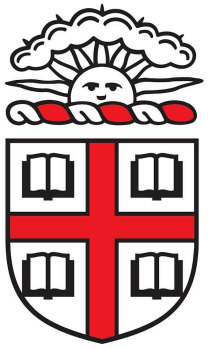


BROWN
Department of Physics

Physics Graduate Program Handbook

2025-26

Table of Contents

Introduction and Overview

Brown's Doctoral Program in Physics aims to help you develop into professional physicists. You will learn to plan and execute original investigations that lead to new, useful physics knowledge. You will gain skills and perspective that enable you to present physical ideas and discoveries to a range of audiences and especially to other experts in your field. We also believe that through the training, you will develop a command of intellectual tools of broad validity, facility with physics' modes of thought, and a capacity to attack the unknown that you can apply within and outside of physics. Our graduates have found this training valuable for careers in physics academia and research, in high technology, business and entrepreneurship, medical physics, and finance, to name a few.

Your training involves two phases that partially overlap. The first phase consists of courses that help you acquire a grounding in the fundamental principles, facts, and methods of physics in general and in your subfield in particular. A comprehensive examination provides you with the opportunity to consolidate your foundation. In the second phase, you build on this foundation as you learn and apply research methods to investigate original questions under the close mentorship of a faculty member and are further advised by a couple of other faculty members following your work. Early in this phase, your preliminary examination provides you with the opportunity to present a topic within your research field to faculty that can help you set your research direction. The second phase culminates in the writing and oral defense of your dissertation.

Program Governance

Director of Graduate Studies (DGS)

The DGS assists the Department Chair in overseeing the graduate program and serves as the liaison with the Graduate School. The DGS oversees your progress throughout the program and keeps you informed of your academic standing. They review and approve any special requests you may have for completing your requirements, such as the waiver of core courses based on your prior studies or the selection of courses outside of physics to satisfy your course requirements. Additionally, they can provide advice throughout your graduate career.

Student Affairs Manager

The Student Affairs Manager provides guidance and support on all graduate-related matters. Serving as the primary point of contact for most academic issues, the Student Affairs Manager ensures there is clear communication and accurate maintenance of student records.

The Faculty & Administrative Staff are Here to Support You

Faculty and administrative staff members are resources for information, advice, and assistance at all stages of your graduate work. We are committed to helping you succeed. You will have the opportunity to get to know faculty members through your courses, at seminars and colloquia, as members of your exam committees, and at informal gatherings. You can enhance these relationships by participating in office hours, reaching out through email to follow up on conversations, or asking questions about physics or whatever topic you choose to discuss. We are interested in you as a person

Program Requirements

Course Requirements Overview

A crucial first step in your development into a professional physicist with a PhD degree is to attain a strong foundation in core physics concepts and techniques that you can draw upon as you pursue your independent research goals. The Physics PhD program now offers two academic tracks: Physics and Astrophysics. Students select their track when applying for admission, and each track has its own set of courses.

The normal full-time course load for Teaching or Research Assistants is three courses per semester. If you have an external fellowship in your first year, you will need to take four courses. These courses are classified as Core courses, Advanced Courses, and Reading and Research courses. After your first year, you will need fewer classroom courses per semester. You will maintain your full-time course load by taking a single or multiple credits of the Research course (designated PHYS2980/2981). **If you wish to drop a course at any time, consult with the DGS.**

Core Courses

The earliest part of your training most likely involves taking a series of courses on generally accepted core areas of physics. These courses in classical and quantum mechanics, electricity and magnetism, statistical mechanics, and experimental methods are designed to help you further develop your ability to master the laws of physics and their implications using mathematics, and to use experiments to explore quantitatively and qualitatively physical phenomena

The courses build upon skills that undergraduate physics majors in the U.S. typically acquire. There are commonly employed textbooks for the core areas, like those used at Brown, that set this standard. Thus, in your core theoretical courses, you will learn how to use the math skills developed in your upper-level undergraduate courses with more facility and employ more advanced techniques. These skills are necessary for deeper insights and for unlocking the description of even more complex phenomena.

In the experimental course, you will use modern instruments and techniques in collaboration with classmates to learn general methods and approaches to understand physical phenomena.

Physics Track Core Courses:

- PHYS 2010 Techniques in Experimental Physics
- PHYS 2030 Classical Theoretical Physics II
- PHYS 2040 Classical Theoretical Physics II
- PHYS 2050 Quantum Mechanics I
- PHYS 2060 Quantum Mechanics II
- PHYS 2140 Statistical Mechanics

Astrophysics Track Core Courses:

- PHYS 2010 Techniques in Experimental Physics
- PHYS 2270 Observational Astrophysics and Cosmology
- PHYS 2280 Theoretical Astrophysics and Cosmology
- Plus 3 of the following 5:
    - PHYS 2030 Classical Theoretical Physics I
    - PHYS 2040 Classical Theoretical Physics II
    - PHYS 2050 Quantum Mechanics I
    - PHYS 2060 Quantum Mechanics II
    - PHYS 2140 Statistical Mechanics

You will not be required to repeat coursework you have already completed. If you have completed the Brown Master's program, all eight of your courses are automatically transferred toward your PhD course requirements. If you are coming from another program and believe that you have taken courses that substantially overlap with any of the core courses, you can request an exemption from those courses during your first advising meeting or by consulting with the DGS.

