GRADUATE STUDENT HANDBOOK

DEPARTMENT OF CHEMISTRY

M.S. in Chemistry

Ph.D. in Chemistry

MICHIGAN TECHNOLOGICAL UNIVERSITY

Graduate Student Handbook
Updated January 2026

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DEPARTMENT OF CHEMISTRY

The following information outlines the requirements and procedures for obtaining an advanced MS or Ph.D. degree in the Department of Chemistry.

I. General Information

A. Department Structure

The Department of Chemistry is a diverse community of faculty, professional staff, students, and scholars working together to further the mission of the department and the University. We are committed to excellence in research and education in chemistry, particularly in medicinal/biochemistry, environmental chemistry, computational chemistry, and materials chemistry. The Chemistry Department Faculty and Staff directory can be found on the Department of Chemistry website.

Graduate academic responsibilities in the department are handled by the department chair and the Graduate Programs Committee.

B. General Information

Desk assignment: Each graduate student is assigned a desk and a desktop computer.

Computers: Chem. Sci. room 717 is an open computer lab. Questions and problems with computers should be directed to the chemistry IT liaison or the Information Technology (IT) help desk located on the first floor in the library, via phone at 7-1111, or via email it-help@mtu.edu.

Keys: Requests for new keys or replacements for lost keys should be made to the faculty member's department coordinator. Lost keys need to be reported to supervisors as soon as they are noticed to be missing. Keys must not be passed on to anyone else or duplicated under ANY circumstances. Lending or duplication of keys is grounds for dismissal. A $100 fee is assessed for any key lost/replaced or not returned to public safety when no longer needed.

Building access: A student's *Husky Card* is used for after-hours access to the Chem. Sci. building via the west entrance. Requests for building access should be made to the department coordinator.

Restricted area access: Husky Card swipe access to equipment rooms or restricted areas should be made to Dean Seppala. Specific training may be required before access is given.

Safety: All students are required to have a safety form on file in the chemistry office before working in any research lab and are responsible for following all safety policies and reporting any potential or realized safety issues. University Safety Manual is available online.

Do not leave office or lab door unlocked when no one is present. No chemicals are allowed in offices. New students are not permitted in lab spaces until safety training has occurred. For safety reasons, visitors are not permitted in research and instructional labs unless the department chair has granted written permission; this includes spouses and children. Children age 12 and under who are not enrolled in a Michigan Tech class or program are not allowed in laboratories at any time.

Annual online safety training is mandatory for ALL employees and will be communicated to you via email when assigned.

Email: Email is the department's primary communication method with graduate students.

You are responsible for checking your official Michigan Tech email regularly and responding to departmental requests in a prompt manner.

Mail Service: Mail is delivered and picked daily to the department around 10:30 a.m. Graduate Student mailboxes are located Chem. Sci. 609, which can be accessed through the main office Chem. Sci. 607. Mail service to the department should be for professional purposes only.

Photocopier/printer and office supplies: Use of the department photocopier/printer and office supplies should be for teaching and research only. Please see one of the office staff for office supplies and the photocopier access code. Note that it is illegal to photocopy copyrighted materials beyond specific limits. If you have a question about copyright law, please contact the library or review the link to learn more about copyright law.

Departmental Seminars: Department seminars are scheduled on Fridays 3-4 pm during the Fall and Spring semesters. Students are expected to attend all Friday seminars unless other responsibilities (teaching or classes only) occur at the same time. Students are encouraged to attend other department seminars or events may also be scheduled throughout the year. These are good learning and networking opportunities. Please pay attention to department emails and calendar invitations.

Mentoring Program: Students are encouraged to network with the Chemistry GSG (graduate student government) and communicate with Chemistry GPC (graduate program committee) on any issues/needs. This allows for a smooth and successful transition through the graduate program. First year graduate students are encouraged to ask advisors for their mentoring plan and complete the individual development plan, reflecting expectations and guide for student through their professional goals.

Write-D Program: Writing in the Discipline, provides a dedicated time and space for graduate students to get work done and receive support on writing projects within their discipline, such as manuscripts, research proposals, etc. so that writing skills are enhanced progressively throughout the program. Guest speakers from Michigan Tech departments or the industry visit to briefly present research, writing, and publishing tips. For more info: Write-D | Michigan Tech Graduate School (mtu.edu)

Additional resources for current students: Current Students | Michigan Tech Graduate School (mtu.edu)

Information for new/incoming students

https://www.mtu.edu/gradschool/resources-for/admitted/incoming-students/

C. Graduate School Orientation

The Graduate School Orientation is held 1-2 weeks before Fall classes begin. Students are introduced to the expectations for graduate students and the basics of responsible conduct for research. Students will review training and receive resources to help you be successful in graduate school.

See the updated link for details on specific events: https://www.mtu.edu/gradschool/resources-for/admitted/orientation/

Both the Graduate School and the Chemistry Department have their own orientation events. Be sure to attend all the sessions to ensure an easy transition into your first week of classes.

Enrollment Checklist (accepted students) or by visiting your Current Student checklist (enrolled students) so we can plan for your attendance!

Upon arrival on campus all international students must register with the Office of International Programs and Services, located in room 200 of the Administration Building. All matters concerning employment and visa renewals are handled through this office. Changes in I-20 forms are handled in the Graduate School.

- International student requirements to do during orientation: take the language assessment, enroll in the GLAS program, and visit the IPS office.
  - Payroll paperwork for supported students.
  - If supported, please bring all immigration documents (international students) and social security card (domestic students) for payroll.
  - Please have a valid government issued photo ID with you in order to process your paperwork and pick up your HuskyCard at the IT Service center in the Van Pelt Opie Library.
  - The employee portion of form I-9 MUST be completed by the deadline (end of orientation week). The I-9 form is available at http://www.uscis.gov/files/form/i-9.pdf. Acceptable identification and eligibility documents for all supported students by ASAP.

- ***For Ph.D. students only:*** Incoming Ph.D. track students are required to take two placement examinations during orientation week. The aim is to assess students' foundational knowledge in their chosen discipline. This will help determine suitable courses in their first year that will strengthen general knowledge in order to provide the sound academic foundation necessary for graduate level research. The exams are American Chemical Society multiple choice exams. We recommend that you review chemistry textbooks and online resources for basic concepts prior to the exams. https://uwm.edu/acs-exams/students/student-study-materials/. (for more info see placement exam section)

- **Academic Advising:** After the placement exams, all MS and PhD students will meet individually with the Graduate Programs Committee for course enrollment (see the course descriptions here and the courses that are being offered) Students are expected to enroll in courses by the end of the day (see https://www.mtu.edu/registrar/students/registration/ for how to enroll online)

- **English Language Assessment *J.R. Van Pelt and Opie Library :*** All international students, whose first language is not English, must take an English Language Assessment. This assessment should take about 15 minutes. See the Michigan Tech Testing Center's Language Assessment page for more information and to schedule an appointment.

Graduate Teaching Assistantship Orientation: The GTA Orientation Schedule is available on the Center for Teaching and Learning (CTL) website and takes place before the start of fall semester.

Other resources for admitted graduate students can be found here: Admitted Students | Michigan Tech Graduate School (mtu.edu)

II. Assistantship and Support Policies

A. Application for and Continuation of Support

Work expectations

Graduate students should be present during business hours to allow for interactions between your advisor, colleagues, and fellow students as well as for safety.

Students should clarify expectations **with your advisor** (though the IDP or their mentoring plan) before beginning the position, which could vary depending on the nature of the work in the research group. Other points for discussion:

- **Work effort** - How many hours per week are you expected to work on research?
- **Work hours** – What hours are expected? Can you work flexible hours?
- **Vacation time** – How many weeks can you take off each year? Does this include university holidays?
- **Summer funding** - Is there summer funding available, or will you need to find funding or find a summer job?
- **Other expectations** - What other responsibilities do you regularly expect of your graduate students – examples might include participation in a journal club, mentoring and supervising undergraduate researchers, helping write grant proposals or patent applications, organizing and managing activities such as team meeting, lab cleaning, and outreach.

Off-campus internships – Agreement for the primary advisor is required for the student to take on the cool or internship opportunities.

Publications – Student are required publish in a peer-reviewed journal(s).

Timeline - Expectation for graduation timeline: MS thesis defense – 2 years, PhD dissertation defense – around 5 years. Milestone timeline is set by the degree requirements.

Conferences – Department can provide up to $500 for conference registration and travel. The request should come through the primary advisor.

