



MONTANA STATE UNIVERSITY PHYSICS GRADUATE MANUAL

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GRADUATE PROGRAMS IN PHYSICS

The Department of Physics grants the degrees Master of Science and Doctor of Philosophy. The general requirements for these degrees as outlined at <http://www.montana.edu/gradschool/>, the Graduate School's webpage, apply. Every student should examine this site and be familiar with its requirements.

The following supplements the Graduate School's requirements and policies which apply specifically to degrees granted by the Department of Physics. In exceptional cases, departmental requirements, prerequisites, and time limits may be adjusted. Such exceptions require consent of the student's Graduate Committee and the Department Head in advance.

Graduate instruction and research are blended with a sequence of assessment tools:

1. Qualifying Exam (all degrees): a written exam that assesses proficiency in Physics at the undergraduate level and preparedness for graduate study
2. Graduate Coursework (all degrees): grade-based assessment of proficiency in advanced techniques and concepts in Physics at the graduate level
3. Comprehensive Exam (M.S. degrees): an assessment of the student's mastery of their discipline
4. Comprehensive Exam (Ph.D. degrees): a written research proposal and an oral exam that assesses preparedness for graduate Ph.D. research
5. Written Thesis and Oral Defense (Ph.D. and Plan A M.S. degrees): assessment of original and substantive contributions to an area of research

UNIVERSITY POLICIES & PROCEDURES

For all other **University Policies & Procedures**, please visit: <http://www.montana.edu/policy/>. Here you will find MSU policies relating to everything from Academic Affairs to Technology Transfer. You are advised to pay particular attention to all policies listed under Student Affairs, and otherwise familiarize yourself with all other policies that are available to you here.

HOUSING & RESIDENCY

A limited amount of on-campus graduate housing is available at affordable rates with month-to-month contracts. Interested incoming students should apply as soon as they are admitted to the program. For more information, please visit:

<https://www.montana.edu/housing/apartments/index-old-210816.html>

Graduate students who are not Montana residents should take steps to become legal residents of the State of Montana, to avoid paying nonresident fees in subsequent years. These students should register for a maximum of 6 credits per semester in the year (probably, their 3rd or 4th year) that they plan to establish residency. For more information, please visit:

https://www.montana.edu/registrar/gradschool_residency.html

MASTER'S DEGREE REQUIREMENTS

The Department of Physics grants the Master of Science Degree under two options:

PLAN A REQUIREMENTS (THESIS REQUIRED)

1. Course Requirements - A minimum of 20 credits of acceptable course work including:

Physics 594	Teaching Seminar	1 credit
Physics 594	Research Introduction Seminar	1 credit
Physics 501	Math Methods and Applications in Classical Mechanics	3 credits
Physics 506	Quantum Mechanics I	3 credits
Physics 519	Math Methods and Applications in Electromagnetic Theory	3 credits
Physics 535	Statistical Mechanics	3 credits
Electives	see comment below	<u>6 credits</u>
		20 credits

2. Thesis Requirements

An acceptable thesis and at least 10 credits of Physics 590 are required.

3. Examinations

Qualifying and Comprehensive Examinations are required. A Final Oral Defense of the thesis is also required. The Comprehensive Examination and the thesis defense may be combined and offered simultaneously.

PLAN B REQUIREMENTS (WITHOUT THESIS)

1. Course Requirements - A minimum of 30 credits of acceptable course work including:

Physics 594	Teaching Seminar	1 credit
Physics 594	Research Introduction Seminar	1 credit
Physics 501	Math Methods and Applications in Classical Mechanics	3 credits
Physics 506	Quantum Mechanics I	3 credits
Physics 519	Math Methods and Applications in Electromagnetic Theory	3 credits
Physics 520	Electromagnetic Theory II	3 credits
or ASTR 550	Radiative processes in Astrophysics	
Physics 535	Statistical Mechanics	3 credits
Electives	see comment below	<u>13 credits</u>
		30 credits

2. Thesis Requirements - None

3. Examinations

Qualifying and Comprehensive Examinations are required.