To request a course transfer/waiver(s), a student submits to the DGS:

- An email request
- A transcript that shows completion of the course(s)
- A syllabus for each course that includes information about the textbook, the scope of the course, and information about the types of work performed in the course. Examples of your work can also be helpful.

Conversely, if it turns out that there is a gap in your undergraduate preparation, you may need to take one or more 1000-level courses (i.e., at the undergraduate level) in your first year. These courses may be able to count for full graduate credit if your grade is B or better. Consult with DGS under those circumstances.

Advanced Course Requirements and Selections

Beyond the core courses, you are required to complete **four advanced courses**, in addition to research courses, to enhance your knowledge in your chosen research field. To fulfill a breadth requirement, at least one of these four courses must be outside of your primary research area. The remaining courses should align with your research interests, considering both your preferences and your advisor's recommendations. These courses are expected to be at the 2000 level.

You may also choose courses offered by other departments, subject to the approval of the DGS. The Department's advanced course offerings vary annually, so consult the Department's annual course announcement listings. Special courses can occasionally be arranged upon request, provided there is sufficient interest and lead time.

Reading courses may count towards the advanced course requirement only with DGS approval. However, a generic research course cannot be used to satisfy this requirement.

The sequence of advanced courses in the various fields of specialization transitions almost imperceptibly into the various weekly series of topical seminars and departmental colloquia. The seminars and colloquia are an important part of the graduate program, and you are expected to attend regularly and participate whenever possible.

List of advanced courses by research area		
Condensed Matter Physics (CMP), including Biophysics	**Particles & Fields/High Energy Physics (HEP)**	**Astronomy/Cosmology (Astro/Cosmo)**
❖ 2630 Biological Physics ❖ 2410 Solid State Physics I ❖ 2420 Solid State Physics II	❖ 2070 Advanced Quantum Mechanics ❖ 2170 Intro to Nuclear & High Energy Physics ❖ 2300 Quantum Theory of Fields I ❖ 2340 Group Theory	❖ 2100 General Relativity ❖ 2280 Astrophysics & Cosmology
Beyond the core courses, Ph.D. candidates are expected to pass **four advanced courses**. **At least one** of the courses **must fall outside a student's research area** (CMP, HEP, Astro/Cosmo). **Students can consult with the DGS about selecting a course that may not be listed above, as some advanced courses not listed may be approved for the breadth requirement.		

Comprehensive Examination

Overview

As described previously, the six core courses that many of you will have taken in your first year cover fundamental concepts of physics and give you practice in fundamental techniques

required for modern physics research. The faculty has created a Comprehensive Exam that encourages you to consolidate and demonstrate that learning through two specific topics selected from the core courses.

The Comprehensive Exam process consists of three distinct phases: Formation of Comprehensive Exam Committees, Selection and Preparation of Summaries of Core Course Topics, and Oral Presentations of Two Core Course Topics. The following sections provide examples of topics, the timing of the processes, and the rubric for evaluating the written summaries. The final section describes the rubric for the oral presentations and how the committee will use it to make their recommendation on whether a student has completed this program requirement.

The Comprehensive Exam Process

Formation of Comprehensive Exam Committees

A committee of three faculty members is formed for you at the end of the spring semester of the first year. The DGS is tasked with forming the examination committees in a way that takes into account all available information to select members likely to be on the preliminary exam committee of the student (see page 11).

Selection and Preparation of Summaries of Core Course Topics

First, you will compose a list of 6 topics for your core course summaries and submit them to your committee chair for their approval. Each topic must be based on one of the six core classes. Some examples are listed below. Your committee chair will consult with your other committee members in this process. Once you have an approved set of 6 topics, you will prepare a short written summary for each topic following the *Written Summaries Rubric* given below. The level of your summaries must correspond to the level of lectures in the core classes. Next, you submit your 6 summaries to your committee. They will review them and approve them or request revisions early enough that a final list will be settled at least a month before the oral presentation.

Oral Presentation of Two Core Course Topics

Upon reviewing and approving your summaries, considering your course record, and your likely research direction, your committee will select two topics for your presentation. You will be notified of these two topics via email at least one week before your oral presentation.

Your exam will only be attended by your committee members (Zoom can be used by committee members as an emergency backup). It will include your two 10-minute presentations on the selected topics, each followed by about 20 minutes of questions. You are encouraged to use a blackboard or whiteboard during your presentation, but slides are not permitted. Committee members will withhold their questions during your presentation unless clarification is needed.

