



GUIDE FOR GRADUATE STUDENTS 2016-2017

UNIVERSITY OF NOTRE DAME
COLLEGE OF SCIENCE
DEPARTMENT OF PHYSICS

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Preface

The purpose of this guide is to explain the rules and procedures of the Department of Physics as they pertain to physics graduate students. As specified by the Graduate School, all graduate programs are to have a guide that sets out the basic policies of the program and also provide guidance on the department's expectations.

Part I of this guide describes the basic academic coursework and requirements, including the preliminary examination. Part II describes the research portion of the program, including research advisors, research committees, candidacy, and the Ph.D. dissertation. Part III discusses general administrative policies, including financial support.

The departmental document *Teaching Assistant Rights, Responsibilities, and Procedures* is included in Appendix B.

The Academic Code of the Graduate School (ACGS) may be found at the end of this guide (Appendix C). You are strongly encouraged to read the ACGS and be familiar with its rules and procedures. The ACGS establishes the minimum standards for all graduate programs. Individual programs such as physics must follow these minimum standards but may require higher standards than those of the ACGS. This guide will also, where relevant, include references to relevant sections of the code.

Every attempt has been made to have this guide as accurate and up-to-date as possible. It is updated yearly, with new versions released at the start of the fall semester. While every attempt is made to make this information error free, in the case conflicting information is found, original Graduate School sources take precedence over this graduate guide.

Part I
Academics

1 Ph.D. Curriculum

The *core curriculum* (Sec. 1.1) of eight courses covers common background material for all physicists.

Then *research area courses* (Secs. 1.2–1.3) address the more specialized knowledge and approaches of specific subdisciplines of physics (such as astrophysics, atomic physics, condensed matter physics, high energy physics, or nuclear physics). Typically, for each research area, an introductory-level research area course provides the fundamental concepts and methods, then advanced courses delve more deeply into more specialized aspects. One-time special topics courses will often also be offered at this advanced level.

The department also provides several elective courses which can be thought of as *skills and methods classes* (Sec. 1.4). These help you to develop proficiency in topics ranging from data analysis to scientific writing.

Ideas on the forefront of research and the status of our field are communicated researcher-to-researcher, through *seminars and colloquia* (Sec. 1.5). The colloquium is where all members of our departmental community learn about each others' fields, at a broadly accessible level. The research seminars, for different research areas, are where more technical details are shared and are where you can expect to learn the current status of your own research field.

Finally, as you progress in your studies and focus more on your own research, you will be registering for *research and dissertation* credit (Sec. 1.6).

The ultimate goal of these courses is to prepare you as a physicist, with both the broad knowledge for you to function in your discipline and interact with other physicists, as well as more specific knowledge for your immediate research aims. These should be the guiding principles as you select and take courses.

To provide structure and ensure certain common ground, there are certain baseline requirements, which are outlined in the following sections. However, the department strongly encourages graduate students to take one or more elective courses, beyond these baseline requirements. These electives may include additional introductory or advanced research area courses (including special topics courses), methods and skills courses, and, if appropriate, courses in other departments. You should consult with your research advisor about any specific expectations from your research group.

1.1 Core Courses

The core curriculum consists of eight courses, taken over the first three semesters of graduate study:

First year (Fall)

PHYS 70003: Mathematical Methods in Physics

PHYS 70005: Classical Mechanics

PHYS 70007: Quantum Mechanics I

First year (Spring)

PHYS 70006: Electromagnetism

PHYS 70008: Quantum Mechanics II

PHYS 71010: Methods of Experimental Physics

Second year (Fall)

PHYS 80001: Electrodynamics

PHYS 80002: Statistical Thermodynamics

These courses are all 3-credit courses and are graded with a letter grade. The department's "standard syllabi" for these courses, summarizing the expected topical coverage, may be found in Appendix A.

1.2 Introductory Research Area Courses

Students are required to take at least two 3-credit courses at the introductory level. One of the goals of this requirement is to ensure that you have exposure to the ideas and approaches of research areas outside your own. The departmental *breadth requirement* stipulates that, at a minimum, at least one of these courses must be outside your own research area.

