



Department of Physics
COLLEGE OF LETTERS & SCIENCES
UNIVERSITY OF WISCONSIN-MADISON

PH.D. PROGRAM

GRADUATE STUDENT

HANDBOOK

2019-2020

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INTRODUCTION

The Ph.D. is at its core a research degree. The degree requires substantial original research, presented in the form of a dissertation. The path to the Ph.D. consists of two stages. In the first (pre-dissertator) stage, the student passes the department's Qualifying Examination, completes required coursework (core and minor), and starts research with their faculty research advisor in preparation for the Preliminary Examination. Once the student completes all departmental and Graduate School requirements and passes the Preliminary Examination, the student has achieved dissertator status. In this stage of the program, the student focuses on their thesis research, and completes their dissertation. The student defends the dissertation in the thesis defense. The student then deposits the dissertation with the Graduate School, which is the final step to the degree. The requirements for the Ph.D. are in accordance with the department's learning goals of the program, and UW-Madison Graduate School policy. The full details of the program requirements can be found in the GUIDE:

<http://guide.wisc.edu/graduate/physics/physics-phd/>

CREDIT REQUIREMENTS

Total Credits

The Physics Ph.D. degree includes a number of coursework and credit requirements. The Ph.D. degree itself requires 51 credits in total to align with the Graduate School minimum graduate degree credit requirement:

<https://grad.wisc.edu/documents/minimum-graduate-degree-credit-requirement/>

Credits Before Dissertator Status

The Graduate School minimum graduate residence requirement requires that at least 32 credits towards the doctoral degree must be completed prior to achieving dissertator status:

<https://grad.wisc.edu/documents/minimum-graduate-residence-credit-requirement/>

The 32 credits are achieved via the core coursework sequence, the Ph.D. minor, and a combination of other coursework and Physics 990 research. 15 of the credits will be accumulated from the Physics core coursework and 9 of the credits will be accumulated from the minor. The remaining 8 credits can include research or other coursework.

Graduate Level Credits

The Graduate School minimum graduate coursework (50%) requirement states that at least 50% of the 51 credits must be at least 700 and above or courses with the Graduate Coursework (G50%) attribute:

<https://grad.wisc.edu/documents/minimum-grad-coursework-requirement/>

To determine which courses can be used to satisfy the graduate level (G50%) credit requirement, please consult <http://enroll.wisc.edu> (Search: "Other Options", check the box "50% Graduate Coursework Requirement"). This will provide accurate results of which courses have been approved through the University to count towards the G50% requirement.

STEPS TO THE PHD

The steps to the Ph.D. are:

1. Pass the Departmental Qualifying Examination
2. Complete the required core coursework
3. Complete the minor requirement
4. Acquire a faculty research advisor and begin research
5. Pass the Preliminary Examination
6. Complete thesis research and defend the dissertation
7. Deposit the dissertation with the Graduate School

SATISFACTORY PROGRESS

The criteria for satisfactory progress and the items required to maintain good standing in the Physics Ph.D. program are outlined below. Satisfactory progress is important to staying on track and completing the degree in a timely manner. When progress items listed below indicate a semester timeline, this includes only Fall and Spring semesters. Summer semester does not count towards these timelines. Graduate students who do not achieve satisfactory progress are considered not in good standing and may not be allowed to continue in the Ph.D. program.

- Enroll each semester according to the Graduate School minimum enrollment requirements (Graduate School requirement: <https://grad.wisc.edu/documents/enrollment-requirements/>)
- Enroll in at least one qualified physics course per semester until the Preliminary Exam is passed
- Maintain an overall graduate GPA of 3.0 or above (Graduate School requirement: <https://grad.wisc.edu/documents/gpa-requirement/>)
- Pass each of the four sections of the Qualifying Exam within the total of four consecutive attempts allowed
- Complete the required core coursework by the end of the fourth semester
- Maintain at least a B or better in the core coursework
- Make progress in acquiring a faculty research advisor and joining a research group in a timely fashion, preferably by the beginning of the summer after the first year
- Make satisfactory progress in research work as judged by the faculty research advisor by earning a P (Progress) or S (Satisfactory) in 990 research each semester
- Complete the Preliminary Exam by the end of the sixth semester

MENTORING COMMITTEE

A mentoring committee pilot program will begin in Fall 2019 for all new incoming graduate students. Participation is voluntary for both graduate students and faculty. The mentoring committee is designed for students in the early years of the graduate program, prior to achieving dissertator status. Once the student has taken the preliminary exam and achieved dissertator

status, the responsibilities of the mentoring committee transition to those of the faculty research advisor.