Your committee will evaluate your presentations using the *Oral Presentations Rubric* in the section below. They will make either a positive or a negative recommendation regarding the

completion of this program requirement. You will be notified of the result and the average scores based on the rubric within 24 hours. In case of a negative recommendation, you can repeat the exam using the same topics. You can take it no sooner than one month later and no later than the end of the fall semester (except with department chair or DGS approval). A decision after a second negative recommendation will be made by the chair of the department. If you feel that there were irregularities in the administration of your exam that led to the negative recommendation, then you may appeal to the DGS and the Chair of the department. Your appeal needs to include a description of the irregularities and their impact on your exam. With your appeal and consultations with committee members, the DGS and the Chair will decide whether there were significant irregularities and if so, put in place a remedy to expedite your completion of this milestone.

Schedule

Timing	**Action**
May	Chair/DGS from the faculty committee.
End of May, early June	You send a list of topics to your committee chair for approval.
Through the end of July	You compose your summaries of the topics.
August 1st	You submit your summaries to your committee.
By September 1st	Your committee reviews your summaries, seeks revisions as necessary, and selects two topics for presentation.
Through September	You present your two topics to your committee in one meeting.
End of Fall Semester	If you need to retake your exam, you must do so successfully by this deadline

A sample of six topics

PHYS 2010: The principles and applications of lock-in amplification
PHYS 2030: The principle of least action
PHYS 2040: A dielectric sphere in a uniform magnetic field
PHYS 2050: The solution of the harmonic oscillator problem with raising and lowering operators
PHYS 2060: Born scattering
PHYS 2140: Conditions of equilibrium in terms of the Gibbs thermodynamic potential

Rubrics

Written Summaries Rubric

Your written summaries will be assessed by your committee using the rubric below. Each component of a written summary will be scored using 1, 0 scoring. A score of 1 indicates that the component meets the criteria and 0 that it does not. You will be expected to revise any summary until it earns a full score. Committees are encouraged to provide written feedback to guide revisions.

Components of the Written Summary	1	0
Title of Topic: Sufficiently specific and clear that professional physicists recognize it and have a sense of the scope of the topic		
Fitness of Topic: Text conveys the importance of the topic in relation to other topics in the subject area both conceptually and technically		
Description: Text describes the essential concepts, derivations, and methods associated with the topic, has a well chosen and presented example of a calculation related to it		
Illustrative Example: Work accurately exemplifies the topic chosen		
Summary Format: Summary is between 500-1500 words or roughly equivalent to two Physical Review Journal pages and is legible.		

Oral Presentations Rubric

The rubric below is for assessing your oral presentations. Each committee member composes their score, and then the average of the scores is tallied. The points for scoring with the rubric mean:

2 - Satisfies all criteria
1 - Satisfies most criteria, but some clarifying questions are necessary to bring out elements or slight inaccuracies apparent in the description and/or the sample calculation
0 - Does not satisfy sufficient criteria

Passing the exam requires an average score of 4 or more on each topic.

	2	1	0
Topic 1			
Presentation - Sufficiently well organized, specific, and given with a fluency that professional physicists can follow, it accurately describes the essential concepts, derivations, and methods associated with the topic, and has a well-chosen and presented example of a calculation related to it.			
Response to questions on presentation - Handles all questions well by ensuring they understand the query, provides responses that indicate that they have a clear facility with the topic (e.g,. can provide intervening steps of calculations, restate or elaborate on concepts presented)			
Response to questions on related physics - Handles all questions well on the relation to the topic and its methods to physics within the specific area (e.g., can you describe another example) or connections to other physics (e.g., where else do these methods find application).			
Topic 2			
Presentation - Sufficiently well organized, specific, and given with a fluency that professional physicists can follow, it accurately describes the essential concepts, derivations, and methods associated with the topic, and has a well-chosen and presented example of a calculation related to it.			
Response to questions - Handles all questions well by ensuring they understand the query, provide responses that indicate that they have a clear facility with the topic (e.g. can provide intervening steps of calculations, restate or elaborate on concepts presented)			
Response to questions on related physics - Handles all questions well on the relation to the topic and its methods to physics within the specific area (e.g. can you describe another example) or connections to other physics (e.g. where else do these methods find application).			

Preliminary Examination

The Preliminary Examination evaluates your ability to understand and orally convey a physics research topic of current interest. You are expected to successfully pass their preliminary examination by the end of their third year. Completion of this exam marks your formal *Advancement to Candidacy*.

1. **In consultation with your advisor, form your committee by the end of your 4th semester and inform the Student Affairs Manager by email of its composition. Typically, this will be the same committee as the comprehensive examination committee.** This committee, which will guide and inform your research work, your graduate career, and, in most instances, will also serve as the Thesis Defense Committee, should include the research advisor and two other members of the Department. Other members outside the Department can serve on the committee, subject to the prior approval of the Director of Graduate Studies, but at least two members of the committee must have appointments in Physics, with one having their primary appointment in the Department.