Courses which count towards the introductory research area requirement include the following:

Astrophysics

PHYS 50445: Advanced Astrophysics (fall)

PHYS 50472: Relativity: Special and General (spring)

Atomic Physics

PHYS 50303: Quantum Optics (on demand)

Condensed Matter Physics

PHYS 50501: Introduction to Solid State Physics (fall)

Elementary Particle Physics

PHYS 50602: Particles and Cosmology (spring)

Nuclear Physics

PHYS 50701: Introduction to Nuclear Physics (spring)

Furthermore, any of the advanced research area courses described below may instead be counted towards the introductory research area requirement. For instance, if you already took a graduate level course (or an advanced undergraduate course at the same level) in a given research area as an undergraduate, before coming to Notre Dame, you might place directly into the advanced course at Notre Dame. Other courses of a comparable nature (either within the department or outside the department) may on occasion also be considered suitable for satisfying this requirement. All course plans for satisfying the introductory research area course requirement must be approved by the DGS.

1.3 Advanced Research Area Courses

Students must also take at least one 3-credit course at a more advanced level. These courses will typically require pre-requisites from the core curriculum and will typically also build upon the relevant introductory level research area course.

The requirement of one advanced research course is merely the baseline departmental requirement. You will typically actually need to take more than this to develop full research proficiency. It is likely that your research group has specific expectations in this regard. You should consult with your advisor on appropriate courses.

Some of the most commonly offered advanced research area courses include:

Astrophysics

PHYS 80202: Astrophysics: Stars (spring, alternate years)

PHYS 80203: Astrophysics: Galaxies (spring, alternate years)

PHYS 80204: Cosmological Physics (on demand)

Atomic Physics

PHYS 80301: Atomic Physics (on demand)

Biophysics

PHYS 80401: Biophysics (spring)

Condensed Matter Physics

PHYS 80501: Solid State Physics (spring)

PHYS 80502: Soft Condensed Matter Physics (on demand)

PHYS 90503: Quasiparticles in Condensed Matter Physics (on demand)

Elementary Particle Physics

PHYS 80003: Quantum Field Theory I (fall)

PHYS 80004: Quantum Field Theory II (spring)

PHYS 80601: Elementary Particle Physics (spring)

Nuclear Physics

PHYS 80701: Nuclear Physics (fall)

PHYS 90702: Nuclear Structure (spring, alternate years)

PHYS 90703: Nuclear Astrophysics (spring, alternate years)

These are all 3-credit courses and are graded with a letter grade.

While other courses at a suitably advanced level (either within the department or outside the department) may be used to satisfy the advanced research area course requirement, plans to do so must be approved by the DGS.

Advanced special topics courses may also be offered on demand. Recently-offered special topics courses have included:

PHYS 87026: Special Topics in Nuclear Physics

PHYS 90506: Topics in Condensed Matter Theory

Graduate students can petition for advanced electives with the departmental Instructional & Course Offering Committee. This committee typically needs to make decisions on the offering of elective courses when the course schedules are developed, which would usually be early September for the upcoming spring semester and January for the upcoming fall semester. The signers of the petition thus indicate their willingness to take the requested course if offered.

1.4 Methods and Skills Courses

The department also offers various elective courses for developing skills and learning research methods, including:

PHYS 60061: Scientific Writing for Physicists (1 credit)

PHYS 60070: Computing and Data Analysis for Physicists (3 credits)

PHYS 95000: Physics Teaching Practicum (1 credit)

1.5 Colloquium and Research Seminars

Colloquium speakers will generally be distinguished visitors to the department presenting their research at a level accessible to physicists from all areas of research. Attendance at colloquia is an essential part of being a member of our departmental physics community. A colloquium tea is generally held in 202 NSH approximately 30 minutes before the colloquium begins.

Every semester, all resident students will register for the weekly general physics colloquium, PHYS 73000. No course credit is given for this. (Note: One undergraduate laboratory section typically overlaps in time with the colloquium, so the teaching assistants assigned for this section will not be able to attend colloquia and need not register for PHYS 73000.)