DOCTORAL DEGREE REQUIREMENTS

1. Course Requirements - A minimum of 34 credits of acceptable course work including:

Physics 594	Teaching Seminar	1 credit
Physics 594	Research Introduction Seminar	1 credit
Physics 501	Math Methods and Applications in Classical Mechanics	3 credits
Physics 506	Quantum Mechanics I	3 credits
Physics 519	Math Methods and Applications in Electromagnetic Theory	3 credits
Physics 520	Electromagnetic Theory II	3 credits
or ASTR 550	Radiative processes in Astrophysics	
Physics 535	Statistical Mechanics	3 credits
Electives	see comment below	<u>17 credits</u>
		34 credits

2. Thesis Requirement

An acceptable thesis is required. A minimum of 26 credits of Physics 690 is required in addition to the courses listed above.

3. Examinations

Qualifying and Comprehensive Examinations are required. A Final Oral Defense of the thesis is also required.

Students accepted into the Ph.D. program are encouraged to apply for and be awarded an M.S. degree (under Plan B) while in the Ph.D. program.

GRADUATE COURSEWORK

First year graduate students are required to register for a Fall Semester 1-credit teaching seminar (PHSX 594-01), and a 1-credit research seminar (PHSX 594-15) in Spring term designed to acquaint the students with the various research areas in the department. These seminars will be presented by persons active in those areas and are designed to aid a student in identifying the particular area or areas he/she would like to pursue. Students are urged to enroll in other seminars of their choice to obtain more in-depth knowledge of particular areas.

GRADUATE COURSE OFFERINGS:

[ASTR 550 - Radiative Processes in Astrophysics*](#)

ASTR 560 - Stellar Astrophysics

ASTR 561 - Astrophysics of Galaxies

[PHSX 501 - Mathematical Methods and Their Applications in Classical Mechanics](#)

[PHSX 506 - Quantum Mechanics I](#)

PHSX 507 - Quantum Mechanics II

PHSX 516 - Experimental Physics

[PHSX 519 - Mathematical Methods and Their Applications in Electromagnetic Theory](#)

[PHSX 519 - Electromagnetic Theory II*](#)

PHSX 523 - Introduction to General Relativity

PHSX 524 - Advanced General Relativity

PHSX 525 - Gravitational Wave Astronomy

PHSX 531 - Nonlinear Optics/Laser Spectroscopy

[PHSX 535 - Statistical Mechanics](#)

PHSX 544 - Condensed Matter Physics I

PHSX 545 - Condensed Matter Physics II

PHSX 555 - Quantum Field Theory

PHSX 565 - Astrophysical Plasma Physics

PHSX 566 - Mathematical Methods for Theoretical Physics

PHSX 567 - Computational Physics

[PHSX 594-01 Teaching Seminar](#)

[PHSX 594-15 Research Introduction Seminar](#)

[\(Required for all graduate degrees.\)](#)

[\(*Choose one - Required for Ph.D. and Plan B M.S.\)](#)

ELECTIVES REQUIREMENTS:

All elective courses must be approved by the student's Graduate Committee and the Physics Department Head. This approval will ensure that the electives represent a coherent block of study of substantial relevance to Physics.

The following limitations normally apply to Elective Courses which may be listed on the Graduate Program for the M.S. or Ph.D. degree in Physics:

- A. No more than half of the Elective credits in the above Course Requirements may be at the 400 level in a student's Graduate Program for any graduate degree in Physics. The remaining Elective credits must be at the 500 level.
- B. The Electives will include courses in Physics and supporting fields (e.g., Math, Computer Science, Engineering). At least half of the elective credits must be in Physics or Astronomy.
- C. Physics 461, 490, 492, 494, 589, 590, 689, 690 cannot be used as Electives in any Physics Graduate Program.
- D. Physics 591 (Special Topics) is allowed as an Elective to a maximum of 12 credits.
- E. Physics 592 (Independent Study) is allowed as an Elective to a maximum of 3 credits for an M.S. Program and 6 credits for a Ph.D. Program. These credits must be letter graded.
- F. No more than 2 credits of non-required, pass/fail seminar courses are applicable as Electives in any Physics Graduate Program.
- G. No more than 3 pass/fail credits can be included in any Physics Graduate Program.
- H. Only 4 course-work credits must be taken beyond a M.S. *en route* or continuing M.S., toward the Ph.D.

