The Department of Biological Sciences

Graduate Student Handbook
2020-2021

https://www.mtu.edu/biological/graduate/program/

DEPARTMENT OF BIOLOGICAL SCIENCES
Graduate Student Handbook
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INFORMATION FOR GRADUATE STUDENTS IN THE DEPARTMENT

The following information has been compiled to assist graduate students with their adjustment to Graduate School and to outline the requirements and procedures for obtaining an advanced degree in the Department of Biological Sciences at Michigan Technological University. The information supplied herein is more specific than that in the Graduate School Catalog as it applies to our programs: M.S. in Biological Sciences, and Ph.D. in Biological Sciences. Students should familiarize themselves with this handbook and the general regulations of the Graduate School as found in their *Academics* web pages http://www.mtu.edu/gradschool/administration/academics/, which covers policies and procedures, degree requirements, necessary forms, and more. The Graduate School website http://www.mtu.edu/gradschool/resources-for/students/ also contains a wealth of information for current students. Convenient links to many of these resources are also available on the Biological Sciences department website https://www.mtu.edu/biological/graduate/program/

I. FACILITIES AND GENERAL INFORMATION

A. Department Structure

The Biological Sciences department is a community of scholars and professional staff who work together to further the mission of the department and the University. Major academic responsibilities in the department are handled by the Department Chair and several important faculty committees.

Biological Sciences Department Chair
Dr. Chandrashekhar Joshi

Biological Sciences Graduate Studies Committee (2019 – 2020 academic year)
Dr. Thomas Werner, Chair, Graduate Studies Committee
Dr. Michael Gretz, Dr. Gordon Paterson, and Dr. Mark (Xiaohu) Tang (Committee members)

Department Staff
Tori Connors: Departmental and Graduate Program Assistant
John Romanowski: Acting Laboratory Supervisor
Raquel Heitor: Administrative Assistant

Graduate Student Government Representatives (2020 – 2021 academic year)
Manas Warke
Laura Schaerer

B. Keys, Desk, Computers, and Research Space Assignments

Each graduate student in residence is provided a desk for personal use in an office in either the Dow or GLRC buildings or in the graduate student common space in Dow 708 and after-hours access to that office space and building. A student's *Tech Express* identification card is used for after-hours access to the Dow Building via the north entrance near GLRC. Office and teaching laboratory keys are ordered by the Administrative Assistant and are available for pick-up at Public Safety and Police Services. Students working on research projects may be issued keys to project laboratories upon approval of the faculty member responsible for that laboratory. Requests for new keys, replacements for lost keys, or swipe-card access to restricted areas should be made to the Administrative Assistant. Keys must not be passed on to anyone else or duplicated under ANY circumstances. Lending or duplication of keys is grounds for dismissal. Lost keys need to be reported to supervisors as soon as they are noticed to be missing. A $100 fee is assessed for any key lost/replaced or not returned to public safety when no longer needed.

Graduate students are provided computer access through computer labs in several common areas (Dow 708) and offices. Computers for research lab use are provided by research advisors. Questions and problems with computers should be directed to the Information Technology (IT) help desk, found on the first floor in the library or via email at it-help@mtu.edu . The IT staff will supply you with your username and password; please change your password the first time you log into your account.

Students should pay particular attention to Michigan Tech computer use policies regarding copyrights, privacy, passwords, and hacking. These can be found at IT's web site http://www.mtu.edu/it/security/security-resources-tools/online-security-privacy/

C. E-Mail, Mail Service, Photocopier, Supplies, Printers

E-mail is the university's and department's primary communication tool with graduate students regarding issues, such as financial support, graduate program obligations & responsibilities, and semester timelines & deadlines, to name a few. You are expected to be responsive to departmental e-mails in a timely manner.

Mail is delivered daily to Biological Sciences department around 10 am. Student mailboxes are located in the Biology Department's main office, Dow 740 (copy room). It is advisable to check your mailbox daily for mail and messages.

Photocopiers, laser printers, and office supplies in Dow 740 are available for biology graduate students **to use for teaching purposes only**. You should use IT printers that are available across campus **for research printing**. Departmental resources are limited, so efficiencies, such as double-sided printing and copying are appreciated. Please see the office assistant for office supplies. Also note that there are important national laws regarding photocopying copyrighted materials. If you have a question about copyright law please inquire in the library or see http://www.admin.mtu.edu/admin/procman/ch13/ch13p10.htm

D. Work Obligation of Teaching Assistants

Graduate teaching assistants (GTAs) should expect to devote a maximum of 20 hours per week to their teaching obligations. This commitment includes office hours set aside to help individual students. Office hours should be a minimum of two hours per week and should be posted in the syllabus and outside GTA's office door. Students employed by the Department of Biological Sciences as teaching assistants are reminded that they serve as representatives of the department, and this must be reflected in their comportment and instruction of undergraduates. Teaching assistants are required to follow all applicable employee policies (https://www.mtu.edu/policy/policies/general/). Teaching assistants are also prohibited from dating or having a sexual relationship with their students. Their immediate supervisor in their position as a teaching assistant is the laboratory course instructor of record, who is generally a faculty member.

E. Work Obligation of Research Assistants

Generally, students supported by graduate research assistantships (GRAs) funded by external grants are expected to work 20 hours per week (including approved coursework) for the research project, from which the stipend and tuition is paid. Since all support money is derived from government or industry contracts and grants, it is the student's responsibility to perform assigned research tasks in a timely manner. It should be noted that most contracts require formal progress reports on the research performed and confidentiality at times. The immediate supervisor of research assistants is their research advisor.

F. Safety

There are a number of safety policies and procedures in effect at Michigan Tech that particularly apply to graduate students, such as those concerning general safety and hazardous waste. Annual online safety training is mandatory for ALL employees and will be communicated to you via email when assigned. Additional safety policies and training required to use the machine shop, any research or teaching laboratories, or chemicals will be communicated and assigned by respective Biological Sciences personnel (Lab supervisor). Please consult your research advisor regarding all applicable safety policies and procedures before beginning work. Questions can also be directed to the safety coordinator who is our laboratory supervisor.

