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*Graduate Program Policies and Degree
Requirements*



Department of Chemistry

Colleg of Arts and Sciences

Western Michigan University

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Welcome to the Department of Chemistry

The Department of Chemistry (CHEM) is comprised of various disciplines that cover broader areas of chemistry including analytical, biochemistry, inorganic, organic and physical chemistry. The graduate programs offered by the Department of Chemistry encompass all of these disciplines providing students the opportunities to receive advanced training in their chosen areas of interest. The department's primary goals are to provide an environment that will foster excitement and curiosity in chemistry and to prepare students to function as productive members of the academic, private, public and scientific communities. The Department of Chemistry at Western Michigan University offers the following graduate programs.

The **Master of Science** in Chemistry enhances students' abilities to plan, conduct, analyze, and report original research. Required coursework enhances a student's scientific preparation and supports his/her research. With the guidance of the research adviser, students choose additional courses to meet their individual needs and interests. The degree may serve as preparation for continued graduate or professional study or for positions in the private or public sector. At the Department of Chemistry, only the thesis option is offered at this moment.

The **Doctor of Philosophy** in Chemistry at Western Michigan University offers a unique combination of traditional rigorous research experience, breadth of coursework, and training in effective communication of scientific concepts. This program is specifically designed for students who wish to pursue careers in chemistry that require excellence in both teaching and research. The pedagogy requirements provide excellent training for careers in academia, government, and industry.

Purpose of the Handbook

This document is intended as a guide to help students complete their graduate training in the Department of Chemistry. All guidelines described herein are subject to compliance with the rules and procedures of the university, as outlined in the Graduate Catalog (catalog.wmich.edu). For additional information, please contact the departmental Graduate Program Adviser or the Graduate College.

POLICIES AND REQUIREMENTS

Placement Examination Policy

1. All full-time Masters students must take 3 of the 5 of the Placement Exams upon arrival at WMU. All full time Doctoral students must take 4 of the 5 Placement Exams upon arrival at WMU. These exams should be in areas in which a student wishes to take 6000-level graduate courses.

This applies to all full-time students including newly arrived non-T.A students. All international students will be considered full-time. These exams will be taken at the beginning of whichever semester or session the student arrives at WMU. The need for taking these exams, and the consequences of failing them, should be made clear to all students ahead of time.

2. Students must officially audit the appropriate undergraduate courses in all areas in which the entrance exams were failed. They must take all examinations and quizzes and complete all required assignments in these courses. The courses to be taken by each student will be determined by the departmental graduate adviser.

Failure to pass an entrance exam indicates an undergraduate deficiency which must be corrected by the student completing the appropriate one or two-semester course sequence. Undergraduate courses include those at the 5000-level and below. Students who enter the program without having had a particular undergraduate chemistry course will enroll in that course *for credit* here at WMU. The schedule for taking the undergraduate courses to remove deficiencies and the timetable for completing the entrance exam requirement will be determined by the departmental graduate adviser.

3. Students must obtain an average grade of B in those undergraduate courses taken to remove any deficiencies indicated by the entrance exams.

An average grade of B in those courses removes the deficiency and satisfies the entrance exam requirement. No grade below a C will be acceptable for satisfying this requirement.

4. Failure to achieve the required GPA in the above courses generally disqualifies a student from continuation in the program. However, this may be modified if extenuating circumstances exist.

In this way both the Department of Chemistry and the student will generally know by the end of the first semester whether a student will be able to continue in the graduate program. Both parties can then make plans accordingly.

5. Part-time students will take those entrance exams as needed prior to taking the appropriate 6000-level course. Part-time students must complete all entrance examinations as part of the requirements for the M.S. or Ph.D. degree.

The schedule for part time students to follow for taking the undergraduate courses to remove deficiencies and the timetable for completing the entrance exam requirement will be determined by the departmental graduate adviser.

STUDENT ACADEMIC CONDUCT

The following policies and procedures shall apply to all matters of student academic conduct.

Academic Honesty

If a student is uncertain about an issue of academic honesty, he/she should consult the faculty member to resolve questions in any situation prior to the submission of the academic exercise.

Violations of academic honesty include but are not limited to:

Cheating

Definition: Cheating is intentionally using or attempting to use unauthorized materials, information, notes, study aids or other devices or materials in any academic exercise.

Clarification

1. Students completing any examination are prohibited from looking at another student's examination and from using external aids (for example, books, notes, calculators, having conversation with others) unless specifically allowed in advance by the faculty member proctoring that specific exam.
2. Students may not have others conduct research or prepare work for them without advance authorization from the faculty member. This includes, but is not limited to, the services of commercial term paper companies.

Fabrication, Falsification, and Forgery

Definition: Fabrication is the intentional invention and unauthorized alteration of any information or citation in an academic exercise. Falsification is a matter of altering information while fabrication is a matter of inventing or counterfeiting information for use in any academic exercise or University record. Forgery is defined as the act to imitate or counterfeit documents, signatures, and the like.

Clarification

1. "Invented" information shall not be used in any laboratory experiment, report of results or academic exercise. It would be improper, for example, to analyze one sample in an experiment and then "invent" data based on that single experiment for several more required analyses.

2. Students shall acknowledge the actual source from which cited information was obtained. For example, a student shall not take a quotation from a book review and then indicate that the quotation was obtained from the book itself.
3. Falsification of University records includes altering or forging any University document and/or record, including identification material issued or used by the University.

Multiple Submission

Definition: Multiple submission is the submission of substantial portions of the same work (including oral reports) for credit more than once without authorization from instructors of all classes for which the student submits the work.

Clarification

Examples of multiple submission include but are not limited to:

- Submitting the same paper for credit in more than one course without all faculty members' permission.
- Making revisions in a credit paper or report (including oral presentations) and submitting it again as if it were new work.
- Submitting sections of a M.S. thesis for a dissertation without permission from members of the student's M.S. and dissertation committee members.

Plagiarism

Definition: Plagiarism is intentionally, knowingly, or carelessly presenting the work of another as one's own (i.e., without proper acknowledgment of the source). The sole exception to the requirement of acknowledging sources is when the ideas, information, etc., are common knowledge.

Instructors should provide clarification about the nature of plagiarism.

Clarification

1. Direct Quotation: Every direct quotation must be identified by quotation marks or appropriate indentation and must be properly acknowledged, in the text by citation or in a footnote or endnote.
2. Paraphrase: Prompt acknowledgment is required when material from another source is paraphrased or summarized, in whole or in part, in one's own words. To acknowledge a paraphrase properly, one might state: "To paraphrase Locke's comment,..." and then conclude with a footnote or endnote identifying the exact reference.
3. Borrowed facts: Information gained in reading or research which is not common knowledge must be acknowledged.
4. Common knowledge: Common knowledge includes generally known facts such as the names of leaders of prominent nations, basic scientific laws, etc. Materials which add only

to a general understanding of the subject may be acknowledged in the bibliography and need not be footnoted or end-noted.

5. Footnotes, endnotes, and in-text citations: One footnote, endnote, or in-text citation is usually enough to acknowledge indebtedness when a number of connected sentences are drawn from one source. When direct quotations are used, however, quotation marks must be inserted and the acknowledgment made. Similarly, when a passage is paraphrased, acknowledgment is required.

Faculty members are responsible for identifying any specific style/format requirement for the course. Examples include but are not limited to American Psychological Association (APA) style and Modern Languages Association (MLA) style.

Complicity

Definition: Complicity is intentionally or knowingly helping or attempting to help another to commit an act of academic dishonesty.

Clarification

Examples of complicity include knowingly allowing another to copy from one's paper during an examination or test; distributing test questions or substantive information about the materials to be tested before the scheduled exercise; collaborating on academic work knowing that the collaboration will not be reported; taking an examination or test for another student, or signing another's name on an academic exercise.

(NOTE: Collaboration and sharing information are characteristics of academic communities. These become violations when they involve dishonesty. Faculty members should make clear to students their expectations about collaboration and information sharing. Students should seek clarification when in doubt.)

Computer Misuse

Definition: Academic computer misuse is the use of software to perform work which the instructor has told the student to do without the assistance of software.

Conduct in Research

Research and creative activities occur in a variety of settings at the University, including class papers, theses, dissertations, reports or projects, grant funded projects and service activities. Research and creative activities rest on a foundation of mutual trust. Misconduct in research and in creative activity destroys that trust and is prohibited. Students shall adhere to professional standards of integrity in both artistic and scientific research including appropriate representations of originality, authorship and collaborative crediting.