Before incoming students start their first year in the program, two faculty will be assigned to each student by the Director of Graduate Studies (DGS), in consultation with the Chair and the Associate Chair, based on the student's stated research interests. Each mentoring committee has a committee chair, with the role and responsibilities tasked to temporary advisors. For students with a faculty research advisor already secured upon their arrival to the program, the advisor is the committee chair, and the second faculty member will be chosen in consultation with the advisor. If a student does not have a faculty research advisor upon entry to the program, one of the two faculty on the mentoring committee will be designated as the committee chair. If changes to the makeup of a student's mentoring committee are desired as the student's research interests evolve, the DGS will work with the student and the faculty implement appropriate changes. The Graduate Coordinator will be informed of any changes to the mentoring committee.

Students are encouraged to request a meeting with the mentoring committee if they wish to do so. It is not required, but encouraged. It is suggested that the mentoring committee meetings take place on an annual basis while the student is at the pre-dissertator stage. The suggested timeline for the annual meeting is to have it take place in the early to mid-semester of the spring term of the first year, so as to provide guidance and feedback for summer support plans if needed. The mentoring committee meetings may also address progress in securing a faculty research advisor and starting research, summer support plans, progress in completing coursework requirements, and any academic concerns that need to be discussed.

ENROLLMENT

The Graduate School policy indicates the minimum enrollment requirements each semester: <https://grad.wisc.edu/documents/enrollment-requirements/>

Physics Ph.D. students must enroll in at least 2 credits of Physics coursework each semester until the Preliminary Exam is completed. Individual 1 credit courses or a combination of 1 credit courses, such as Physics 701 and 801, do not count towards this requirement.

It is often suggested that students who hold teaching assistant (TA) appointments take only 6 credits during their first semester, as more than this may affect performance in both teaching and coursework as students become acquainted with the demands of the program. After the first semester, students are encouraged to take three courses per semester until they reach dissertator status. All students are encouraged to consult with the faculty advisor and mentoring committee to discuss the course schedule each semester.

COURSEWORK

Core Course Sequence

All Ph.D. candidates must take the core course sequence in physics and achieve a grade of B or better in each core course, or repeat these courses until a B grade is achieved. Students should complete the core courses by the end of their fourth semester in the program. The core courses should be taken as soon as possible in the graduate career. Finishing the core courses allows the most rapid entry into research, and much of the material will be required for more advanced work in each student's research specialty. The core course sequence is as follows:

- Physics 711 (Dynamics)
- Physics 715 (Statistical Mechanics)
- Physics 721 (Electrodynamics)
- Physics 731 (Quantum Mechanics)
- Physics 732 (Quantum Mechanics)

Students should enroll for courses after consulting with the DGS, faculty advisor, and/or mentoring committee. Faculty advisors and mentoring committees are expected to review course selections each semester before a student enrolls.

Most incoming students take two of these core courses in the fall semester and two in the spring semester. 711, 721, and 731 are offered in the fall, and 715, 721, and 732 are offered in the spring. To avoid scheduling conflicts, all core courses occur in the morning on Monday/Wednesday/Friday. Usually, students take two core courses in each semester of their first year. Each research group may have a recommended sequence of courses and/or additional required coursework.

Course Waivers: Prior Coursework

Students who believe that they have done graduate-level work in one or more of the core course subjects prior to their arrival in Madison may be eligible for course waivers, or they may decide to try to test out of these subjects. Course waivers or test-out forms are available for those students who have taken equivalent courses at another institution. Waivers of core courses can be granted for credits earned at other universities in equivalent graduate-level courses, pending approval by the DGS. Students who believe that they qualify for a waiver of the course requirement for a core course based on prior graduate course work from another institution should request consideration for a waiver within the first month of the graduate program. The Graduate School will allow these credits to count towards the graduate degree at UW-Madison only if they were earned post-baccalaureate as outlined in the Prior Coursework policy:

<https://grad.wisc.edu/documents/prior-coursework/>

Test Out

Students who believe that they have had graduate level coursework in a subject or subjects comparable to what is covered in the core courses, but who do not clearly qualify for a waiver of any specific courses, have the option of trying to test out of the course. At a minimum, this

typically requires passing the final exam for the course at a level that would clearly lead to a grade of B or better in the course. Requests to test out of core courses should be made to the DGS during the first month in the graduate program. Testing is to be completed during the first semester in the graduate program. Testing out of a course does not include any credits towards a graduate degree at UW-Madison.