GRADE REQUIREMENTS:

Graduate Coursework for all graduate degree-seeking students will assess proficiency in advanced topics, techniques, and concepts in Physics. Graduate students are required to receive a minimum grade of B- in all courses that are listed on the Program of Study and maintain a minimum average GPA of 3.0 to fulfill the coursework requirement for their degrees. Note that the Physics Department minimum grade requirement is more stringent than the requirement set by the Graduate School.

PROGRAM OF STUDY:

The program of study acts as a contract between the student, the department, the college, The Graduate School, and the University. The program of study defines the minimum requirements for the degree. Approval of a program of study is a two-step process. The first step is the submission to The Graduate School and the second step is a review by the ODPC.

The graduate committee and the student together develop the [Graduate Program of Study](#). Once a listed course is taken and graded, it cannot be removed from a program of study. Courses applied toward one degree may not be used for another. Exception: the graduate committee may recommend that up to thirty (30) credits obtained from a master's degree can be applied to a doctoral degree.

Students may take classes beyond those listed on their program of study. Other requirements as determined by the student's graduate committee may also be listed.

PROGRAM APPROVAL— The program of study must be recommended by the graduate committee chair and department head. Final approval rests with The Graduate School.

FILING DEADLINES — The program of study must be submitted on an official [Program of Study](#) form to The Graduate School by the end of the student's second (2rd) semester of graduate attendance. A one-time fee is associated with the filing of this form. See [Fees & Holds](#). See [Requirements/General/Other Credits](#).

A student must have an approved Program of Study and Committee form on file with The Graduate School prior to sitting for any portion of the comprehensive examination or dissertation defense.

CHANGES TO THE PROGRAM OF STUDY — The program of study may be amended through the course of the student's graduate study. Changes to a student's program of study must be made through the [Program of Study Revision](#) form and recommended by the graduate committee chair and department head. Final approval rests with The Graduate School. No fee is associated with this form.

EXAMPLE COURSE CURRICULUM:

YEAR 1

Fall Semester

- PHSX 501 – Mathematical Methods and Their Applications in Classical Mechanics (3)
- PHSX 506 – Quantum Mechanics I (3)
- PHSX 594-01 – Teaching Seminar (1)

Spring Semester

- PHSX 519 – Mathematical Methods and Their Applications in Electromagnetic Theory (3)
- PHSX 535 – Statistical Mechanics (3)
- PHSX 594-15 – Research Introduction Seminar (1)

YEAR 2

Fall Semester

- PHSX 520 – Electromagnetic Theory II (3) or ASTR 550 – Radiative Processes in Astrophysics (3; offered Spring, even years)
- Elective
- Elective (optional)

Spring Semester

- Elective
- Elective
- Elective (optional)

YEAR 3

- Complete Electives (need 17 elective credits in total for Ph.D.)