Definition: Misconduct in research is defined as serious deviation, such as fabrication or falsification of data, plagiarism, or scientific or creative misrepresentation, from accepted

professional practices of the discipline or University in carrying out research and creative activities or in reporting or exhibiting/performing the results of research and creative activities. It does not include honest error or honest differences in judgments or interpretations of data.

Clarification

Examples of misconduct in research include but are not limited to:

1. Fabrication of Data: Deliberate invention or counterfeiting of information.
2. Falsification of Data: Dishonesty in reporting results, ranging from unauthorized alteration of data, improper revision or correcting of data, gross negligence in collecting or analyzing data, to selective reporting or omission of conflicting data.
3. Plagiarism and Other Misappropriation of the Work of Another: The representation of another person's ideas or writing as one's own, in such ways as stealing others' results or methods, copying or presenting the writing or ideas of others without acknowledgment, or otherwise taking credit falsely. Representing another's artistic or technical work or creation as one's own. Just as there are standards to which one must adhere in the preparation and publication of written works, there are standards to which one must adhere in creative works in the tonal, temporal, visual, literary and dramatic arts.
4. Abuse of Confidentiality: Taking or releasing the ideas or data of others which were given in the expectation of confidentiality, e.g., stealing ideas from grant proposals, award documents, or manuscripts intended for publication or exhibition/performance when one is a reviewer for granting agencies or journals or when one is a juror.
5. Dishonesty in Publication or Exhibition/Performance: Knowingly publishing, exhibiting or performing work that will mislead, e.g., misrepresenting material, particularly its originality, or adding or deleting the names of other authors without permission.
6. Deliberate Violation of Requirements: Failure to adhere to or receive the approval required for work under research regulations of federal, state, local or university agencies, including guidelines for the protection of human subjects or animal subjects and the use of recombinant DNA, radioactive material, and chemical or biological hazards.
7. Failure to Report Fraud: Concealing or otherwise failing to report known misconduct or breaches of research or artistic ethics.

Research Board Requirements

Misconduct in research includes failure to comply with requirements of the conduct of research and creative activities, e.g., the protection of human subjects, the welfare of laboratory animals, radiation, and biosafety. Allegations in these areas may be brought by Human Subjects Institutional Review Board, the Institutional Animal Care and Use Committee, and the Institutional Biosafety Committee.

SELECTION OF RESEARCH TOPIC

The M.S. and Ph.D. degrees in chemistry combine traditional classroom learning with a research experience. The research experience is critical to the completion of the degree and future aspirations of the student. This experience should be of sufficient depth to prepare a student in matters of critical thinking, experimental design and methodology, data evaluation and scientific ethics (see catalog description on research conduct). It is the responsibility of both the student and the adviser that this experience is both productive and rewarding. The student must ensure that they maintain proper communication (written and oral) with their research adviser to ensure timely completion of research objectives. The adviser may choose several options to ensure that research objectives are met through:

- Required presentations at group meetings,
- Weekly, monthly or semester reports,
- Submission of manuscripts for publication, or
- Presenting one's work at local, regional, national or international meetings.

Students should ask their research adviser of the group requirements and ensure that these requirements are met.

Teaching and/or Research Responsibilities

Students are responsible for carrying out the assigned duties of their assistantship. Yearly attendance at safety lectures or other workshops may be required as part of your assignment. Failure to carry out the duties as specified by the Head Instructor or Research Adviser may result in termination of the appointment.

Teaching Assistant Duties in the Department of Chemistry

Full-time Teaching Assistants (TAs) in the Department of Chemistry are typically assigned to three laboratory sections of approximately 24 students each. These laboratory sections may be of the same course or of two different courses. The head instructor of the Laboratory course will oversee TA instruction. Part-time TAs teach one or two labs. The duties for each lab section are as follows:

1. All TAs must become familiar with the material associated with the lab they are teaching and the materials for the associated lecture course.
2. TAs must prepare and present a pre-lab lecture on the experiment being done on that day. The Pre-lab lecture covers key points in the experiment and any cautions that need to be taken when doing the experiment. This lecture also covers any problems students had with the previous report.
3. TAs must attend weekly meetings with the head instructor who details the information that they need to cover in their pre-lab lecture as well as any problems with or modifications to the upcoming experiment.

4. Prepare solutions or unknowns that are used in their labs if these are not provided by the stockroom staff.
5. Oversee the students while they are performing the experiment and answer any of the student's questions.
6. They must ensure that their laboratory is ready for the next session.
7. Grade any material associated with the laboratory including pre-laboratory assignments, lab reports, lab notebooks and quizzes.
8. Hold office hours where students can come in and ask for help with their labs or with materials from the associated lecture course.
9. Proctor exams in the lab or the associated lecture course.

The exact duties of a Teaching Assistant vary depending on the course and the head instructor. It is the responsibility of each TA to understand their responsibility and fulfill their duties.

Graduate Student Requirements for Continued Good Standing

The following requirements must be met in order for a student to remain in good standing in the Department of Chemistry at Western Michigan University. Students who fail to meet these requirements will be placed on departmental probation. Students on probation will have one semester (Fall, Spring, or Summer) to make up their deficiencies. If the deficiency is not made up by the end of an additional semester, the student will be dismissed from the program. These requirements are meant to keep students on course towards graduation in a timely fashion.

General Requirements:

1. Each student must choose a research adviser by the end of their first semester in the program.
2. Each student must demonstrate enough command of the English language by the end of their first year to be able to be placed in the classroom.
3. Each student must complete their literature seminar by the end of their second year in the program.
4. Each student must have their thesis committee selected by the end of their first year and meet with their committee by the end of the first semester of their second year.
5. Each student must meet with their committee at least once a year thereafter.

Doctoral Program:

1. Each student must pass two CUME questions by the end of their first year, and six by the end of their second year.
2. Each student must complete their research proposal before the end of their third year.

GENERAL REQUIREMENTS FOR THE CHEMISTRY MASTERS DEGREE PROGRAM

The Masters of Science in Chemistry is planned to provide a broad background in the various fields of chemistry with concentration in at least one. Entrance requirements include admission to The Graduate College and the passing of placement examinations covering at least three of the fields of Analytical, Biochemistry, Inorganic, Organic, and Physical Chemistry.

The placement examinations are scheduled during the week preceding each semester (see placement exam policy). New full time students, unless entering with an acknowledged deficiency, are required to take all three examinations before they start classes. Enrollment in a 6000-level chemistry course is not permitted unless the appropriate placement examination (or undergraduate course) has been passed.

The student is required to elect at least twenty hours in the field of chemistry, including the Master's Thesis. The chemistry hours may be more than twenty depending on the student's background. The remaining hours up to at least thirty (30) hours may be in a related field or fields. The course sequence will include (if not previously elected):

1. CHEM 5070, Ethical Chemical Practice.
2. CHEM 5200, Instrumental Methods in Chemistry.
3. At least one of:
 - CHEM 5150, Inorganic Chemistry (3 hrs.)
 - CHEM 5500, Biochemistry I (3 hrs.)
 - CHEM 5510, Biochemistry I Laboratory (4 hrs.)
4. Two 6000-level courses from different divisions, including at least one course in the division of the Master's Thesis. Graduate courses in the Department of Chemistry are numbered by division, using the second digit of the course number:

Inorganic	x1xx
Analytical	x2xx
Physical	x3xx
Biochemistry	x5xx
Organic	x6xx and x7xx
5. Literature Seminar: All M.S. students are required to complete a Literature Seminar no later than during their third semester in the program. The seminar is presented to faculty and students. The presentation is graded by the faculty. In order to pass the literature seminar, the average score must be between 80 and 100 %. Students who do not pass the literature seminar during the first attempt may request permission to present another seminar on a new topic.
6. At least 3 hours of CHEM 6900, Special Investigations in Chemistry.
7. CHEM 7000, Master's Thesis (6 hrs., no more, no less).

The requirement for any of the above 5000-level courses can be waived if the student has passed a corresponding course as an undergraduate. Please be aware that a grade of C or better is necessary in all required courses to fulfill that requirement. This is in addition to the requirement of an overall minimum GPA of 3.0.

The student is required to satisfactorily present the results of the Master's research and pass a final oral examination administered by the student's graduate committee. The student is also required, as part of the graduate training in chemistry, to attend departmental seminars, colloquia, and symposia, and to participate in research within the department.