MINOR

Breadth is a required component of graduate study at UW-Madison. The Graduate School policy outlines the minimum requirements for all doctoral minors:

<https://grad.wisc.edu/documents/minors/>

The purpose of the minor is to add breadth to the Ph.D. course of study by broadening students' knowledge of physics or related fields, and/or to support their research and prospective professional activities. There are two options for completing the minor. The Ph.D. Minor Agreement Form must be completed, signed, and returned to the Graduate Coordinator at or before the time the warrant for the Preliminary Exam is requested.

Option A Minor: External

- Minimum of 9 credits in an external department at the graduate level
- Consists of coursework in one single department outside of the Department of Physics and is named accordingly
- Consult with the minor department for specific minor requirements and processes to declare an external minor
- A list of all external doctoral minors and the Graduate School external minor requirement: <https://guide.wisc.edu/graduate/#doctoralminorstext>

Option B Minor: Distributed

- Minimum of 9 credits of minor coursework taken in one or more departments
- Must include a minimum of 3 credits in Physics at or above the 500 level
- Coursework must be outside of the student's area of specialization, form a coherent theme, and provide breadth in programmatic or professional development
- Physics core coursework may NOT be counted towards the minor
- Additional coursework relevant to the student's area of specialization may NOT be counted towards the minor

Physics Minor for Non-Physics Students

The doctoral minor requirement in Physics for non-physics graduate students is 9 credits numbered above 300, each passed with a B or better. The program must be approved by the Director of Graduate Studies before it is completed:

<https://guide.wisc.edu/graduate/physics/physics-doctoral-minor/index.html>

FUNDING

The Graduate School provides information on graduate assistantships, benefits, minimum stipend levels, and assistantship stipends by program:

<https://grad.wisc.edu/funding/graduate-assistantships/>

The Graduate School and the Office of Human Resources outlines the transition of policy from the former Teaching Assistants Association (TAA) contract to a Graduate Assistantship Policies and Procedures (GAPP) document. The GAPP document was released in spring 2019 and includes campus policy for TA's. <https://hr.wisc.edu/policies/gapp/>

Teaching Assistant (TA)

Many Physics Ph.D. students will hold a teaching assistantship (TA) at some point during the program. A TA is both a job and a means of financial support for graduate study. Because of the coexistence of these two functions, the relationship between the department and the individual teaching assistant (TA) is complex. The advantages of holding a teaching assistantship for at least one semester during graduate studies are that teaching activities solidify and deepen the teaching assistant's undergraduate education in physics, help improve communication skills, and help prepare for a possible career in teaching. Because teaching is a job, the Department of Physics conducts regular TA evaluations. TAs are evaluated by their students at the middle and end of each semester. The purpose of the mid-term evaluation is for the TA to get feedback from the students (who remain anonymous), while there is still time to change teaching practices. The mid-term evaluations are not part of the TA's permanent record. The final evaluation results in a letter, which does remain on the TA's record, in which the TA's performance is classified as either Excellent, Very Good, Good, Satisfactory, Marginally Satisfactory, or Unsatisfactory.

Because teaching is a means of financial support for graduate study, the Department of Physics typically admits graduate students with a guarantee of support in the form of a TA. This guarantee is described in each student's offer of admission. During the time covered by the funding guarantee, students who are not supported as RAs or Fellows, and who remain in good standing and making satisfactory progress, are guaranteed by the department to be supported as TAs during the academic year.

After the natural expiration of the funding guarantee, students who need TA positions during the academic year may apply for them, but cannot be assured of receiving them. The number of TA positions available depends on the number of undergraduates who enroll in physics classes that use TAs, as well on the percentage time of each position. Whereas guarantees of support typically specify 50%-time appointments, the minimum percentage required for a TA to receive a tuition waiver is 33%. The Department of Physics sometimes offers non-guaranteed graduate students 33% positions, in order to maximize the number of students who might receive the tuition waiver. On occasion students have requested 33% positions rather than 50% positions in order to free up more time for research. If a TA in the Physics Ph.D. program switches to another

graduate program on campus, the physics department's commitment to continuing support is terminated.