2. **Schedule a date for your prelim before the end of your 6th semester and inform the Student Affairs Manager by email of the timing.**

3. **Email a title and abstract for your preliminary exam to your committee at least two weeks in advance of your preliminary exam.** The abstract provides a brief description (approximately one typed 8 1/2 x 11 page in length) of the topics that you will present and on which you are willing to be tested during the exam. The topic will be in the area of your research and may, but does not have to, represent a specific research paper, provided its subject is dealt with in sufficient generality, perhaps preceded by an appropriate introduction formulated by you.

4. **Fill out this Google Form** with the same information as in 1-3 when you share the abstract and title with your committee. (https://forms.gle/cntzZPH34joEeV9s6)

5. **Take your preliminary exam**. The first forty minutes of the exam are devoted to your prepared presentation. You should expect questions based on your graduate coursework and relevant to the topic under discussion.

6. **Your advisor reports the result of your exam to the Student Affairs Manager within a week of the exam**. A two-thirds favorable vote is necessary to pass. The exam may be retaken as needed.

Dissertation and Oral Defense

The written dissertation and oral defense represent the final requirements for the PhD in Physics. To prepare for graduation, schedule your defense and coordinate closely with the Student Affairs Manager to finalize all arrangements. Adherence to University policies is mandatory for graduation.

Dissertation

The Ph.D. dissertation typically includes an abstract, introduction, methods, results, and discussion or conclusion, and it may incorporate submitted or published papers as individual chapters, provided the overall document presents a coherent and publishable body of work. Students are expected to demonstrate original contributions to the field and must follow the official formatting and submission requirements outlined by the Graduate School.

Please follow the Graduate School dissertation guidelines, which are available on the Graduate School website:
https://graduateschool.brown.edu/academics-research/rules-regulations/dissertation-guidelines

The dissertation must be submitted at least two weeks before the scheduled oral defense. The Dissertation Information Form must also be submitted to the Student Affairs Manager at least two weeks prior to your oral defense. Upon approval, the Student Affairs Manager will provide the paperwork for the defense to you and your advisor.

Oral Defense

The oral defense is a public presentation followed by a closed-door examination with the committee. The committee will then determine if you passed the defense. Passing may be conditional upon minor revisions to the dissertation. Once the dissertation is finalized, you will work with the Student Affairs Manager to ensure all required paperwork for graduation is completed. It's important to be aware of and adhere to submission deadlines for your intended graduation semester.

Academic and Research Timeline

Time	Requirements and Deadlines	Supporting Efforts
Semester 1		For a TA: Take 3 core courses Work as a TA For a Fellow: Take 3 core courses Take a 4th course Explore group meetings in your area of interest
Semester 2	Complete 6 core courses with an average of B or better in semesters 1&2 Obtain a summer preliminary research position in a group by mid-April	For a TA: Take 3 core courses Work as a TA For a Fellow: Take 3 core courses Take a 4th course Engage in group meetings of research group(s) that interest you most
Summer I	Comprehensive Exam (CE) Requirements: - CE Topics - Obtain approval by mid-June - CE Topic Summaries - Submit by August 1st	Do preliminary research with a group Compose and submit your CE summaries
Semester 3	Obtain a funded research position CE oral exam - Complete by mid-September	Do research Take a total of 3 course credits by enrolling in ● advanced course(s) ● PHYS2980 or 2981 for 1 to 3 credits
Semester 4	Compose Preliminary Exam Committee	Do research Take a total of 3 course credits by enrolling in ● advanced course(s) ● PHYS2980 or 2981 for 1 to 3 credits
Summer II		Do research
Semesters 5,6	Complete Preliminary Exam by the end of semester 6	Do research Take a total of 3 course credits by enrolling in ● advanced course(s) ● PHYS2980 or 2981 for 1 to 3 credits
Semester 7 and beyond	Complete your Advanced Course Requirement prior to submitting your dissertation Submit your Dissertation to your committee at least two weeks in advance of your scheduled PhD oral defense Complete your PhD oral defense	Same as above

Master's Degree

You can earn a **Transitional Master's Degree (ScM)** prior to the PhD. This *transitional* degree recognizes a significant level of academic achievement beyond an undergraduate degree. The ScM degree requires eight courses, which usually include the six core courses (PHYS 2010, 2030, 2040, 2050, 2060, 2140) and two other 2000-level courses. No more than two courses can be research courses. Courses outside the Department may be substituted with permission from the DGS. At least half of the grades in the core courses must be B's or better under the ABC/NC option, or must represent performance of equivalent quality under the S/NC option. (A written recommendation from the instructor will be required in this case.) Ordinarily, a thesis is not required for the ScM; however, the Department reserves the right to require a thesis in special cases. This decision will be made no later than one semester after you have announced your candidacy for a master's degree in physics to the Department Chair.

Financial Support

Obtaining a Funded Research Position

Your admission to the PhD program includes a guarantee of five years of financial support. This guarantee hinges on your meeting the program requirements on schedule. In physics, the support most often comes through a TA appointment in your first year and an RA appointment in your succeeding years.

You will be taking an active role in exploring and developing your relationship with a research mentor who can provide your RA support. Faculty expect to be contacted by you for discussions about their research program and what you need to do to join their group as a funded member. A faculty member whom you approach may suggest that you attend seminars, their group meetings regularly, read and discuss literature, do calculations, or work in a lab.