EXAMPLE COURSE CURRICULUM INCLUDING FOUNDATIONAL UNDERGRADUTE COURSES:

YEAR 1

Fall Semester

- PHSX 320 – Undergraduate Classical Mechanics (3)
- PHSX 461 – Undergraduate Quantum Mechanics I (3)
- PHSX 592 – Independent Study (3)
- PHSX 594-01 – Teaching Seminar (1)

Spring Semester

- PHSX 462 – Undergraduate Quantum Mechanics II (3)
- PHSX 423 – Undergraduate Electricity and Magnetism (3)
- PHSX 592 – Independent Study (3)
- PHSX 594-15 – Research Introduction Seminar (1)

YEAR 2

Fall Semester

- PHSX 425 – Undergraduate Electricity and Magnetism II (3)
- PHSX 501 – Mathematical Methods and Their Applications in Classical Mechanics (3)
- PHSX 506 – Quantum Mechanics I (3)

Spring Semester

- PHSX 519 – Mathematical Methods and Their Applications in Electromagnetic Theory (3)
- PHSX 535 – Statistical Mechanics (3)

YEAR 3

Fall Semester

- PHSX 520 – Electromagnetic Theory II (3) or ASTR 550 – Radiative Processes in Astrophysics (3; offered Spring, even years)
- 500-level Elective

Spring Semester

- 500-level Elective

GRADUATE EXAMINATIONS

QUALIFYING EXAMINATION:

The Qualifying Exam for all degree-seeking students is a written test on the general principles of physics at the upper-undergraduate level. The Qualifying Exam tests knowledge and comprehension of the general principles of physics through their application in solving a carefully chosen set of problems. Passing the Qualifying Exam in the allotted timeframe is part of making satisfactory progress toward a degree.

FORMAT: The Qualifying Exam consists of problems drawn from upper-level undergraduate course work in four subject areas: quantum mechanics, electricity and magnetism, classical mechanics, and statistical mechanics and thermodynamics.

TIMELINE: The Qualifying Exam is given twice a year: once in August and once in January before the starts of the Fall and Spring semesters. It is expected that students make use of each opportunity to take the exam until it is passed.

DEADLINE: Graduate students should first take the Qualifying Exam at the beginning of their first year and are required to pass the Qualifying Exam by January of their second year for all graduate degrees. However, it is strongly recommended that students do all they can to pass within the first two attempts, so they have more time to dedicate towards research during the summer after their first year.

GRADING: Subjects will be graded individually. Graduate students can pass individual subjects on each attempt and culminate a complete pass over four attempts. To pass the Qualifying Exam at the PhD level, a student must receive a passing grade in all four subjects. To pass the Qualifying Exam at the Master's level, a student must receive a passing grade in at least three subjects. The Exam Committee is solely responsible for the administration and grading of the Qualifying Exam.

For more information, please visit: <https://physics.montana.edu/grad/qualifyingexam.html>

Ph.D. COMPREHENSIVE EXAMINATION:

The Comprehensive Exam for Ph.D. degree-seeking graduate students is a written and oral exam that requires the student to present and defend a thesis research plan to their Ph.D. committee. The passing of this Comprehensive Exam fulfills the Comprehensive Examination requirement of the Graduate School for a doctoral degree and is subject to all conditions and requirements set forth by the official policies of the Graduate School.

FORMAT: The Comprehensive Exam consists of a written research proposal and an oral defense. The research proposal describes, in five pages or less, the student's research progress and proposes future work towards the completion of the written thesis requirement. It is appropriate and expected that the research proposal will be developed collaboratively by the student and the student's advisor. The research proposal must be submitted at least one week prior to the oral defense. In the oral part of the exam, the graduate student must present a defense of the research proposal before the student's Ph.D. committee. The committee will probe the student's

understanding of the fundamental physics and intellectual context of the research topic.

TIMELINE: Students must pass the Qualifying Exam before taking the Comprehensive Exam.

DEADLINE: The Comprehensive Exam can be scheduled any time after passing the Qualifying Exam, with the first attempt occurring no later than the Spring semester of the second academic year. Postponement of the Comprehensive Examination beyond this time is granted only in exceptional cases. Requests for postponement must be submitted to the student's Ph.D. committee by the student's advisor at least two months before the deadline. The Comprehensive Examination may be repeated once, six to nine months after the first attempt.

GRADING: Through the written research proposal and oral presentation of the research proposal, the graduate student must demonstrate a comprehensive knowledge base that is suitable to conduct the proposed research as judged by the Ph.D. committee. Passing or failing grades are determined by the majority vote of the Ph.D. committee.

