GRADUATE STUDENT

HANDBOOK

Department of Physics

Virginia Polytechnic Institute

and State University

August 2020

Note:.

The policies in this Handbook apply

to students entering Virginia Tech

in Fall 2020 or later.

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General Policies and Procedures

The Physics department offers M.S. and Ph.D. degrees. Requirements vary somewhat, but the expectation is that the M.S. should be completed in two years and that the Ph.D. will require an average of five to six years beyond the B.S. degree in physics. The following regulations supplement the rules are listed in the Graduate School Catalog and the Graduate School's Procedural Guidelines

All entering students are expected to attend the Graduate School's Orientation Week according to the schedule provided by the Graduate School. Student's holding Graduate Teaching Assistantships are required to attend a mandatory GTA workshop given by the Graduate School (details are given in the Graduate School's orientation schedule). Failure to attend and comply with the GTA workshop's requirements could jeopardize possible GTA support.

All entering students are required to attend the Physics Department's graduate student orientation, which is held the week prior to the start of the Fall semester. Students will be informed of the date, time, and place of the Graduate School's GTA Workshop and the departmental orientation session by July 15, if entering in the Fall semester.

Each incoming student is assigned to a faculty member of the Graduate Committee who will serve as the student's *temporary* advisor. The faculty member will monitor the student's academic progress and will be available for advice and consultation. Students should meet monthly with their temporary advisors (scheduling the meeting time is the student's responsibility). Students can only drop a class with their (temporary) advisor's and the Graduate Program director's consent.

Academics

General Requirements

The University requirements for the M.S. and Ph.D. degrees are stated in detail in the Graduate School catalog. They include course credits and submission of a Plan of Study.

All graduate students must submit a Plan of Study that meets at least the minimum Graduate School requirements for the designated degree. The Plan of Study must be approved by the student's research advisor, the Graduate Program Director, and the Graduate School. All courses on the Plan of Study, including supporting courses, must be taken on a letter grade (A/F) basis except for those courses approved to be graded on a pass-fail (P/F) basis only. Audit courses cannot be included on the Plan of Study. After approval by the student's Advisory Committee and the Graduate Program, the Plan of Study will be entered and sent electronically to the Graduate School for approval, according to the following schedule.

Master's: The Plan of Study is due by the end of the second academic semester for all Master's degree students (based on full time enrollment of 12 credits per semester**). For students in the Accelerated Undergraduate Graduate Degree Program in Physics the Plan of Study is due by the end of the first full semester of graduate study.**

Ph.D.: The Plan of Study is due by the end of the third academic semester for all doctoral students (based on full time enrollment).

Transfer Courses on the Plan of Study.

No more than 50% of the graded credit hours needed to satisfy the requirements for a Virginia Tech graduate degree may be transferred in from a regionally accredited university. All such credits must have earned grades of "B" or better, have been earned while in good standing in graduate status, and must have been graduate courses (numbered 5000 or higher) at the institution where the student took the courses. Grades of "S" or "P" are not acceptable for transfer credit. All transfer courses must be acceptable to the student's Advisory Committee and the Graduate Program Director. For transfer course work more than five years old, a Justification of 'Old' Course Work form must be filed with the Plan of Study (see below).

Credits from other universities are transferred to a Virginia Tech graduate degree at the time the Plan of Study that includes those courses is approved by the Graduate School. Transferred courses count only as credit hours and are not included in the calculation of the Virginia Tech GPA. Official transcripts are required before transfer course work can be approved for the Plan of Study.

Transfer credits should be arranged with the Graduate Committee upon first arrival at Virginia Tech, but no later than the end of the student's first semester. Although a physics Ph.D. student may bypass the M.S. degree, all students are strongly encouraged to obtain at least the non-thesis M.S. degree when the requirements are fulfilled.

Advisory Committees: The Ph.D. Advisory Committee should be composed of a minimum of four members, with at least two members from the same research area as the student's advisor and one other member from a different research area. The advisory committee chair or co-chair and two of the committee members should be regular Virginia Tech physics faculty. The corresponding M.S. committee should have three members. The advisory committee chair or co-chair and one of the committee members should be regular faculty. Any non-physics faculty member needs to be approved by the Physics Department Graduate Committee.