The larger research areas of the department also sponsor weekly research seminars on topics of interest to those in that discipline. Speakers at seminars may include distinguished visitors to the department and senior graduate students presenting their research in a seminar setting. Seminar talks are generally at higher (or more technical) level and go into greater depth than those given as a colloquium. Attendance of a weekly seminar is considered to be an important part of all physicists' continued education.

All resident students past their first semester are required to register for one of the research seminar courses each semester. The following seminars are offered as 2-credit S/U research seminar courses:

PHYS 83200: Astrophysics Seminar
PHYS 83500: Condensed Matter Seminar
PHYS 83600: Elementary Particles Seminar
PHYS 83700: Nuclear Seminar

Generally, students from the smaller research areas without their own seminar series will take one of the four seminars listed above, e.g., biophysics and network science students traditionally take PHYS 83500 and atomic students will tend to take either PHYS 83500 or PHYS 83600. Attendance of the regularly scheduled seminar is a requirement of all resident graduate students; unexcused absences may result in an unsatisfactory grade. Note that TA schedules are adjusted to allow students in each research area to attend the regularly scheduled seminar. (Note: In the second semester of the first year of graduate studies, the experimental methods course overlaps in time with nuclear seminar. Affected students are excused from the seminar requirement.)

On occasion, research advisors may recommend for their students the substitution of a special talk for the weekly seminar. The research advisor will notify the seminar instructor of the substitution and will verify the student's attendance of that special talk.

1.6 Research and Dissertation Courses

Starting in the spring semester of the first year, students will take at least one credit of research and dissertation per semester, registering under the section assigned to the student's research advisor.

PHYS 98699, Research and Dissertation, is the course most students should take. This is a variable credit course graded on a S/U scale. At the time of registration, the number of credits should be chosen to ensure that, in combination with any other courses being taken, the student maintains at least the 9-credit minimum full-time load. The 0-credit option is used for students receiving a degree in August (see Sec. 2.6).

PHYS 98700, Non-Resident Research and Dissertation, is the appropriate course for students not living near the University of Notre Dame (see ACGS, Sec. 3.3). Common examples include: students located and doing research at CERN, those who are located at Argonne National Laboratory, or those who are "all but dissertation" (ABD) and completing their writing of the thesis at a location other than Notre Dame. It also is a variable credit course graded on a S/U scale. Because being in PHYS 98700 means that the student is non-resident, the student will not be allowed to register for any other courses concurrent with PHYS 98700.

1.7 Typical Course Schedule

First year (Fall)

Colloquium	0 credits
Mathematical Methods of Physics	3 credits
Classical Mechanics	3 credits
Quantum Mechanics I	3 credits
Introductory research area course (<i>optional</i>)	0–3 credits
Scientific Writing for Physicists (<i>optional</i>)	0–1 credits
	<i>9–13 credits</i>

First year (Spring)

Colloquium	0 credits
Seminar	2 credits
Electromagnetism	3 credits
Quantum Mechanics II	3 credits
Methods of Experimental Physics	3 credits
Introductory research area course (<i>optional</i>)	0–3 credits
Research and Dissertation	1 credit
	<i>12–15 credits</i>

Second year (Fall)

Colloquium	0 credits
Seminar	2 credits
Electrodynamics	3 credits
Statistical Thermodynamics	3 credits
Introductory/advanced research area courses	0–6 credits
Methods and skills elective (<i>optional</i>)	0–3 credits
Research and Dissertation	1 credit
	<i>9–15 credits</i>

Second year (Spring)

Colloquium	0 credit
Seminar	2 credits
Introductory/advanced research area courses	0–9 credits
Research and Dissertation	1–7 credits
	<i>9–15 credits</i>

Third year and beyond

Colloquium	0 credit
Seminar	2 credits
Advanced research area courses (<i>optional</i>)	0–6 credits
Research and Dissertation	1–7 credits
Physics Teaching Practicum (<i>optional</i>)	0–1 credits
	<i>9–15 credits</i>

2 Procedures for Taking Courses

2.1 Registration and Enrollment

Reference: ACGS, Sec. 3.1

Students must register and complete ND Roll Call (“enrollment”) before each semester and summer session at the time and locations announced by the University Registrar. The tuition scholarship is only for academic year courses; tuition must be separately requested for summer session (see Part III of this guide). Instructions are found through the Registrar’s web site.