There is a small number of TA positions available in the summer term. Please note that the support guarantee does not extend into the summer. Depending on the number of requests, TA positions may or may not be available for all who request them. For further information about summer TA positions, please consult the Director of Undergraduate Studies. The majority of TA positions are in large general Physics classes for non-physics-majors. TAs in these classes lead both discussion sections and laboratory sections. There are also a few TA positions in smaller, more advanced classes for physics majors. These are usually (although not always) given to experienced TA's. Some involve discussion only (no lab), others involve lab only (no discussion).

Research Assistant (RA)

Many Physics Ph.D. students will hold a research assistantship (RA) at some point during the program. RA positions are made available by individual professors to students who have decided on their field of research. Students who wish to be considered for an RA appointment should contact the faculty directly.

Fellowship

Fellowship opportunities for graduate students include external fellowships, as well as supplemental fellowship opportunities that are available through the UW-Madison campus or the Department of Physics. UW campus fellowship opportunities include University Fellowships and Advanced Opportunity Fellowships (AOF), which are awarded by the Graduate School upon recommendation of the Department of Physics during the admissions process. The Department may also have fellowships available for incoming first-year graduate students. Funding for graduate student fellowship support is made possible by generous endowments from Physics Department alumni. These fellowships can be found here:

<http://www.physics.wisc.edu/academics/gradstudents/fellowships>

QUALIFYING EXAM

The qualifying exam is designed to assess students' understanding of core physics topics at the undergraduate level. The goal is to provide students with an opportunity to solidify their knowledge of advanced undergraduate level physics, which helps ensure a strong foundation in physics that is needed for advances in original research. The exam is thus connected to the departmental learning goals for the Ph.D. program.

The qualifying exam is a written exam that is offered twice a year. It is always held the weekday before classes begin each semester in September and January. The dates are posted at <https://www.physics.wisc.edu/academics/gradstudents/qualifying-exams/>. Students with special requirements must consult with the Chair of the Qualifying Exam Committee at least two weeks prior to the exam date.

The exam is separated into four sections:

- Classical Mechanics (CM)
- Electricity and Magnetism (EM)
- Statistical Mechanics/Thermodynamics (SM)
- Quantum Mechanics (QM)

Each exam section can be passed independently. More precisely, if a student receives failing scores on one or more sections of the exam, in subsequent attempts the student only needs to take the section or sections of the exam that remain to be passed.

All physics Ph.D. students have four consecutive opportunities within the first two years of the program to pass the exam in its entirety at the Ph.D. level. All entering Ph.D. students are required to take the qualifying exam in its entirety in their first semester in the program.

Physics graduate students that pass all sections of the exam at the Ph.D. level have passed the department's qualifying exam requirement and are automatically qualified to continue in the Ph.D. program. The nominal Ph.D. passing score for each area is 60% and a Master's level passing score for each area is 50%.

Exam Structure

The qualifying exam is held over one full day. Each section of the exam is 1.5 hours long. Two of the sections (CM and QM) are held in the morning and two (EM and SM) are held in the afternoon, separated by a lunch break. There is a 15-minute break between the two sections of the exam in both the morning and afternoon sessions.

Each section of the exam consists of five problems. Students are to do the first two problems, which are at the [calculus-based] introductory level, and two other problems (out of three offered) at the intermediate/advanced level. Students are only able to submit answers to these four problems for each section of the exam. The first two problems comprise one-third of the total score, and second two problems chosen comprise the remaining two-thirds of the total score.

Exam Topics & Preparation

The exam is designed to cover standard topics as included in undergraduate physics courses in CM, EM, SM, and QM at both the introductory and intermediate/advanced levels. For example, these topics may include:

- CM: motion in electromagnetic and gravitational fields, rigid bodies, coupled oscillations, and continuum vibrations;
- EM: statics, fields in matter, time-dependent fields, Maxwell's equations, light and radiation (with optics and circuits covered at the introductory level);
- SM: thermodynamics and statistical mechanics of matter and radiation;

- QM: wave mechanics, matrix mechanics, observables and measurements, angular momentum, perturbation theory, elementary atomic physics, and elementary scattering theory.