Financial support: GTA, GRA, Co-cop policy, jobs on campus, finishing fellowships, other fellowship opportunities. The Department of Chemistry strives to support all students needing financial assistance using a combination of external and internal funding. However, this may not be possible for every student, particularly those engaged in the coursework/report MS programs. The Graduate Programs Committee makes support recommendations simultaneously with decisions on admission. Department (internal) funding is reserved for PhD students, however individual faculty members may have external support available for MS students to conduct research. https://www.mtu.edu/gradschool/financial/assistantships/

Decisions on financial support and contract offers for the coming academic year are made every spring semester. However, some funding opportunities may become available at other times during the year. New students who start as GTAs, are preferentially assigned to faculty advisors who have open research funding. Reappointments to graduate teaching assistant (GTA) positions are subject to review by the Graduate Programs Committee and the Department Chair in consultation with the graduate committee and faculty mentors. GTA evaluations submitted by faculty on GTA performance will play a major role in decisions made regarding reassignment of GTA positions. Graduate research assistantships (GRAs) are selected based on the decision of the faculty advisor providing the financial support and can be withdrawn at the discretion of the advisor based on student performance.

Continued funding of assistants (GTA or GRA) requires good coursework and research performance, adequately completing GTA/GRA duties, completing program requirements, maintaining effective communication with advisors and instructors, and following all safety policies. Failure to meet these expectations from prolonged absences (unexpected vacations, leaving town on non-professional events) may lead to suspension or termination of financial support.

- Departmental support decisions are made by the Department Chair based on recommendations by the GPC and a review of student performance, including teaching, research, and conduct. The decision of the Chair is final.
- Summer departmental support, usually offered at a half-time level, is subject to availability of funds and the student's satisfactory progress as detailed above.

B. Graduate Teaching Assistantships

GTAs are assigned course-related duties, which are specified by the course instructor, but may include grading, teaching a laboratory, developing assignments, designing tutorials, holding review sessions, giving lectures while the instructor is traveling, supervising

undergraduate graders, and proctoring exams. New GTAs are required by the University to go through the GTA orientation before they begin their TA position. Additionally, international students must take an English Language

Graduate teaching assistants (GTAs) should expect to devote 20 hours per week to their teaching obligations, including office hours set aside to help individual students. Teaching assistants are required to follow all applicable university employee policies. The Laboratory Supervisor is the immediate supervisor of GTAs. *Vacations may not be planned during fall or spring semesters, including finals week.*

C. Graduate Research Assistantships

Graduate Research Assistantships (GRAs) are awarded to PhD students, with the Department Chair's approval, by the funded principal investigator (PI), who is also usually the GRA's immediate supervisor and research advisor. Students are expected to dedicate most of their time to research to meet the objectives of the funded project and their dissertation research. Students are expected to make substantial progress on the research through scientific communications.

D. Vacation/Leave Policy

The department supports the health and well-being of its students, including occasional breaks from their studies. Graduate Students receiving financial aid through the University (teaching assistantship, research assistantship, fellowship) are entitled to staff holidays* and two weeks of annual paid vacation. ***Please note that the Thanksgiving and Spring breaks, the breaks between academic terms, and the summer semester are not automatically considered holidays or time off.*** It is student's responsibility to follow the guidelines below prior to scheduling or leaving for vacation.

- Students planning to be away from campus for more than a few days must complete the Student Leave Request Form (see Appendix) to ensure prior approval and that all necessary parties are aware (office, advisor, teaching supervisor) of the absence. This includes self-supported students.
- GTAs are not permitted to take vacations while classes are in session. In addition, students must allow enough time to account for travel delays (weather, visa issues, etc.) when planning their return to campus.
- Students should work out the details of their responsibilities with their supervisors/advisors, including the timing and duration of absences. If research-related travel to professional development or conferences is unavoidable while classes are in session, it is the student's responsibility to discuss this with his or her teaching supervisor and arrange for coverage of the missed classes. A Student Leave Request Form must be completed and approved prior to travel.
- Students who plan to be away for more than two weeks in either Track A or Track B will generally not be eligible for summer departmental support.
- Students needing long term leave should consult with the advisor, the department chair, the GPC, and the Graduate School.

* If not overlapping with the paid vacation, when classes are in recess (semester breaks, winter holidays, Winter Carnival, spring break), it is expected that graduate students will make use of these quiet times to pursue progress in their studies and research (lab work, reading, publications). Taking some time off, in consultation with your advisor, is reasonable. Leaving your studies for the duration of all class recesses is not reasonable and may adversely affect your progress to degree and future offers of financial support. *Communication with your advisor is essential.*

E. Professional Travel Funding

Subject to the availability of funds and at the discretion of the department chair, the chemistry department will pay registration fees (up to a reasonable limit), and some travel expenses for graduate students **who present their work** at professional meetings. **Important Note:** *Students should confirm the level of funding support they will receive from the department before finalizing their travel plans*.

Before you travel:

- Submit a copy of your abstract, signed by your advisor, to the Graduate Assistant.
- Attach a page of information about the meeting.
- Include a statement on how the meeting will benefit your research and professional development.
- Notify your teaching/ lab supervisor (if applicable) as soon as you submit the abstract and register to attend, follow their instructions for covering your instructional responsibilities, and submit a Student Leave Request Form for approval.

F. Work-Internship (Co-op) Policy

Many of our graduate students take internships which consist of leaving Michigan Tech for one semester to intern at a company. Graduate students can benefit from experience in laboratories outside Michigan Tech. Some students are fortunate enough to be offered employment at the company where they interned. It is necessary to have a formal procedure to streamline this process. It is suggested that the following statements may be useful as a guide for this process. A leave can be granted in specific circumstances.

The basic framework consists of the following criteria:

1. Students wishing to engage in an internship experience must first discuss this with their primary research advisor. A student should not accept an internship experience without prior approval of their primary research advisor. ***The advisor must grant approval before positions are sought or applied for.*** These experiences are only possible with the permission of the professor, the Graduate Programs Committee and the Department Chair. The process is initiated by the student discussing the matter with their mentor and then providing the application materials described below.
2. Internships will be granted for one semester only.
3. Internship experiences must involve some sort of chemical work, either in synthesis and characterization or theoretical work.
4. Students will only be allowed one internship experience.

5. An internship should not be granted in the final year of research prior to dissertation defense.

Application Materials:

The Graduate Programs Committee will require the following information from the advisor and student before a recommendation will be made to the Department Chair:

1. The advisor must provide a cover letter indicating how they have initiated and (co)developed the internship.
2. The student must submit a letter to the Graduate Programs Committee explaining how the experience benefits his or her research and career goals, and detailing a timeline to completion of the degree program.

The complete set of information provided to the Graduate Programs Committee and the recommendation of the Graduate Programs Committee will be forwarded to the Department Chair who will make the final decision. Additional stipulations may be defined by the Graduate Programs Committee or the student's primary research advisor.

Co-op or internship experiences can affect a student's insurance status, financial aid eligibility, graduate school standing, and visa status. *It is the student's responsibility to comply with all university requirements regarding a co-op or internship.*

III. Academic Policies

A. Academic Integrity

The University and the department expect all students to maintain the highest level of academic and scientific integrity in all aspects of their studies, from classwork to exams to research. If you are unsure of or have specific questions about assignments, projects, examinations, etc., please ASK your instructor or research advisor, as appropriate to the situation.

A detailed booklet describing Michigan Tech's academic integrity policy and procedures, including definitions of plagiarism, cheating, fabrication, and facilitating academic dishonesty, is available from the Dean of Students office or on the University Senate website. All graduate students should carefully read this policy. Graduate Students must view the orientation as well as responsible conduct of research training website.

Michigan Tech strives to promote an atmosphere of honesty and integrity and requires all research to be carried out in a manner reflective of these principles. For more information, please review Scientific Misconduct Procedures here.

B. Conflict Management Procedures

Healthy debate of data or opinions about research is welcomed as part of the learning process of developing into a professional, independent scientist. We can respectfully disagree with our colleagues. This may lead to new ideas for research and learned skills in data analysis. Also, advisors have different management styles and expectations for their research group, based on lab activities. Talk with your advisor about their expectations to avoid

misunderstandings. Everyone wants students and research projects to succeed. Students are encouraged to review the Graduate School's Guidelines for Success.

Causes of Conflict: Disagreements or misunderstandings in procedures and expectations can result in conflict. Students have the right to fair and equal treatment by administrators and to expect professional behavior from faculty and other students. Professional behavior includes such matters as a respect for expertise, individual beliefs, and personal privacy (e.g. health records).

General Guidelines: Faculty or students with concerns or complaints about disagreements or conflicts in professional situations should follow the procedures described below. Below are guidelines to approach and handle conflicts that may arise in the lab environment. Other resources on campus are available for actions based on the United States laws.