Grades on Plan of Study Courses. All graded courses on the Plan of Study must be taken for a letter grade (A/F) except for those courses offered on a pass/fail (P/F) basis only (for example, Independent Study courses and many seminars are only P/F). Students must maintain a 3.0 GPA or better on the Plan of Study course work. Once a course on the Plan of Study is taken for a grade, it must remain on the Plan of Study (see below).

Repeating Courses on the Plan of Study. Students are required to repeat any courses on the Plan of Study in which a grade below "C-" has been earned. Courses may not be repeated if a "P" grade or a grade of "C" or better is earned. After a course has been repeated, the grade for the first enrollment will be Repeat Graduate (RG, defined as a 'C-' or lower; RP, defined as a grade of C or higher when the course was first taken). Only the most recent enrollment in the course will receive a letter grade and be calculated in the GPA.

All physics graduate students are bound by the rules of the University's Graduate Honor System, which is described in the Graduate School catalog:

https://graduateschool.vt.edu/academics/expectations.html

Degree requirements include courses, both required and elective, thesis research, and examination(s). The credit requirement for a Ph.D. is 92 hours, including a maximum of 60 hours of research and dissertation. For the M.S. there are two options, thesis and non-thesis, both of which require 32 credit hours.

All first-year students are required to take the PHYS 5944 Seminar (1 hour, 1 credit, pass/fail) course, in the fall **AND** the spring semester of their first year. In the fall semester, to pass, a student must attend at least 10 seminar or colloquia *and* give a 10 minute presentation (towards the end of the semester, usually the day before Reading Day) on the topic of either one of these seminars/colloquia or recent (published within the last 5 years) journal articles. The topic of the student's choice should be on a level that their fellow students can follow. In the spring semester students are required to submit a written research paper (roughly 10 pages with specified format), including relevant literature. Students are expected to adhere to the standard rules and style of scientific writing (proper citations and references, no colloquialisms, etc.). The paper must give proper credit and cite all relevant sources. The paper can be based on work performed before enrolling at Virginia Tech, but must in that case credit former collaborators and advisers. The student must be the sole author of the paper, which should be written after enrolling at Virginia Tech--an edited version of an older paper is not acceptable.

Requirements accompanying the specific degrees are discussed in the appropriate sections below.

Degrees in Physics

The following physics courses constitute the core courses, required of students in both the M.S. and Ph.D. programs.

Course No.	Title	Hours
5354	Classical Mechanics	3
5405-6	Classical Electromagnetism	6
5455-6	Quantum Mechanics	6
5705	Statistical Mechanics	3
	Total Course Hours	**18**

These are normally taken during the first year of graduate study and must be completed by the end of the second year. An overall GPA of 3.0 will need to be maintained in all courses (cores + electives).

Master of Science (M.S.)

There are two options in this program: *non-thesis* and *thesis*. In the former option, only course work is required. In the latter, between 6 and 10 hours of research toward the thesis is required.

Course Requirements

The specific course requirements are:

Course No.	Title	Hrs.,
	Core (six courses as detailed before)	18
5714	Methods of Theoretical Physics	3
5944	First-Year Seminar	2
	Electives	9
	Total Course Hours	**32**

Of the electives, up to 6 hours may be Independent Study (PHYS 5974).

The Graduate Committee needs to approve any elective numbered below 5000 included in the plan of study.

Thesis

A student choosing the thesis option is encouraged to seek out as much information as possible about the activities of the faculty before choosing a research advisor. M.S. theses completed in earlier years may serve as a guide. Of course, a student should talk with each faculty member in whose work he/she may have a potential interest. Like the Ph.D. dissertation, a M.S. thesis represents a written communication of the original research findings.

Final Examination

Every student must pass a qualifying examination and should be prepared to answer questions in the core areas of physics (e.g., classical mechanics, electrodynamics, quantum mechanics statistical mechanics, and modern physics) at the advanced undergraduate level. Students who complete a thesis must also give an oral defense of their research (roughly comparable to a prelim).

Doctor of Philosophy (Ph.D.)

Course Requirements

The *minimum* course requirements for the Ph.D. in physics are:

Course No.	Title	Hrs.,
	Core (six courses as detailed before)	18
5714	Methods of Theoretical Physics	3
5944	First-Year Seminar	2
	Electives	9
	Total Course Hours	**32**

Of the electives, up to 6 hours may be Independent Study (PHYS 5974).