We believe it is important for your transition into PhD research that you start engaging in these activities in your first semester. The goal in your first year is for you to have learned enough about a research group and for the faculty member to have learned enough about you for you to get a funded appointment with them in the summer after your second semester. That summer appointment will provide you with the opportunity for you and your mentor to assess whether you will become an RA in the group in your 3rd semester.

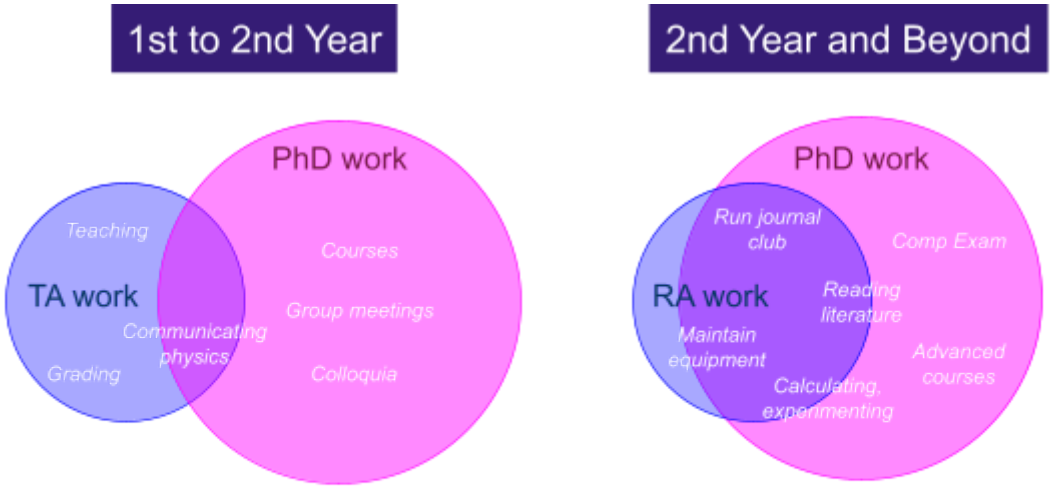
You can obtain advice from your first-year advisor, the DGS, and the Student Affairs Manager throughout this process. Your efforts and outcomes in developing your research relationship will be considered in the annual review by the physics faculty of your academic standing, as they directly impact your progress toward your degree.

Mutual expectation of the student and advisor

It is expected that the student and the advisor agree upon mutual expectations for their joint research at the time the student joins the research group. The expectations should be revised from time to time to reflect the changing nature of the research project and the student's academic development.

Dual Efforts: Making Academic Progress while Working to Support Your Education

As a PhD student with a teaching or research assistant position, you will be both a student and an employee. You will be granted tuition relief to support your PhD work as a student and earn compensation for 20 hours per week of TA or RA work as an employee. The overlap of your efforts to earn this compensation and to advance toward your degree increases as you advance through the program, as shown by the diagram below.



The blue circle represents your assigned or compensated work effort as you would have for a TA position or for shared responsibilities in your lab such as running the helium liquefier or doing outreach or mentoring students. The pink circle represents effort expended to advance to your PhD. In your first year, represented by the left Venn diagram these efforts overlap less than in your latter years as represented by the right Venn diagram.

More specifically, your assigned work as a TA will support the teaching mission of the University. Your assigned work as an RA will be advancing a research agenda set by a grant or other forms of support. It can include tasks such as maintaining equipment or computing facilities, participating in new student or faculty recruitment, and supporting a journal club. Receiving compensation for this work is contingent upon your good performance as described in Article X of the GLO contract.

With this compensation and tuition relief, you will also be expending the effort necessary to make the steady academic progress necessary to complete your program in a timely manner (see other sections and the graduate school handbook for more information about this). As a typical first-year student, your PhD work consists of taking three courses per semester, fulfilling your assigned TA work, learning about research programs in the department, and working on your comprehensive examination. In later years, when you have completed your course requirements, your PhD work consists of doing your research, which includes preparing for and taking your preliminary exam, disseminating your results, and writing and defending your dissertation. Consult with your research advisor during this period for their advice on how to spend your efforts to make the progress necessary to complete your degree on time.

Activities Outside Stipend Appointments

We understand that various training opportunities outside of these stipend appointments can be valuable in preparing you for careers both within and beyond academia. The Graduate School recognizes (see: Activities Outside of Stipended Appointments) the importance of such additional activities and is supportive of them for graduate students in good standing.

According to Graduate School policy, you may engage in paid activities outside of your primary appointments for up to 12 hours per week. If you wish to exceed the 12-hour limit, you must obtain permission from both your research advisor and the Senior Associate Dean of Student Development at the Graduate School. This process ensures that any additional commitments are carefully considered and aligned with your academic goals and well-being.

Furthermore, please be aware that policies set forth by outside agencies providing funding to specific students, as well as those governing visas for international students, must be adhered to at all times.