- **Research related Conflicts**: Students should attempt to first resolve the disagreement or misunderstanding with their advisor. The advisor's role is to manage their research group and provide professional guidance to students. We encourage students to adopt a growth mindset, in learning from these experiences. Students should avoid discussing their complaints with colleagues, as this can result in more confusion, harness resentment, and wasted time in resolving the conflict.
- **Other Conflicts**: For other conflicts, students who have complaints about administrators, faculty, or other students should first discuss their complaints with the person concerned, if possible. If the complaint cannot be resolved in this way, they should discuss the complaint with the Chemistry Graduate Committee Chair. The Graduate Committee Chair will attempt to resolve the problem through discussions with relevant parties and/or the Graduate Programs Committee. If resolution is not possible, the complaint will be referred to the Chemistry Department Chair. If the complaint concerns the Graduate Committee Chair, it should be referred directly to the Chemistry Department Chair. If the complaint concerns the Chair and resolution is not possible within the Chemistry Department, the complaint should be referred to the Dean of the Graduate School.
- The campus provides an ombudsperson through the campus conflict resolution network. One of the functions of the ombudsperson is to process student complaints anonymously. This should only be used if the above procedures cannot resolve the conflict.
- If students are struggling with their mental health, Michigan Tech has resources to help **Mental Health Resources.** If you or someone you know is feeling overwhelmed, depressed, or in need of support, services are available. For help or to find additional resources, contact Counseling Services at 906-487-2538 or visit the Counseling Services website. Mental Health Services records are not included in any of your other University records. All information about you, acknowledgments of your visits, is confidential and cannot be released without your written permission except under specific circumstances outlined in our confidentiality policy.

Other severe conflicts can be followed accordingly:

Academic Integrity and Plagiarism: Questions of plagiarism should be taken to the Dean of Students according to University Procedures. It is important to everyone at Michigan Tech that academic standards are maintained; academic misconduct may result in an appropriate

conduct sanction/educational condition(s) imposed by the Office of Academic and Community Conduct.

Both students and faculty are responsible for ensuring the academic integrity of the University according to the procedures in "Academic Integrity at Michigan Tech - A Guide for Students and Faculty." Specific violations in this course could be the intentional use of any unauthorized study aids, equipment, or another person's work during an examination (cheating) or allowing/helping another individual to cheat (facilitating academic dishonesty). This includes on campus and online assignments.

Harassment: Sexual discrimination and sexual harassment issues should be taken to the University Title IX Coordinator. These procedures are designed to protect the rights and privacy of both faculty and students and to equitably adjudicate conflicts among faculty and students. Students who believe they have been subjected to discrimination based on sex or sexual harassment, suspect that an unfounded discrimination complaint may be filed against them, or have been threatened with the filing of such a complaint should notify the Affirmative Action Officer as soon as possible. If you have a concern of any nature, you may report this through the Dean of Students website. More information found here.

University policy prohibits discrimination and harassment on the basis of sex, which includes sexual harassment, sexual assault (rape, fondling, statutory rape, and incest), dating and domestic violence, stalking and discrimination on the basis of sex. Incidents involving a student and/or employee should be reported to the Title IX Coordinator. If you have any other concerns regarding the policies above, please inform your advisor and follow this page to report a concern.

Disability: Michigan Tech complies with all federal and state laws and regulations regarding discrimination, including the Americans with Disabilities Act of 1990 (ADA). If you have a disability and need a reasonable accommodation for equal access to education or services at Michigan Tech, Student Disability Services (sds@mtu.edu , or the Dean of Students (7-2212). Information for veterans found here.

C. Graduate Program Committee (GPC)

GPC is a committee consisting of faculty members. The mission of the committee is to maintain the program's rules (their handbook), oversee the progress of students in the program, and run the admission process.

D. Advisor Selection

The selection of the research advisor is one of the most important choices facing new students. All first-year graduate students must choose a major area and a research advisor by the end of their first semester.

The Research Advisor Selection Form is available from the Graduate Programs Assistant. This list has names of faculty members who have an opening in their research group in the current academic year.

1. Research Advisor Selection Form is available in the Appendix. During academic advising (review of placement scores) student and the Graduate Program Committee (acting

advisor) will determine which faculty are to be interviewed based on available openings, student research interests, and needs of the department.

2. Student must interview faculty of interest, gather their signatures on the Advisor Selection Form, and use the interview process to identify the research advisor.
3. The graduate programs director will, based on both student and faculty preference lists and other factors (such as the faculty member's current, desired and optimum group size, his/her grant funding, the status of students currently in the group, similar factors for the student's second choice, etc.), assign each student to one of his/her preferred faculty.
4. Each student must submit Graduate Advisor Selection Form rom MyMichiganTech profile to the graduate school by the designated date.

E. Process for Changing Advisor

Before initiating the process to change you Research Advisor, please consider all the options listed on the Graduate School's website for ***how to address difficulties in the student-advisor relationship*.**

Once you have decided to change your graduate advisor, you must follow the steps listed below.

1. Meet with the Graduate Programs Director to initiate the process to change advisor. In case of conflict of interest, meet with the department chair.
2. Discuss with the Graduate Programs Director (or Department Chair):
   - Whether additional resources within or outside the department (such as the Ombuds office) could help resolve the situation.
   - The impact of the change of advisor on your time to complete the degree. Coursework, qualifying exam(s), and the research proposal examination are all factors that could be impacted with a change in advisor.
   - Your current and future funding.
   - Research already conducted, and whether this will be incorporated into the dissertation, thesis, or report, and if so, how.
   - Impact on immigration status (if any). Consult International Programs and Services (IPS), if necessary.
   - Record the agreement from the discussions in writing, including indications of agreement from all affected faculty advisors, and provide copies to the student, the graduate programs director, and all affected faculty advisors.
3. File an updated *Advisor and Committee Recommendation Form* for approval by the Graduate School.
4. If the student and the graduate programs director are unable to reach agreement on the advisor change, contact the assistant dean of the Graduate School to determine additional steps to resolve the situation.

F. Academic Standing, Progress to Degree, and Evaluations

The Graduate School mandates that all graduate students receive regular evaluations regarding their progress toward degree no less than once per year. The Chemistry Department has their own procedures which satisfy this requirement.

Student academic progress is reviewed by the Graduate Program Committee (GPC). This evaluation takes into consideration the demonstration of foundational competencies (via placement exam or earning a grade of B or higher in assigned foundation courses), coursework progress, grade point average (GPA), proficiency requirements, and acceptance to a research laboratory. After two semesters, the GPC judges a student to be in good academic standing if the student has:

1. Demonstrated foundational competencies (via placement exam or earning a grade of B or higher in assigned foundation courses), with a minimum overall GPA for all courses of 3.0.
2. Taken discipline specific graduate level courses.
3. Joined a research group and make adequate progress each semester.
4. Shown proficiency in teaching as indicated by supervisor (if applicable).
5. Earned excellent research evaluations.

Failure to meet these criteria will result in the student being placed on a probationary status. Student will have at most one semester to satisfy all first-year requirements. Students who fail to maintain good academic standing can be terminated from the graduate program.

Probation: Students who fail to maintain a 3.0 GPA or who receive a "Q" grade in research credits will be placed on academic probation. If you are given a "Q" research grade, your research advisor is required to meet with you that semester to give you feedback and help develop a plan and timelines for improvement. Students who successfully raise their GPA above a 3.0 and receive "P" grades in their research credits the semester following probation, will be returned to good academic standing and removed from probation.

Suspension: Students who are on probation for two sequential semesters will be placed on academic suspension and will not be allowed to enroll in courses the following semester. Students suspended for poor research performance will need to review their probationary plan, identify deficiencies in the plan and their progress, and revise and develop a new research plan for the returning semester with benchmarks and deadlines for satisfactory progress. This plan must be approved by the research advisor. Students who bring their grade point above a 3.0 and achieve research grades of "P" will be moved from suspension back to probation the following semester. Progression from probation to good academic standing will proceed as indicated in the previous section.

Dismissal: Students will be dismissed from the program who:

- Fail to improve following two semesters on suspension
- Fail their qualifying exam twice (PhD only)
- Fail to pass a proposal defense twice (PhD only)
- Fail to pass the final thesis (MS research) or dissertation (PhD) defense

Response to Suspension and Dismissal: Students may either appeal as described in the Graduate Appeals of Suspension or Dismissal policy, or leave campus. Those who leave campus must follow closeout procedures.

G. Policy on Timely Written Feedback

The chemistry department provides constructive written feedback to graduate students who are completing a report, thesis, or dissertation through two primary processes to help ensure that both students and advisors are aware of the student's academic progress and plans for the future.