All students are required to take 18 hours of core courses and Methods of Theoretical Physics. Exceptions are granted (for those with appropriate qualifications or a MS degree), provided a student passes the final examination (or its equivalent) given in the preceding semester at Virginia Tech (with a grade of B+ or higher). If a student transfers with their faculty advisor to Virginia Tech, the Graduate Committee may waive the core course placement exam requirement.

According to the requirements of the Graduate School, a minimum of 60 hours of research credit may be counted towards the minimum of 92 hours necessary for the Ph.D. degree.

PhD Committee

Students are encouraged to seek a potential thesis advisor as soon as possible after entering the program, and to form a Ph.D. Advisory Committee by May of their first academic year. This will serve to prepare the students for the pre-defense exams (prelim and post-prelim).

Students will need to pass a qualifying exam during the fall semester of their second year. If a student fails their first attempt, they may take it for a second time in the Spring semester of their second year. Failure to pass the qualifying exam after 2 attempts will result in dismissal from the graduate program.

Annual Report

The University (Presidential Policy Memoranda No. 1 and No. 229) requires each department to evaluate each graduate student's performance and to provide each with constructive feedback annually. Regular evaluations help students understand what is expected of them, analyze their development, and meet higher performance targets. The Graduate School collects and files these evaluations annually.

Feedback should be candid, useful, timely, and fair.

Progress Portfolio. Each student shall submit an electronic progress portfolio every year. The portfolio documents the student's most recent calendar year of academic work, including research, courses, program milestones and contributions to the department's teaching and outreach/service missions. The portfolio includes a one-page Self-Evaluation, a Student Activities Report (SAR), and a Research Update. These documents are prepared and submitted electronically in CANVAS under the corresponding Assignment section.

Faculty Evaluation. Every faculty member shall submit a written evaluation of their own student's progress (deadline established each year by the Graduate Committee). Each student's progress portfolio should serve a valuable resource for the evaluation. The faculty member shall seek comment on the evaluation from the student's entire committee if possible.

Rating and Filing. The Graduate Committee (GC) will review progress portfolios and faculty evaluations (typically in March), assign each student a performance rating, and work with faculty members and students to address any perceived irregularities or other special concerns. After addressing any problems, all evaluation materials will become a permanent part of the student's record.

Qualifying Exam

The **qualifying exam**, which is an examination on general physics, at the upper undergraduate level.

The exam is an oral exam and is expected to last approximately 1.5 hours. Students are expected to perform satisfactorily on the qualifying exams in order to be allowed to proceed toward a Ph.D.

Students are required to attempt the qualifying examination by the end of their third semester in the program. These time limits can be extended by the graduate committee if good cause is demonstrated. Examples of reasons to extend time limits include debilitating medical conditions, medical conditions that require hospitalization, the birth of a child, data loss caused by mechanical failure. The committee will consider each student request on a case-by-case basis.

If a student fails the first attempt at the qualifying examination, he or she is allowed a second attempt at the earliest convenience but not later than the following semester. In the case of failure on the second attempt, the student will be considered as not making

satisfactory progress toward their degree and thus will be dismissed from the program.

The qualifying exam will be administered by members of the department's qualifying exam committee. The student's research advisor will not be one of his or her examiners. Students will receive guidance and practice material at the end of their first year so that they can prepare for the qualifying exam.

These rules are designed to ensure that students pass the qualifying examination no later than by the end of their second academic year in the Ph.D. program.

The time limits can be extended, at the discretion of the Graduate Committee, but *only* if the extension is granted *before* the time limits have expired, and extenuating circumstances beyond the student's control exist.

The qualifying exam consists of questions on general physics, at upper undergraduate level, the student is expected to have a firm and well-integrated understanding of undergraduate physics and the mathematical methods involved.