To prepare for the exam, students are encouraged to consult their faculty advisor and mentoring committee, as well as the DGS, about good practices. Outside reading and individual problem-solving practice, group problem solving sessions, and auditing or taking appropriate UW-Madison courses (if needed) are typical study strategies. Previous qualifying exams are also available for study. An archive of exams and other useful study materials can be found at: <http://abadonna.physics.wisc.edu/QualPrep>

Before the fall semester begins, a qualifying exam “boot camp” is offered by the DGS. Physics 801 is also offered each fall semester to assist students with their qualifying exam preparation. This course reviews the core topics at a rapid pace and provides students with opportunities to strengthen “qualifier-like” problem solving skills.

Please note that the exam structure represents a significant change in format from that of previous qualifying exams. More precisely, exams prior to Spring 2018 were not broken up into four topical sections, but instead had Part I (short problems) and Part II (long problems), which each covered a much broader range of topics. Please keep this in mind when using previous exams for studying purposes. Any questions about these issues should be directed to the DGS.

Grading Policies

The exam is graded anonymously by faculty. After grading is completed, the Qualifying Exam Committee reviews the graded problems in detail for consistency. Only after this thorough review is the final grade of pass or fail for each student in each exam section assigned. The results are then unblinded and distributed. Students receive their scores, their original work, and the grading rubrics used by faculty in grading the exam.

Students may request a review of their grades for specific exam problems to the Chair of the Qualifying Exam Committee at any point within two weeks after the exam is returned. The committee chair consults with the faculty that graded the problems in question and returns the final grade determination to the student. Students should be aware that the grading rubrics used for assigning partial credit, which are also reviewed prior to the final pass or fail score assignments, are generally respected unless there are obvious inconsistencies or errors.

Appeal Process

If a student does not pass all four topical areas of the written qualifying exam at the Ph.D. level after the four exam attempts, the student can request an appeal. Upon this request, an appeals committee is formed. The committee consists of a faculty member of the student’s choosing, such as the student’s faculty advisor, and two other faculty that are to be determined on a case-by-case basis. The appeal is a broad assessment that includes the student’s prior qualifying exam results, performance in graduate courses, and progress to date in research. Upon a careful

evaluation of all factors involved, the appeals committee makes a final recommendation as to whether or not the student has achieved qualification status. If the final recommendation is positive, the student has passed the department's qualifying exam requirement.

FACULTY RESEARCH ADVISOR

The responsibility to acquire and be accepted by a faculty research advisor, is entirely with the student. Acceptance for Ph.D. research by a faculty member depends on the professor's appraisal of the student's potential for research and on the ability of the professor to accept a student at that time. Please note that while all incoming students are assigned a temporary advisor to help oversee their progress in the first few semesters in the program, the temporary advisor is not automatically the research advisor unless there is a clear and concrete understanding between both the student and the faculty advisor that the student has already been accepted by that professor into their group.

To aid incoming students in selecting a research area and faculty advisor, Physics 701: Introductory Seminar, is offered each fall semester. In this course, professors from each of the research groups describe their research, show their laboratories, and discuss matters of general interest to graduate students. First-year students are required to enroll in Physics 701.

Graduate students should begin research work as early as possible. Ideally students make progress in acquiring a faculty research advisor and joining a research group in a timely fashion, preferably by the beginning of the summer after the first year. The summer after the first year is the ideal time to do research unencumbered by course work or teaching. It is also very important to determine summer funding support options as soon as possible. Ideally most students will have begun a trial project with an advisor or at least made the necessary introductions and have at least one solid prospect by the end of the first year. The DGS and the faculty mentoring committee can be additional resources during this process.

MASTER'S DEGREES

Master of Arts (M.A.)

The master of arts degree is a purely academic degree, requiring 30 credits of graduate course work, completion of the core graduate coursework and passage of the qualifying exam at the master's level. It is designed to strengthen the student's physics background and enhance the opportunities for employment as a physicist or in physics education.

To earn the M.A. degree in the Department of Physics, a student must satisfy the department's minimum graduate-level credit requirement and pass the qualifying exam at the master's level. The department requires at least 30 credits at the 500 level or above. 15 of the 30 credits must be earned from taking the physics core graduate courses, each passed with a grade of B or better. These courses are Physics 711 (Dynamics), 715 (Statistical Mechanics), 721 (Electrodynamics), and 731 and 732 (Quantum Mechanics). The remaining 15 credits may be

earned through a combination of coursework, directed study, and research to be determined in consultation with the student's faculty advisor. The courses should be selected in consultation with the student's faculty advisor to best meet the student's professional objectives.