Suggested Sequence of Events for the Successful Completion of the Master's Degree

1. Attend training/orientation sessions and complete Graduate Student Information sheet.
2. Pass the three Placement exams (see placement exam policy) or requirements resulting from failed exams as soon as possible and discuss course registration with the graduate adviser. This is necessary in order to
 - a. take 6000 level courses in the respective areas
 - b. submit a candidacy request to The Graduate College
 - c. select a research adviser and start your research.
3. Starting from the first semester, all students are required to carry out **up to two** laboratory rotations spanning **4 to 6 weeks** in the laboratories of prospective advisors. Students can choose the advisor for laboratory rotations based on their research interests. They should ask the advisor if he/she is interested in taking new graduate students in their laboratories. If the advisor agrees, student can start their laboratory rotation as early as first week of the semester. Within the laboratory rotation, the student is supposed to carry out research described by the advisor and commit a minimum of 10 hours of work per week. At the end of the laboratory rotation, the student is required to provide a written report and an oral presentation to the advisor about the work that was carried out in the laboratory and fill out the laboratory rotation completion form. After the completion of laboratory rotations, the student and selected advisor should mutually agree so that the student can join the research group. At this stage, they are required to complete an advisor-student agreement form which will enable the selection of the research advisor.

After the student selects their research advisor, the student and advisor should mutually agree to write one or two page tentative research plan for the research direction of the student. This will be a living document and will go into the file of the student and can be changed at any time with mutual agreement between the student and advisor. The process of the selection of research advisor should be completed within the first semester and if the student is unable to find an advisor in the first semester, they are subject to probation. The probation is for one semester and can be lifted if the student is able to find a research advisor. If the student cannot find a research advisor at the end of the two semesters, the student will be subject to the policy of no retention.

After the selection of research advisor, the student should establish a research committee within 2 months. The committee should be comprised of the advisor serving as chair and at least two other faculty members from the department. No more than two of the departmental committee members should be from the student's major area of study. Emeritus faculty may serve on the committee. Removal of a committee member will require mutual consent of the student and the dissertation committee or a majority vote of the department faculty.

4. The student must complete the literature seminar during the third semester. The topic and paper should be chosen in consultation with *both* the Seminar coordinator and the research adviser.5. After selecting the committee, the student must complete the Selection of Research Committee Form

(<http://www.wmich.edu/grad/forms/committee.appt.pdf>). Within the first year, the student will meet with the research committee to outline research plans and to receive comments and approval from the committee members. This meeting could also include suggestions for courses in the program.

6. Discuss the complete course sequence with his/her research adviser, the committee, and the Department Graduate Adviser. A Graduate College Permanent Program Form (<http://www.wmich.edu/registrar/pdf/forms/GSPP.pdf>) outlining coursework and other requirements will then be submitted to The Graduate College. The form should include courses that the student *plans* to take, as well as those that are already completed. Submission of the form **must** be completed before the last six hours of registration but after passing the Chemistry placement exams. *It is advisable to determine the course sequence as soon as possible.*
7. Meet again with the research committee after completing some of the research work and then again when most of the research is completed but before beginning to write the thesis. This last meeting is to satisfy the committee and confirm sufficient material from research to write a thesis. The student **must** meet with the committee within the first year of the program and *at least* annually thereafter.
8. Apply for graduation audit by the deadlines outlined in the Graduate Catalog, usually in the term *before* defending the thesis.
9. Submit the *completed* thesis to committee members **at least** two weeks before the student expects to defend the thesis. Normally the primary research adviser has read and commented on early drafts before it is given to the committee members.
10. Complete the final oral examination *at least* two weeks before degree completion. Have the appropriate Graduate College forms signed by the committee.

Note: There is a five year limitation for the completion of a Master's Degree. *Students with Teaching Assistantships or other forms of WMU financial support should normally not expect more than 2.5 years of support.*

M.S. Requirement Check List

- Satisfied any deficiencies elucidated by the entrance exams.
- Completed Selection of Research Problem for Thesis of Dissertation Form (see form attached to this document)
- Completed Selection of Research Committee Form
(http://www.wmich.edu/grad/forms/committee_appointment.pdf)
- Completed Notification of Appointment to a Dissertation or Thesis Committee Form
- Completed and submitted the Program of Study form
(http://www.wmich.edu/registrar/word_docs/GSPP.doc)
- Completed CHEM 5200 *Instrumental Analysis* or equivalent course
- Completed one of CHEM 5150, CHEM 5500 or CHEM 5510 or equivalent course
- Completed CHEM 5070 *Ethical Chemical Practice* or equivalent course
- Presented a passing Literature Seminar
- Completed a total of at least two (2) 6000-level chemistry courses in different areas of chemistry, including one in the student's major area
- Completed at least three (3) credit hours of CHEM 6900 *Special Investigations in Chemistry*
- Completed at least 30 credits of graduate level courses, including six (6) hours of CHEM 7000 *Master's Thesis*
- Research thesis has been written and defended*

***Note:** Before starting their defense the student must have met with his/her research committee who have then agreed that he/she has completed enough research to begin writing. The student must submit their thesis to the committee *at least two weeks* prior to the scheduled public defense. The student must also publish a public notice of their defense *at least one week* prior to the scheduled time of defense.

GENERAL REQUIREMENTS AND TIMELINE FOR THE DOCTORAL DEGREE IN CHEMISTRY

The Doctor of Philosophy in Chemistry, with emphasis in environmental chemistry, is a research degree designed for persons intending to take a leadership role in teaching or research in chemistry. The educational goals of the program stress a well-rounded expertise in chemistry, as well as a literate acquaintance with another environmentally related discipline. These educational goals provide scientific breadth not often found in traditional chemistry degrees. Combining formal education with a research endeavor encompassing a chemical discipline will provide students with the high quality education necessary to contribute to the resolution of the expected and unexpected environmental issues of the future.

Program Requirements

1. After admission, the student will be required to take standardized placement examinations covering any four of the fields of Analytical, Inorganic, Organic, Physical, or Biochemistry. The entrance examinations are scheduled during the orientation week preceding each semester. Identified deficiencies, if any, will be remedied with appropriate coursework determined by the Graduate Adviser. Enrollment in a 6000-level Chemistry course is not permitted unless the appropriate entrance requirement has been satisfied.
2. Starting from the first semester, the student is required to carry out **up to three** laboratory rotations spanning **4 to 6 weeks** in the laboratories of prospective advisors. Students can choose the advisor for laboratory rotations based on their research interests and should ask the advisor if he/she is interested in taking new graduate students in their laboratories. If the advisor agrees, the student can start their laboratory rotation as early as first week of the semester. Within the laboratory rotation, the student is supposed to carry out research described by the advisor and commit to a minimum of 10 hours of work per week. At the end of the laboratory rotation, the student is required to provide a written report and an oral presentation to the advisor about the work that was carried out in the laboratory and fill out the laboratory rotation completion form. After the completion of laboratory rotations, the student and advisor should mutually agree so that the student can join the research group. At this stage, they are required to complete an advisor-student agreement form which will enable the selection of the research advisor.

After the student selects their research advisor, the student and advisor should mutually agree to write one or two page tentative research plan for the research direction of the student. This will be a living document and will go into the file of the student and can be changed at any time with mutual agreement between the student and advisor. The process of the selection of research advisor should be completed by the middle of February (Feb 15) for the students starting in fall semester and end of summer 1 for students starting in the spring semester. If the student is unable to find an advisor during this time span, they are subject to probation. The probation can be lifted if the student is able to find a research advisor. If the student cannot find a research advisor at the end of the two semesters, the student will be subject to the policy of no retention.

After the selection of research advisor, the student should establish a research committee within 2 months. The committee should be comprised of the advisor serving as chair and at least two other faculty members from the department and one member from outside the department. No more than two of the departmental committee members should be from the student's major area of study. Emeritus faculty may serve on the committee. Removal of a committee member will require mutual consent of the student and the dissertation committee or a majority vote of the department faculty.