For safety purposes, visitors are not permitted in research and instructional labs unless written permission has been granted by the Department Chair; this includes spouses and children. There have been incidents in other departments where unauthorized visitors, including children, have had accidents causing themselves harm. This rule is designed to prevent this type of tragedy.

For your reference, the Michigan Tech safety manual is available on line at: http://www.mtu.edu/ehs/documents/safety-manual/

G. Absence Policy

Students receiving financial aid through the University (teaching assistantship, research assistantship, fellowship) are entitled to staff holidays. Please note that the breaks between academic terms and the break at Christmas are not automatically considered as holidays or time off. **PRIOR written approval** is required for business and personal absences in consultation with the student's advisor, the laboratory supervisor, and the department coordinator. The absence forms for the Biological Sciences department are to be completed for the requisite signatures.

In general, graduate students may take up to two weeks of personal time each year, excepting that in NO CASE may it be during an academic term or finals week. Personal absences in excess of two weeks will result in prorated stipend; a decrease in pay for the balance of time absent.

Additionally, **PRIOR written approval** is required for international travel on official business http://www.admin.mtu.edu/acct/forms/travel/index.html

Any absence that does not follow this policy will result in an automatic deduction of pay and may be subject to disciplinary action.

H. Seminar Series

The Biological Sciences department organizes a seminar series during every Fall and Spring semester held on Thursdays at 3:00 p.m. The venue of this meeting as well as speakers will be announced every semester. Its purpose is to broaden the education of each student by bringing leaders in various areas of biological sciences to campus. **Attendance is required of all students seeking graduate degrees from our department**, and is explicitly stated in the course description for the department's graduate seminar course; **BL5012**. In addition to being an important educational experience, attendance at seminars is also a professional courtesy to your colleagues and to the invited speakers. Students habitually missing departmental seminars will face appropriate actions. There is usually a pizza lunch on the days of the seminars, and you get an opportunity to meet with the speakers at noon in Dow 708 or Dow 743. Please RSVP the Department Coordinator when requested, each and every time.

Students in their second year of study (second semester for M.S. students) and beyond are required to participate in the departmental seminar series through a 20-30-minute talk, outlining their proposed research, results to date or completed thesis/dissertation chapter work. These seminars provide an opportunity for constructive feedback, practice in giving professional presentations, and increase awareness of the exciting research being conducted in the department. Additional details of this activity will be emailed to you later.

I. Academic Integrity

The University and the Biological Sciences department expect all students to maintain the highest level of academic and scientific integrity in all aspects of their studies, from

class work to exams to research. If you are unsure of or have specific questions about assignments, projects, examinations, etc., please ask your instructor.

A detailed booklet describing Michigan Tech's academic integrity policy and procedures, including definitions of plagiarism, cheating, fabrication, and facilitating academic dishonesty, is available in the Dean of Students office, or on the web at: http://www.admin.mtu.edu/usenate/policies/p109-1.htm. All graduate students should carefully read this policy. Students must also view/complete the orientation module on academic integrity at http://www.mtu.edu/gradschool/admissions/admitted/online-orientation/.

Further information regarding Academic and Scientific Misconduct Procedures can be found at https://www.mtu.edu/research/administration/integrity-compliance/misconduct/.

J. International Students

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 practices, visa renewals, and related matters are handled through this office http://www.mtu.edu/international/students/current/f1-students/

All international students, whose native language is not English and who intend to be graduate teaching assistants, must take an English Language Assessment. The assessment takes place in the Michigan Tech Testing Center, Center for Teaching and Learning, Van Pelt and Opie Library 226. Visit the Testing Center to schedule a time to take the assessment or contact them at 906-487-1001, techtesting-l@mtu.edu. Additional details can be found at http://www.mtu.edu/ctl/for-graduate-teaching-assistants/language-assessment/

Additionally, all first-time international students that will be acting as graduate teaching assistants (GTAs) must attend the International Graduate Teaching Assistants Assistance Program (IGTAAP) orientation. Students' language skills and their cultural competency will be assessed, and students will be coached on an as-needed basis, so that they can provide a better service to our undergraduates and faculty, while serving as GTAs. Additional information is here https://www.mtu.edu/ctl/for-graduate-teaching-assistants/orientation/

In order to remain visa compliant, international students must register as full-time students (enroll in at least 9 credits each semester). Questions regarding I-20 forms and full-time status may be directed to the Graduate School.

K. Financial Support: Stipend, Tuition, and Health Insurance

General information about the graduate assistantships at Michigan Tech can be found at

https://www.mtu.edu/gradschool/financial/assistantships/. Assistantships are available only to full-time, graduate degree-seeking students. All applicants to the Graduate School are automatically considered for graduate assistantship opportunities. Michigan Tech does not have a separate graduate assistantship application, and separate application materials (e.g. resumes, letters of recommendation, etc.) will not be needed. Each of our graduate programs offers assistantships. Graduate Student Assistantships are a form of student employment, which includes compensation in the form of a stipend, tuition, and lab/course fees. Assistantship recipients perform research, teaching, or administrative services for the University as part of a student's academic and professional training and development. Assistantships provide graduate students with experiences that strengthen and enhance their education and contribute directly to their thesis, dissertation, or report.

Funding for a limited number of Graduate Teaching Assistants (GTAs) is available in the Biological Sciences department, and all funding decisions about GTAs are made by the Department Chair depending on the teaching needs. In addition, many of our faculty receive external grants that could be used to support graduate students as Graduate Research Assistants (GRAs). We expect that most of our M.S. students are self-supported, and we attempt to fund as many Ph.D. students as possible. As indicated in each student's contract letter, continued funding is based on successful job performance and satisfactory academic progress.

All funding decisions are generally made during the spring semester. However, some funding opportunities may become available at other times during the year. Potential graduate students are encouraged to visit our web site to view the list of faculty (https://www.mtu.edu/biological/people-groups/faculty-staff/faculty/) and look for a faculty member who works in their areas of research interest. Please contact those faculty by email first before submitting a formal application to discuss the possible research projects as well as funding availability as GRAs in their labs. Potential graduate students could also contact the Graduate Program Director or Department Chair (Listed on Page 1) if they have any questions about funding or research opportunities.