EXPIRATION: According to the Degree Requirements of the Graduate School, the results of any department's comprehensive examination "[are] valid for five (5)¹ years from the term of successful completion." When the successful results of a student's Physics comprehensive exam are deemed to have lapsed, the student's graduate committee will administer an ad hoc re-examination. This will take the form of an oral exam by the entire committee and will serve to re-validate the results of the entire Physics comprehensive examination. The content of the exam will be set by the committee and may focus on topics relevant to the student's thesis research. The oral exam may be counted as the annual meeting of the student's committee required by the Physics Department. If it occurs, it must occur before the student schedules a thesis defense, and a passing result in the re-examination is required prior to scheduling the thesis defense.

M.S. COMPREHENSIVE EXAMINATION:

PLAN A: Passing the Physics Comprehensive Examination covering the thesis and related areas (as described above) fulfills the Comprehensive Examination requirement of the Graduate School for M.S. degree-seeking graduate students under Plan A.

PLAN B: The Comprehensive Exam for M.S. degree-seeking graduate students under Plan B is based on the student's aggregate performance in the five core physics courses. Passing this Comprehensive Exam fulfills the Comprehensive Examination requirement of the Graduate School for a master's degree and is subject to all conditions and requirements set forth by the official policies of the Graduate School.

FORMAT: The degree committee for the student will review that student's coursework performance in the five core physics courses: Math Methods and Their Applications in Classical Mechanics, Quantum Mechanics I, Math Methods and Their Applications in Electromagnetic Theory, Statistical Mechanics, Electromagnetic Theory II (or Radiative Processes in Astrophysics).

TIMELINE: Students must pass the Qualifying Exam at the Master's level before being considered for the Comprehensive Exam.

¹ The Physics Department has an exception to this policy which allows validation for six (6) years from the term of successful completion (per Dr. Karlene Hoo, Graduate School, 2/13/15).

GRADING: A student who has achieved a B average or higher in the standard first-year graduate courses, and no lower than a B- in any individual course, will be deemed to have passed the M.S. Comprehensive Examination.

DEADLINE: The conditions for a passing grade for the Comprehensive Exam for M.S. degrees must be met by the end of the second year of graduate studies.

WRITTEN THESIS AND ORAL THESIS DEFENSE:

For both the Ph.D. and Plan A M.S. degrees, a final oral examination is conducted by the student's Graduate Committee to assess the research contributions of the student. The passing of this Thesis Defense fulfills the Defense of Thesis requirement of the Graduate School for a doctoral or master's degree (as applicable) and is subject to all conditions and requirements set forth by the official policies of the Graduate School.

FORMAT: A written thesis is submitted no later than two weeks before the oral defense. The graduate student must present and defend the doctoral or master's thesis to the committee in a manner that demonstrates the student's original contributions to the work and expertise in the area of research. The oral defense will consist of a public presentation that is followed by a closed-door examination that is conducted by the graduate student's Ph.D. committee.

TIMELINE: This examination takes place after the thesis has been submitted.

DEADLINE: There is no deadline for this examination.

GRADING: Through the written thesis and oral presentation, the graduate student must demonstrate original research contributions as judged by the Ph.D. committee. Passing or failing grades are determined by the majority vote of the Ph.D. committee.

GRADUATE STUDENT RESEARCH

First year graduate students are required to register for a 1-credit research seminar (PHSX 594-15) in Spring term designed to acquaint the students with the various research areas in the department. These seminars will be presented by persons active in those areas and are designed to aid a student in identifying the particular area or areas he/she would like to pursue.

In addition to taking formal courses, students in their first two years of study are expected to be making progress in research projects under the supervision of a research advisor.