3. The student will complete at least sixty (60) semester hours of credit for the degree, with no more than half the credits as coursework. A minimum of nine (9) formal courses, plus Graduate Seminar, must be completed satisfactorily. Fifteen (15) hours of doctoral dissertation research are required. The remaining hours will be completed through a combination of coop/internship experiences and/or special research problems and investigations in chemistry. The coop/internship option should be especially attractive to individuals who are considering an industrial career or who are already employed by industry and wish to set up a new scientific initiative. The student must maintain an overall grade point average of 3.0/4.0 to meet graduation requirements. The following describes the distribution of credit hours for the degree.
 - *Seven (7) graduate-level Chemistry courses (21 hours)*
 - at least two (2) must have environmental, biotechnology, nanotechnology or other applied focus
 - at least two (2) must emphasize the student's major field
 - appropriate courses from departments other than Chemistry may be substituted with approval of the student's Committee
 - *One (1) Cognate course from outside the department (3 hours)*
 - *Completion of CHEM 5070 - Ethical Chemical Practice Credit: (3 hours)*
 - *Special research problems or coop/internships (18 hours)*
 - *Doctoral dissertation (15 hrs.)*
4. Beginning in the first year and concurrent with coursework, the student will be required to take cumulative examinations (CUMEs) that cover all of the major areas of study in chemistry. The purpose of the cumulative examination is to ensure that the student has, and can demonstrate and apply, knowledge of current, advanced chemical principles. The following describes the cumulative examination process.
 - Eight (8) cumulative examinations (CUMEs) will be given in each academic year.
 - On each examination, there will be offered a question from three of the five major areas of study: analytical chemistry, biochemistry, inorganic chemistry, organic chemistry, and physical chemistry. The student will choose any two (2) questions to answer.
 - The student must pass a total of six (6) required CUME questions within the first **two** years of the program and obtain a total of six points. At least two (2) questions passed must be from an area outside the student's concentration.
 - The student must pass at least two (2) CUME questions by the end of the first year.
 - The student must fulfill the CUME requirement before standing for the research proposal defense.
5. Within the first two years, the student will be required to present a Literature seminar on a paper

or papers from the current literature. The literature seminar is to be presented by the student to the departmental faculty, staff and students. The literature seminar is graded by the faculty. Students must obtain an average score no less than 80% to pass the literature seminar requirement. Regular attendance at departmental seminars is expected while the student is in residence.

6. The student, after successful completion of the CUME requirement, will be required to defend a written proposal for a unique research topic. The proposal topic must be unrelated to the student's current dissertation research project and must be approved by the student's dissertation committee.
7. To be considered a candidate for the degree and to ensure a timely completion of the program, a full-time student should have completed the following by the end of the third year:
 - Any deficiencies identified by the entrance examinations.
 - At least five (5) of the seven (7) required chemistry courses with a minimum course grade point average of 3.0.
 - Completed the CUME requirement.
 - The proposal defense.
8. The program is designed to allow the flexibility of tailoring the curriculum to the needs of the student. Thus, the research tools requirement includes professional tools that facilitate successful academic, government, or industrial careers. Where necessary, satisfaction of the research tools requirement, including approval of appropriate courses, shall be determined by the dissertation committee. The committee can be petitioned regarding significant experience or expertise in these areas, which generally implies the use of a research tool in the context of current or prior employment or internships. The research tools component shall be met when a student satisfactorily accomplishes two of the following tasks:
 - Demonstrates competence in computer programming and use by receiving a grade of "B" or better in an approved elective computer science course, or by sufficient previous course work, or by applying programming to a research problem. Such application could be through design and use of a program subroutine to analyze data acquired from a scientific instrument, computer modeling and simulation, design and analysis of algorithms or database management.
 - Achieves a working knowledge of statistics by receiving a grade of "B" or better in an approved elective statistics course or by showing the ability to apply advanced statistical analysis such as multivariate analysis to a scientific research problem.
 - Shows proficiency in the design or manufacture of electronic circuits and devices by construction of an instrument used in a research project or by receiving a grade of "B" or better in an appropriate course.
 - Masters the design, repair, and development of chemical instrumentation used as part of an upper-level course or in a research project.
 - Demonstrates a reading knowledge of one of the foreign languages important in the chemical literature or chemical industry (French, German, Russian, Japanese) by receiving a grade of "B" or better in a 4010 course in one of the languages, by passing a standardized examination, or by successfully translating a technical article assigned by the department.
9. The Ph.D. candidate must complete and successfully defend a dissertation on a research topic approved by the dissertation committee.

Ph.D. Requirement Check List

- Satisfied any deficiencies elucidated by the entrance exams.
- Completed and submitted Selection of Research Problem for Thesis of Dissertation Form (see form attached to this document) by the end of the first semester
- Completed and submitted the Selection of Research Committee Form (by the end of the first year) (http://www.wmich.edu/grad/forms/committee_appointment.pdf)
- Completed and submitted the Doctoral Dissertation Proposal Approval Form (by the end of the third year) (http://www.wmich.edu/grad/forms/proposal_approval.pdf)
- Completed and submitted the Permanent Program of Study form
- (http://www.wmich.edu/registrar/word_docs/doctoral%20program%20of%20study%20form.doc)
- Completed seven (7) graduate level (5000- or 6000-level) chemistry courses (including two (2) courses that emphasize your major field)
- Completed one (1) cognate course (a course from outside the department)
- Completed two (2) courses with applied focus (*e.g.*, environmental, biotechnology, nanotechnology)
- Completed the CUME exam requirement.*
- Presenting and passing a Literature Seminar no later than the end of the second year.
- Completed CHEM 5070 (Ethical Chemical Practice) or equivalent course
- Completed 2 Research Tools
- Defended a unique written research proposition*
- Completed and submitted the Doctoral Candidacy form (http://www.wmich.edu/grad/forms/Doctoral_Candidacy.pdf)
- **Note:** Before standing for Candidacy, the student must have satisfied any deficiencies elucidated by the entrance exams, completed 5 of the 7 required chemistry courses with a minimum total course grade point average of 3.00/4.00, passed the critique seminar, passed the required 12 cumulative exam questions and successfully defended their unique written research proposal.
- **U Research** dissertation has been written and defended
- **Note:** Defense Scheduling form (<http://www.wmich.edu/grad/forms/defense.scheduling.pdf>) must be completed

*At least two (2) CUME questions by the end of the first year and all CUME questions completed by the end of the second year.

University Policies and Guidelines

The policy statements of the Western Michigan University Catalog and the College of Arts and Sciences have been consulted in the construction of this document. All advisors and graduate students are encouraged to thoroughly review these policy statements, paying close attention to the following sources:

1. *Expectations for Good Practice in Graduate Education*
2. *Student Rights & Responsibilities*
3. *Policy on Hiring Grant Supported Graduate/Undergraduate Research Assistants*
4. *Graduate Policies and Degree Requirements in the Department of Chemistry*
5. *Western Michigan University Research Handbook*

Advisor Responsibilities

1. Students will be evaluated solely on academic criteria. Students have protection against prejudiced or capricious academic evaluation.
2. Interact with students in a professional and civil manner in accordance with the accepted standards of discipline and Western Michigan University's policies governing discrimination and harassment. Harassment is a form of employment discrimination that violates Title VII of the Civil Rights Act of 1964, the Age Discrimination in Employment Act of 1967, (ADEA), and the Americans with Disabilities Act of 1990, (ADA).
3. Advisors will make themselves fully aware of all US Equal Employment Opportunity Commission policies regarding harassment. Briefly, Harassment is unwelcome conduct that is based on race, color, religion, sex (including pregnancy), national origin, age (40 or older), disability or genetic information. Harassment becomes unlawful where 1) enduring the offensive conduct becomes a condition of continued employment, or 2) the conduct is severe or pervasive enough to create a work environment that a reasonable person would consider intimidating, hostile, or abusive.
4. Prevent personal rivalries with colleagues from interfering with their duties as graduate advisors, committee members, directors of graduate studies, or colleagues.
5. Not impede a graduate student's progress and completion of his/her degree in order to benefit from the student's proficiency as a teaching or research assistant.
6. Create supervisory relations with students that stimulate and encourage students to learn creatively and independently.
7. Provide oral and written comments and evaluation of each student's work in a timely manner.
8. In instances where performance concerns arise, written feedback must be provided. If a research advisor determines that a student is not making satisfactory progress, the student will receive a warning in writing. The student will have two weeks to schedule a committee meeting and meet with his/her dissertation committee members to determine what must be done to remedy the problem. The student will need to submit to the Thesis/Dissertation committee and the Graduate Studies Committee a plan of action. The Graduate Studies Committee will determine what length of time is permissible for a re-evaluation. If the problem is not remedied within the given time, the dissertation committee will make a decision to discontinue support and/or dismiss the student from the program.
9. Discuss laboratory, departmental and authorship policy with graduate students in advance of entering into collaborative projects.
10. Evaluate students' progress and performance in a regular and informative ways consistent with timely completion of the degree.
11. Impartially evaluate student performance, regardless of the graduate student's religion, race, gender, sexual orientation, nationality, or other criteria as established by law, the collective bargaining agreement, and/or University policies.