First, all graduate students engaged in research are required to submit a Research Progress & Evaluation form (see the Graduate Student Research Progress & Evaluation form in the Appendix) at the end of each semester. This form is meant to be filled out by both the student and research advisor and discussed between them at a meeting that should be a two-way discussion of the overall progress toward degree, student development over the prior year; and to set research, performance, and development goals for the next year. The completed form should be signed by the student and advisor and submitted to the GPC through the Graduate Assistant. If deficiencies are identified in a student's performance, written feedback will be provided twice yearly by the student's advisory committee, specifically addressing the area(s) of deficiency, timeline for making up the deficiency, and consequences for continued unsatisfactory performance.

The second process of providing timely written feedback to students is coincident with the Graduate Learning Outcome (GLO) assessment. In particular, after a student completes the Qualifying Exam and the Original Research Proposal, the examining committees will provide copies of the GLO evaluation forms (see Appendix for the Graduate Learning Outcome rubrics and GLO forms) to the advisor and a summary form to the student. Advisors are encouraged to meet with the students to review the feedback.

H. Individual Development Plan

Individual Development Plans (IDPs) are designed to help students reflect on what they want to get out of their graduate education, think of short-term and long-term goals, and explore their interests and career paths. It is a living planning document and should be modified as needed. The IDP is a tool to help identify goals, opportunities, and potential hurdles and discuss these with a student's advisor.

An IDP is a useful tool to help a graduate student and advisor:

- Reflect and develop a strategy for graduate education
- Manage their expectations and maintain a positive working relationship
- Minimize misunderstandings and conflicts

IV. Degree Program Requirements and Timelines

A. M.S. Degree (Thesis Option) Requirements

- A minimum of 30 credits beyond the bachelor's degree are required for a master's degree.
    - Twenty (20) Course Credits:
        - CH 5130 Prof Dev: Chemical Safety (1 credit)
        - CH 5900 Chemistry Graduate Seminar (1 credit)

    - Minimum 12 credits of 5000 levels or higher.
    - Maximum 9 credits of 3000 to 4000 level.
  - Ten (10) Research Credits.
- M.S. thesis
- Presentation of research in a seminar followed by an oral defense.
- Proof of mastery of chemistry concepts through passing placement exams and department courses.
- **Timeline for degree completion.** All work must be completed within the specified time frame starting from the first enrollment in the degree program or earliest course listed on the degree schedule, whichever is earliest. Expected timeline for master's degree is 4-6 semesters. Any time extension beyond 6 semesters (3 calendar years) has to be approved by the department chair. Master's degree must be completed within five (5) calendar years.

What:	When:
Provide proof of health insurance or obtain a University policy	Every Year
Register for courses, Pay your bill Confirm enrollment	Every Semester
Select an advisor by submitting Advisor and Committee Recommendation Form	By end of first academic semester
Responsible Conduct of Research (RCR)	BASIC by end of first academic year ADVANCED by end of fourth semester
Select an Advisory Committee by submitting Advisor and Committee Recommendation Form	During second semester.
Master's Degree Schedule Form	Due prior to moving to Research Mode or semester prior to defense.
Dissertation/Thesis Workshop	Well in advance of planned defense. As scheduled by the Graduate School.
Commencement Application Form	Semester of planned degree completion
Pre-Defense Form	Two weeks prior to oral defense. Coordinate with Chemistry Department Graduate Assistant for room scheduling, advertising, and review of procedures. Submit with draft copy of dissertation to graduate school & advisory committee
Report on Final Oral Examination Form	Day of defense Bring form to defense. Complete for advisory committee signatures following oral defense

What:	When:
Approval of Dissertation, Thesis, Report Form	Complete all revisions, obtain advisory committee approvals, submit form to graduate school WITHIN ONE WEEK submit dissertation, thesis, report to Digital Commons & ProQuest
Workspace Cleanout Form	Before graduating/leaving campus
Exit Survey	Before completing degree

B. M.S. Degree (Coursework Option) Requirements

- A minimum of 30 credits with a maximum of 12 credits at the 3000 to 4000 level.
- See graduate programs director for additional requirements and details.

Timeline M.S. (Coursework Option)

What:	When:
Provide proof of health insurance or obtain a University policy	Every Year
Register for courses, Pay your bill Confirm enrollment	Every Semester
Responsible Conduct of Research (RCR)	BASIC by end of first academic year ADVANCED by end of fourth semester
Master's Degree Schedule Form	Due semester before final semester.
Workspace Cleanout Form	Before graduating/leaving campus
Exit Survey	Before completing degree

C. Accelerated MS Degree Requirements

- A minimum of 30 credits beyond the bachelor's degree are required for an Accelerated MS degree.
    - Twenty (20) Course Credits:
        - CH 5130 Prof Dev: Chemical Safety (1 credit)
        - CH 5900 Chemistry Graduate Seminar (1 credit)
        - Minimum 12 credits of 5000 levels or higher.
        - Maximum 9 credits of 4000 level.
    - Minimum of six (6) Research Credits.
- Research Report (MS thesis)

- Presentation of research in a seminar followed by an oral defense.
- Proof of mastery of chemistry concepts through passing placement exams and department courses.

Maximum 9 credits of 4000-level can be double counted to both BS and Acc. MS degree.
Maximum one-third of the required non-research course credits can be Senior Ruled. Senior ruled credits cannot be applied to BS degree.
See this LINK for information.

D. Ph.D. Degree Requirements and Timelines

Credit Requirements:

- A minimum of 60 credits beyond the bachelor's degree are required.

Course Credit Requirements:

- A minimum of twenty (20) Course Credits:
  - CH 5130 Prof Dev: Chemical Safety (1 credit).
  - CH 5900 Chemistry Graduate Seminar (1 credit).
  - Minimum 12 credits of 5000 levels or higher.
  - Maximum 6 credits of 4000 level (with a maximum of 6 credits of fundamental undergraduate courses assigned based on the Placement Exams).

Students are required to take Advanced Responsible Conduct of Research *course before the end of second year*. Please see the list of pre-approved courses for advanced training here. The RCR course involves being aware of and putting into practice the established professional norms and ethical principles of research. Intellectual honesty and responsible conduct is necessary for excellence in research and for maintenance of public trust. More and more, privately and publicly funded research institutions see RCR as an essential component of training.

Michigan Tech has developed several training programs to support graduate students and postdoctoral fellows in their professional development and fulfill obligations to sponsors of our research programs. All doctoral students and master's students completing thesis or report options must complete basic and advanced RCR training as described below. Students completing a master's degree with the coursework option no longer need to complete advanced RCR training.

https://www.mtu.edu/gradschool/resources-for/students/academic/rcr/

Some Advanced RCR course credits do not count towards the degree course credit requirements.

Note: The following credits are not allowable to count toward graduation according to Graduate School requirements:

- Courses numbered below the 4000 level
- Audited courses
- Continuous enrollment courses (ex: UN 5951, UN 5953)
- Non-research courses taken on a pass/fail basis

- Credits applied toward another degree (with limited exceptions; see the Graduate School web site for details)

In addition, the Chemistry Department requires a grade of B or better for a course to count toward graduate degree requirements. Up to 6 credits with BC or C grades may count upon recommendation of the GPC and approval by the Department Chair.

Research Credit Requirements:

- A minimum of thirty (30) Research Credits.
- Additional ten (10) credits that can be Course Credits and/or Research Credits.

Required Milestones:

- Qualifying Examination - Seminar
- Research Proposal Examination
- Ph.D. Dissertation.
- Oral Defense of Ph.D. Research.

Timeline for degree completion:

All work must be completed within the specified time frame starting from the first enrollment in the degree program or earliest course listed on the degree schedule, whichever is earliest. Any time extension beyond 10 semesters (5 calendar years) has to be approved by the Department Chair upon recommendation of the GPC. Ph.D. degree must be completed within eight (8) calendar years.

What:	When:
Provide proof of health insurance or obtain a University policy	Every year
Register for courses, Pay your bill Confirm enrollment	Every semester
Selecting advisor by submitting Advisor and Committee Recommendation Form	By end of first academic semester
Responsible Conduct of Research (RCR)	BASIC by end of first academic year ADVANCED by end of fourth semester
Select an Advisory Committee by submitting Advisor and Committee Recommendation Form	Fourth semester (prior to Qualifying Examination)
Qualifying Examination 1	Must be completed by 4-th semester
Qualifying Examination 2: Research Progress Update	Must be competed by 4-th semester

Petition to Enter Candidacy (Research Mode)	See Graduate School deadines
Dissertation/Thesis Workshop	Well in advance of planned defense. As scheduled by the Graduate School.
Commencement Application Form	Semester of planned degree completion
Pre-Defense Form	Two weeks prior to oral defense. Coordinate with Chemistry Department Graduate Assistant for room scheduling, advertising, and review of procedures. Submit with draft copy of dissertation to graduate school & advisory committee
Report on Final Oral Examination	Day of defense Bring form to defense. Complete for advisory committee signatures following oral defense
Approval of Dissertation, Thesis, Report	Complete all revisions, obtain advisory committee approvals, submit form to graduate school Within one week submit dissertation, thesis, report to Digital Commons & ProQuest
Workspace Cleanout Form	Before graduating/leaving campus
Survey of Earned Doctorate Exit Survey	Before completing degree

V. Description of Exams and Milestones

A. Placement Exam

This policy applies to incoming students to the M.S. and Ph.D. programs.[1]

Ph.D. or thesis M.S. are research-oriented degrees. The aim of the placement exam is to determine the most suitable courses for a person which will help them achieve the best results within our Graduate Program. All incoming M.S. and P.D. program students are required to take American Chemical Society (ACS) standardized tests in ***two subject areas*** (see below). Demonstration of proficiency for each subject area is defined as a score in no less than the 50th percentile. A photocopy of the completed cover sheet will be given to the student to use in course registration. The original cover sheet and exam results will be kept in the student's file.