Questions in classical mechanics, electrodynamics, quantum mechanics, statistical and modern physics (including special theory of relativity) are likely to be posed. Texts demonstrating the level and coverage of the material include:

- Baierlein, R., *Newtonian Dynamics* (McGraw-Hill)
- Symon, K. R. *Mechanics* (Addison-Wesley)
- Fowles & Cassiday, *Analytical Mechanics* (Thompson)

- Griffiths, *Introduction to Electrodynamics* (3rd Edition, Addison-Wesley)
- Lorrain, P., and Corson, D. R., *Electromagnetic Fields and Waves* (Freeman)
- Thornton, S. T., and Marion, J. B., *Classical Dynamics of Particles and Systems* (5th edition, Brooks Cole Publishing)
- Reitz, J. R., Milford, F. J. and Christy, R. W., *Foundations of Electromagnetic Theory* (Addison-Wesley)
- Griffiths, *Introduction to Quantum Mechanics (*2nd Edition, Addison-Wesley)
- Liboff, R. L., *Introductory Quantum Mechanics* (Addison-Wesley)
- Eisberg, R., and Resnick, R., *Quantum Physics of Atoms, Molecules, Solids, Nuclei, and Particles* (Wiley)
- Krane, K. S., *Modern Physics* (Wiley)
- Tipler & Llewellyn, *Modern Physics* (W. H. Freeman)
- Young, *University Physics with Modern Physics* (12th Edition, Addison-Wesley)
- Giambattista & Richardson, *College Physics* (McGraw)
- Schroeder, Daniel V., *An Introduction to Thermal Physics* (Addison-Wesley)
- Baierlein, Ralph, *Thermal Physics* (Cambridge University Press)
- Cowan, Brian, *Topics in Statistical Mechanics* (Imperial College Press)
- Kittel, C. and Kroemer, H., *Thermal Physics* (W. H. Freeman)
- Hecht, E., *Optics* (4th Edition, Addison-Wesley)

Examinations

Students are encouraged to seek a potential thesis advisor as soon as possible after entering the program, and to form a Ph.D. Advisory Committee by May of their first academic year. This will serve to prepare the students for the pre-defense exams, which consist of two equally important, independent parts:

A) The **preliminary exam**, which consists of a presentation of and examination on the background material and preliminary research the student has performed.

B) The **pre-defense exam**, which consists of a presentation of and examination of the work that the student has performed and the student's research achievements.

Students are required to attempt the preliminary examination no later than by the end of their fifth semester. This time limits can be extended by the graduate committee if good cause is demonstrated. Examples of reasons to extend time limits include: debilitating medical conditions, medical conditions that require hospitalization, the birth of a child, data loss caused by mechanical failure. The committee will consider each student request on a case-by-case basis.

Students must form an advisory committee, consisting of their advisor and at least three other faculty (with the restrictions specified above), as well as complete a Plan of Study, before they can request a prelim exam. Faculty members from other departments are allowed to serve on student advisory committees.

These rules are designed to ensure that students pass the preliminary examination by the end of their third year. If a student fails to meet these time limits, he or she will not be allowed to continue toward a Ph.D., but may remain in the program to obtain a M.S. degree in Physics. The time limits can be extended, at the discretion of the Graduate Committee, but *only* if the extension is granted *before* the time limits have expired, and extenuating circumstances beyond the student's control exist. In particular, failure to form an advisory committee in time to meet the limits is not grounds for an extension.

If a student fails the first attempt at the preliminary examination, one full semester (a minimum of 15 weeks) must elapse before the second attempt is scheduled. In case of failure at the second attempt, students will not be allowed to continue toward a Ph.D., but may remain in the program to obtain a M.S. degree in Physics.

Preliminary examination

The Preliminary Exam is a formal part of all doctoral programs at Virginia Tech. Students must read the relevant section of the Graduate Catalog
https://secure.graduateschool.vt.edu/graduate_catalog/
look in the section marked "Examinations" under the "policies" tab at the top of the page).

Purpose of the Prelim Exam. The Preliminary Examination determines whether a student demonstrates sufficient academic preparation, progress toward scholarly independence,

accomplishment in research, and promise for future intellectual growth to justify continuing toward the doctoral degree. The oral exam format allows the PhD Committee to assess these qualities in a single, vigorous session of direct, interactive questioning without recourse to textbooks, course notes, online databases, or other aids. Students should not expect their PhD Committee members to "coach" them toward the right answers.

Enrollment. A preliminary exam can only be held during a term in which the student is enrolled. Therefore, the exam may not be held during a Summer Session unless the student has paid tuition (3 credits) for that session. With prior permission from the Graduate School, prelim exams may be held during Exam Week.