12. Ensure that students have all the training and supervision necessary to provide a foundation to excel in their research activities.
13. Provide graduate student with basic description of availability for meetings and training.
14. Ensure that the students are provided all materials necessary to provide a foundation for graduate students to excel in their research projects. The students must not be charged for the damages of samples or materials unless determined otherwise.
15. Advisors may only require paid student researchers to work during mutually agreed upon hours.
16. A weekly schedule for paid research work must be developed when student employees are hired, and may be modified only by mutual agreement of the research director and student employee. Student workers may be allowed to set their own schedule by mutual agreement of the research supervisor and student researcher. All hours worked for pay must be documented on time sheets signed by the student and supervisor.
17. Student workers may complete additional hours of unpaid research. Supervisors must clearly explain to student researchers that, during unpaid time, student researchers have the authority to determine when and where they work.
18. Supervisors must provide students with time off to observe religious holidays if students request it. Students should not expect to be paid for time taken off for such holidays.
19. Discuss career and internship opportunities with graduate students to apprise them of the “job market” so that students can develop realistic expectations for the outcomes of their studies.
20. Recognize that WMU is required to protect the rights of students, scholars, and staff in their rights to access data from research in which they participated. Transfer of data in the event a researcher leaves WMU must be addressed. When an individual researcher leaves WMU (or a research group), he/she may take copies of the research record which he/she has generated for the purposes of constructing manuscript or another professional purpose with due acknowledgement of the concerned personnel involved in the work.

Student Responsibilities

1. Take primary responsibility to inform themselves of regulations, rules, and policies governing their graduate studies and research at WMU.
2. Recognize that the faculty adviser, who provides the intellectual and instructional environment in which that student plans a program of study, may be involved with research for which the student provides assistance, and that the University, through the faculty advisor’s access to teaching and research funds, may also provide the student with special financial support for that research.
3. Recognize that the faculty advisor is responsible for monitoring the accuracy, creativity, validity, and integrity of the student’s research. Careful, well-conceived research reflects favorably on the student, the faculty advisor, the degree program, and WMU.
4. Exercise the highest integrity in taking examinations, completing master’s, specialist’s, and doctoral projects, and/or collecting, analyzing, and presenting research data in theses, dissertations, and presentations.
5. Recognize that in some disciplines, the faculty advisor will determine when a body of work is ready for publication, exhibition or performance, and is an acceptable product, since the faculty advisor bears responsibility for overseeing the performance of the students and ensuring the validity of any applicable research.
6. Devote an appropriate amount of time and energy toward achieving academic excellence and earning an advanced degree.
7. Take the initiative to ask questions that promote understanding of the academic subjects and advances in the field.

8. Communicate regularly with faculty advisors, particularly in matters related to research and progress within the graduate program and with any teaching responsibilities.
9. Collaborate with the advisor and the committee to outline and carry out a series of research projects.
10. Propose and maintain a basic work schedule which is mutually agreed upon by the graduate student and advisor.
11. Work to thoroughly review, understand, and incorporate all verbal and written feedback provided by the advisor into research activities.
12. Schedule and attend regular meetings with the advisor to discuss research findings, struggles, data interpretations, etc.
13. Use all available resources to utilize and interpret collected data.
14. Request all materials, reagents, and software necessary to excel in all research activities.
15. Responsible for organizing the annual review meetings and the completion of the annual review form.

Department of Chemistry Advisor-Student Research Agreement

Student Name: _____ WIN #: _____

Date: _____

Advisor Name: _____

Research Topic: _____

General Requirements for the completion of the Degree

6. Each graduate student must choose a research advisor after completing the laboratory rotations. (check the laboratory rotation policy in graduate handbook)
7. Each graduate student must choose their committee members within two months after the completion of laboratory rotations and meet with their committee by Mar 1.
8. Each graduate student must complete the literature seminar by the end of the second year in the program.
9. Each graduate student must have a committee meeting and submit the annual review form before Mar 1.
10. The graduate student and advisor, in conjunction with the committee, will chair the student's research project.
11. Graduate students and faculty will thoroughly review and adhere to all university guidelines, particularly those pertaining to research ethics and work-place discrimination.
12. This agreement will be reviewed and signed each academic year by the graduate student and advisor. At the discretion of either the graduate student or advisor, an impartial party may be present during the modification and signing of this agreement.
13. Students have the right to free inquiry, expression, and association.
14. Students should be free from discrimination and harassment which violates the law or which constitutes inappropriate or unprofessional limitation of employment opportunity, University facility access, or participation in University activities, on the basis of race, color, religion, national origin, sex sexual orientation, gender identity, age, protected disability, veteran status, height, weight, or marital status.

Doctoral Program:

3. Each graduate student must pass two CUME questions by the end of their first year, and six by the end of their second year.
4. Each graduate student must complete the research proposal before the end of the third year.

Advisor Responsibilities and Expectations

Advisor responsibilities (specifically related to research)

1. Provide clear work expectations and train students so that the students are fully aware of their duties and research work. Develop and provide each student with a written list of expectations.
2. Ensure that the students have all the training and supervision necessary to provide a foundation for them to excel in their research work

3. Provide clear and frequent feedback about student research performance. Especially in instances where performance concerns arise, written feedback should be provided.
4. Meet with the student regularly to update the progress of research work.
5. Provide opportunities and career advising to the students.

Detailed Advisor Expectations:

(Include a separate page if needed)

1. Time to Degree Completion
2. Number of Projects
3. Number of Publications
4. Conference Attendance and Activities
5. Other expectations

Student Responsibilities and Expectations

Student responsibilities (specifically relating to research)

- Schedule appointments and meet the advisor regularly to update the progress of your research work.
- Attendance of group meetings.
- Follow all WMU’s as well as advisor’s rules and regulations with respect to the laboratory work ethics and guideline.
- Responsible for organizing the annual review meetings and the completion of the annual review form.
- Adhere to all Expectations for Good Practices in Graduate Education.

Detailed Student Expectations:

(Include a separate page if needed)

6. Time to Degree Completion
7. Number of Projects
8. Number of Publications
9. Conference Attendance and Activities:
10. Other expectations

Should either party become uncomfortable or dissatisfied with this agreement, the graduate student and advisor should meet and address the issues at hand as soon as possible. Both the issue and resolution must be outlined in this document. If such a discussion is unsuccessful or either party is uncomfortable initiating a one-on-one meeting, a neutral third party can be consulted for further assistance (graduate advisor or department chair).

By signing this document, the advisor and student agree to each other's responsibilities and expectations as well as understood the university policies and guidelines provided.

Advisor Signature (Name)

Date

Student Signature (Name)

Date

Graduate Advisor Signature (Name)

Date

**ANNUAL REVIEW OF GRADUATE STUDENTS
DEPARTMENT OF CHEMISTRY**

Annual Review of Students in the Chemistry Ph.D. Program

As required by Western Michigan University's Graduate College, all PhD students must undergo an annual review. The review will be conducted by the student's research adviser and reviewed by the Graduate Studies Committee. The Annual Review serves to provide feedback to doctoral students regarding progress in the program, performance, and professional accomplishments expected in the field of Chemistry. The review will result in one of three valuations: (i) continuation, (ii) continuation with reservations, or (iii) dismissal with the designation 'Continuing Status', 'Continuing with reservations status' or 'discontinuing status'. (Note: dismissal can occur as a result of this review only in accordance with the dismissal process stipulated by the Graduate College.) The Department of Chemistry holds no obligation to re-admit any student dismissed from the department program. All students enrolled in the Chemistry Ph.D. program are expected to maintain 'Good Standing' in the University and 'Continuing Status' in the department, meaning all coursework and department program requirements must be completed successfully and on time, and proper academic conduct and research progress must be maintained throughout the student's tenure in the department.

The annual review process is coterminous with the funding process, but is required of all PhD students (whether funded by the department or not). Each year, students must fill out the "Annual Review of Doctoral Graduate Students" form found on the department website by the due date provided by the Graduate Adviser. The form is cumulative; students will add to it each year. Each student will be provided with written feedback from the Graduate Studies Committee, particularly in cases when the review results in a "continuation with reservations" valuation. The feedback will represent the judgment of the Review Committee, not just the Research Adviser, Graduate advisor, or Department Chair, whose signatures will appear with the valuation and comments. All students must demonstrate satisfactory performance in all three areas listed below. Failure to demonstrate satisfactory performance in any one area and an evaluation of 'continue with reservation' can result in loss of student eligibility for continued funding.

Lack of Satisfactory Performance in Coursework

- Failure to complete the necessary courses with satisfactory grades in 3 years
Students unable to complete the necessary coursework in 3 years with an overall grade average of B or better grade will receive a valuation of 'continue with reservation' or will be dismissed from the Graduate Program depending on the circumstances. Students who receive a valuation of 'continue with reservation' will be provided with specific conditions to meet and a timeline to bring their status to 'continuing status' in the department.