2.2 Maximal Registration

Reference: ACGS, Sec. 3.7

During the academic year, a graduate student may not register for more than 15 credit hours of graded graduate courses each semester, i.e., 60000-, 70000-, 80000- and 90000-level courses. (In Summer Session that limit is 10 credit hours.) Exceptions to maximal registration must be approved by the DGS and by the Graduate School.

2.3 Auditing a Class

Reference: ACGS, Sec. 4.3

With the permission of the instructor and the DGS, the student may also audit courses. (A form to request that a course be marked as audited is available through the Graduate School web site.) Normally, graduate students are limited to auditing two courses per semester. A recorded audit is graded V. Incomplete audits are not recorded. The audit grade of V cannot be changed to a credit grade. In the academic year, full-time graduate students may audit courses without charge. In the summer session, there are no free audited courses. Any course taken or audited in the summer session will be charged at the full price.

2.4 Changes in Class Schedule

Reference: ACGS, Sec. 4.2

Once the semester begins, students may add courses only during the first six class days of the semester. After this time, students may add courses only on the recommendation of the department and with approval of the Graduate School.

Students may drop courses during the first six class days of the semester. To drop a course after this period and up to the mid-semester point (see the Graduate School Calendar for the exact date), students must have the approval of the department offering the course, the physics DGS, and the Graduate School. A course may be dropped after the mid-semester point only in cases of serious physical or mental illness. Courses dropped after this date will be posted on the student’s permanent record with the grade of “W.” It is expected that students receiving a stipend will maintain a full-time schedule.

Warning: The consequences of dropping and adding a course in the first six days of the semester may be serious. Students should consult with the DGS to discuss any changes in schedules.

2.5 Grades

Reference: ACGS, Secs. 3.5 and 4.5

For an explanation of the grading scale, see ACGS, Secs. 4.3 and 4.5.

Note: There are rules about the assignment of the grade “incomplete” and the time frame for completion of the work by the student: See ACGS, Sec. 4.4. The student has 30 days from when grades were due to complete the coursework. If coursework is not completed by that date, the grade of “I” is changed permanently to the grade of “F.”

2.6 Summer Session

Reference: ACGS, Sec. 3.5

There are separate policies and procedures for Summer. The following describes the policy, including the reasons behind the policy.

There are different situations where students should or might want to take a course during Summer Session. First, there is the situation of those who might need academic credit in summer session. This includes those expecting to earn an academic degree (MS or Ph.D.) at the end of Summer Session. It also includes those with a need or desire to take an academic class during Summer Session. This document refers to this group as the “academic-need group.”

The second group includes the other students, those who are continuing graduate students and earning stipends for the summer. These students typically do not have an academic need to take any graduate course. If they were full-time students in the spring semester, they remain full-time students during the summer. As full-time students, they should be exempt from FICA taxes. But because the Notre Dame payroll system looks at the schedule that a student has registered for each pay period in order to determine eligibility for the exemption, there is a need for the students to at least register for a zero-credit class. So, the Graduate School has set up a special zero-credit course for each program, “Independent Summer Research,” PHYS 67890. By registering for this class, the students will be recognized as exempt from FICA taxes for their summer stipend. The second group of students is thus labeled the “financial group.” (Those international students who are already exempt from FICA taxes do not need to take PHYS 67890.)

In the “academic-need group” are students expecting to earn a degree (MS or Ph.D.) during Summer Session. To be listed for an August degree, students must be enrolled in Summer Session (see ACGS, Sec. 3.6). Any graded course can be used to establish degree eligibility. But the tuition scholarship granted to most graduate students does not apply for Summer Session. So, to avoid unnecessary costs, the Graduate School has decided that it is allowable for students seeking a degree in August to register for 0 credits of Research and Dissertation, that is, either PHYS 98699 or PHYS 98700. The registration for the class establishes the student’s degree eligibility for the summer. Note: no tuition is required to take the 0-credit class.