Advising and Mentorship

Assigned Academic and Research Advisors

Throughout your graduate studies, you will be supported by formally assigned advisors. Initially, you will have an academic advisor and likely a Teaching Assistant supervisor. As you progress, you will be guided by your research advisor, who will oversee your PhD work.

Timing	Advisors	
Year 1	1st year advisor	On matriculating, you will be paired with one of the small groups of faculty who advise first-year PhD Students. Your advisor will meet with you at least 4 times over your first year and will be available at

		other times upon request. Know that your advisor is open to additional meetings for specific issues that arise unexpectedly. **Expectations for your 1st Year Advisor:** 1) Arrange at least 4 meetings with you over the first year. 2) Assist you in selecting courses that match your previous knowledge and your longer-term goals. Your advisor will be asking you about your previous experiences and aspirations. 3) Discuss your research goals with you and how you can learn about opportunities in research groups that will match your interests. **Expectations for you:** 1) For your initial advising meetings, be prepared to describe your previous coursework in physics by having your transcript and information about your previous courses available. 2) For your ongoing meetings, be prepared to describe your research interests, experiences, and initial choices for research groups to join. 3) Engage with your course instructors by going to office hours and asking questions in class when and at other times when you need to know more about physics and/or expectations for the course. 4) Seek to understand the core physics topics and skills introduced in your courses at a level to build a foundation crucial for your development as a PhD physicist and prepare for the commensurate Comprehensive Examination assessment of your foundation.5) Attend the weekly department colloquia regularly.
Year 1 and other TA years	Teaching Assistant Supervisor	If you have a Teaching Assistant appointment, you will have a supervisor who will advise you on how to perform and organize the 18-20 hours per week of effort that you will devote to this role. The supervisor is the instructor or one of the instructors for the course to which you are assigned. **Expectations for your TA Supervisor**: 1) Inform you of the responsibilities, schedules, and goals of your work in your TA position. 2) Advise you on the skills that you need to have or develop to perform your work. 3) Advise you on how to organize your time around your various tasks, such as meeting with your students, preparing materials for your students, preparing yourself for meeting with your students by reviewing course concepts, for example, or attending classes and grading. 4) Update you in a timely manner on changes in the course that impact your work. 5) Provide feedback to you on your work through the course of the semester and summatively at the end of the semester. **Expectations for you**: 1) To help you be ready for the start of the course, contact your TA supervisor as soon as you can after you receive your TA assignment and arrange a meeting. 2) In preparation for your first meeting, review online or other material about the course and make a list of questions that you need to

		know about the assignment, including how you will be communicating with your supervisor over the semester.
Year 2	Research Mentor	At the end of your first two semesters, you are expected to be working in a research group on at least a trial basis. Your research advisor becomes your primary advisor. **Expectations for your research advisor**: 1) Advise you on the skills needed for working in the research field and the methods for developing them. This advising often involves giving you a project with specific goals that requires you to develop appropriate skills. 2) Suggest resources for you to learn more about the research field, like papers, talks, etc. 3) Meet regularly with you to provide feedback on your progress and guidance on next steps. 4) Advise you on which advanced courses you can take that will help you develop the foundational knowledge that you need to work in your specific field and keep you on track to satisfy the advanced course requirements. **Expectations for you:** You will 1) engage in your assigned work with as much or more focus as you have given any research project or coursework that you have done in the past. Proactively seek the guidance you need if you get stuck and take ownership of your work. 2) Take advantage of opportunities like seminars and colloquia, and advanced course offerings to learn more about the latest in your field. 3) Read papers in your field, as you will be writing your own and will need to know the latest developments. 3) Contribute consistently to your group's efforts, group's meetings, and be open to learning from and with others.
Year 3	Research Mentor and Preliminary Exam Committee Members	In year 3, you will continue to develop your research skills and research while preparing for and taking your preliminary exam. The formation of your preliminary exam committee will provide you with two additional advisors. **Expectations for your research advisor**: 1) Similar to the 2nd year. 2) Provide advice on the preliminary exam and how to prepare for it. Your preliminary exam committee members might also advise you on preparing for it. **Expectations for you:** 1) Similar to Year 2, and 2) Ask your research advisor about their expectations for the preliminary exam. Meet individually with your other committee members to give them a preview of your plans and to learn about their expectations for the exam. 3) Seek opportunities to attend and participate in conferences and other venues to learn about research in your field and to develop your ability to convey your research ideas.
Years 4	Research	During these later years, you will be expected to become more

and 5	Mentor and Preliminary Exam Committee Members	independent and to perhaps begin mentoring students newer to your research area. You will be working on the project(s), papers, and talks that will form the basis of your dissertation. **Expectations for your research advisor:** 1) Assist you in bringing your research to fruition and in disseminating your results to a broader community. 2) Setting expectations for your progress and helping you set the goals you need to meet to complete your dissertation and defend it successfully. 3) Advise you on career paths and finding resources for exploring them. **Expectations for you:** 1) Set goals for your work and seek advice and feedback on them from your advisor. Providing drafts for feedback at regular intervals could be one approach that you take. 2) Attend and participate in conferences and discussions with other researchers. 3) Seek postgraduate employment opportunities.