- Failure to maintain a 3.0 GPA
Students who fail to maintain a GPA of 3.0 at the end of any given semester or summer session will be placed on academic probation by the University. Any student on academic probation will be ineligible to hold a GA, RA or DA position in the Department of Chemistry. Students on academic probation will receive a valuation of ‘continue with reservation,’ and will have up to one semester to bring their GPA back to a 3.0. Failure to meet the GPA requirement will result in dismissal from the department program.
- Failure to comply with matters related to proper academic conduct.
All matters related to student misconduct as defined in the Graduate Student Handbook will be handled by the Western Michigan University Office of Student Conduct. Students who are found responsible for academic misconduct may receive a valuation of ‘continue with reservation’ or may be dismissed from the Graduate Program, depending on the circumstance. The Department of Chemistry reserves the right to decide on whether a student should remain in the program or be dismissed from the program given the nature of the misconduct. Each circumstance will be handled individually by the Graduate Studies Committee and brought to the department faculty if deemed necessary.

Lack of Satisfactory Performance in Meeting Department Requirements

- Failure to complete the *Literature Seminar* by Year 2 of the program will result in a valuation of ‘continuation with reservation’. A student will be required to apply for a request for an extension. Extension will only be granted under extreme circumstances, for example, medical illness. Proof for the extreme circumstances must be provided. The Graduate Studies Committee will decide whether a student should be granted an extension. If the committee agrees to provide the student with an extension, the student will not be in Continuing status within the department during the period of extension, until the specific requirement is met. If the committee decides that the student cannot be granted an extension, the committee reserves the right to make recommendations to the student’s program of study, which could include dismissal from the program or applying to the Chemistry M.S. or M.A. program.
- Failure to complete the *Research Proposal* by Year 3 of the program will result in a valuation of ‘continuation with reservation’. A student will be required to apply for a request for an extension. Extension will only be granted under extreme circumstances. Proof for the extreme circumstances must be provided. The Graduate Studies Committee will decide whether a student should be granted an extension. If the committee agrees to provide the student with an extension, the student will not be in Continuing status within the department during the period of extension, until the requirement is met. If the committee decides that the student cannot be granted an extension, the committee reserves the right to make recommendations to the student’s program of study, which

could include dismissal from the program or applying to the Chemistry M.S. or M.A. program.

- Failure to pass 2 CUME exams by the end of Year 1 and a total of 6 CUME exams by the end of Year 2 of the program will result in a valuation of ‘continuation with reservation’. A student will be required to apply for a request for an extension. The Graduate Studies Committee will decide whether a student should be granted an extension. If the committee agrees to provide the student with an extension, the student will not be in ‘Continuing status’ during the period of extension, until the requirement is met. If the committee decides that the student cannot be granted an extension, the committee reserves the right to make recommendations to the student’s program of study, which could include dismissal from the program or applying to the Chemistry M.S. or M.A. program.

Lack of Satisfactory Performance in Research

Students are encouraged to meet regularly with their research advisers to ensure that they are making satisfactory progress toward their dissertation research. If a research adviser determines that a student is not making satisfactory progress, the student will receive a warning in writing. The student will have two weeks to schedule a committee meeting and meet with his/her dissertation committee members to determine what must be done to remedy the problem. The student will need to submit to the Thesis/Dissertation committee and the Graduate Studies Committee a plan of action. The Graduate Studies Committee will determine what length of time is permissible for a re-evaluation. If the problem is not remedied within the given time, the dissertation committee will make a decision to discontinue support and/or dismiss the student from the program.

According to University policy students must complete all requirements for the Doctorate Program within 7 years. Continuation toward degree after failure to meet this requirement requires approval by the Western Michigan University Graduate College. Adjustments for students on part-time status will be accommodated in accord with University policy.

2017-18



Department of Chemistry

Annual Review of Doctoral Students – Research and course work

Instructions

Each graduate student must arrange an annual meeting with his or her committee by Jan 15 of each year in the program. The meeting will give students the opportunity to update the committee on their research accomplishments and course work over the academic year, receive feedback about their research, and seek advice on their program. Based on discussions at the annual committee meeting, the committee will conduct its annual review of the student's progress in research and course work, provide a rating of the student, and give recommendations or requirements to guide the student over the next year.

This form will be used for the annual review. To facilitate discussion of student research and course work at the annual committee meeting, students will

- fill out form as completely as possible in advance of annual committee meeting
- provide committee with written progress report and copy of updated CV either at the meeting or two weeks in advance of meeting, depending on the committee's preference (students should ask their major advisor about this requirement)
- discuss with their major advisor any additional requirements that he or she may have for the annual committee meeting.

Students, their major advisor, and the Graduate Advisor will receive a copy of their annual evaluation to keep with their records. It is recommended that students use the forms to help build a record of their annual committee meetings, including candidacy, yearly accomplishments, and recommendations of the committee for improving or maintaining their productivity. Students will also receive a letter from the Graduate Advisor summarizing the results of the annual review.

Annual Review of Doctoral Students – Research and course work

Date of annual committee meeting: _____

- Committee meetings must be held each year by Jan 15 to maintain standing in the graduate program. Students who enroll in the Spring semester are required to hold their first committee meeting by Jan 15 of the year following enrollment.

- Students are reminded that faculty serve on the committees of multiple graduate students in and outside of the department and may have limited availability as the Jan 15 deadline approaches. Students therefore are strongly encouraged to schedule and hold their annual committee meeting well in advance of the Jan 15 deadline.

CV and written report given to committee

Student information

Name: _____

Email: _____

Telephone (lab): _____

Date enrolled in program: _____

GPA at enrollment: _____ Current GPA: _____

Committee members

- Students should identify an advisor and select a dissertation committee as soon as possible, but at the latest by Jan 15 of the year following admission to the program. Failure to identify a major advisor and committee by the deadline may result in an unsatisfactory annual review.
- Doctoral Dissertation Committees consist of four members, including the major advisor, two or more members from the Department of Chemistry, and one or more Externals members from outside of the Department of Chemistry. Please confirm with the Graduate Advisor that your external committee member has been approved by the Graduate College.

Committee Chair: _____

CHEM Member: _____

CHEM Member: _____

External Member: _____

Committee Appointment Form submitted to the Graduate College

Course work

- Doctoral students must enroll in 60 credit hours of course work to meet degree requirements. Graduate courses are numbered 5000 and above. A student must complete required courses at 5000 level and rest of them at 6000 level. One course should be from outside the department.

Course Number	Course Name (credit hours)	Date completed	Grade
Graduate Core Courses			

Publications: _____
Conference Presentations: _____

TEACHING PROGRESS *(To be completed by Teaching Supervisor if applicable)*

Teaching Progress [Meets/Exceeds/Below expectations]:

- Permanent Program of Study submitted to Graduate College
 - After completing 9 hours of course work, students must complete a Permanent Program of Study, which must be approved by the major advisor, Dean of the College of Arts & Sciences, and Dean of the Graduate College.
 - Any changes to your proposed coursework must be indicated in a Program Change form.

Annual review rating by committee

- Continuation
- Continuation with reservations
- Dismissal

Committee recommendations and/or requirements for student to maintain or improve annual review rating:

Committee signatures:

Committee Chair: _____

CHEM Member: _____

CHEM Member: _____

External Member: _____

For Committee Members: Please circle relevant statements in boxes. An entire box need not be selected, and statements from more than one box per row may be circled.

	Beginning (first year)	Emerging (during second year)	PhD Candidate (during third year)	Proficient (before defense)
Hypothesis/Discovery Goal	Hypothesis or discovery goal not stated or not fully formulated. Some evidence of a research objective is presented. Some background and significance of proposed research given to support objective.	Hypothesis or discovery goal is stated, but is not fully defined. Scope of research is not sufficient for degree completion. Hypothesis or goal is not yet fully supported by preliminary data or review of scientific literature.	Hypothesis or discovery goal is clearly stated. Specific aims for research to complete PhD degree are defined and supported by data or a scholarly review of scientific literature, written in the form of a grant proposal.	Hypothesis or discovery goal and specific aims for research are fully defined and supported by data and a scholarly review of scientific. Scope of proposed research is sufficient for degree completion.
Experimental Design or Discovery Goal Methods	Evidence of research method development and skill development.	Appropriate research methods with appropriate controls are proposed. The student shows developing understanding of the methodologies or reagents being used.	All research methods for specific aims in proposal are defined, with appropriate controls. The student has full understanding of the methodologies or reagents used in proposal.	The student has demonstrated competence and full understanding of the methodologies and reagents used in thesis research.
Results from Experiments or Discovery Methods	Evidence of some data collection and handling, especially associated with methods development	Some data appropriate for hypothesis testing or research goals have been collected.	Sufficient high-quality data with appropriate controls and replication were generated to test a hypothesis and support proposed experiments.	Sufficient high-quality data with appropriate controls and replication were generated to complete proposed research.
Analysis and Synthesis	Limited collected data, evidence of graphical, statistical, and/or database analyses that include initial interpretation and/or synthesis.	Some data have been appropriately analyzed. Some synthesis of data into the relevant scientific literature was presented.	Data analysis has been performed and the findings have been placed in context in the scientific literature. The synthesis of these findings is suitable for publication, and supports the specific aims in a grant proposal that will extend the research.	Data analysis has been performed and the findings have been placed in context in the scientific literature.