The M.A. degree requires a warrant. Warrant requests must be made to the Graduate Coordinator, allowing at least three weeks for the warrant to be processed.

Master of Science (M.S.)

The master of science degree in Physics requires the completion of a directed master's project and thesis in the student's area of interest, completion of the core graduate coursework, and passage of the qualifying exam at the master's level. It is designed to strengthen the student's background and experience in physics, and enhance the opportunities for employment as a physicist or in physics education.

To earn the M.S. degree in the Department of Physics, a student must satisfy the department's minimum graduate level credit requirement and pass the Qualifying Exam at the Master's level. The department requires at least 30 credits at the 500 level or above. 15 of the 30 credits must be earned from taking the core graduate courses, each passed with a grade of B or better. These courses are Physics 711 (Dynamics), 715 (Statistical Mechanics), 721 (Electrodynamics), and 731 and 732 (Quantum Mechanics). The remaining 15 credits may be earned through a combination of coursework, directed study, and research to be determined in consultation with the student's academic advisor. The courses should be selected in consultation with the student's advisor to best meet the student's professional objectives.

Additionally, the student must present satisfactory evidence of scientific research, writing, and presentation skills. This will usually be done through a master's research project that results in the submission of a master's thesis written at a satisfactorily professional level, together with an oral presentation of the project in a master's thesis defense.

The M.S. degree requires a warrant. Warrant requests must be made to the Graduate Coordinator at least three weeks prior to the date of the thesis defense.

PRELIMINARY EXAM

The Preliminary Exam must be passed for admission to candidacy for the Ph.D. and to achieve dissertator status through the Graduate School. It should be taken no later than the end of the fifth semester in the program, unless a student has received approval for an extension. If the Preliminary Exam not passed on the first attempt, it may be repeated once before the end of the sixth semester.

The Preliminary Exam is intended to test whether the student has mastered the physics and technology necessary for research in the proposed general area of study, and to assess whether the student is on track to satisfying the department's learning goals for the Ph.D. degree. The

Preliminary Exam is held before the student's Preliminary Exam Committee, which at minimum consists of three members:

- Faculty research advisor, who serves as the chair of the committee
- Faculty representative from the departmental Preliminary Exam Committee (student should contact the current Prelim Committee Chair to obtain this member)
- Additional committee member that is typically chosen by the student and/or their advisor and is typically a UW-Madison faculty either in physics or another related department

The exam is typically scheduled during a two-hour time block. The talk is aimed at a general physics audience and should be understandable for a physicist working in an entirely different area. The format can vary slightly depending on the research advisor and research group, but it typically begins with a one-hour talk covering a subject in the student's chosen area of research, and is followed by a question and answer period designed to assess the student's background knowledge and research potential. The committee will ask questions to clarify points made in the talk and determine if the student adequately understands the physics behind the topics that were discussed. The question and answer period typically takes place both in open session (in front of a general audience) and in closed session (just in front of the committee). The committee will deliberate the exam outcome in closed session, and communicates the result to the student once the decision is made. The committee will indicate the result of pass by signing the Preliminary Exam warrant.

A student planning to take the Preliminary Examination will need to present a completed and signed Minor Form and request a Preliminary Examination warrant from the Graduate Coordinator at least three weeks prior to the date of the examination.

<https://go.wisc.edu/g863tf> After the exam, the signed Preliminary Exam warrant is submitted to the Graduate School for processing of dissertator status.