All GTAs and GRAs are paid a stipend set by the Graduate School (https://www.mtu.edu/gradschool/financial/assistantships/stipends/). Students on full assistantship appointments as GTAs are expected to work half-time (20 hours/week). Programs may offer less than a full appointment, resulting in three-quarter, one-half, or one-quarter assistantship appointments. All assistantship recipients are full-time students who perform their duties in concurrence with work appropriate for at least nine credits of coursework or research activities. As such, a student's workload, including teaching preparation and grading, should not exceed the level of their appointment in order to better ensure their success as a graduate student and as a graduate assistant. Stipend payments are issued bi-weekly and generally increase as you progress toward your degree and submit the required Advisor and Committee Recommendation form (https://www.mtu.edu/gradschool/documents/policies-procedures/forms/advisor-committee.pdf) and appropriate masters or doctoral degree scheduling forms available through the Graduate school website (https://www.mtu.edu/gradschool/policies-procedures/forms-deadlines/). Supported graduate students must be enrolled for nine credits each semester during the academic year and one credit in the summer (except

graduate students paid hourly), with tuition paid directly by the department or a research grant. Tuition charges in excess of these values will be your responsibility, along with student-voted fees and late-registration fees.

Graduate students are required to enroll in the Michigan Tech graduate student health insurance program or provide proof of comparable insurance coverage. Financially supported students receive partial support toward their health insurance cost. More information about health insurance and health care can be found at http://www.mtu.edu/hr/students/insurance/. Questions regarding health insurance coverage can be addressed to Human Resources or to the Biological Sciences department representative to the Graduate Student Government (listed on page 1).

L. Accommodation Policies for Americans with Disabilities

Michigan Tech complies with all federal and state laws and regulations regarding discrimination, including the Americans with Disability Act of 1990 (ADA) (http://www.mtu.edu/equity/access-disability/ada/). If any student has a disability and needs a reasonable accommodation for equal access to education or services at Michigan Tech, please call the Dean of Students Office, Coordinator for Student Disability Services (extension 7-1494 from a campus phone). For other concerns about discrimination, contact your advisor, department head, or the Affirmative Action Office (extension 7-3310 from a campus phone).

M. Grievance Procedure

Graduate students with concerns or complaints about the behavior of other faculty members, staff, or students in professional situations should consult with the Graduate Program Director and Department Chair to address the issue. However, questions of plagiarism should be taken to the Dean of the Graduate School, and sexual discrimination and sexual harassment issues should be taken to the University Title IX Coordinator (Link to web: https://www.mtu.edu/title-ix/assault-harassment/). 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 have the right to fair and equal treatment by faculty members, staff, and fellow students. If the issue raised by the students cannot be resolved by the Program Director and Chair of Biological Sciences or in the case of conflict, the student should consult the Dean of the Graduate School or the Ombudsperson on campus (https://www.mtu.edu/ombuds/)

II. ADVISORS

A. Research Advisor

Your advisor is a member of the faculty, with whom you work to propose, design, conduct and defend your thesis and dissertation. The ideas generated are not only yours but are intellectual property of many (you, your advisor and committee members, and possibly

the funding source); please consider and acknowledge that. If, for some reason, you feel you are not getting the guidance you need, please see the Graduate Director before considering any change in advisor. Open communication will help limit the likelihood of a needed change.

Accelerated M.S.: To help expedite degree completion, a student should ideally begin conducting degree research with a faculty research advisor no later than during the senior year. Each student will work with a faculty research advisor who is a member of the Department of Biological Sciences graduate faculty. The advisor's primary responsibility is to supervise the student's research and academic & professional growth, as well as to work with the student to develop an academic plan for enrolling in appropriate courses. The academic plan developed by the student and academic advisor will need written approval from the faculty advisor.

B. Coursework M.S. Advisor:

The Graduate Program Director will serve as the advisor for coursework. M.S. students and will choose their courses based on their career goals in consultation with the Graduate Program Director. The Graduate Program Director will keep track of students' grades and progress in the program.

C. Advisory Committee or Committee Members

Select your committee in consultation with your advisor and meet with your committee by the second semester. Submit the Advisor and Committee Recommendation Form once your committee has been formed. Meet with committee members to: get a feel for your working relation with the committee, committee advice on coursework, future career direction/tools (see individual development plan in section IV), etc. Visit the Graduate School website (https://www.mtu.edu/gradschool/policies-procedures/requirements/) for degree requirements and for additional information about requirements. **Your graduate committee must have at a minimum**:

- For Ph.D. students: your advisor plus at least one faculty from the department and one or two external members (outside the department). Total number: 4
- For M.S. students: your advisor plus 2 faculty from within the department (except for coursework MS students, who do not need a committee).

D. Expectations from Students and Advisors

Visit the link on Graduate School's website (https://www.mtu.edu/gradschool/resources-for/students/academic/succeeding/index.html) and click on the tabs "What Do Advisors Expect From You?" and "What Can You Expect from Your Advisor?"

E. Changing Advisors or Committee Members

Before initiating the process to change your graduate advisor, please visit the Graduate School's website (*https://www.mtu.edu/gradschool/resources-*

for/students/academic/succeeding/index.html) and click on the tab "How Can I Change my Advisor". Once you have decided to change your graduate advisor, you must follow the steps listed below.

1. Meet with the Graduate Program Director to initiate the process to change the advisor. If meeting with the Graduate Program Director is not feasible or appropriate, meet with the Chair of the department. If you are in a non-departmental program, you may meet with the Chair of your administrative home department.
2. Discuss the following with the Graduate Program Director (or Chair) and, if appropriate, the current advisor:
    - Whether additional resources within or outside the department including the Ombuds office (https://www.mtu.edu/ombuds/) could help resolve the situation.
    - The impact of the change of advisor on your degree completion schedule. 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. 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. The Graduate Program Director will ensure that copies of all written agreements will be distributed among the student, the faculty advisor, and the student's graduate committee members and retain a copy for departmental graduate program records.
3. File an updated *Advisor and Committee Recommendation Form* for approval by the Graduate School (https://www.mtu.edu/gradschool/documents/policies-procedures/forms/advisor-committee.pdf).
4. If the student and the Graduate Program Director are unable to reach an agreement on the advisor change, contact the Assistant Dean of the Graduate School to determine additional steps to resolve the situation.