[1] This procedure does not generally apply to Michigan Tech undergraduates in the Accelerated M.S. degree program since they are earning a Michigan Tech undergraduate degree in Chemistry.

Students that do not demonstrate adequate proficiency based on the placement exam, will be required to earn a grade of B or better in the appropriate undergraduate foundation course, which must be taken in the first year of graduate study.

Descriptions of the placement exams:

1) *Physical Chemistry Placement Exam*
   Placement Exam questions in physical chemistry consist of problems that generally fall into three subject areas: thermodynamics, chemical kinetics and elementary quantum mechanics. The student should be able to manipulate, solve and apply differential and algebraic equations, provide straightforward derivations, and occasionally explain significant physical techniques or theories.

2) *Inorganic Chemistry Placement Exam*
   The placement examination in inorganic chemistry will contain questions designed to test a student's knowledge of inorganic chemistry at the undergraduate level of an ACS accredited program. Such programs usually include courses in inorganic chemistry at the freshman/sophomore and junior/senior levels; the content of these courses normally span both descriptive chemistry and physical principles and methods.

3) *Organic Chemistry Placement Exam*
   The organic chemistry placement examination is designed to verify that each student has retained a basic knowledge and understanding of the organic chemistry of functional groups, as well as synthetic methods, reaction mechanisms, and spectroscopic methods of characterization.

4) *Biological Chemistry Placement Exam*
   The biological chemistry placement examination is designed to verify that each student has retained a basic knowledge and understanding of molecular aspects of biological structures, equilibria, energetics, and reactions. It will cover three general subject areas: Biological structures and interactions; Biological reactions; Biological Equilibria and thermodynamics.

5) *Analytical Chemistry Placement Exam*
   The analytical chemistry placement exam includes quantitative analysis (errors in chemical analysis, statistical data treatment, and evaluation, chemical equilibriums, classical methods of analysis including gravimetric methods of analysis, and titration methods in analytical chemistry) and instrumental analysis (kinetics and separations {gas chromatography, liquid chromatography and other miscellaneous separation methods}, electrochemical method, spectrochemical analysis {molecular absorption spectrometry, molecular fluorescence spectrometry, atomic spectroscopy and mass spectrometry}).

B. Advising for Course Selection

Performance on the placement examinations and review of the student's undergraduate and graduate transcript will be used by the GPC to guide course selection during the first year of graduate study. Grades and research needs will guide later course selections.

Within the first semester, a member of the GPC will act as a student's advisor. Starting second semester, students should also consult their research advisor in conjunction with the GPC for approval of courses. Student performance review will be held with GPC at the end of each calendar year to ensure progress and make funding recommendations.

C. Ph.D. Advisory Committee

Students form their Advisory Committee before their Qualifying Examination. The same advisory committee can be in place for the final Thesis Defense.

The Advisory Committee shall consist of (i) the primary research advisor who serves as the Committee Chair, (ii) two members of the Chemistry Graduate Faculty, and (iii) one member of the Graduate Faculty external to Chemistry, according to Graduate School stipulations. One of the committee members should be outside of student's research area.

The student shall submit a completed Advisor and Committee Recommendation Form listing recommended advisory committee members to the Graduate Program Director prior to proceeding with qualifying examinations.

D. Guidelines for the Qualifying Examination 1 – Departmental Seminar

Goal: to examine the student's fundamental knowledge in chemistry.

Exam Summary: Students must prepare 40-45 min **literature overview** in a seminar format. The research topic should be broadly related to your discipline (organic, inorganic, biochemical, physical, analytical) and not be repeated assignment from a course or previous thesis/degrees. We encourage you to make use of the Library, the Writing Center, and other resources to ensure properly referencing and utilizing proper resources.

Guidelines for Oral Examination:

The Oral Examination, which follows the presentation, students on fundamental chemistry knowledge, understanding of research methods, and critical thinking. The examination should focus on the knowledge of fundamental concepts of chemistry and the overall understanding of the presented work; understanding of methods and outcomes of presented studies; understanding and critical analysis of outcomes. See the PhD rubric in the appendix for expectations.

Evaluation Committee

The Committee will consist of student's Ph.D. Advisory Committee.

E. Guidelines for Qualifying Examination 2 - Research Proposal

Goal: to examine the student's research progress and plan towards the Ph.D. degree.

Qualifying Exam Committee: The Examination Committee will consist of Ph.D. Advisory Committee members (see section V. C.).

Advisor Role: PhD advisor(s) *are expected* to read the written report and watch practice oral presentation(s) and give feedback to help mentor their student through this process. Advisors can provide comments and feedback on the written report; however, they should not physically edit the documents. Advisors should not answer the questions posed to the student, as they were involved in mentoring the student in the research. Advisors are allowed to answer questions only to clarify on the content and to provide details on student performance and their perception on the likelihood of their success. However, the committee has the ultimate say in whether the student was successful in their exam.

Guidelines for Written Report:

The goal of the exam is to:

- Determine your ability to perform your research
- Determine your ability to describe what is already known in your field and what questions remain
- Determine whether the student can identify a significant research question in their field, address it using their research, and impact of their project in their respective field
- Use the literature to develop and support claims in a logical format

Details of report:

- Up to 20 pages, single-spaced, with 1-inch margins inclusive of any figures, tables, and graphs (references excluded).
- Font: 12-point font, Times New Roman, or 11-point Helvetica or Arial
- All graphics and charts must be of publishable quality with citations (minimum of 15 references), and the entire document must be of professional quality visually and in the clarity of the language.

The report should reflect the goals, supporting literature, current results and progression of research towards Ph.D. thesis.

Abstract: Introduce the research, identify project objectives, reflect on the methods, and include results and conclusion.

Introduction: Provide an in-depth description of the prior research in the field that is relevant to the project. Highlight the pitfalls or state the problem that is (will be) addressed through the conducted study.

Hypothesis/Objectives: Describe the plan to achieve the stated hypothesis or objectives. Provide relevant supporting preliminary data that has been acquired and additional supporting data form literature (if applicable). Present data, explain findings and discuss how results contribute to addressing the pitfalls/problems identified in the introduction. Use appropriate figures, schemes, tables to summarize data. Provide sufficient explanation for the reader to understand the results that you have observed.

Preliminary (current) data: Present your data. Explain findings and discuss how your results contribute to addressing the pitfalls/problems identified in the introduction. Use appropriate

figures, schemes, tables to summarize your data. Provide sufficient explanation for the reader to understand the results you have observed. Highlight if method optimization of development is necessary.

Where relevant, provide a justification an outline for studies to be competed to address the hypothesis/objective. This art is written in a proposal format with projections on experiments and required data.

Pitfalls and alternative strategies: Identify possible limitations of the stated approach (pitfalls) and suggest alternative strategies to achieve the goal.

Appendix: For data acquired during research, provide a separate *Materials and Methods section as an appendix (limited to 5 pages).* In this section, identify all materials and methods that were used. For studies involving synthesis of compounds, provide synthetic procedures and complete compounds characterization (NMR, MS, diffraction, computational methods). For parts to be investigated, provide a research plan.

Guidelines for Oral Presentation

- 30-40-minute professional presentation addressing the information contained in the written report.

Guidelines for Oral Examination

The Oral Examination by the QuE Committee includes testing the candidate's knowledge of fundamental concepts in chemistry (bonding, energies, pKa, chemical mechanisms, etc.) and in the field of research; understanding of methods used; critical analysis of published data and preliminary data, understanding of conducted experiments, experiment design, feasibility of research objectives and research plan. Advisors should be mindful that this is part of an examination and therefore should refrain from answering questions from the committee members and let the student answer.