Also in the “academic-need group” are students who wish to take a credit-bearing class during Summer Session. The Graduate School has an electronic form on their website for students who wish to request tuition to take such a class. There is a limit on how many credits can be requested (typically, three), on what courses can be requested (relevant to degree and not normally offered during the academic year). Questions on the approval process should be brought to the DGS. Details on how to access the approval form are normally circulated in the spring by email.

3 Transfer Credit and Waiver of a Required Course

Reference: ACGS, Sec. 4.6

The Department of Physics makes the following distinction between the transfer of credit and the waiver of a requirement:

Transfer credits are entered by the Registrar's Office onto a graduate student's University transcript. The awarding of transfer credits by the University is a formal acknowledgment that a student has previously taken graduate course(s) that can count in the place of Notre Dame graduate course(s). The awarding of transfer credit follows rules established by the Graduate School and the University. This is the normal and preferred mechanism to be used by the department to indicate the acceptance of a core course requirement taken elsewhere.

On occasion, and as an exception, a student may request that a requirement in the Physics core curriculum be waived. This will occur when the student believes that he or she has a course background equivalent to one of the Notre Dame core courses, but the course taken does not meet the requirements for transfer credit. In this case, the student may ask the department to waive the requirement of the course. If a waiver is granted, the record of this waiver is maintained by the DGS. No record of the waiver appears on the student's University transcript.

3.1 Transfer Credit Evaluation

The following applies to incoming graduate students to Physics who have already taken one or more graduate courses elsewhere.

For a course to be eligible for transfer:

- The student must have had graduate student status when he or she took the course;
- The course must have been completed within a five-year period prior to admission to the physics degree program;
- Grades of "B" or better must have been achieved;
- It must be a graduate level course.

Additionally:

- If student is transferring from an unfinished master's program, the student will not be allowed to transfer more than six semester credit hours into a Notre Dame Physics Ph.D. program;
- If student has completed a master's or Ph.D. program, the student will not be allowed to transfer more than 24 semester credit hours to the Notre Dame Physics Ph.D. program.

The above is a partial summary of the transfer-credit rules of the Graduate School and the University (see ACGS, Sec. 4.6, for more complete information).

The Department of Physics' role in transfer credit decisions is to make recommendations on the suitability of a graduate course as replacements for Notre Dame's physics core course requirements.

3.2 Review Process

At the time of student's orientation to the department, an initial meeting will be scheduled with the DGS. Prior to that meeting, the DGS will have reviewed the student's transcript in order to generate the list of possible transfer courses.

The student and the DGS will decide together which courses should be reviewed for possible transfer credit. The student may decide to forgo the transfer credit and take the Notre Dame course.

The student then makes an appointment with a designated recent professor(s) of the course(s). A list of these professors will be made available at orientation. This “review panel of professors” is responsible for making recommendations for particular courses in the Notre Dame physics core. The review panel professor will evaluate the suitability of the course taken as replacement for one of the physics core requirements.

The professor will ask to examine material related to the course taken, e.g., the syllabus, textbook, and tests taken as part of the course. The professor may ask the student to answer orally basic questions on the material studied in the course. If the student is unable to answer these questions satisfactorily, then the course will not be transferred.

The professor will report his or her recommendations on transfer credit back to the DGS. Final decisions on courses to be taken in the fall and on courses to be transferred will be made by the DGS after a second discussion with the student. The DGS has the responsibility of making the department’s recommendations on transfer credit to the Graduate School. At the end of the fall semester, the DGS forwards transfer credit recommendations to the Graduate School.

3.3 Waiver of Required Course

As described above, at the time of the student’s arrival in the department, the DGS will have reviewed the student’s previous transcripts looking for courses that are eligible for transfer credit. If the student believes that he or she has course background equivalent to one of the Notre Dame core courses, but the course taken does not meet the requirements for transfer credit, then the student may request that a requirement be waived.