The training of Ph.D. candidates in physics goes beyond formal coursework and the doctoral research project. The department runs several informal activities that are aimed at giving students experience with giving professional talks and reading the scientific literature. Graduate students are urged to enroll in seminars of their choice to obtain more in-depth knowledge of particular areas.

Graduate students are also required to attend department colloquia and should take advantage of opportunities to meet with colloquium speakers.

Students in the Ph.D. program are expected to attend regional, national and/or international conferences during their tenure as graduate students. Students are especially encouraged to attend conferences at which they will make research presentations.

RESEARCH HOURS:

The doctoral degree in physics requires students to write and defend a dissertation that presents the results of independent research. To progress to that point, each student must first pass the Comprehensive Examination to become a Doctoral Candidate.

After passing the Comprehensive Examination, students should typically enroll in 6 credits of PHSX 690 – Doctoral Thesis and spend a minimum of 18 hours per week (3 hours/credit x 6 credits) on their research based on MSU recommendations for study time, plus an additional 19 hours per week for their work as a Graduate Research Assistant (GRA).

GRADUATE COMMITTEE:

The graduate committee advises the student on academic matters and is the examining committee for the comprehensive examination and the thesis defense.

COMMITTEE CHAIR — A tenured or tenure-track faculty member serves as the chair of the student's graduate committee and acts as a channel of communication within the degree-granting department. A student may instead elect to have two co-chairs, with at least one being tenured/tenure-track faculty. In the event that the student does not select a chair of their graduate committee within the first (1st) term of attendance as a graduate student, the department head will appoint a temporary advisor. This advisor will advise the student until a tenured or tenure-track faculty member is selected as chair of the graduate committee.

COMMITTEE COMPOSITION — Committees should be formed in the best interest of the student. A research doctoral committee is composed of a minimum of four members. For a research master's (i.e. those with a thesis or a research paper), a master's committee is composed of a minimum of three (3) members. The majority of the committee and the committee chair should be from the degree-granting academic unit or be affiliated with the academic unit. The chair must hold a doctoral degree. The graduate committee chair and the academic unit head recommend the committee composition to The Graduate School. Final approval of committee composition rests with The Graduate School.

NON-TENURE TRACK COMMITTEE MEMBERS — Committee members not holding tenure or tenure-track faculty status at MSU, including people from outside MSU, must be approved by the student's department head. In some cases, these committee members may act as co-chair of a student's committee.

CHANGES TO THE COMMITTEE — The student may make changes to their committee, using the [Graduate Committee Revision](#) form. Committee makeup should not be changed simply to accommodate short term scheduling issues.

COMMITTEE APPOINTMENT DEADLINE — The doctoral committee composition must be submitted to The Graduate School by the end of the student's third (3rd) semester of graduate attendance. For a research master's (i.e. those with a thesis or a research paper), the committee composition must be submitted to The Graduate School by the end of the student's second (2nd) term of graduate attendance.

MANDATORY ANNUAL MEETINGS WITH THE GRADUATE COMMITTEE:

The Department of Physics requires senior graduate students to hold annual meetings with their graduate committee to discuss progress and plans for completing their Ph.D. thesis. These meetings are not intended to test the student's knowledge, but are simply intended to be a meeting (generally not more than 0.5 hour) to have the student and committee discuss progress on and plans for the thesis project. The meetings will also serve as a regular source of input from other members of the committee.

The annual meetings are encouraged once a student joins a research group and has formed a Ph.D. committee, but become mandatory beginning with the Spring term of the student's second (2nd) year in the program, that is prior to the student starting his/her 3rd year.

The student is responsible for scheduling the committee meeting. Attendance at the meeting for the nonreaders on the committee is desired but not required. The three readers are required to attend the meeting, or an appropriate substitute found in rare, conflicted cases.

The graduate student will discuss the planned timeline and progress on the thesis at the meeting. After the meeting, the thesis advisor will submit a summary letter to the Department Head, with copies to the student and other members of the committee, prior to the end of that spring semester. Failure to do this will delay initiation of the GTA or GRA appointment for the following Fall term. Questions regarding this policy should be brought to the Department Head.