Annual Review of Students in the Chemistry M.S. Program

As required by Western Michigan University's Graduate College, all M.S. students must undergo an annual review. The review will be conducted by the student's research adviser and reviewed by the Graduate Studies Committee. The Annual Review serves to provide feedback to M.S. students regarding progress in the program, performance, and professional accomplishments expected in the field of Chemistry. The review will result in one of three valuations: (i) continuation, (ii) continuation with reservations, or (iii) dismissal with the designation 'Continuing Status', 'Continuing with reservations status' or 'discontinuing status'. (Note: dismissal can occur as a result of this review only in accordance with the dismissal process stipulated by the Graduate College.) The Department of Chemistry holds no obligation to re-admit any student dismissed from the departmental program. All students enrolled in the Chemistry M.S. program are expected to maintain 'Good Standing' in the University and 'Continuing Status' in the department, meaning all coursework and department program requirements must be completed successfully and on time, and proper academic conduct and research progress must be maintained throughout the student's tenure in the department.

The annual review process is coterminous with the funding process, but is required of all M.S. students (whether funded by the department or not). Each year students must fill out the "Annual Review of M.S. Graduate Students" form found on the department website by the due date provided by the Graduate Adviser. The form is cumulative; students will add to it each year. Each student will be provided with written feedback, particularly in cases when the review results in a "continuation with reservations" valuation. The feedback will represent the judgment of the Review Committee, not just the Research Adviser, Graduate Adviser, or Department Chair, whose signature will appear with the valuation and comments. All students must demonstrate satisfactory performance in all three areas as shown below. Failure to demonstrate satisfactory performance in any one area and an evaluation of 'continue with reservation' will lead to a student losing eligibility for continued funding.

Lack of Satisfactory Performance in Coursework

- Failure to complete the necessary courses in 2 years
Students unable to complete the necessary coursework in 2 years, with an overall grade average of B or better grade will receive a valuation of 'Continue with Reservation' or will be dismissed from the Graduate Program depending on the circumstances. Students who receive a 'valuation of 'continue with reservation' will be provided with specific conditions to meet and a timeline to bring their status to 'continuing status' in the department.
- Failure to maintain a 3.0 GPA
Students who fail to maintain a GPA of 3.0 at the end of any given semester or summer session will be placed on academic probation by the University. Any student on academic probation will be ineligible to hold a GA or RA position in the Department of Chemistry. Students on academic probation will receive a valuation of 'Continue with Reservation,' and will have up to one semester to bring their GPA back to a 3.0. Failure to meet the GPA requirement will result in

dismissal from the University. The Department of Chemistry holds no obligation to re-admit any student dismissed from the departmental program.

- Failure to comply with matters related to proper academic conduct in the classroom or in courses.

All matters related to student misconduct as defined in the Graduate Student Handbook will be handled by the Western Michigan University Office of Student Conduct. Students who are found responsible of academic misconduct may receive a valuation of 'Continue with Reservation' or may be dismissed from the Graduate Program, depending on the circumstance. The Department of Chemistry reserves the right to decide whether a student should remain in the program or be dismissed from the program given the nature of the misconduct. Each circumstance will be handled individually by the Graduate Studies Committee and brought to the department faculty if deemed necessary.

Lack of Satisfactory Performance in Meeting Department Requirements

Failure to complete the *Literature Seminar* by Year 2 of the program will result in a valuation of 'continuation with reservation'. A student will be required to apply for a request for an extension. Extension will only be granted under extreme circumstances, for example, medical illness. Proof for the extreme circumstances must be provided. The Graduate Studies Committee will decide whether a student should be granted an extension. If the committee agrees to provide the student with an extension, the student will not be in 'continuing status' within the department during the period of extension, until the specific requirement is met. If the committee decides that the student cannot be granted an extension, the committee reserves the right to make recommendations to the student's program of study, which could include dismissal from the program or applying to the Chemistry M.A. program.

Lack of Satisfactory Performance in Research

Students are encouraged to meet regularly with their research adviser to ensure that they are making satisfactory progress toward their thesis research. If a research adviser determines that a student is not making satisfactory progress, the student will receive a warning in writing. The student will have two weeks to schedule a committee meeting and meet with his/her committee members to determine what must be done to remedy the problem. The student will need to submit to the Thesis committee and the Graduate Studies Committee a plan of action. The Graduate Studies Committee will determine what length of time is permissible for a re-evaluation. If the problem is not remedied within the given time, the committee will make a decision to discontinue support and/or dismiss the student from the program.

According to University policy students must complete all requirements for the Masters Program within 6 years. Continuation toward degree after failure to meet this requirement requires approval by the Western Michigan University Graduate College. Adjustments for students on part-time status will be accommodated in accord with University policy.

2017-18



Department of Chemistry

Annual Review of Masters Students – Research and course work

Instructions

Each graduate student must arrange an annual meeting with his or her committee by Jan 15 of each year in the program. The meeting will give students the opportunity to update the committee on their research accomplishments and course work over the academic year, receive feedback about their research, and seek advice on their program. Based on discussions at the annual committee meeting, the committee will conduct its annual review of the student's progress in research and course work, provide a rating of the student, and give recommendations or requirements to guide the student over the next year.

This form will be used for the annual review. To facilitate discussion of student research and course work at the annual committee meeting, students will

- fill out form as completely as possible in advance of annual committee meeting
- provide committee with written progress report and copy of updated CV either at the meeting or two weeks in advance of meeting, depending on the committee's preference (students should ask their major advisor about this requirement)
- discuss with their major advisor any additional requirements that he or she may have for the annual committee meeting.

Students, their major advisor, and the Graduate Advisor will receive a copy of their annual evaluation to keep with their records. It is recommended that students use the forms to help build a record of their annual committee meetings, including candidacy, yearly accomplishments, and recommendations of the committee for improving or maintaining their productivity. Students will also receive a letter from the Graduate Advisor summarizing the results of the annual review.

Annual Review of Masters Students – Research and course work

Date of annual committee meeting: _____

- Committee meetings must be held each year by Jan 15 to maintain standing in the graduate program. Students who enroll in the Spring semester are required to hold their first committee meeting by Jan 15 of the year following enrollment.

- Students are reminded that faculty serve on the committees of multiple graduate students in and outside of the department and may have limited availability as the Jan 15 deadline approaches. Students therefore are strongly encouraged to schedule and hold their annual committee meeting well in advance of the Jan 15 deadline.

CV and written report given to committee

Student information

Name: _____

Email: _____

Telephone (lab): _____

Date enrolled in program: _____

GPA at enrollment: _____ Current GPA: _____

Committee members

- Students should identify an advisor and select a dissertation committee as soon as possible, but at the latest by Jan 15 of the year following admission to the program. Failure to identify a major advisor and committee by the deadline may result in an unsatisfactory annual review.
- Doctoral Dissertation Committees consist of four members, including the major advisor, two or more members from the Department of Chemistry, and one or more External members from outside of the Department of Chemistry. Please confirm with the Graduate Advisor that your external committee member has been approved by the Graduate College.

Committee Chair: _____

CHEM Member: _____

CHEM Member: _____

Committee Appointment Form submitted to the Graduate College

Course work

- Masters students must enroll in 30 credit hours of course/research work to meet degree requirements. Graduate courses are numbered 5000 and above. A student must complete required courses at 5000 level and rest of them at 6000 level. One course should be from outside the department.

Course Number	Course Name (credit hours)	Date completed	Grade
Graduate Core Courses			

Publications: _____

Conference Presentations: _____

TEACHING PROGRESS *(To be completed by Teaching Supervisor if applicable)*

Teaching Progress [Meets/Exceeds/Below expectations]:

- Permanent Program of Study submitted to Graduate College
 - After completing 9 hours of course work, students must complete a Permanent Program of Study, which must be approved by the major advisor, Dean of the College of Arts & Sciences, and Dean of the Graduate College.
 - Any changes to your proposed coursework must be indicated in a Program Change form.