Evaluation Criteria

1) *Written Document Evaluation Criteria.*
   Criteria that might be used to accomplish this are (in no particular order):
   - Quality of communicating research objective and merit
   - Quality of images, tables, other graphics
   - Adequate selection of graphical support
   - Adequate reflection of literature background
   - Adequate use of citations from reputable sources
   - Quality of communicating research goal, research plan, methods, key experiments or instrumental analysis, data analysis, molecular modeling methods, etc.
   - Level of critical insight into the proposed work such as understanding of limitations of the approach, experimental methods, analytical tools, or potential broader implications of a successful or failed project to other fields.

2) *Oral Presentation Evaluation Criteria.*

The Evaluation of the Oral Presentation should be based on how well the student met the objectives of this Exam Part. (see Qualifying Exam Graduate Learning Outcomes (GLOs) and the Rubric for Ph.D. Student Evaluations in appendix for guidelines). Examples of Specific Criteria that might be used to accomplish this are (in no particular order):

- Overall quality of presentation including background overview, communication of the content, organization, slide quality, graphics quality, use of captions and citations, student narrative, etc.
- Quality of research design with experimental plans, understanding of the research methods and the significance of the data obtained to move the project forward.
- Demonstration of a broader impact

3) *Committee Examination:* The Examination Committee is expected to ask an appropriate number of questions with a suitable range and depth within student's research and the nearest academic discipline, as outlined in the PhD rubric.

Guidelines for Committee Evaluation

The Examination Committee discusses the student's effectiveness at accomplishing the objectives for Parts 1-3 of the Qualifying Exam based on the following criteria:

- A breadth and depth of knowledge related to their research project
- A breadth and depth of knowledge in their nearest Academic Discipline
- The ability to analyze data or extrapolate from data or form hypotheses
- The ability to defend their ideas or analyses in an oral defense

Each Examination Committee member will independently evaluate student's performance using the evaluation form for Qualifying Exam Graduate Learning Outcomes (GLOs) and the Rubric for Ph.D. Student Evaluations (see Appendix). All forms must be collected and passed to the graduate program assistant. The Graduate Assistant will provide a copy of Assessment Summary to the student. Advisors are encouraged to discuss the outcome and the assessment with the student after the exam to ensure proactive progress.

Each committee member will independently assign an overall determination of Pass, Provisional Pass, or Fail. The committee will also come to a consensus for its overall determination of Pass, Provisional Pass, or Fail, which will determine the student's overall Qualifying Exam outcome.

- Provisional Pass will require student to address all committee requirements in a timely manner.
- In case of a Fail grade, students are allowed to retake the Exam in the following semester. Failure to Pass QuE on a second attempt will be considered as evidence of not making satisfactory progress toward the degree and will result in dismissal from the Ph.D. program.
- If a student passes their QuE exam, but changes research direction or advisor, the student does not need to retake the exam.

VII. APPENDICES

Graduate (Research) Advisors

NAME	TITLE	EMAIL	OFFICE
ATA, Athar	Professor	aata	607E
BI, Lanrong	Associate Professor	lanrong	620A
CHARLESWORTH, Paul	Associate Professor	pcharles	708A
CHRISTOV, Christo Z	Professor	christov	312C
DAM, Tarun K	Professor	tkdam	0510C
FANG, Shiyue	Professor	shifang	620C
HEIDEN, Patricia A	Professor	paheiden	415
KARABENCHEVA-CHRISTOVA, Tatyana	Associate Professor	tatyanak	312B
LIU, Haiying	Professor	hyliu	402E
LUCK, Rudy	Associate Professor	rluck	701B
MAZZOLENI, Lynn R	Associate Professor	lrmazzol	402D
PERRINE, Kathryn A	Associate Professor	kaperrin	402C
TANASOVA, Marina	Professor	mtanasov	620 B
THOMPSON, Martin J	Associate Professor	thompson	510B
TIWARI, Ashutosh	Professor	tiwari	402B
VALENZANO-SLOUGH, Loredana	Associate Professor	lvalenza	701A

Graduate Advisor Selection For is located at the Students portal and Graduate School Website (https://www.mtu.edu/gradschool/policies-procedures/requirements/advisor/).

The form must be completed by the student and advisor and submitted by the student to the graduate school.

Rubric for Ph.D. Student Evaluations (QuE #1 - Seminar)

	Departmental Objectives	Deficient	Marginal	Satisfactory	Excellent
GLO1: Demonstrate Mastery of Chemistry	**Synthesizes existing knowledge**	● Does not understand basic concepts or conventions; ● Misinterprets or misuses sources.	● Displays a basic understanding of the field.	● Displays a solid understanding of the field; ● Adequate exploration of interesting issues and connections.	● Demonstrates thorough mastery as well as creativity in drawing upon multiple sources; ● Demonstrates a deep understanding of relevant literature.
GLO2: Demonstrate Advanced Critical Thinking Skills	**Understands the application of methodologies and techniques**	● Misapplies or refers to nonstandard techniques without adequate rationalization.	● Identifies standard techniques; ● Does not recognize limitations in data/techniques were applicable.	● Understands appropriate, theory, methods and techniques; ● Appropriately explains limitations of data/techniques were applicable.	● Suggests improvements to standard methods and techniques; ● Limitations are thoroughly and competently discussed.
	Critically analyzes and evaluates their own findings and those of others	● Does not recognize improbable results.	● Relies on others to suggest data that are relevant to solving a problem; ● Literature review is adequate but not critical.	● Identifies weaknesses in own work but discussion is not comprehensive.	● Provides critical evaluation of previous works; ● Identifies and corrects weaknesses or flaws in referenced work;
GLO4: Demonstrate Professional Skills	**Displays effective written and oral communication skills**	● Writing or presentation has frequent spelling and grammatical errors; ● Does not grasp intent of questions.	● Writing or presentation is adequate; ● Illustrations are technically correct, and appropriate; ● Understanding of concepts adequate but incomplete.	● Writing or presentation is well organized and effective; ● Illustrations are appropriate and effective; ● Understanding of concepts is satisfactory.	● Writing or presentation is concise, elegant, and engaging; ● Technical content and graphic design of illustrations are well planned/executed; ● Thoroughly understands concepts.
GLO5: Demonstrate Responsible Conduct in Research	**Safe lab practices; Proper attribution of credit in writing and research.**	● Failed Lab Safety Course ● Fails to attribute credit in writing, illustrations, or joint research.	● Passed Lab Safety Course ● Insufficient attribution of credit in writing, use of illustrations, or joint research.	● Passed Lab Safety Course ● Appropriate attribution in writing and use of figures and joint research efforts.	● Passed Lab Safety Course ● Full attribution in writing and use of figures, illustrations, and joint research.

Individual Evaluation of Ph.D. Graduate Student Outcomes: QuE1 - Seminar

Student's Name: _____ **Semester / Year:** _____

Examiner's Name: _____

GLO1: Mastery of Chemistry: Demonstrates broad knowledge in chemistry

Deficient Marginal Satisfactory Excellent

Comments: _____

_____

GLO2: Research Skills:

a) Understands the application of methodologies and techniques

Deficient Marginal Satisfactory Excellent

b) Understands the limitations of data/techniques where applicable

Deficient Marginal Satisfactory Excellent

c) Critically analyzes and evaluates their own findings and those of others

Deficient Marginal Satisfactory Excellent

Comments: _____

_____

GLO4: Professional Skills:

Written Communication

a) The presentation provided an effective overview of the research topic

Deficient Marginal Satisfactory Excellent

b) The presentation clearly states the objectives and merit of the topic

Deficient Marginal Satisfactory Excellent

c) The presentation clearly presents and justifies the originality of the topic

Deficient Marginal Satisfactory Excellent

Oral Communication

a) The presentation components are organized and work together to communicate the topic

Deficient Marginal Satisfactory Excellent

b) The presentation effectively presents the relevant research to put the original ideas in context and to show the novelty and merit of the original idea

Deficient Marginal Satisfactory Excellent

c) All graphics, captions, and units in the slides are visible to the audience and support the talk

Deficient Marginal Satisfactory Excellent

Comments: _____

_____

GLO5: Responsible Conduct in Research: The use of citations, figures, illustrations, and joint research contributions were appropriately documented

Deficient Marginal Satisfactory Excellent

Comments: _____

_____

Summary of the Student's Major Strengths and Weaknesses:

_____

_____

_____

_____

_____

Overall Determination: Pass Provisional Pass Fail

Examiner's Signature: _____

Evaluation Committee Summary of Ph.D. Graduate Student Outcomes

Qualifying Exam 1- Seminar

Student's Name: _____ **Semester / Year:** _____

Please check one: ☐ **Qualifying Exam** ☐ **Original Research Proposal**

Committee Decisions

GLO1: Mastery of Chemistry: Demonstrates broad knowledge of chemistry

Deficient Marginal Satisfactory Excellent

GLO2: Demonstration of advanced research skills

Deficient Marginal Satisfactory Excellent

GLO4: Demonstration of professional skills (effective **written** communication)

Deficient Marginal Satisfactory Excellent

GLO4: Demonstration of professional skills (effective **oral** communication)

Deficient Marginal Satisfactory Excellent

GLO5: Demonstration of responsible conduct of research

Deficient Marginal Satisfactory Excellent

Overall Determination: **Pass** **Provisional Pass** **Fail**

Consensus Comments of the Committee:

_____

_____

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_____

Rubric for Ph.D. Student Evaluations (Proposal Defense, Thesis Defense)

The following evaluation criteria are being used to assess Ph.D. student performance in major qualifying examination. Based on these criteria, individual evaluations forms (provided below) are filled up by each committee member for formal assessment of examination.