GRADUATE STUDENT TEACHING

Teaching experience is an important component of graduate students' education and their preparation for future careers. All students must take PHSX 594-01 – Teaching Seminar in the first year.

Typically, graduate students are supported as Graduate Teaching Assistants (GTAs) during their first two years. GTAs are generally assigned 19 hours per week of work for duties such as leading lab sections, grading, and meeting with students in the help center. GTAs are not expected to be “instructors of record”, i.e., to have the responsibility for preparing an entire course, syllabus, lectures, course materials, etc. However, in exceptional circumstances, students in advanced standing may request this opportunity.

The Graduate School has more information to help you be a successful GTA. Please visit: <https://www.montana.edu/gradschool/admissions/orientation-gta-videos.html>

PHYSICS DEPARTMENT FINANCIAL AID GUIDELINES

Most students admitted to advanced degree programs in the Physics Department are awarded financial aid, in the form of research or teaching assistantships, fellowships, and fee waivers. To receive financial aid, a student must satisfy the requirements of the Graduate School as listed on their webpage, as well as requirements of the Physics Department given below. Satisfaction of these requirements does not guarantee financial aid, although it is the policy of the Physics Department to support as many qualified graduate students as permitted by the available resources. Limited financial assistance is offered in the summer. For foreign students, continuation of financial aid beyond the first year is contingent upon satisfactory performance in spoken English as well. Also see <https://www.montana.edu/gradschool/fellowships/index.html>

CREDIT REQUIREMENTS: Students receiving financial aid must be registered for a minimum of 9 credits during the academic year, unless instructed otherwise by the Department Head. Exception: during the year in which a student plans to establish residency, domestic students should register for 6 credits in order to earn state residency and reduce fees. This will typically occur during a student's 3rd or 4th academic year.

GRADE REQUIREMENTS: Financial aid may be revoked if a student's cumulative grade point average (GPA) falls below 3.0; graduate standing may also be removed in this case. Please see: http://www.montana.edu/gradschool/policy/grades_academicstanding.html

The Department of Physics defines a passing grade for required graduate level classes to be a B- or better. A student receiving a C+ or lower is considered to have failed the required class and must retake the class when it is next offered. Questions regarding this policy should be brought to the Department Head.

M.S. CANDIDATES: Candidates for the degree of M.S. in Physics will generally be granted a maximum of two years of financial aid including summers. Note that all specific course requirements for this degree can be satisfied in one year. Exception: students selecting the Plan A (thesis) option may apply for research assistantships for up to one academic year beyond the second year of study; generally, teaching assistantships will not be awarded after the second year.

Ph.D. CANDIDATES: Financial aid will be continued beyond three years only if the written Ph.D. Comprehensive Exam is passed by the second attempt.

TIME RESTRICTION FOR GTA SUPPORT: This time restriction would apply to the ninth year after the student enters the program. For example, if a student enters the program in fall 2012, a time restriction would apply to GTA support for the fall semester of 2020. The department will normally not give GTA support to students beyond their eighth year in the graduate program. To request GTA support for semesters after the eighth year would require a letter from the graduate advisor to the Department Head describing the circumstances that justify the continued GTA support for the student. Moreover, the student could continue on GRA support or personal funds. Our hope is that the mandated annual meetings of the student and his/her committee will mean that the restriction on GTA support rarely comes into play. Questions regarding this policy should be brought to the Department Head.

APPLYING FOR FELLOWSHIPS: Students are encouraged to talk to their advisors about applying for fellowships and scholarships from the Graduate School and external funding agencies.

PHYSICS DEPARTMENT PROFESSIONAL EXPECTATIONS

As professional scientists and educators, a safe, constructive, healthy, and supportive work and learning environment is essential to our success. In the MSU physics department, we have clear professional expectations for ourselves and our colleagues. Promoting a safe, constructive, healthy, and supportive work and learning environment is the responsibility of everyone within the department, including faculty, staff, graduate students, and undergraduate students.