F. Student Progress Feedback

All grades must be a B or better in the major subject areas and a GPA of 3.0 must be maintained. If your GPA falls below 3.0, you are automatically on probation. Each student is expected to meet with his or her committee annually to update them (in a form of a presentation) on research progress. The committee will assess the following Graduate Learning Objectives (GLOs) and will record the results on the **Annual Evaluation/Feedback Form (see section V for form)**:

For Accelerated M.S. students: Students who are accepted in the accelerated Master's program will not be allowed to continue in this program if their cumulative undergraduate GPA drops below 3.0. However, such a student will be eligible to apply through the non-accelerated master's degree option (credits cannot be double-counted).

Graduate Learning Objectives (GLOs) for Ph.D. Students

- Demonstration of mastery of the subject matter (GLO1)
- Demonstration of advanced research skills (for example, design and executing a research project) (GLO2)
    i) Master application of existing research methodologies and techniques
    ii) Ability to critically analyze and evaluate your findings and the findings of others
- Ability to make an original and substantial contribution to the discipline (GLO3)
- Demonstration of professional skills (GLO4)
    i) Effective written communication skills
    ii) Effective oral communication skills
- Practice of responsible conduct of research (GLO5)

Graduate Learning Objectives (GLOs) for M.S. Students (Thesis & Report)

- Demonstration of proficiency of the subject matter (GLO1).
- Demonstration of research skills, execute a research project (GLO2).
    C. Ability to apply existing research methodologies and techniques
    D. Ability to critically analyze and evaluate your findings and the findings of others
- Contribution to the discipline (M.S. thesis only; GLO3)
- Demonstration of professional skills (GLO4)
    i) Effective oral communication skills.
    ii) Effective written communication skills.
- Practice responsible conduct of research (GLO5).

Graduate Learning Objectives (GLOs) for M.S. Students (Coursework)
Students will meet with the Graduate Program Director to assess GLO1, GLO4, and GLO5 (for M.S. students).

NOTE: A copy of all Annual Evaluation/Feedback Forms (see section V for forms) should be submitted to the Graduate Program Director.

III. GRADUATE DEGREES AND REQUIREMENTS

Requirements:
The Department of Biological Sciences offers Master of Science (M.S.) and Doctor of Philosophy (Ph.D.) degree programs. For the M.S. degree program, both regular and accelerated degree paths exist. Michigan Technological University undergraduate students with either a Biology, Biochemistry and Molecular Biology, Medical Laboratory Science, or Bioinformatics degree can be accepted into the accelerated M.S. program, which adds an additional year to their 4-year B.S. degree. The students must start their research towards their accelerated M.S. degree 1 year before their B.S. degree

completion. The program allows 6 undergraduate credits (3000-4000 level) to be double-counted towards the accelerated M.S. degree. The six credits are independent of a maximum of six Senior Rule credits. Senior Rule credits that may additionally count toward the M.S.; thus a total of 12 credits earned while being an undergraduate, can be applied towards the Master's degree. More details of this degree program are available under the Graduate Program section of the Biology Department website (https://www.mtu.edu/biological/graduate/accelerated/).

There are three M.S. options within the regular M.S. program: i) Thesis M.S. (Research), ii) Coursework M.S. and iii) Report-based M.S. The specific requirements of these options are outlined below and also available through the Biological Sciences Graduate program website (https://www.mtu.edu/biological/graduate/bio-sci/). Students selecting either of these three options within the regular M.S. degree program are expected to complete their respective degree requirements within approximately 2 years.

Students choosing to pursue a Ph.D. in the Biological Sciences Department should anticipate a timeline of between 4 – 6 years to complete the necessary degree requirements. Doctoral students will be required to develop an original research hypothesis, design and conduct the necessary research to test the hypothesis, complete both written and oral examination to demonstrate competency in the discipline, and complete an original written dissertation.

A. Graduate Courses

Students are highly recommended to complete their required coursework by the end of their fourth semester (i.e., year 2) in their respective degree program, excluding the accelerated M.S. degree. A list of graduate level courses (5000 and 6000 level) is available through the graduate courses link (https://www.banweb.mtu.edu/pls/owa/studev.stu_ctg_utils.p_display_class_facbio?ps_department=BL&PS_STYLE_DEPT=biological&ps_level=5000&ps_faculty=all).
All graduate students regardless of degree program or option are required to take 2 credits of the Graduate Seminar in Biology course (BL5012), except for Accelerated MS students who are only required to take 1 credit of the Graduate Seminar in Biology course (BL5012). In addition to BL5012, all Biological Sciences graduate students must complete The Scientific Profession course (BL5025); this course also fulfills Responsible Conduct of Research requirement (below)**.**

B. Responsible Conduct of Research

Responsible Conduct of Research (RCR) involves being aware of and putting into practice the established professional norms and ethical principles of research. Intellectual honesty and responsible conduct are necessary for excellence in research and for maintenance of public trust. 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 graduate students must complete basic responsible conduct of research training. **This training must be completed by graduate students within their first two semesters** at Michigan Tech, or a registration hold will be placed on the student's account. Students may not graduate or enter candidacy if the training is not complete.

To fulfill this requirement, students may either:

- Attend the Graduate School's on-campus orientation program (held before the start of each semester), or
- Complete the basic online CITI training course.
- Alternatively, students can fulfil the Responsible Code of Research requirement by enrolling and completing The Scientific Profession course (BL5025).

Degrees:

A. Master of Science in Biological Sciences

1) Thesis (Research) option; this also applies to students in the accelerated M.S. program who wish to do a thesis

This option requires a research thesis prepared under the supervision of a departmental faculty advisor. The thesis describes a research investigation and its results. The scope of the research topic for the thesis should be defined in such a way that a full-time student could complete the requirements for a M.S. degree in twelve months or three semesters following the completion of coursework by regularly scheduling graduate research credits. Visit the Graduate School website (https://www.mtu.edu/gradschool/policies-procedures/timelines/thesis/) for a 2-year degree timeline. Students should consult current instructions for thesis formatting and guidelines available through the Graduate School website (https://www.mtu.edu/gradschool/policies-procedures/theses-dissertations/formatting/).