DISSERTATOR STATUS

The Graduate School sets the minimum requirements and deadlines each semester for dissertator status:

<https://grad.wisc.edu/deadlines/>

<https://grad.wisc.edu/documents/dissertator-status/>

Dissertator status is effective at the start of the semester immediately following the completion of these requirements. In addition to the Graduate School requirements for dissertator status, the Physics program also requires students to:

- Pass the Qualifying Exam at the Ph.D. level
- Complete the required core coursework with a grade of B or better
- Satisfy the minor requirement
- Pass the Preliminary Exam

DOCTORAL DEGREE

Thesis Defense

The doctoral thesis defense is an oral defense of the dissertation. The thesis defense includes both a presentation of the dissertation material, and question/answer sessions that can take place both in open session (before a general audience) and closed session (just in front of the doctoral thesis committee). Graduate School policy requires that the thesis defense must be completed within five years of passing the Preliminary Examination. Details from the Graduate School about the final oral examination (thesis defense) can be found here:

<https://grad.wisc.edu/documents/final-oral-examination/>

The thesis defense also requires a warrant. Warrant requests must be made to the Graduate Coordinator at least three weeks prior to the date of the thesis defense.

<https://go.wisc.edu/g863tf>

Thesis Committee

In accordance with Graduate School policy, the doctoral thesis committee consists of the student's faculty advisor and three other committee members. The chair or one of the co-chair's must be graduate faculty from the Department of Physics. At least three of the members must be graduate faculty; at least one of the faculty must be from another graduate program. Further details are available here: <https://grad.wisc.edu/documents/committees/>

Formatting

The Graduate School doctoral guide outlines the very important formatting requirements for the dissertation as well as the steps to deposit the dissertation:

<https://grad.wisc.edu/current-students/doctoral-guide/>

Deadlines

Degrees are conferred three times during the year by academic term: Fall, Spring, & Summer. The date the dissertation is deposited to the Graduate School determines the degree term. The Graduate School deadlines are listed here:

<https://grad.wisc.edu/deadlines/>

GRIEVANCES

Graduate students should consult their faculty advisor and/or mentoring committee, if appropriate, the DGS, and/or the Graduate Coordinator about any concerns related to academic issues or the academic environment. Graduate students may also reach out directly to the Department Chair as an alternate approach. The hope is that this will result in the development of a working environment that all will find supportive. If graduate students have a question of whether or not a situation or discomfort should be discussed, the answer is YES! Any issue that is troubling should be addressed and, if it is within the Department's authority, it will be resolved.

If a graduate student feels unfairly treated or aggrieved by faculty, staff, or another student, it is recommended that the concerns are first handled directly with the person responsible for the objectionable action, if possible. If the student is uncomfortable making direct contact with the individual(s) involved, the student should contact the faculty advisor or the person in charge of the unit where the action occurred (program or department chair, section chair, lab manager, etc.), and/or contact the people mentioned above.

There are also resources and formal grievance procedures at the campus level that can be followed, which are outlined in the Graduate School policies:
<https://grad.wisc.edu/documents/grievances-and-appeals/>

LEAVE OF ABSENCE

While in most cases participation in the program is continuous over time, students sometimes find it necessary to take a temporary leave of absence. Graduate students may request a leave of absence for one semester or for one year by submitting a form outlining the timeline for the leave and general reasons. The faculty advisor must agree that the student is leaving in good standing and may re-enter the program in a reasonable stated length of time. Written requests for a leave of absence should be addressed to the DGS and the Graduate Coordinator. Please note that the Department Chair, in consultation with the Associate Chair and DGS, approves any leave of absence requests.

If a student is granted a one semester leave of absence, the milestone due dates and terminal deadlines are pushed back one semester. If a student is granted a full year leave of absence, all due dates and deadlines are pushed back one year. Students may be granted a leave of absence for no more than one year at a time. Students who do not register for more than one semester (Fall or Spring) will be considered inactive and must apply for re-entry.

Re-entry

Graduate students who leave the program in good standing for more than one term (not including summer) may request re-entry to the program by completing the Graduate School application for re-admission. The Department Admissions Committee in consultation with the faculty advisor, DGS, Associate Chair, and Department Chair will review the request and approve the request based on information provided.

The Graduate School outlines the policy for readmission for previously enrolled graduate students:
<https://grad.wisc.edu/documents/readmission/>

Time Limits

In addition, the Graduate School specifies time limits for completion of current coursework and research. Students who take a leave of absence or re-enter into the program should be aware of these policies:

<https://grad.wisc.edu/documents/time-limits/>

EXCEPTIONS

The DGS, Associate Chair, and Chair of the Department have the authority to make individual exceptions to policies found in the PhD program handbook. Exceptions must involve extenuating and/or unique individual circumstances. Requests for such exceptions should be made in writing to the DGS, Associate Chair, and/or Department Chair from the student and/or faculty advisor.