Annual review rating by committee

- Continuation
- Continuation with reservations
- Dismissal

Committee recommendations and/or requirements for student to maintain or improve annual review rating:

Committee signatures:

Committee Chair: _____

CHEM Member: _____

CHEM Member: _____

Important Deadlines

Students starting in fall 2017*

Qualifier exams – During orientation week (one week before the start of the Fall 2017 semester)

Laboratory rotations – Rotations 1 to 3 (as required, to be completed by Dec 2017 for Masters students and by Feb 15 2018 for PhD students)

Laboratory rotation completion forms – submit after the rotation is over

Student-advisor agreement – Mar 1, 2018

Formation of research committee – End of the spring 2018 semester

First committee meeting – Before Jan 15, 2019

Annual review form-1 – Jan 15 2019

Permanent program of study form – After 9 credits for Masters students and after 18 credits for PhD students

Literature seminar – End of the spring 2019 semester

MS dissertation defense – by Spring 2019 or Fall 2019

CUMEs for PhD students – Starts from Sep 2017- At least 2 to be completed by the end of Spring 2018 and all 6 by the end of Spring 2019.

Second committee meeting – Before Jan 15 2019

Annual review form-2 – Jan 15 2019.

Independent research proposal defense – End of the Spring 2020 semester

Third committee meeting – Before Jan 15 2021

Annual review form 3- Jan 15 1 2021

Final committee meeting – Before Jan 15 2022

Annual review form 4- Jan 15 2022

PhD defense – End of the Spring 2022 (For extensions, please contact graduate advisor)

*For students starting spring 2018 semester, extend the deadlines by 1 semester except for committee meetings and annual review form submissions.

Retention Policy/Check List

Graduate students who fail to make adequate progress towards their degree will be subject to dismissal from the program. When reviewing the progress of graduate students, the Graduate Adviser and Graduate Studies Committee takes into account a number of factors, especially the annual reviews. While the following criteria serve as guidelines, these are not to be considered the only requirements.

Guidelines of the Graduate College for academic standards include the following:

- Overall grade point average in the degree program must be at least 3.0.
- Whenever the GPA for a particular semester is less than 3.0, but the overall GPA is 3.0 or above, the student will be warned.
- If the overall GPA falls below 3.0, the student is placed on probation for one semester.
- If the student makes some improvement to the overall GPA, although still below the standard, the student can continue on probation for one additional enrollment period, at the department's discretion.
- When the conditions are restored, probation is removed.
- If a student fails to increase the overall GPA while on probation, or fails to reach the standard GPA on a continuation of probation, he/she will be dismissed from the university. Dismissed students must apply for readmission, but they must remain out at least one full 15-week semester.
- A student may appeal to the program or academic unit and the Graduate College.

Additional departmental guidelines:

- Failure to find a compatible research mentor by the beginning of the second year of study is grounds for no retention.
- Failure to participate in the annual review process for two years is grounds for no retention.
- An unsatisfactory evaluation in the annual review process will result in the student being placed on probation for one year. During that year, the student must remedy the issues outlined in the annual review letter and make obvious progress towards their degree. Probation will be removed if the second annual review results in a satisfactory or satisfactory with reservations evaluation.
- A second unsatisfactory evaluation in the annual review process is grounds for no retention.
- Students found responsible for academic misconduct may be not retained at the discretion of their thesis/dissertation committee or the Graduate Policies and Admissions Committee, if no thesis/dissertation committee is formed.

FORMS

Form	When Due?	Where Found?	Done
Committee Formation	Within 1 st year	https://wmich.edu/grad/forms https://wmich.edu/sites/default/files/attachments/u67/2015/committee_appointment_0.pdf	
Permanent Program of Study	Within 1 st year, after 9 credits	https://wmich.edu/grad/forms https://wmich.edu/sites/default/files/attachments/u108/2015/wmu-grad-permanent-program.pdf https://wmich.edu/sites/default/files/attachments/u67/2015/doctoral-programofstudy_1.pdf	
Change of Program Form	As needed, if you alter your Permanent program of Study	https://wmich.edu/grad/forms https://wmich.edu/sites/default/files/attachments/u67/2015/course-substitution-grad.pdf	
Annual Review MS	Before Jan 15	Graduate adviser emails form each year	
Annual Review PhD	Before Jan 15	Graduate adviser emails form each year	
Doctoral Proposal Approval	Within 3 rd year	https://wmich.edu/grad/forms https://wmich.edu/sites/default/files/attachments/u67/2015/proposal_approval_0.pdf	
Advancement to doctoral candidacy	Within 3 rd year	https://wmich.edu/grad/forms http://www.wmich.edu/sites/default/files/attachments/u67/2015/Doctoral_Candidacy.pdf	
Under-enrollment form	As needed when enrolled only in thesis or dissertation credits	https://wmich.edu/grad/forms https://wmich.edu/grad/files/forms/permission-under-enroll.pdf	
Graduation Audit	2 semesters before graduation	https://wmich.edu/registrar/graduation-graduate	
Dissertation Defense Scheduling	At least 2 weeks before defense date	https://wmich.edu/grad/forms https://wmich.edu/sites/default/files/attachments/u67/2015/defense.scheduling_1.pdf	
Thesis, Project, and Dissertation Approval	Bring to defense	https://wmich.edu/grad/forms https://wmich.edu/grad/dissertation-approval	
Dissertation Submission Check-In	When turning in dissertation to Graduate College	https://wmich.edu/grad/forms https://wmich.edu/sites/default/files/attachments/u67/2015/diss_checkform_0.pdf	
Thesis Project Submission Check-In	When turning in thesis to Grad College	https://wmich.edu/grad/forms https://wmich.edu/sites/default/files/attachments/u67/2015/t_p_checkform_0.pdf	

Outline for Graduate Student Original Research Proposals
Department of Chemistry
Western Michigan University

All graduate students in the Chemistry Ph.D. program are required to write and defend a proposal for a *unique* research topic. The purpose of the research proposal is to convince readers that the research is worthwhile and that the researcher (you) has the competence and the background knowledge complete it. All research proposals should address, at a minimum, (1) what will be accomplished, (2) why it should be studied and accomplished, and (3) how it will be accomplished. The proposal topic must be unrelated to the student's current dissertation research project and must be approved by the student's dissertation committee.

The proposal should have sufficient information to convince readers of the importance of the research idea and that you have a strong grasp of the literature. The gaps in knowledge in the field along with a rationale for methods to address the 'gap' must be clearly described.

Two weeks prior to the proposal defense date, the student will submit the written proposal to each committee member. It is the student's responsibility to schedule the defense date. All proposals must be completed no later than the end of the student's third year in the Ph.D. program in Chemistry. Successful completion of the original research proposal advances the student to Ph.D. candidacy.

The following guidelines must be met when writing the proposal:

- **Title:** The proposal title should be concise and descriptive.
- **Summary:** All proposals must include a one-page project summary or abstract. The purpose of the summary is to provide a reader with the main objectives and the plan for the proposed project.
- **Project Description:** The project description for all proposals must not exceed 10 pages in length. Sections that should be included in the project description include:
 - Introduction/Literature review
 - The purpose of a literature review is to demonstrate your understanding of the field and to indicate what gaps exist. This section should set the stage for your proposed work.
 - It should also show that you are judicious in your selection of issues to focus on and take an approach of critical inquiry.
 - Problem statement
 - This section should refer to a 'gap' in knowledge/understanding in the field and the need for specific work to address the gap.

- The value of the knowledge gained by the scientific community, by addressing this gap should be discussed.
- Objectives
 - State clearly the purpose of the work in terms of the broader context of the study
 - What are the key research question(s) to be addressed? (Keep the work focused)
 - State the specific objectives or aims as they relate to the purpose of the work and to addressing the proposed questions.
- Plan of work
 - This section should demonstrate your understandings of the nature of the problem being addressed and how this affects your choice of research approach
 - A description of and rationale for selection of techniques, methods of data collection and analysis, and procedures you will use, should be clear.
 - Expected outcomes of the work should be described.
 - All figures and tables related to the proposed work should be included in the project description section.
- **Budget:** A budget (1 page) and budget justification (1 – 2 pages) must be submitted.
- **Timeline:** A timeline (1 page) indicating the duration of specific project objectives should be presented.
- **Format:** Font should be Times New Roman (font size 12) or Arial (Font size 11). No alternate fonts will be accepted. Proposals should be single-spaced. The paper size should be 8.5 x 11 with 1 inch margins on all four sides.
- **References:** All proposals must include adequate references (1-5 pages) as is necessary for proposed scope of project. All references must be in the American Chemical Society format. For additional information please refer to the ACS Style Guide. See for example: <http://www.libraries.psu.edu/content/dam/psul/up/pams/documents/QuickGuideACS.pdf>



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