three of your graduate chemistry coursework instructors, which may be followed up by an oral exam to address any weaknesses in written work.

Students wishing to make research a substantial part of their degrees should pursue the thesis MS degree option, but non-thesis students may still count up to 4 credits of graduate research (among CHEM 5581, 5582, and 6635) toward their degrees. Note that after you take CHEM 6635 you will be required to maintain continuous registration, including summer semesters, until you graduate.

A minimum of 30 graduate credits is required, although a larger number of credits (9 graduate credits each semester) will be required to maintain full-time standing. Note that although these are the official requirements, every program of study must be approved by your advisory committee and signed by the Department Chair. Your final graduate GPA must stand above 3.0, and no more than two courses in which you earned grades lower than B- may be counted toward your final program of study.

Non-thesis MS Requirements

CHEM 6601	2 cr	
Additional CHEM/XXXX 66XX	13 cr	<i>no CHEM 6650, ≤4 cr CHEM 6635</i>
Graduate Electives*	15 cr	

*Graduate Electives may be 55XX or 66XX courses in CHEM or related disciplines, typically in the College of Science and Engineering or the College of Pharmacy. These classes should be selected in consultation with your advisor and must be approved by your advisory committee and the Department Chair. A total of no more than 4 research credits (CHEM 5581, 5582, or 6635) may be counted toward the degree.

Recommended Schedule for Non-Thesis Degree

The following schedule of coursework is recommended for students intending to maintain full-time status, although courses may be replaced by graduate electives provided that 15 credits of 6600-level courses are included. Be sure to consult with an advisor or the department chair if you wish to deviate from the courses outlined below. The sequence of the core advanced chemistry courses CHEM 6609, 6630, 6655, and 6671 will vary depending on the year you enroll.

First Year Fall

CHEM 6630	Advanced Analytical Chemistry	3 cr
XXXX XXXX	Graduate Coursework Elective	3 cr
XXXX XXXX	Grad Elective / Prereq Completion	3 cr

First Year Spring

CHEM 6601	Seminar (Literature Presentation)	1 cr
CHEM 6655	Advanced Physical Chemistry	3 cr
CHEM 5582	Independent Research	2 cr
XXXX XXXX	Graduate Coursework Electives	5 cr

Second Year Fall

CHEM 6671	Advanced Organic Chemistry	3 cr
CHEM 6635	Masters Research	2 cr
XXXX XXXX	Graduate Coursework Electives	4 cr

Second Year Spring

CHEM 6601	Seminar (Variable Subject)	1 cr
CHEM 6609	Advanced Inorganic Chemistry	3 cr
XXXX XXXX	Graduate Coursework Electives	5 cr

TOTAL: 36 cr

Year One of the Non-Thesis MS Program

You should begin by forming an **Advisory Committee** who will be responsible for approving your program of study and overseeing your exam at the end of the program. This committee will include your primary advisor and a second member of the chemistry department, both of whom should be on the graduate faculty. You may also opt to have another member from outside the department, but for the non-thesis degree this Graduate Faculty Representative is optional.

Upon entering the program, you should work with your advisor to construct a detailed **Program of Study** specifying when you will complete the required coursework. Course requirements are listed above. Because most courses are offered only once every two years, and you may need to first complete prerequisites, it is important to begin the required coursework immediately. To fill out a full-time schedule you will likely need to take one or two courses outside the department during some semesters. Your curriculum must be approved by your advisory committee and signed by the Department Chair, and you should not register for excessive research credits without prior approval. The initial program of study should be approved by the Advisory Committee by the end of Fall semester, and it is better to complete it even before finalizing your Fall schedule.

The first seminar you present in CHEM 6601 should not be on a topic directly involved with any research you are pursuing. Instead, the seminar should be on a topic from the literature that you find interesting. During your second credit of CHEM 6601 in year two, you may present on any subject.

Year Two of the Non-Thesis MS Program

You must submit your **Final Program of Study** to the Graduate School for evaluation in the Fall semester. The Graduate School examines your Final Program of Study and you will be informed of any deficiencies that you then need to rectify in the spring semester.

During your penultimate semester you should also **apply at the graduate school for graduation** with an MS degree. If you do not apply for graduation at this time, you must then do so within the first two weeks of the semester you plan to graduate. If you do not complete all the requirements for the MS program by the end of the semester you planned to graduate, you will have to reapply for graduation.

During your final semester, you must **complete written exams**. Typically, three two-hour exams will be prepared and graded by three instructors of your most advanced chemistry coursework. Your advisory committee will approve this examination committee and schedule the exams to be completed no later than four weeks prior to graduation. Following grading of the exams, the examiners will confer with the chair and decide if an oral exam to address areas of weakness is warranted. If so, the advisor will determine the date and the composition of the oral examination committee, and you may elect to invite a GFR if you so choose.

If you have done research, you must also clean up your work area, properly dispose of all waste, and complete the **Checkout Approval** form.

Non-Thesis MS Checklist

<u>PRIOR TO ADMISSION</u>	SUBMIT TO:	DATE DUE	DATE COMPLETE
Complete all CHEM, MATH, and PHYS prerequisites	(NA)	before admission, or ASAP	
If necessary according to graduate school policy, report satisfactory GRE / TOEFL Score(s)	Chemistry Department	before admission, or ASAP	

<u>YEAR 1</u>	SUBMIT TO:	DATE DUE	DATE COMPLETE
Form Advisory Committee			
Initial Program of Study Form	Advisor	end of Fall	

<u>YEAR 2</u>	SUBMIT TO:	DATE DUE	DATE COMPLETE
Final Program of Study Form	Graduate School	end of Fall semester	
Application for Graduation with MS Degree	Graduate School	first two weeks of Spring semester	
Written Exam Scheduling Form	Advisor	6 weeks before graduation	
Written Exams		4 weeks before graduation	
Checkout Approval Form (if applicable)	Chem. Admin. Assistant	upon graduation	

Non-Thesis MS Written Exam Schedule

Written exams should be completed during the student's final semester before graduation, and at least **four weeks prior to the intended graduation date**. Exams should cover three distinct areas defined by 3 chemistry courses reflecting the emphases of the student's program of study.

Student Name _____ Student Number _____

Course Instructor Name Exam Date

Instructor Signature

Course Instructor Name Exam Date

Instructor Signature

Course Instructor Name Exam Date

Instructor Signature

Student's signature Date Second member's signature Date

Advisor's signature Date Chairperson's signature Date

Submit to your advisor no fewer than six weeks before graduation.

CHECKOUT APPROVAL

The undersigned, which comprise the MS candidate, research advisor, and the Laboratory Materials Supervisor, find the MS candidate's research work area to be satisfactorily clean. The undersigned also agree that all chemicals and other items of a hazardous nature resulting from the MS candidate's research have been disposed of properly.

MS Candidate

Name

Signature

Date

Research
Advisor

Name

Signature

Date

Laboratory
Materials
Supervisor

Name

Signature

Date

Submit to the Chemistry department administrative assistant before leaving the department.