	Departmental Objectives	Deficient	Marginal	Satisfactory	Excellent
GLO1: Demonstrate Mastery of Chemistry	**Synthesizes existing knowledge**	● Does not understand basic concepts or conventions; ● Misinterprets or misuses sources.	● Displays a basic understanding of the field.	● Displays a solid understanding of the field; ● Adequate exploration of interesting issues and connections.	● Demonstrates thorough mastery as well as creativity in drawing upon multiple sources; ● Demonstrates a deep understanding of relevant literature.
GLO2: Demonstrate Advanced Research Skills	**Understands the application of methodologies and techniques**	● Misapplies or uses nonstandard techniques without adequate rationalization.	● Applies standard techniques; ● Does not recognize limitations in data/techniques were applicable.	● Uses appropriate, theory, methods and techniques; ● Appropriately explains limitations of data/techniques were applicable.	● Suggests and utilizes improvements to standard methods and techniques; ● Limitations are thoroughly and competently discussed.
	Critically analyzes and evaluates their own findings and those of others	● Does not recognize improbable results.	● Relies on others to suggest data that are relevant to solving a problem; ● Literature review is adequate but not critical.	● Identifies weaknesses in own work but discussion is not comprehensive.	● Provides critical evaluation of previous works; ● Identifies and corrects weaknesses or flaws in referenced work;
GLO3: Make an Original and Substantial Contribution to the Discipline	**Think originally & independently to develop concepts & methodologies**	● Fails to put their research into suitable context to show it advances existing science; ● Fails to apply proper methods.	● Inadequately puts research into a suitable context to show it advances existing science; ● Inadequate use or analysis of available methods.	● Demonstrates how research fits into and advances existing science; ● Appropriate use or analysis of available methods.	● Demonstrates a completely original idea or new method to apply or interpret data from existing methods; ● Shows how the idea or method can lead to new discoveries or significantly advance science.
GLO4: Demonstrate Professional Skills	**Displays effective written and oral communication skills**	● Writing or presentation has frequent spelling and grammatical errors; ● Does not grasp intent of questions.	● Writing or presentation is adequate; ● Illustrations are technically correct, and appropriate; ● Understanding of concepts adequate but incomplete.	● Writing or presentation is well organized and effective; ● Illustrations are appropriate and effective; ● Understanding of concepts is satisfactory.	● Writing or presentation is concise, elegant, and engaging; ● Technical content and graphic design of illustrations are well planned/executed; ● Thoroughly understands concepts.
GLO5: Demonstrate Responsible Conduct in Research	**Safe lab practices; Proper attribution of credit in writing and research.**	● Failed Lab Safety Course ● Fails to attribute credit in writing, illustrations, or joint research.	● Passed Lab Safety Course ● Insufficient attribution of credit in writing, use of illustrations, or joint research.	● Passed Lab Safety Course ● Appropriate attribution in writing and use of figures and joint research efforts.	● Passed Lab Safety Course ● Full attribution in writing and use of figures, illustrations, and joint research.

Individual Evaluation of Ph.D. Graduate Student Outcomes:
Qualifying Exam 2 - Research Proposal Defense

Student's Name: _____ **Semester / Year:** _____

Examiner's Name: _____

GLO1: Mastery of Chemistry: Demonstrates broad knowledge of chemistry

Deficient Marginal Satisfactory Excellent

Comments: _____

_____

_____

GLO2: Research Skills:

a) Understands the application of methodologies and techniques

Deficient Marginal Satisfactory Excellent

b) Understands the limitations of data/techniques where applicable

Deficient Marginal Satisfactory Excellent

c) Critically analyzes and evaluates their own findings and those of others

Deficient Marginal Satisfactory Excellent

Comments: _____

_____

_____

GLO3: Contribution: Makes an original and substantial contribution to the discipline

Deficient Marginal Satisfactory Excellent

Comments: _____

_____

GLO4: Professional Skills:

Written Communication

a) The report provides an effective overview of the prior research relevant to the project

Deficient Marginal Satisfactory Excellent

b) The report clearly states the objectives of the research project and the approach

Deficient Marginal Satisfactory Excellent

c) The report clearly presents and interprets experimental data

Deficient Marginal Satisfactory Excellent

d) The report Abstract, Conclusions, and Future Perspectives are well-written and appropriate

Deficient Marginal Satisfactory Excellent

Oral Communication

a) The presentation components are well-organized and work together to communicate the topic

Deficient Marginal Satisfactory Excellent

b) The presentation includes relevant background to put the research plan into context and shows how the project advances the disciplinary knowledge

Deficient Marginal Satisfactory Excellent

c) The content and presentation demonstrate understanding and insight into the research topic

Deficient Marginal Satisfactory Excellent

d) All graphics, captions, units in the slides are visible to the audience and support the talk

Deficient Marginal Satisfactory Excellent

Comments: _____

_____

GLO5: Responsible Conduct in Research: The use of citations, figures, illustrations, and joint research contributions were appropriately documented

Deficient Marginal Satisfactory Excellent

Comments: _____

_____

Summary of the Student's Major Strengths and Weaknesses:

_____

_____

_____

_____

Overall Determination: Pass Provisional Pass Fail

Examiner's Signature:_____

Evaluation Committee Summary of Ph.D. Graduate Student Outcomes

Qualifying Exam 2- Research Proposal Defense

Student's Name: _____ **Semester / Year:** _____

Please check one: ☐ **Qualifying Exam** ☐ **Original Research Proposal**

Committee Decisions

GLO1: Mastery of Chemistry: Demonstrates broad knowledge of chemistry

Deficient Marginal Satisfactory Excellent

GLO2: Demonstration of advanced research skills

Deficient Marginal Satisfactory Excellent

GLO3: Contribution: Makes an original and substantial contribution to the discipline

Deficient Marginal Satisfactory Excellent

GLO4: Demonstration of professional skills (effective **written** communication)

Deficient Marginal Satisfactory Excellent

GLO4: Demonstration of professional skills (effective **oral** communication)

Deficient Marginal Satisfactory Excellent

GLO5: Demonstration of responsible conduct of research

Deficient Marginal Satisfactory Excellent

Overall Determination: **Pass** **Provisional Pass** **Fail**

Consensus Comments of the Committee:

_____

_____

_____

_____

Individual Evaluation of Ph.D. Graduate Student Outcomes:
Ph.D. Dissertation and Defense

Student's Name: _____ **Semester / Year:** _____

Examiner's Name: _____

GLO1: Mastery of Chemistry: Demonstrates in-depth knowledge of the primary chemistry area

Deficient Marginal Satisfactory Excellent

Comments: _____

_____

GLO2: Research Skills:

a) Understands the merits and limitations of methodologies and techniques

Deficient Marginal Satisfactory Excellent

b) Understands the limitations of data where applicable

Deficient Marginal Satisfactory Excellent

c) Critically analyzes and evaluates their own findings and those of others

Deficient Marginal Satisfactory Excellent

Comments: _____

_____

GLO3: Contribution: Makes an original and substantial contribution to the discipline

Deficient Marginal Satisfactory Excellent

Comments: _____

_____

GLO4: Professional Skills:

Written Communication

a) The dissertation provided an effective presentation of the prior research relevant to the project

Deficient Marginal Satisfactory Excellent

b) The dissertation clearly states objectives, accomplishments, and weaknesses of the research

Deficient Marginal Satisfactory Excellent

c) The dissertation clearly presents and justifies the originality of the research

Deficient Marginal Satisfactory Excellent

d) The dissertation Conclusions and Future Perspectives are appropriate

Deficient Marginal Satisfactory Excellent

Oral Communication

a) The presentation effectively and professionally communicates the topic and its significance

Deficient Marginal Satisfactory Excellent

b) The presentation effectively presents the dissertation research in context to show its originality and appropriateness in approach

Deficient Marginal Satisfactory Excellent

c) The presentation demonstrates deep understanding and insight into the research topic and how the research contributes to the advancement of knowledge

Deficient Marginal Satisfactory Excellent

Comments: _____

_____

GLO5: Responsible Conduct in Research: The use of citations, figures, illustrations, and joint research contributions were appropriately documented

Deficient Marginal Satisfactory Excellent

Comments: _____

_____

Summary of the Student's Major Strengths and Weaknesses:

_____

_____

Overall Determination: Pass Provisional Pass Fail

Examiner's Signature: _____

Rubric for MS Student Evaluations (Thesis and Defense)

The following evaluation criteria are being used to assess MS student performance in major qualifying examination. Based on these criteria, individual evaluations forms (provided below) are filled up by each committee member for formal assessment of examination.