Two-Week Rule. Students must submit an exam request, at least two weeks prior to the exam date, through the Electronic Signature System (ESS):
https://ess.graduateschool.vt.edu/pages/login.php.

Committee Attendance. Students must plan in advance to ensure that all committee members can attend the examination for the date/time requested. If any committee member does not approve the examination request, the student must resubmit the request. Identifying a room in the ESS does not reserve the room; students must reserve the room through the appropriate physics department staff or ask for help to the Graduate Coordinator, Betty Wilkins.

Forms to Bring to the Exam. None. The Graduate Coordinator, Betty Wilkins should be informed and should be notified of the date and room in which the exam will be conducted. She will also check that the exam has been approved by the graduate school.

The Prelim Exam may not be conducted if the student's PhD advisor has not received notification from Graduate School that the exam has been scheduled. No exception to this policy is envisioned.

Latest Possible Prelim. Graduate School policy requires that students pass their Preliminary Exam at least six months before they plan to defend their dissertations. The target date for the Physics Department Prelim Exams is the end of the fourth semester of study. Students transferring from another university or who have joined the PhD program after completing an MS thesis must pay special attention to this policy.

GPA Requirements. GS policy allows Departments to decide whether a student may take the Prelim Exam if the GPA is less than 3.0 or who have not completed all of the graded (lecture) course work on their Plans of Study. At present the Physics Department allows only students with

- GPA of at least 3.0 in all courses,
- GPA of at least 3.0 in all core physics courses
- a complete and approved plan of study.
- successful qualifier exam

to proceed to the Preliminary Exam.

Committee Attendance. Graduate School policy requires that the student's entire doctoral PhD Committee attend the Prelim Exam. In order to pass the exam, the student may receive no more than one failing vote from among the members of the examining committee.
Substitute Committee Members. Graduate School policy allows a maximum of one member of your Examining Committee to be someone who is not a regular member of your PhD Committee. This situation sometimes arises when one of your regular PhD Committee

members is on sabbatical leave or is impossible to schedule. In this situation, the Chair of PhD Committee (faculty advisor), in consultation with the Program Director should appoint a proxy. This appointment must be done in writing (an e-mail message to the Graduate Program Director is needed).

Those conducting the examination must log in to the Electronic Signature System and enter their decision on the exam result within 2 days after the exam. The proxy must communicate with the committee member for whom he or she is serving as a proxy regarding the exam result decision and the original committee member must log into the Electronic Signature System and enter the decision.

Professor Absent for the Exam. Graduate School policy does not address the issue of professors being absent from a student's Prelim Exam. However, sometimes a professor suddenly becomes unavailable immediately before a student's exam and a substitute cannot be found in time for the exam. (Rarely, a professor forgets about the exam, but students should seek to minimize that problem by sending timely reminders to their PhD Committee members.) If the student still has four Examining Committee members present, then the exam can proceed. If not, then the exam must be rescheduled.

After an exam where a professor was absent, the Chair of the PhD Committee must prepare a brief letter explaining the situation (an email message to the Graduate Program Director is sufficient).

Completion of Graded Course Work. Graduate School policy allows Departments to decide how much of the student's graded course work must be completed prior to the Preliminary Exam. However, the Graduate School requires uncompleted courses scheduled for semesters prior to the Preliminary Exam to be explained. All of the student's Core courses must be completed;

Time Allotted for Exam. Traditionally, the Physics Department has allowed two hours for each prelim exam. Students should consult their Faculty Advisor to see if a longer interval is needed.

Exam Coverage. The preliminary exam is partly a Literature Review document. Although the Research Plan is only a minor part of the document, it can play a very significant role in the Prelim Exam. In addition, your Committee will evaluate your research progress. Students should therefore prepare a presentation that combines the key points of their review and the highlights of their research progress. Because the Prelim Exam is also a comprehensive exam, students should expect questions of a general nature – often these will arise naturally during the discussion of the review or research results. The specific balance of the exam is left to the Ph.D. Advisory Committee to determine, and typically that decision depends on how the student responds to the first few questions asked during the exam.

Refreshments. Students should not bring refreshments to their exams.

The Prelim Exam is a formal academic exercise.

PowerPoint. Students should prepare their presentations in PowerPoint or similar presentation software. A presentation of approximately 25 slides is suggested. Approximately half of those slides should summarize research progress. A more lengthy presentation can cause your exam to exceed the amount of time allotted. Consult your

Faculty advisor for further guidance.

Room Scheduling. Schedule your exam room by contacting the Physics Department main office at calendar@phys.vt.edu, with the date, time and room. It is the student's responsibility to make sure that the projector is functioning and that the laptop can be connected to the LCD projector, and that the room can be unlocked and made available for use.

Reminding the Committee. Students should send an email reminder to their Ph.D. Committee members the day before the prelim exam.

Executing the Exam. Prelim Exams are not open to the public. Only the student and the Examining Committee should be present. In unusual cases, an additional observer (the Graduate Program Director or the Department Chairperson) may be present. The student's presentation, including the typically frequent interruptions, should consume about 45 minutes. Then the student can respond to additional questions (including general comprehensive questions) for about 15 minutes. A small interval should be left at the end for the Committee to confer and discuss the results of the exam. The intervals proposed are rough guides. At the conclusion of the exam, the Faculty Advisor should input the exam result in the GSS online system.

Pre-defense Examination

The Pre-defense Exam is a formal part of all doctoral programs at Virginia Tech. It is a specific requirement of the Physics Department.

Purpose of the Pre-defense Exam. The Pre-defense Examination determines whether a student is ready to graduate and have sufficient research achievements. The oral exam format allows the PhD Committee to assess these qualities in a single, vigorous session of direct, interactive. Students should not expect their PhD Committee members to "coach" them toward the right answers.

Enrollment. A pre-defense exam can only be held during a term in which the student is enrolled. Therefore, the exam may not be held during a Summer Session unless the student has paid tuition (3 credits) for that session.

Students must submit an exam request to their corresponding Ph.D. Advisory committee prior to discussion and agreement with their research advisor. The research advisor will be responsible for the committee to fill the appropriate form and then sending the filled form to the graduate program coordinator.

Committee Attendance. Students must plan in advance to ensure that all committee members can attend the examination for the date/time requested. Students must reserve the room through the appropriate physics department staff or ask for help to the graduate program coordinator.

Forms to Bring to the Exam. Pre-defense form. The graduate program coordinator should be informed and should be notified of the date and room in which the exam will be conducted.

Committee Attendance. Same as the preliminary Exam.

Time Allotted for Exam. Traditionally, the Physics Department has allowed two hours for each prelim exam. Students should consult their Faculty Advisor to see if a longer interval is needed.

Exam Coverage. One year or so prior to the Ph.D. dissertation defense, students are expected to convene their advisory committee and present/report on their research progress and accomplishments; e.g. this could happen in the framework of a departmental seminar. The advisory committee members will also ask probing questions to determine if the student is on track to complete his or her thesis and defend within the next semester or so. Plan for completing the Ph.D. and write a Ph.D. thesis should be presented and discussed with the advisory committee.

Refreshments. Students should not bring refreshments to their exams.

PowerPoint. Same as the preliminary exam.

Room Scheduling. Same as the preliminary exam.

Reminding the Committee. Students should send an email reminder to their PhD Committee members the day before the pre-defense exam.

Executing the Exam. Same as the prelim exam.

Dissertation and Final Examination

For most graduate students, research is the most important and satisfying experience of their graduate education. Under the supervision of a member (or members) of the Advisory Committee, the student pursues original research in some area of physics, developing many of the skills necessary for a career in physics: proposing and defining a problem, carrying out the investigations and performing the analyses, as well as arriving at justifiable conclusion and communicating the results in both written (dissertation) and oral (final examination) forms.

To insure a timely progression, a student should, immediately upon enrollment in the Ph.D. program, begin to investigate potential dissertation research areas. Useful sources of information include seminars and colloquia, faculty, postdoctoral researchers, and other graduate and undergraduate students carrying out research in the department, and reports/papers published by the research groups. A good way to study an area in greater depth is to sign up for research hours or independent study under the supervision of a faculty member. The first part of the preliminary examination is an opportunity for the student to present a proposal for his or her planned research.

Financial Support

Graduate Students entering the physics program may be granted support upon admission. Typically, this support is in the form of a GTA appointment from the department. After a student passes the Preliminary Examination, he/she is often supported by an GRA from the advisor's research group. In extraordinary cases, a research group may offer G RA support from the beginning.

Graduate Teaching Assistant (GTA)

Incoming graduate students holding a GTA must have attended the mandatory GTA training workshop. This program is designed to prepare the graduate students for their GTA duties. There are also additional training sessions given by the faculty in charge of laboratories in the Department to which you may be assigned. Students are required to attend these sessions as scheduled by the faculty to whom they are assigned.

Assignments and Duties

Assignments will be made by the Associate Chair, in consultation with the Department Chair. The Physics Department expects the graduate students who have accepted GTA positions to take their teaching responsibility seriously. GTAs should each hold at least one office hour per week when they can meet with their students. Lab Instructors will have orientation meetings with students who have laboratory assignments. GTAs must work through the laboratory assignments before they meet their lab sections.

The nominal service required for a GTA can be up to, but should not exceed, 20 hours per week. The activities included are preparation, grading, office hours, and other student contact. The estimated time allotted for the completion of each should be agreed upon before the semester begins. The instructor of the course and the Associate Chair should be informed as soon as possible if these estimates are not according to the guidelines given above.

Eligibility for and Duration of Support

To be eligible for such support by the department in the following year, a regular student in any graduate program in physics must satisfy the following criteria for Minimum Academic Progress in the current year, which is a GPA of 3.0 or higher.

Priority for support will be given to those students with a physics core GPA's of $\geq$ 3.0. A student enrolled in the M.S. program may be supported beyond the second year if he/she switches to the PhD program. In this case, the Graduate Committee must be informed in writing, by December 1st of the second year. For Ph.D. students, GTA support is not normally guaranteed beyond the fifth year. Exceptions will be considered by the Graduate Committee, on a case by case basis.

Graduate Research Assistant (GRA)

A Graduate Research Assistant is supported by individual faculty members or research groups. The duties are specified by the research supervisor. Although there are exceptions, GRAs are usually offered to students that have passed the Preliminary Examinations. Students on GRA support during the academic year when they are signed-up for research credit hours should fulfill both the obligations of the GRA support and their credit hour requirements. Details should be discussed with their research advisor and may vary.

All students are encouraged to seek RA support as early as possible in their graduate careers.

Graduate Honor System

All students are expected to abide by the Graduate Honor System. The Graduate Honor Code establishes a standard of academic integrity that all graduate students at Virginia Tech are expected to uphold. You are encouraged to familiarize yourself with it. Details areavailableat:https://graduateschool.vt.edu/academics/expectations.html

Graduate Committee

The Graduate Committee consists of faculty members, two student representatives and the Graduate Program Coordinator. A graduate student with particular concerns about any aspect of the graduate program is encouraged to speak to any member of this committee.

Faculty Membership

At present, the faculty members of the Graduate Committee are:

Camillo Mariani (Graduate Program Director)
Satoru Emori
Shunsaku Horiuchi
Nadir Kaplan
Djordje Minic
Tommy O'Donnell
Kyungwha Park
Vito Scarola
Tatsu Takeuchi

Graduate Student Representatives

The Graduate Committee has two graduate student members, who serve as v oting members for a period of two years. At the time of appointment, each student must have passed the Preliminary Examination. Prior to the beginning of each academic year, the graduate student body will elect a new student representative. The selected student will be the representative of the graduate student body for two academic years, mentoring the newly elected representative during the last year of their term.

Current graduate student representative: James Stidham and David Smith

Admission to the Graduate School

Admission to the Graduate School is contingent upon receipt of a BS/BA degree from an accredited university or college, an undergraduate cumulative grade point average of 3.0/4.0, and presentation of evidence of potential to do graduate work. Specifically, 20 credit hours of physics courses, excluding general physics and including modern and thermal physics and junior/senior level mechanics, electricity and magnetism, and quantum mechanics; a grade point average in physics and math of at least 3.0 (B) during the last two years; and courses in math through vector calculus and partial differential equations are required. Students who lack some of the prerequisite courses may be considered for admission but will have to remedy the deficiencies during their first year of graduate study.

International students must take the TOEFL. A minimum score of 90 iBT is required by the Graduate School.

Prior to submitting the online application, individuals are encouraged to review the requirements and conditions for admission. Applications for admission should be made on-line at: https://applyto.graduateschool.vt.edu/pages/login.php

All official test scores (such as TOEFL, where applicable) should be sent directly to the Graduate School (please instruct ETS to have your scores sent to institution code 5859. PLEASE do NOT enter a department code.). A completed application consists of the on-line application form, uploaded official up-to-date transcripts of all undergraduate and graduate work from institutions from which you received a degree, ETS scores, three letters of recommendation, and a $75 non-refundable application fee.

Uploading a transcript

While completing your online application and prior to submitting it, you will be required to upload one copy of your scanned official transcript from each institution from which you have earned or will earn an undergraduate or graduate degree. Do not send transcripts for community college attendance or from any institution where you enrolled in classes but did not earn a degree.

Please do NOT mail your official transcripts to our Graduate School until you have received an offer of admission from Virginia Tech, and plan to accept the offer. **Make sure your scanned documents are legible BEFORE uploading. Non-legible documents will not be accepted.**

You may scan a copy of your official paper or electronic transcript provided to you from your institution's Registrar. Do **NOT** upload your institution's web-based academic record or a document stating it is not an official transcript. Make sure that **all** critical and identifying marks have been scanned and are legible. These include the institution's name, your name, the names of your courses and the grades you have received. It is important that you scan both the front and back of your transcript as we will need to be able to review the information provided on the back of your transcript concerning credit hours, the institution's grading scale, etc. Please ensure that your file is in PDF format.

The process of uploading transcripts is intended to eliminate the need for you to mail in your transcripts, as our departments will be able to review your application based on your uploaded transcripts. If you are offered admission, you will be required to provide an official copy of your transcript(s) upon the awarding of your degree and its posting to your transcript prior to your enrollment at Virginia Tech.

Virginia Tech reserves the right to rescind any offer of admission if any discrepancies are found between your uploaded and official transcript(s).

Virginia Tech does not discriminate against employees, students, or applicants on the basis of race, color, sex, sexual orientation, disability, age, veteran status, national origin, religion, or political affiliation. The university is subject to title VI and VII of the Civil Rights Act of 1964, Title IX of the Education Amendments of 1972, Sections 503 and 504 of the Rehabilitation Act of 1973, the Age Discrimination in Employment Act, the Vietnam Era Veteran Readjustment Assistance Act of 1974, Federal Executive Order 11246, Governor Allen's State Executive Order Number Two, and all other rules and regulations that are applicable. Anyone with questions concerning any of these regulations should contact the Equal Opportunity/Affirmative Action office.

Virginia Tech's Title IX coordinator is Kathryn Polidoro. (Contact at polidoro@vt.edu; 540-231-1824)

Physics Personnel

For an updated list of all physics faculty, research faculty, instructors, and staff, please go to: http://www.phys.vt.edu/People.html

Student Resources on Campus

4Help (online or by phone): If you need to reset your password or have trouble logging on to university online services, such as Canvas or Hokie SPA.

The Graduate School (Graduate Life Center): Can help with any university-specific graduate education questions

Cranwell Center (Harper Hall): Advisors there handle all questions relating to immigration, including I-20 extensions and OPT requests.

Student Medical Insurance Office (Student Services Building): Provides information regarding signing up for the subsidized student health insurance plan and how to add additional policies, such as dental insurance.

Schiffert Health Center and Cooks Counseling (next to McComas gym): Provides basic health care to students who have paid their student fees; Cooks Counseling offers one-on-one and group therapy sessions to students. Cooks Counseling Center also has a full-time therapist located at the Graduate Life Center to work exclusively with graduate students.

Services for Students with Disabilities (Lavery Hall): Provides accommodations and services to students with disabilities and temporary illnesses or injuries.

Hokie Passport Office (Student Services Building): Obtain new student ID; deposit money onto Hokie Passport account to use on campus and around town.

Parking Services (505 Beamer Way): You must register your vehicle and purchase a parking permit to park on campus. This is where you would go to obtain a permit, appeal a citation, or pay a ticket. (Also, if you ride a bike to campus, you should obtain a parking permit, which is free of charge.)