Of the minimum total of 30 credits, at least 20 must be earned in coursework; the remainder will be research credits.

The minimum requirements are as follows:

Coursework (minimum)	20 credits
Thesis research	6–10 credits
Total (minimum)	30 credits
Distribution of coursework credit	
5000–6000 level (minimum)	12 credits
3000–4000 level (maximum)	12 credits

Candidacy: Students who have completed certain requirements may register for research credits at a reduced tuition rate and register as candidacy. For M.S. students, all required courses must be completed in addition to the required number of credits for the degree (30).

At least two weeks prior to the oral examination, students must

- Schedule their examination using the Pre-defense form
- Submit a draft thesis to the Graduate School
- Distribute the thesis to the examining committee

A Degree schedule form must be approved before a defense is scheduled. Students must also report the results of the oral examination on the Report on Final Oral Examination Form and submit a final thesis to the Graduate School prior to completing their degree.

Post defense:
- Make all required editorial and technical corrections received from the advisor and examining committee. Also make all required formatting corrections from Graduate School. Submit the Approval of a dissertation, thesis, or report form to the graduate school.

- Within one week of submitting the "Approval of a dissertation, thesis, or report" form and by the deadline for the semester you wish to complete your degree, submit your thesis to Digital Commons and also to ProQuest.

- Complete the Exit Survey.

- After the thesis is approved by Graduate School, pay any open fees (if needed).

- Within two weeks after the end of the semester, check your e-mail or MyMichiganTech for the notification that your degree is awarded.

- Two months after the end of the semester, check your e-mail for the notification that your diploma is ready.

- One month after the degree is awarded, check Digital Commons to see your published thesis.

2) Report Option; this also applies to students in the accelerated M.S. program who wish to do a report
This option requires a report describing the results of an independent study. The scope of the research topic should be defined in such a way that a full-time student could complete the requirements for an M.S. degree in twelve months or three semesters following the completion of coursework by regularly scheduling graduate research credits. Visit the

Graduate School website (https://www.mtu.edu/gradschool/policies-procedures/timelines/report/) for a 2-year degree timeline. A report must be prepared and formatted following the current procedures (https://www.mtu.edu/gradschool/policies-procedures/reports/formatting/).

Of the minimum total of 30 credits, at least 24 must be earned in coursework other than the project.

Minimum coursework	24 credits
Report	2–6 credits
Total (minimum)	30 credits
Distribution of coursework credit	
5000–6000 series (minimum)	12 credits
3000–4000 level (maximum)	12 credits

At least two weeks prior to the oral examination, students must

- Schedule their examination using the Pre-defense form
- Distribute the report to the examining committee
- Submit the report to the Graduate School

A Degree schedule form must be approved before a defense is scheduled.

Students must also report the results of the oral examination on the Report on Final Oral Examination Form and submit the final report to the Graduate School, using the current procedures.

Post defense:
- Make all required editorial and technical corrections received from the graduate student's advisor and examining committee. Also. make any required formatting corrections received from the Graduate School. Submit the Approval of a dissertation, thesis, or report form to graduate school.

- Within one week of submitting your completed "Approval of a dissertation, thesis, or report" form and by the deadline for the semester you wish to complete your degree, submit a PDF copy of your report to MTU's Digital Commons data repository and also to the ProQuest thesis and dissertation repository.

- Complete the Exit Survey.

- After the report is approved by the Graduate School, pay any open fees (if

needed)

- Within two weeks after the end of the semester, check your e-mail or MyMichiganTech for notification that your degree is awarded.

- Two months after the end of the semester, check your e-mail for a notification that your diploma is ready.

- One month after the degree is awarded, check Digital Commons to see your published report.

iii) Coursework Option

This option allows students to take only courses. Students are expected to take a total of 30 credits of courses. Visit the Graduate School Website for a 2-year degree timeline of items required for the coursework M.S. degree option. The following table provides the credit requirements and allowances for this option.

Coursework	30 credits
Total (minimum)	30 credits
Distribution of coursework credit	
5000–6000 series (minimum)	18 credits
3000–4000 level (maximum)	12 credits

- During finals week of planned degree completion, submit the Verification of final degree requirements form.

- Complete the Exit Survey.

- Within two weeks after the end of the semester, check your e-mail or MyMichiganTech for notification that your degree has been awarded.

- Two months after the end of the semester, check your e-mail for a notification that your diploma is ready.

B. Doctor of Philosophy in Biological Sciences

Students who enter the Ph.D. program and already hold an M.S. degree are required to take 30 coursework and research credits in addition to completing the necessary Ph.D. degree qualifying and research proposal examinations. Students who enter the Ph.D. program with a B.S. degree (i.e., no M.S.) are required to take 60 total coursework and research credits; they also need to fulfill the M.S. requirements of 12 graduate credits at the 5000-level or above. Visit the Graduate School website (https://www.mtu.edu/gradschool/policies-procedures/requirements/phd/) for an expected Ph.D. degree timeline.

All students enrolled in the Ph.D. program are expected to have completed their **qualifying exams** (written and oral) and their **Ph.D. proposal defense** by their 6th semester (year 3) in the Ph.D. program.

i) Qualifying Exam

The program recommends a four-member Graduate Committee that is responsible for administering the qualifying examination. The committee consists of at least 4 members and includes: the advisor, at least one other faculty from the department, and one or two external member(s) (outside the department of the advisor). The examination consists of written and oral components, each designed to test the student's breadth and depth of fundamental knowledge in Biological Sciences, with emphasis on their potential area of research. Each of the four-committee members is responsible for providing individual written exam questions (based on courses that the student has taken or on the student's research area). Each committee member grades his/her option of the exam and notifies the student's PI/student of the outcome. The student is allowed to retake, one more time, the written exam (or parts of the exam) in case of unsatisfactory performance. Once the student passes the written exam, an oral exam is held. The oral exam is also administered by the Ph.D. student's committee members. The results from the qualifying exam are recorded in the Ph.D. qualifying Exam Form (see section V; also, the form is available at https://www.mtu.edu/biological/graduate/program/ under Faculty Resources) and are submitted to the Graduate Program Director. Also, submit the results of the qualifying exam to the Graduate School using the Report on Qualifying Examination Form.

ii) Research Proposal and Defense

Students are expected to write (in consultation with their supervisors) and defend a proposal of their research. The proposal should include project objectives, background and significance, testable hypotheses, detailed methods, and an anticipated timeline for completing the research. Students should send a copy of the proposal to their committee at least 2 weeks before a research proposal defense date. In coordination with their examining committee, students will schedule a proposal defense date, prepare a presentation, and defend their proposal in front of their committee. Students progress to candidacy status only once they pass their Ph.D. proposal defense. Results from the proposal defense are recorded in the Ph.D. Proposal Form (see section V; the form is available at https://www.mtu.edu/biological/graduate/program/ under Faculty Resources) and are submitted to the Graduate Program Director. Also, submit the results of the proposal defense to the Graduate School, using the using the Report on Research Proposal Examination Form.

iii) *Candidacy*

Students who have completed certain requirements may register for research credits at a reduced tuition rate and register for candidacy. Ph.D. students are eligible for candidacy at the start of the first semester, following the successful completion of their qualifying and research proposal examinations, as well as following the completion of the required number of credits for their degree as applicable. Additional

credit requirements for entering candidacy are in place for students that entered the Ph.D. program with an M.S. degree from another academic institution **OR** for students who entered the Ph.D. program directly from a B.S. degree program (i.e., no MS degree).

The semester before you enter candidacy, submit the Degree schedule to the Graduate School; all coursework credits must be completed before you enter candidacy, regardless of entering program with B.S. or M..S degree. Optional: Submit the petition to enter candidacy to the Graduate School one week before the start of the semester you wish to enter candidacy.

iv) Doctoral Dissertation Defense
Dissertation must be prepared and formatted following the current procedures (https://www.mtu.edu/gradschool/policies-procedures/theses-dissertations/formatting/).

At least two weeks prior to the oral examination, students must

- Schedule their examination using the Pre-defense form.
- Submit a draft dissertation to the Graduate School.
- Distribute the dissertation to the examining committee.

A Degree schedule form must be approved before a defense is scheduled. Students must also report the results of the oral examination on the Report on Final Oral Examination Form and submit a final thesis to the Graduate School prior to completing their degrees.

Post defense:
- Make all required technical corrections from advisor and committee. Also, make all required formatting corrections from the Graduate School. Submit the Approval of a dissertation, thesis, or report form to the Graduate School.

- Within one week of submitting the "Approval of a dissertation, thesis, or report" form and by the deadline for the semester you wish to complete your degree, submit your dissertation to Digital Commons and to ProQuest.

- Before completing your degree, complete the Survey of Earned Doctorates (required). Also complete the Exit Survey.

- After the dissertation is approved by the Graduate School, pay any open fees (if needed).

- Within two weeks after the end of the semester, check your e-mail or MyMichiganTech for a notification that your degree is awarded.

- Two months after the end of the semester, check your e-mail for a notification that your diploma is ready.

- One month after the degree is awarded, check Digital Commons to see your published dissertation.

IV. PROFESSIONAL DEVELOPMENT OPPORTUNITIES AND SUPPORT SERVICES

A. Individual Development Plan (IDP).

Graduate School has developed an IDP to help you plan your future career goals (short- and long-term), while you pursue your education. The link to the IDP is: https://www.mtu.edu/gradschool/resources-for/students/professional/documents/mtu-gs-idp.docx. **You are advised to use it with your advisor to help you prepare for your career goals**.

B. Graduate Student Government

The website of the Graduate Student Government lists resources and activities for graduate students, both social and academic. It also contains a helpful FAQ section in case you have problems: http://gsg.mtu.edu/

C. Support Services

i) Graduate Student Professional Development Seminars. The following links provide the current schedule of events and archived seminars for professional development:
https://blogs.mtu.edu/gradschool/2017/09/13/pd-2017/
https://www.mtu.edu/gradschool/resources-for/students/academic/seminar/

ii) Thesis, Dissertation, Report Guide and Seminars. The Graduate School News Blog provides help with these activities. https://blogs.mtu.edu/gradschool/2016/04/18/thesis-dissertation-presentation-and-proposal-writing-support/

iii) Writing and Technology Resources at Walker
The Michigan Tech Multiliteracies Center (MTMC) coaches can help with anything in the realm of multiliteracies. This can include resumes, drafting emails, and design or production of multimodal projects. Dissertation boot camps are also offered by the MTMC, which are writing-focused sessions, where graduate students can set writing goals to make progress in long-term projects. MTMC is located in Walker 107. In addition, MTMC offers online appointments, so that graduate students can find writing support anytime, anywhere.

iv) The J.R. Van Pelt and Opie Library. Online resources offered by MTU library can be found at: https://www.mtu.edu/library/
Literature items that the library cannot offer can be requested through the Inter Library Loan website. The requested items usually arrive within a day or two: https://michigantechuniversity.account.worldcat.org/account/requests
v) If you are a current student and have questions about academic resources, planning for your future, or making Houghton your home, check out the Graduate School website

at https://www.mtu.edu/gradschool/resources-for/students/ or email gradschool@mtu.edu.

V. RUBRICS AND EVALUATION / FEEDBACK FORMS

1. PhD

Graduate Learning Obj.	What is being assessed	Unacceptable	Marginal / Needs Improvement	Satisfactory	Excellent
1 - Demonstrates mastery of the subject matter	**Synthesizes existing knowledge.**	E.g. 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 on multiple sources. Synthetic and interdisciplinary. Demonstrates a deep understanding of relevant literatures
2 - Demonstrates advanced research skills	**Mastered application of existing methodologies and techniques.**	E.g. Misapplies or uses non-standard techniques without adequate rationalization.	Applies standard techniques. Does not recognize limitations of 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 evaluate their own findings and those of others.	E.g. 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. Identifies and discusses shortcomings in own work.
3 - Make an original and substantial contribution to the discipline	**Think originally & independently to develop concepts & methodologies; identify new opportunities.**	E.g. 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.
4 - Demonstrates professional skills	**Displays effective written communication skills.**	E.g. Writing is disorganized, has frequent spelling and grammatical errors. Illustrations poorly selected or illegible.	Writing is adequate. Structure and organization are weak, but sufficient. Illustrations legible, technically correct, and appropriate.	Well written and organized.	Concise, elegant, engaging. Technical content and graphic design of illustrations well planned / executed.
	... Oral communication skills.	E.g. Disorganized or unable to articulate an argument. Does not grasp intent of	Clear and coherent, partially understands or addresses questions, responses may have some gaps in logic or	Clear & coherent. Engages appropriate audiences. Grasps intent.	Compelling, persuasive, and accessible to multiple audiences. Articulately addresses questions.

Biological Sciences PhD Graduate Student Learning Outcomes Evaluation Form
Qualifying Exam (written & oral)

Semester / Year _____

Committee decisions

GLO1: Demonstrate mastery of the subject matter

Circle one: Deficient Marginal Satisfactory Excellent

GLO4: Demonstrate professional skills (effective **written** communication)

Circle one: Deficient Marginal Satisfactory Excellent

GLO4: Demonstrate professional skills (effective **oral** communication)

Circle one: Deficient Marginal Satisfactory Excellent

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

Consensus comments of the reviewing faculty (comments required if *Deficient* or *Marginal* scores are earned):

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Consensus comments of the reviewing faculty (comments required if Deficient or Marginal scores are earned):
This form is to be used for information purposes for the department and student. The reviewing faculty will indicate the grade in each area and provide comments to the student.

Biological Sciences PhD Graduate Student Learning Outcomes Evaluation Form
Research Proposal and Defense

Semester / Year _____

Committee decisions

GLO1: Demonstrate mastery of the subject matter

Circle one: Deficient Marginal Satisfactory Excellent

GLO2: Demonstrate advanced research skills

Circle one: Deficient Marginal Satisfactory Excellent

GLO3: Make an original and substantial contribution to the discipline

Circle one: Deficient Marginal Satisfactory Excellent

GLO4: Demonstrate professional skills (effective **written** communication)

Circle one: Deficient Marginal Satisfactory Excellent

GLO4: Demonstrate professional skills (effective **oral** communication)

Circle one: Deficient Marginal Satisfactory Excellent

GLO5: Practice responsible conduct of research (field-appropriate)

Circle one: Deficient Marginal Satisfactory Excellent

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

Consensus comments of the reviewing faculty (comments required if *Deficient* or *Marginal* scores are earned):

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Consensus comments of the reviewing faculty (comments required if Deficient or Marginal scores are earned):
This form is to be used for information purposes for the department and student. The reviewing faculty will indicate the grade in each area and provide comments to the student.

Biological Sciences PhD Graduate Student Learning Outcomes Evaluation Form
Dissertation and Defense

Semester / Year _____

Committee decisions

GLO1: Demonstrate mastery of the subject matter

Circle one: Deficient Marginal Satisfactory Excellent

GLO2: Demonstrate advanced research skills

Circle one: Deficient Marginal Satisfactory Excellent

GLO3: Make an original and substantial contribution to the discipline

Circle one: Deficient Marginal Satisfactory Excellent

GLO4: Demonstrate professional skills (effective **written** communication)

Circle one: Deficient Marginal Satisfactory Excellent

GLO4: Demonstrate professional skills (effective **oral** communication)

Circle one: Deficient Marginal Satisfactory Excellent

GLO5: Practice responsible conduct of research (field-appropriate)

Circle one: Deficient Marginal Satisfactory Excellent

Overall Determination: Fail Provisional Pass Pass

Consensus comments of the reviewing faculty (comments required if *Deficient* or *Marginal* scores are earned):

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Consensus comments of the reviewing faculty (comments required if Deficient or Marginal scores are earned):
This form is to be used for information purposes for the department and student. The reviewing faculty will indicate the grade in each area and provide comments to the student.

1. MS Thesis/Report

Graduate Learning Objective	What is being assessed	Deficient	Marginal / Needs Improvement	Satisfactory	Excellent
1: Demonstrates proficiency of the subject matter	Is proficient in 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 on multiple sources. Synthetic and interdisciplinary.
2: Demonstrates research skills	Applied existing methodologies and techniques.	Misapplies or uses non-standard techniques without adequate rationalization.	Applies standard techniques. Does not recognize limitations of data / techniques where applicable.	Uses appropriate, techniques. Appropriately explains limitations of data / techniques where applicable.	Suggests and utilizes improvements to standard techniques. Limitations are competently discussed.
	Critically analyzes and evaluate 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. Identifies and discusses shortcomings in own work.
3: Make a contribution to the discipline (thesis only)	Thinks to develop concepts & methodologies; identify opportunities.	Question or problem is trivial, weak, or previously solved.	Demonstrates competence but is not much of a contribution. Displays little insight.	Argument is present with reasonable structure. Is connected to observations.	Argument is strong, comprehensive, and coherent. Has some original ideas, insights, and observations.
4: Demonstrates professional skills	Displays effective written communication skills.	Writing is disorganized, has frequent spelling and grammatical errors. Illustrations poorly selected or illegible.	Writing is adequate. Structure and organization are weak, but sufficient. Illustrations legible, technically correct, and appropriate.	Well written and organized.	Concise, elegant, engaging. Technical content and graphic design of illustrations well planned / executed.
	… 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. Partial but inadequate.	Clear & coherent. Engages appropriate audiences. Grasps intent.	Compelling, persuasive, and accessible to multiple audiences. Articulately addresses questions.

	Understand and abide by the principles of Responsible Conduct of Research (RCR).	Little knowledge and understanding of RCR and/or displays willingness to violate principles of RCR.	knowledge and understanding of principles of RCR and/or displays tendency to violate principles of RCR unintentionally or through negligence.	Adequate knowledge and understanding of principles of RCR and abides by principles of RCR.	Thorough knowledge and understanding of principles of RCR and strives to promote RCR in his/her own research and the research of others.

2. MS Coursework

Graduate Learning Objective	What is being assessed	Deficient	Marginal / Needs Improvement	Satisfactory	Excellent
1: Demonstrates proficiency of the subject matter	Is proficient in 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 on multiple sources. Synthetic and interdisciplinary.
2: Knowledge of core competencies in selected, complementing areas of the discipline.	Is proficient in core competencies.	Does not understand basic concepts of the core competencies.	Displays a basic understanding of the core competencies.	Displays an understanding of the core competencies.	Demonstrates proficiency in the core competencies.
3: Demonstrates professional skills	Displays effective written communication skills.	Writing is disorganized, has frequent spelling and grammatical errors. Illustrations poorly selected or illegible.	Writing is adequate. Structure and organization are weak, but sufficient. Illustrations legible, technically correct, and Appropriate.	Well written and organized.	Concise, elegant, engaging. Technical content and graphic design of illustrations well planned / executed.
	…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 through negligence.	Clear & coherent. Engages appropriate audiences. Grasps intent.	Compelling, persuasive, and accessible to multiple audiences. Articulately addresses questions.
3. Practice responsible conduct in the discipline	Understand and abide by the principles of Responsible Conduct within the discipline.	Little knowledge and understanding of academic integrity and/or displays willingness to violate principles of academic integrity.	Partial but inadequate knowledge and understanding of academic integrity and/or displays tendency to violate principles of academic integrity unintentionally or through negligence.	Adequate knowledge and understanding of principles of academic integrity and abides by principles of academic integrity.	Thorough knowledge and understanding of principles of academic integrity and strives to promote academic integrity.
	…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 through negligence.	Clear & coherent. Engages appropriate audiences. Grasps intent.	Compelling, persuasive, and accessible to multiple audiences. Articulately addresses questions.
4. Practice responsible conduct in the discipline	Understand and abide by the principles of Responsible Conduct within the discipline.	Little knowledge and understanding of academic integrity and/or displays willingness to violate principles of academic integrity.	Partial but inadequate knowledge and understanding of academic integrity and/or displays tendency to violate principles of academic integrity	Adequate knowledge and understanding of principles of academic integrity and abides by principles of	Thorough knowledge and understanding of principles of academic integrity and strives to promote academic integrity.

			unintentionally or through negligence.	academic integrity.	

Biological Sciences Evaluation of MS Graduate Student Outcomes
Thesis/Report Defense

Semester / Year _____

Committee decisions

GLO1: Demonstrates proficiency of the subject matter
Circle one: Deficient Marginal Satisfactory Excellent

GLO2: Demonstrate advanced research skills; mastered application of existing methodologies & techniques
Circle one: Deficient Marginal Satisfactory Excellent

GLO2: Demonstrate advanced research skills; critically analyze & evaluate their own findings & those of others
Circle one: Deficient Marginal Satisfactory Excellent

GLO3: Make a contribution to the discipline **(thesis only)**
Circle one: Deficient Marginal Satisfactory Excellent

GLO4: Demonstrate professional skills (effective **written** communication)
Circle one: Deficient Marginal Satisfactory Excellent

GLO4: Demonstrate professional skills (effective **oral** communication)
Circle one: Deficient Marginal Satisfactory Excellent

GLO4: Practice responsible conduct of research (field-appropriate)
Circle one: Deficient Marginal Satisfactory Excellent

Overall Determination:

Circle one: Deficient Marginal Satisfactory Excellent

Consensus comments of the reviewing faculty (comments required if *Deficient* or *Marginal* scores are earned):

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Consensus comments of the reviewing faculty (comments required if Deficient or Marginal scores are earned):
This form is to be used for information purposes for the department and student. The reviewing faculty will indicate the grade in each area and provide comments to the student.

MS Coursework Final Exam Form

Semester / Year

GLO1: Demonstrates proficiency of the subject matter

Circle one: Deficient Marginal Satisfactory Excellent

GLO2: Knowledge of core competencies selected, complementing areas of discipline

Circle one: Deficient Marginal Satisfactory Excellent

GLO3: Demonstrate professional skills (effective written communication)

Circle one: Deficient Marginal Satisfactory Excellent

GLO3: Demonstrate professional skills (effective oral communication)

Circle one: Deficient Marginal Satisfactory Excellent

GLO4: Practice responsible conduct in the discipline

Circle one: Deficient Marginal Satisfactory Excellent

Overall Determination:

Circle one: Deficient Marginal Satisfactory Excellent

Comments of the Graduate Program Director (comments required if *Deficient* or *Marginal* scores are earned):

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Consensus comments of the reviewing faculty (comments required if Deficient or Marginal scores are earned):
This form is to be used for information purposes for the department and student. The reviewing faculty will indicate the grade in each area and provide comments to the student.

Biological Sciences PhD Graduate Student Learning Outcomes Evaluation Form
Annual Evaluation/Feedback

Semester / Year _____

Committee decisions

GLO1: Demonstrate mastery of the subject matter

Circle one: Deficient Marginal Satisfactory Excellent

GLO2: Demonstrate advanced research skills

Circle one: Deficient Marginal Satisfactory Excellent

GLO3: Make an original and substantial contribution to the discipline

Circle one: Deficient Marginal Satisfactory Excellent

GLO4: Demonstrate professional skills (effective **written** communication)

Circle one: Deficient Marginal Satisfactory Excellent

GLO4: Demonstrate professional skills (effective **oral** communication)

Circle one: Deficient Marginal Satisfactory Excellent

GLO5: Practice responsible conduct of research (field-appropriate)

Circle one: Deficient Marginal Satisfactory Excellent

Overall Determination: Fail Provisional Pass Pass

Consensus comments of the reviewing faculty (comments required if *Deficient* or *Marginal* scores are earned):

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Consensus comments of the reviewing faculty (comments required if Deficient or Marginal scores are earned):
This form is to be used for information purposes for the department and student. The reviewing faculty will indicate the grade in each area and provide comments to the student.