	Departmental Objectives	Deficient	Marginal	Satisfactory	Excellent
GLO1: Demonstrate Proficiency in Chemistry	**Is proficient with existing knowledge**	● Does not understand basic concepts or conventions; ● Misinterprets or misuses sources.	● Displays a basic understanding of the field.	● Displays an understanding of the field; ● Adequate exploration of interesting issues and connections.	● Demonstrates proficiency as well as creativity in drawing upon multiple sources.
GLO2: Demonstrate Research Skills	**Understands the application of methodologies and techniques**	● Misapplies or uses non-standard techniques without adequate rationalization.	● Applies standard techniques; ● Does not recognize limitations in data/techniques were applicable.	● Uses appropriate, theory, methods and techniques; ● Appropriately explains limitations of data/techniques were applicable.	● Suggests and utilizes improvements to standard methods and techniques; ● Limitations are competently discussed.
	Critically analyzes and evaluates their own findings and those of others	● Does not recognize improbable results.	● Relies on others to suggest data that are relevant to solving a problem; ● Literature review is adequate but not critical.	● Identifies weaknesses in own work but discussion is not comprehensive.	● Provides critical evaluation of previous works; ● Identifies and corrects weaknesses or flaws in referenced work.
GLO3: Make a Contribution to the Discipline	**Think originally to develop concepts & methodologies; identify new opportunities**	● No independent research; ● Question or problem is trivial, weak, unoriginal, or previously solved.	● Demonstrates competence but is not very original or significant; ● Displays little creativity, imagination, or insight.	● Argument is strong, comprehensive, and coherent; ● Has some original ideas, insights, and observations.	● Has a compelling question or problem; ● Project is original, ambitious, creative, and thoughtful; ● Asks or addresses new / important questions.
GLO4: Demonstrate Professional Skills	**Displays effective written communication skills**	● Writing is disorganized, has frequent spelling and grammatical errors; ● Illustrations are poorly selected or illegible.	● Writing is adequate; ● Structure and organization are weak, but sufficient; ● Illustrations are legible, technically correct, and appropriate.	● Well written and organized.	● Concise, elegant, engaging; ● Technical content and graphic design of illustrations are well planned/executed.
	Displays effective oral communication skills	● Disorganized or unable to articulate an argument; ● Does not grasp intent of questions.	● Clear and coherent, partially understands or addresses questions, responses may have some gaps in logic or inconsistencies.	● Clear & coherent; ● Engages appropriate audiences; ● Grasps intent.	● Compelling, persuasive, and accessible to multiple audiences; ● Articulately addresses questions.
GLO5: Demonstrate Responsible Conduct in Research	**Understands safe lab practices; gives proper attribution of credit in writing and research.**	● Failed Safety Course; ● Fails to properly attribute credit in writing, illustrations, or joint research.	● Passed Lab Safety Course; ● Insufficient attribution of credit in writing, use of illustrations, or joint research.	● Passed Lab Safety Course; ● Attribution in writing and use of figures and joint research efforts.	● Passed Lab Safety Course; ● Full attribution in writing and use of figures, illustrations, and joint research.

Individual Evaluation of MS Graduate Student Outcomes: MS Thesis and Defense

Student's Name: _____ **Semester / Year:** _____

Examiner's Name: _____

GLO1: Proficiency in Chemistry: Demonstrates broad knowledge of chemistry

Deficient Marginal Satisfactory Excellent

Comments: _____

_____

GLO2: Research Skills:

a) Understands the merits and limitations of methodologies and techniques

Deficient Marginal Satisfactory Excellent

b) Understands the limitations of data where applicable

Deficient Marginal Satisfactory Excellent

c) Critically analyzes and evaluates their own findings and those of others

Deficient Marginal Satisfactory Excellent

Comments:

_____

_____

GLO3: Contribution: Makes a contribution to the discipline

Deficient Marginal Satisfactory Excellent

GLO4: Professional Skills:

Written Communication

a) The thesis provided an effective presentation of the prior research relevant to the project

Deficient Marginal Satisfactory Excellent

b) The thesis clearly states objectives, accomplishments, and weaknesses of the research

Deficient Marginal Satisfactory Excellent

c) The thesis clearly presents and justifies the research findings

Deficient Marginal Satisfactory Excellent

d) The thesis Conclusions and Future Perspectives are appropriate

Deficient Marginal Satisfactory Excellent

Oral Communication

d) The presentation effectively and professionally communicates the topic and its significance

Deficient Marginal Satisfactory Excellent

e) The presentation effectively presents the thesis research in context to show its originality and appropriateness in approach

Deficient Marginal Satisfactory Excellent

f) The presentation demonstrates proficient understanding and insight into the research topic and how the research contributes to the advancement of knowledge

Deficient Marginal Satisfactory Excellent

GLO5: Responsible Conduct in Research: The use of citations, figures, illustrations, and joint research contributions were appropriately documented

Deficient Marginal Satisfactory Excellent

Comments: _____

_____

Summary of the Student's Major Strengths and Weaknesses:

_____

_____

_____

_____

_____

Overall Determination: Pass Provisional Pass Fail

Examiner's Signature: _____

Graduate Student Research Progress & Evaluation

Student's Name: _____ **Semester / Year:** _____

Advisor's Name: _____ **Program Start Date**:_____

GLO1: What classes/training did you take/complete this year?

_____

_____

_____

GLO2 and GLO3: Please list your most important research accomplishments from the past 4 -6 months (please note works in progress, if applicable).

_____

_____

_____

_____

_____

GLO4: Please list your recent oral presentations or posters with the class/conference name, location and date (please indicate poster or presentation).

_____

_____

_____

_____

GLO4: Please list your recent publications, reports or other written documents (please indicate the status of publications: in preparation, submitted, in revision, or published).

_____

_____

_____

_____

_____

GLO1 – GLO4: Please list your research goals for the next 4 - 6 months.

Timeline to Completion: When do you expect to complete your degree program?

Do you feel that you are making adequate progress toward your goals? Why or why not?

----------***Advisor Evaluation Only Below This Line*** ----------

GLO1 – GLO4: Please summarize the student's major research progress strengths and weaknesses:

GLO1 – GLO4: Please summarize your recommendations for student's next steps

Progress towards Degree: ☐ **Deficient** ☐ **Marginal** ☐ **Satisfactory** ☐ **Excellent**

Advisor's Signature: _____

Department of Chemistry Graduate Student Leave Request Form

Date:

I_____, am planning to take time off from my studies, research, and (if any) assistantship responsibilities in accordance with chemistry department graduate program policies.

My leave start date is: _____

My leave end date is: _____

(The date you will be back on campus for work and study.)

If traveling:

I am traveling to:_____.

Is this international travel? Circle: Yes No

What is the best way to contact you if necessary when you are gone? Provide contact information below: (email, telephone, address, etc.):

☐ I understand that it is my responsibility to ensure that I have adequate access to any communications from any university department or office while I am on leave.

☐ I understand that *this form is for departmental use only* and is **not** provided to any other university office, and that it is my responsibility to be aware of and comply with all university, graduate school, and departmental requirements and deadlines (enrollment, registration, bill payment, etc.) that may occur while I am on leave.

☐ If I am an international student who plans to travel away from campus, I understand that *this form is for departmental use only* and is **not** provided to the IPS office, and that it is my responsibility to consult with the IPS office regarding any requirements relating to my student visa status while I am away from campus.

☐ I understand that it is my responsibility to ensure that I will be back on campus no later than the date provided above, and that late returns for any reason, including unforeseen travel difficulties, may be considered an unauthorized absence and a factor in future support decisions.

☐ I have discussed my plans to be away from campus with my advisor and if applicable, my GTA supervisor (see comments below).

Student Signature	Student Name (Print)	*Date*
Advisor Signature	Advisor Name (Print)	*Date*
GTA Supervisor Signature	GTA Supervisor Name (Print)	*Date*

Department Chair signature required for international travel:

Dept. Chair Signature	Chair Name (Print)	*Date*

Comments: