



College of Liberal Arts & Sciences  
Department of Physics

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May 22, 2023

Dear Incoming Graduate Student:

It is my pleasure to welcome you to the Department of Physics at the University of Florida. I would like to introduce myself as the Graduate Coordinator for the Department, and Ms. Pam Marlin, who operates our Departmental Office of Student Administrative Services. Our role is to guide you through our graduate program, help you with the selection of your courses, and make sure that you find an appropriate mentor so that you can work towards your degree in a timely manner. Both of us are here to help, Ms. Marlin in all administrative questions and I in all academic questions.

**PLAN TO ARRIVE BY AUGUST 16, 2023.** Your stipend will start on August 16. In late July, you will receive an email with instructions for the online hiring procedure. The stipend is paid biweekly, but you may not receive your first paycheck until the end of August or later, depending on when you complete the online forms. **Therefore, we advise you to bring sufficient funds for your rent, utility deposits and other expenses (approximately \$3,000).**

#### IMPORTANT DATES

**August 16, 9:00am:** Incoming Graduate School Orientation  
(<http://graduateschool.ufl.edu/admissions/orientation/>)

**August 16, 1:30pm:** Meet with Pam Marlin in room 2205 of the physics building  
Overview of administrative processes and desk assignments.

**August 17 – 18:** Preliminary Exam

The Preliminary Examination is designed to check how prepared you are for graduate study. *All incoming students take the exam.* We realize that not everyone will have studied over the summer and not everyone will pass on the first attempt. Previous exams are available at <https://www.phys.ufl.edu/wp/index.php/graduate/preliminary-exam>.

Part A: August 17, 9:00am – 12:00 noon

Part B: August 17, 2:00 pm – 5:00 pm

Part C: August 18, 9:00am – 12:00 noon

Part D: August 18, 2:00 pm – 5:00 pm

**August 21, 2:00pm:** Department orientation with Professor Yoonseok Lee, Graduate Coordinator in room 2205 of the physics building. Reception immediately following orientation at approximately 3:30pm.

**Final Documents.** Please be aware that any student who has submitted a partial or incomplete transcript must provide their official, **final** transcript to the Office of Admissions in order to register for classes. It is also necessary to show the Admissions office a copy of your diploma so that they may make a copy of this for their records. Even though some of you might not receive these documents until after you arrive, you should plan to provide the documents to the registrar's office (Criser Hall) by the end of the fall 2023 semester.

**Immunization.** Submit medical information to the UF Student Health Care Center. If you do not have all your immunizations, you will not be able to register for classes. More information: <https://healthcompliance.shcc.ufl.edu/>.

**Gator Grad Care:** You are eligible to enroll in the Gator Grad Care Insurance plan. Enrollment is not automatic. To participate you must submit your Gator Grade Care enrollment during the designated enrollment periods and must re-enroll in Gator Grade Care each academic year to continue coverage. Initial enrollment will be available once your payroll appointment is complete. More information: <https://benefits.hr.ufl.edu/health/gatorgradcare/>

**FERPA Training.** It is required that all graduate assistants who teach take the FERPA training. More information: <https://training.it.ufl.edu/training/items/uf-ferpa-training.html>.

**Data Privacy and Security.** More information: <https://privacy.ufl.edu/privacy-policies-and-procedures/onlineinternet-privacy-statement/>

We look forward to working with you to take the next step in your successful future career. If you have any questions, please feel free to contact me.

Sincerely,

A handwritten signature in black ink, appearing to read 'Yoonseok Lee', written in a cursive style.

Yoonseok Lee  
Professor and Graduate Coordinator

# **1. Requirements for Graduate Degrees in the Department of Physics**

## **(Adopted by the Faculty on 21 January 2000.)**

Summary (details to follow):

1. Preliminary Examination (written)
2. Graduate Core Courses
3. Composition of Ph.D. Supervisory Committee
4. Qualifying Examination (written and oral parts)
5. Masters Degrees
6. Implementation Mechanisms

Note: All the rules of the Graduate School, as described in the Graduate Catalog, are to be maintained. The Committee consisting of GSAC (the Graduate Student Advisory Committee) and the Graduate Core Course instructors will be referred to as the GSAC(+) Committee.

### Preamble

The purpose of the Preliminary Examination is to assess the student's preparation for working toward an advanced degree. This Examination covers material typical of an undergraduate physics major curriculum. The performance needed to pass the Examination is intended to correspond to a mature command of such a curriculum.

The purpose of the Graduate Core Courses is to provide a comprehensive knowledge of the foundations of physics and to prepare the student for the specialized work necessary for pursuing an advanced degree.

The Qualifying Examination, which has both written and oral parts, serves the purpose of deciding whether the student is qualified to continue work toward a Ph.D. degree.

### **1. Preliminary Examination (written)**

- A. Covers material learned as an undergraduate major, but requires a higher level of sophistication than the minimum required to pass these courses.
- B. All graduate students who have not passed should take the examination when it is offered. To continue work toward a Masters or Ph.D. degree, the Preliminary Examination must be passed by the end of the second year. You will not be allowed to attempt the qualifying exam before passing the preliminary exam. In the special cases, as judged by the GSAC(+) Committee, students who require significant additional undergraduate preparation may be allowed, at most, one extra year to pass the Preliminary Examination. These cases will be judged after the student has taken the Preliminary Examination for the first time.
- C. Given twice a year at the start of the Fall and Spring semesters.
- D. In any year, the Fall and Spring Semester Preliminary Examinations will be administered by two different Committees with one common Chair. Composition of the Committees: The Chair of the Department will appoint 12 faculty members to each sub committee (Fall and Spring), along with one common Committee Chair.
- E. Format of the Exam: For the Fall semester, the Exam will be given on two consecutive days during the week before classes begin. The exam period will be 6 hours per day, 3 hours in the morning and 3 hours in the afternoon, with a break of at least two hours between the sessions. Six problems will be posed each day, i.e. three in the morning and three in the afternoon. All

assigned problems are to be worked in the session in which they are assigned.

F. Content: All of the problems are graded and contribute to the final score.

From the total of 12 problems, at least three problems will be generally classified as QM (quantum mechanics), three as EM (electromagnetism), two as SM&T (statistical mechanics and thermodynamics), and two as CM (classical mechanics). The remaining two problems may be generated from any area of physics that is studied in a typical undergraduate program and may be a synthesis of several specialized subjects, including QM, EM, SM&T, and CM. Specifically, the content of the exam may draw heavily from the advanced courses required for UF physics majors, namely Modern Physics (PHY 3101), Mechanics (PHY 3221-4222), Electromagnetism (PHY 3323-4324), Thermodynamics and Statistical Physics (PHY 3521-4523), Quantum Mechanics (PHY 4604), and Laboratory Physics (PHY 4802L-4803L). Each problem is graded on 10 points, totaling 120 points for the exam.

G. Grading: "Blind" grading procedures will be used. More specifically, the ID numbers used for the Exam will not allow deciphering of information about the students, such as the number of times the Exam has been attempted. Each problem will be graded by someone other than the person who composed that problem and provided a solution. The Pass/Fail determinations will be made while maintaining "blind" procedures (thereby being independent of the number of times the Exam has been attempted by a student) and will be based on the total score. No partial/conditional passes will be given. The GSAC(+) Committee will review the results of the examination, including the performance on each question, for diagnostic purposes. However, the GSAC(+) Committee is not allowed to know the identity of the students ahead of the entire Faculty.

H. While maintaining blind procedures about the identity of the students, the Pass/Fail results are approved by the entire Faculty at the first Faculty Meeting of each semester.

## **2. Graduate Core Courses**

A. Students are required to pass (or obtain a waiver for) the Graduate Core

Courses (i.e. "Core Courses"), namely two semesters of QM, two semesters of EM, one semester of CM, and one semester of SM. Students seeking to pursue a Ph.D. thesis must have a Core Course GPA of at least 3.30 before attempting the Qualifying Examination. If a Core Course is repeated, only the highest grade is considered when computing the Core Course GPA.

B. The Core Courses may be taken over a period of two years, although well-

prepared students are encouraged to complete the Core Course requirement in the first year.

C. The GSAC(+) Committee will review the student's performance on the

Preliminary Examination and in the Core Courses. At the end of the Fall and Spring Semesters, the GSAC(+) Committee may grant waivers of individual Core Course requirements and/or make recommendations for satisfactory completion of additional courses. If significant additional undergraduate work is deemed necessary, the GSAC(+) Committee may extend the Core Course deadline by at most one year.

D. First year students who enter with advanced degrees and/or the Core Course

equivalent experience are expected to take the QM and EM Core Courses in their first semester and to perform all the work required in these courses. At the end of the semester, the GSAC(+) Committee will review the student's performance on the Preliminary Examination and in the Core Courses. This committee may waive the Core Course requirements. Exceptionally well prepared students may, upon entering the Department, request a waiver of the Core Course requirements. When considering these requests, the GSAC(+) Committee will review the student's performance on the Preliminary Examination and the previous academic record.

### **3. Composition of the Ph.D. Supervisory Committee**

- A. Students are encouraged to form their Supervisory Committees as soon as possible, and certainly before the end of their second year. The Supervisory Committee should include a breadth of faculty expertise, including an appropriate balance between experiment and theory.
- B. A proposed Supervisory Committee should be drafted by the student only after discussions with the proposed thesis advisor and with each person who is being listed as a proposed member.
- C. All subsequent changes to the Supervisory Committee must be approved by the Chair of the Department.
- D. The Supervisory Committee shall meet annually to evaluate the student's progress towards the degree. The first annual evaluation or Qualifying Examination (whichever comes earlier) should take place within a year after that the date the Supervisory Committee was formed. The annual meetings should be attended by at least 3 members of the Supervisory Committee, including the Chair/co-Chair of the Committee.

### **4. Qualifying Examination (written and oral parts)**

- A. May not be attempted until after satisfactory completion of the Preliminary Examination and Core Course requirements. The earliest time that the Qualifying Examination may be attempted is during the third semester of graduate study beyond the bachelor's degree (as described by the rules of the Graduate School). In all cases, this Examination shall be attempted before the end of the third year and must be passed before the end of the fourth year in order to continue work toward a Ph.D. degree.
- B. For this examination, the student is expected to present a proposed research topic to the Supervisory Committee. Although the topic may be related to the eventual thesis subject, a direct relationship is not a requirement.
- C. The written part of the examination consists of a 10-15 page document describing the proposed research topic. The motivation for the proposed study and the proposed methods should be described. This document must be given to each member of the Supervisory Committee at least one week before the oral part of the examination.
- D. The oral part of the examination shall begin with a concise presentation by the student. The goal is to introduce the proposed research area and to summarize the salient features of the proposed topic.
- E. During and after the oral presentation, the Supervisory Committee may ask questions about any aspect of the student's preparation for the proposed research. The questions may involve fundamental questions about the foundations of the physics topics that are being discussed.
- F. On the basis of the student's performance on the written and oral parts of the Qualifying Examination, the Supervisory Committee will decide whether the student is qualified to continue work toward a Ph.D. degree.
- G. Arranging a time and place for the exam is the responsibility of the student. You must notify the Graduate Program Assistant at least two weeks prior to your scheduled date to ensure all announcements and paperwork is in order.

## 5. Masters Degrees

- A. The present MST degree requirements will not be changed.
- B. In order to receive a Masters (non-thesis) degree, the student must pass the Preliminary Examination by the end of the second year. In addition, the student must pass the Core Courses with a Core Course GPA of 3.00. If a Core Course is repeated, only the highest grade is considered when computing the Core Course GPA.
- C. In order to receive a Masters (thesis) degree, the student must pass the Preliminary Examination by the end of the second year. The first semester of the QM and EM Core Courses must be taken. In addition, the student must write a thesis and present it to the Supervisory Committee as described by the Graduate School.

### **Preliminary Examination: Bibliography (v. August 2004)**

This listing is to provide a bibliography that might be reviewed prior to taking the Preliminary Examination. The advanced courses required for UF majors are listed, along with present (or recent) textbooks that have been used during the courses. In many cases, numerous textbooks are available at the same level of presentation. This listing is only to provide a guide. The textbook for our introductory course is *Physics 1 & 2*, 4th Edition, Resnick, Halliday, Krane, and it is assumed that you have a comprehensive knowledge of the material present in this textbook (or its equivalent).

*Reminder:* The Preliminary Examination contains 12 questions/problems that will consist, in general terms, of 2 in classical mechanics, 2 in statistical mechanics and thermodynamics, 3 in quantum mechanics, and 3 in electromagnetism. The remaining 2 problems may be generated from any area of physics that is studied in a typical undergraduate program. In addition, the problems might not be specifically described as related to one area of physics, but they may be a synthesis of several subjects.

**Classical Mechanics (PHY3221 and PHY4222)**

*Classical Dynamics of Particles and Systems*, 5th Edition, Thornton and Marion

*Classical Mechanics: A Modern Perspective*, 2nd Edition, Barger and Olsson

**Statistical Mechanics and Thermodynamics (PHY3521 and PHY4523)**

*Introductory Statistical Mechanics*, Bowley and Sanchez

*Fundamentals of Statistical and Thermal Physics*, Reif

*Thermodynamics and An Introduction to Thermostatistics*, 2nd Edition, Callen

*Thermal Physics*, Kittel and Kroemer

*Heat and Thermodynamics*, Zemansky and Dittman

**Electromagnetism (PHY3323 and PHY4324)**

*Introduction to Electrodynamics*, 3rd Edition, Griffiths

**Quantum Mechanics (PHY4604 and PHY4605)**

*Quantum Mechanics, Vol 1 and 2*, Cohen-Tannoudji

*Quantum Physics*, Gasiorowicz

*Intro to Quantum Mechanics* 2<sup>nd</sup> Edition David J. Griffiths

**Optics (PHY4422)**

*Optics*, Hecht

*Optics*, Klein and Furtak

**Modern Physics (PHY3101)**

*Modern Physics*, 4th Edition, Tipler and Llewellyn

*Modern Physics*, Ohanian

*Concepts of Modern Physics*, 4th Edition, Beiser

**Laboratory Physics (PHY4802L and PHY4803L)**

*The Art of Electronics*, Horowitz and Hill

*Experimental Physics: Modern Methods*, Dunlap