Student Progress Evaluation

Academic Standing

Every student admitted to the graduate Physics program enters in Good Standing. The Physics Faculty expects all graduate students to maintain this status and complete their PhD degree. Changes in your academic standing do not affect your funding. On the other hand, non-performance of your stipended 20 hours of work per week can lead to suspension of your funding.

> *Good Standing* indicates that you have met the requirements on time and are performing and developing adequately as a TA or an RA.
>
> *Satisfactory* indicates that you have encountered “difficulties of some kind – inadequate performance or slow progress in coursework, research, writing, in their performance as a TA or RA, etc.“ (from the Graduate School Handbook). The letter you receive will provide a brief description of the difficulties observed.
>
> *Warning* signals “chronic or severe deficiencies.“ (from the Graduate School Handbook) The letter you receive will describe the deficiencies and provide steps that you will be able to take to mitigate them and milestones you will need to pass to get back into Satisfactory or Good Standing. The DGS will review your progress meeting the milestones at the end of each semester and summer in consultation with your advisor.

Assessing Your Academic Progress

We have set a schedule for meeting program requirements to help you know the pace at which you are expected to progress in PhD work. At the end of each semester in your first year and after the end of the fall semester in your later years, the faculty in the department collectively review your progress. You will receive a letter soon thereafter that gives you feedback by notifying you of the faculty's determination of your formal Academic Standing as either Good Standing, Satisfactory, or Warning as described in the Graduate School Handbook.

By the end of:	**Good Standing**	**Change to Satisfactory**	**Change to Warning**
Semester 1	Completed at least two core courses with B's or better and fulfilled TA responsibilities.	Has not fulfilled one of the good-standing criteria.	Has not fulfilled either of the good-standing criteria.
Semester 2	Completed 6 core courses with B's or better. Fulfilled TA responsibilities. Secured a summer research position.	Has not fulfilled one of the good-standing criteria.	Has fulfilled none of the good standing criteria or has not fulfilled requirements for satisfactory standing from the previous semester. The standing may be changed to Warning if a student does not fulfill more than one standing criterion or has persistent severe deficiencies in any area.
Summer I	Comprehensive exam deadlines are met so that you are ready to complete the exam by mid-September. Secured a position with a research mentor to be able to take research course credits in the fall.	Has not fulfilled one of the good-standing criteria.	Has fulfilled none of the good-standing criteria. The standing may also be changed to Warning if a student does not fulfill more than one standing criterion or has persistent severe deficiencies in any area.
Semester 3	Completed Comprehensive Exam.	Has not fulfilled one	Has fulfilled none of

	Completed any leftover fall core courses with Bs or better. Performed RA or TA duties adequately.	of the good-standing criteria.	the good-standing criteria. The standing may also be changed to Warning if a student does not fulfill more than one standing criterion or has persistent severe deficiencies in any area.
Semester 4	Assembled preliminary exam committee.	Has a research mentor but has not assembled a preliminary exam committee.	Does not have a research mentor. The standing may also be changed to Warning if a student does not fulfill more than one standing criterion or has persistent severe deficiencies in any area.
Semester 6	Passed preliminary exam.	Has taken but not passed the preliminary exam.	Has not taken the preliminary exam. The standing may also be changed to Warning if a student does not fulfill more than one standing criterion or has persistent severe deficiencies in any area.

To be in good standing, you must:

- Pass three approved courses each semester if a Teaching Assistant, or four courses if holding a Fellowship, after two semesters of graduate study at Brown; then pass or be excused from taking the remainder of the "core" courses by the end of four semesters of graduate study at Brown and achieve the following core course grade record: no NC's and at least 50% B's or better by the end of two semesters and no remaining NC's or I's and 50% B's or better by the end of four semesters.
- Successfully pass the Comprehensive Examination
- Establish a plan for financial support with a research advisor who can guide your PhD research effort within two semesters of successfully passing the Comprehensive Examination or by the start of your fifth semester of graduate study, whichever comes first. The relationship with the research advisor is expected to

remain through the remainder of your PhD study. This relationship and the associated plan of support must be endorsed by the department chair.
- Pass the Preliminary Oral Exam by the end of your sixth semester of graduate study
- Satisfactorily perform any teaching and/or research duties.

A student failing to meet at least one of these criteria is not in Good Standing unless a prior exception has been made by the Department Chair in consultation with the DGS. Examples of exceptional circumstances include illness, inadequate preparation for some graduate courses, and/or postponement of the Comprehensive Exam, or personal issues.

All core courses are expected to be taught and graded on an ABC/NC basis. Students who receive an "S" in a core course will need the instructor to provide the Department Chair with an evaluation form. The evaluation will include an equivalent ABC letter grade to help establish the student's academic standing.

The student and/or advisor are allowed to call a special meeting of the student and the student's committee once a year, except during the academic years of the preliminary exam and the dissertation defense. During the meeting, the student will present a 30-minute progress report followed by questions from the committee. After the meeting, the committee will produce a brief written summary, sent to the student, the DGS, and the Chair. The committee should be the same as the comprehensive exam committee before the preliminary exam and the preliminary exam committee after the preliminary exam. Any changes to the committee must be authorized by the DGS.

Student Resources

In addition to the resources for teaching and professional development, there are many wellness and enrichment resources available for graduate students. Faculty, deans, administrators, and even your cohorts are devoted to helping you during your graduate school experience. However, it is up to you to take the first step and reach out to these resources! It is especially important to reach out when your academic progress is in peril. Below is a listing of some of the resources available; a comprehensive listing can be found on the Graduate School's resources webpage.

- *Student Accessibility Services (SAS)* - coordinates and facilitates services for students with physical, psychological, and learning disabilities·
- *Counseling and Psychological Services (CAPS)* - free, confidential counseling for Brown students is offered Monday through Friday during the academic year at the Counseling and Psychological Services office in J. Walter Wilson·
- *Associate Dean of Student Support*- handles all Graduate Student medical leave requests and any student support services for Graduate students. The office is located at 110 Horace Mann, 401-863-1802.

The DGS and the department should be informed of any disability or other condition that might require accommodations or modification of any of the program or course procedures. As part of this process, students should register with Student Accessibility Services (SAS). SAS provides students with an academic accommodation letter to be given to instructors.

Leave of Absence - If a student feels a leave of absence is necessary during their course of study, the department follows the rules outlined in the Graduate School's handbook. For a **medical leave** of absence, students should contact Student Support Services (Graduate Center, 4th floor) and the Associate Dean for Student Support. All other leaves (**personal, professional development, family, childbirth, and academic-probationary**) require the student to fill out the Graduate School's leave of absence form and have it signed by the Department chair and DGS before sending it to the Graduate School. All forms should be cc'd to the Student Affairs Manager to ensure they are included in the student's record.

Grievances
We hope that students do not encounter difficulties in their interactions with members of the department or the University. However, if a problem does arise, it's important to understand how it will be handled. For detailed information, please visit the Graduate School's website and review the Grievance Process page. Here is a brief overview:

Students have the right to a fair and prompt hearing of grievances after following these steps:

1. Attempt to resolve the issue directly with the person(s) involved.
2. Discuss the matter with the Chair of the department and/or the Director of Graduate Studies (DGS)
3. The DGS can connect students with additional resources within the department, e.g., the Diversity Officer.
4. If the issue is outside of the department, the Dean of the Graduate School will be consulted.

Vacation Time Policy and Approval Process

Overview

Over the course of your time in the PhD program, you will have opportunities to take vacations from your studies and research. The following describes the policies and procedures that you must follow as you plan and take vacations. In accord with the GLO agreement, all University holidays (there are about 10 of them) and the winter break (typically from 12/23 - 1/2) provide vacation opportunities. Our department's policy guarantees you an additional two weeks of vacation time (i.e., 10 working days) over the calendar year. This time corresponds to Article VII. Section N. Other Leave in the GLO Final Agreement. The timing and duration of any vacation time you take will be subject to the work requirements of your appointment (e.g., RA or TA) as determined by your supervisor, as described below. Note that it is important to

communicate clearly with your supervisor, as deviations from following this policy can affect your academic standing.

For Teaching Assistants

If you have a teaching assistant appointment, you will be able to take a vacation after the end of a semester or the time that your TA supervisor indicates that your assignment's responsibilities have been completed. This time typically lasts from the start of your appointment until the end of the final exam period and final exam grading. Breaks during semesters when classes may not meet but University offices are open (e.g., Spring Break) could also be taken as vacation with the approval of your TA supervisor as described in the Approval Process below.

For Research Assistants/Fellowships/Traineeships

If you have a research assistant, fellowship, or traineeship appointment, your research supervisor must approve your vacation time as described in the Approval Process below. Breaks taken during semesters when classes may not meet but University offices are open (e.g., Spring Break) count as vacation days for RAs. It is important for you to communicate with your supervisor about how to account for your vacation time, as each group's work culture and temporal constraints can be different.

Approval Process

You must seek approval from your supervisor at least two weeks in advance of any vacation time. This approval is required even for breaks during semesters when classes may not meet but University offices are open (e.g., Spring Break). Your request and its approval should be done via email and copied to the Director of Graduate Studies (physics-dgs@brown.edu) and the Student Affairs Manager (physics-student-affairs@Brown.edu) to provide a written record.

Requesting Leave for Extended Vacation

Under some personal circumstances, you might want to take a more extended break from your work than the Vacation Time policy can accommodate. You can request a more extended break from your research advisor, provided you have accrued sufficient unused vacation time to cover the time. It is not possible to accrue more than 20 working days. If you are an international student, it is important for you to communicate with OISSS and the Graduate School ahead of time to review visa and funding implications.