- All students and university personnel are required to adhere to the Montana State University policies and procedures on Discrimination, Harassment and Retaliation.
- Both graduate and undergraduate students are required to adhere to Montana State University's Student Code of Conduct.
- Faculty, staff, graduate research assistants, graduate teaching assistants, and administrators are required to adhere to Montana State University's Ethical and Professional Standards.

In addition to adhering to the above policies and any other university policies that apply to Montana State University faculty, staff, and students, all members of the Department of Physics are expected to hold themselves to the highest professional standards, in part by committing to the following:

1. To conduct ourselves in a professional and considerate manner at all times while at work or otherwise representing the Department.
2. To actively encourage a healthy, safe, supportive, and welcoming environment for the creation and dissemination of scientific knowledge by:
 - a. Treating everyone with respect and dignity. Harassment (including sexual harassment) and bullying are unacceptable. Definitions and examples of harassment and bullying are available on the MSU website.
 - b. Taking concerns of students and colleagues seriously.
 - c. Being familiar with and respecting all applicable rules and policies of MSU.
 - d. Being accountable: when we fail to meet these guidelines, to work together to identify problems and adjust policy and practice.
 - e. Taking personal responsibility for:
 - Promoting a non-hostile and constructive environment for everyone within the department.
 - Considering the safety of everyone within the department.
 - Taking appropriate steps when we become aware of hostile or harmful behavior.
3. To assess and evaluate the work and contributions of all department members impartially, keeping all feedback professional and constructive.

4. To promote equality of opportunity and fair treatment regardless of gender, race, ethnic and national origin, religion, age, marital status, sexual orientation, gender identity and expression, disability, and veteran status.

Unacceptable behavior that violates these professional expectations will be viewed as promoting a hostile and unconstructive work environment. The consequences, including potential dismissal, loss of financial support, loss of office space, and/or loss of access to research facilities will follow the guidelines described in the MSU Faculty Handbook and as set forth by the MSU Office of Institutional Equity as appropriate.

Violations of these professional expectations should be reported to the Department Head or, if a conflict of interest arises, to the Dean of the College of Letters and Sciences. Alternatively, reports of violations may be made directly to the responsible parties described in the MSU Personnel Policy. Violations of the Student Code of Conduct can be reported to the Dean of Students. As needed, additional reporting will follow the guidelines set forth in the current Personnel Policy of MSU. Questions about or reports of protected class discrimination or harassment can be made to the Office of Institutional Equity.

IMPORTANT MILESTONES AND CHECKLIST FOR THE PHD DEGREE

MILESTONE	DEADLINE
1 Find a research advisor	Spring of 1 st year
2 Begin research project	Summer after 1 st year
3 Submit M.S. Program of Study to Graduate School	End of Spring semester, 1 st year
4 Submit M.S. Committee to Graduate School	End of Spring semester, 1 st year
5 Submit Ph.D. Program of Study to Graduate School	End of Fall semester, 2 nd year
6 Submit Ph.D. Committee to Graduate School	End of Fall semester, 2 nd year
7 Complete Qualifying Exam	January of 2 nd year
8 Comprehensive Exam	Spring semester, 2 nd year
9 Submit dissertation to graduate committee	14 business days prior to defense date
10 Defend dissertation	14 business days prior to end of term

The candidate must file a [Graduation Application](#) form with The Graduate School in the term of intended graduation.

DEADLINES —

Fall - September 20

Spring - February 5

Summer - June 10

In the research (thesis) master's, a comprehensive examination and thesis defense are required. These may be combined and offered simultaneously.

Disclaimer: To the best of our knowledge, the information included herein is correct and up to date (3/25/24). Should you reference it in the future, please be sure to check our webpage at: www.physics.montana.edu for updates, changes, and additions. This document can be found in its entirety on the webpage and will note the date that any changes are made in the future.