After a discussion with the student, the DGS will send the student to the appropriate member of the review panel for transfer courses. The professor will evaluate the suitability of the course as a replacement for one of the Physics core requirements. If there appears to be a good match, then the professor will arrange to give a written exam comparable to past finals in the course. This final will be graded on a scale of pass/fail. There are no allowed retakes of this exam. A report of the grade and a recommendation on the waiver will be made by the professor to the DGS.

The student must discuss possible waivers of credit with the DGS before contacting any of the faculty on the review panel.

Written examinations on first-semester courses must be taken before the fourth class day, and graded before the sixth class day. Written examinations on all other core courses must be taken and graded before the end of the first semester.

The DGS maintains discretion on the number of courses that may be waived for a particular student. Generally, for students following a Ph.D. program, no more than six courses will be waived. If a student following the Ph.D. program has a combination of waived and transferred courses, the total of the two categories generally will not exceed eight courses (or 24 credits).

Similar restrictions on waived and transferred courses exist for master’s students. A student may not transfer more than six credits or two courses towards a Notre Dame MS degree. Additionally, for master’s students, the combination of waived and transferred courses will not be allowed to exceed two courses (or 6 credits).

4 Preliminary Examination

Students are required to pass the written preliminary examination on undergraduate physics (“prelim”) prior to being invited to take the Ph.D. candidacy examination.

4.1 Description

The preliminary examination is in two parts. The first part of the examination contains questions similar to or from volume 1 of the text *Physics* by Halliday, Resnick, and Krane, current edition; the second part is based on volume 2 (extended) of the same text. These texts are available through the publisher, John Wiley and Sons; the fifth edition is current at the time of writing, ISBN 0-471-32057-9 and 0-471-40194-3. Some copies of these texts are available on loan from the department.

4.2 Policies

Students are allowed four tries to pass each part of the preliminary examination. Each part will be offered once on different Saturdays in the fall and spring semesters. Students must take each part of the examination when it is offered until he or she passes the entire prelim. If an exam is skipped for any reason other than a medically documented illness, that exam will be counted as a failure. One medically documented absence is allowed for each part of the prelim. Note that any student with a chronic illness should consider withdrawal until such time that the illness is resolved.

No preliminary examinations will be given to students who are past their second year. The student must pass both parts of the preliminary examination by the end of the second year of residence in order to continue in the program.

Each part of the preliminary examination is a four-hour written examination. Each question is graded independently by two faculty members on a scale of 0.0-4.0, with 3.0 being a Ph.D. pass. While the membership of the prelim committee will be public, the names of the two graders of each exam will not be released. The two graders will grade independently a scanned PDF copy of the student’s solved exam. The original solved exam will be retained on file by the department for one year after the student completes the requirement or leaves the university. The prelim committee will review the scores of both graders. If the committee judges that the grades differ significantly (e.g., by one grade point), they will ask for the graders to meet to reconcile scores. If this does not resolve the discrepancy, then a third grader will be found for that problem, and three grades will be averaged. Average grades for problems on failed exams will be released to students. No appeals of scores are allowed. The scores on the examination are reported to the DGS, who then notifies each student of his or her results.

After each exam is given, a copy (marked confidential) of the preliminary exam questions will be placed in a notebook available to students through the department office. Upon request to the DGS, the student and the student’s research advisor may receive a scanned PDF copy of the student’s solved exam. The prelim committee and the DGS will not go through the solved exam with the student, nor will they release solutions to the problems posed on previous exams. Research advisors will have the option to go through the student’s solved exam with the student.

4.3 Preparation Course

The department has regularly offered summer prelim preparation courses

PHYS 77031: Review of Fundamental Physics I

PHYS 77032: Review of Fundamental Physics II

for a subset of incoming graduate students (incoming graduate students who are already present in the country). Those students taking the courses are paid on a pro-rated basis for the one or two months of attendance, with the Graduate School paying the tuition. Attendance for enrolled students is mandatory. The course web site for PHYS 77031-77032, accessible through the physics web site, contains useful information for studying for the preliminary exams, including PDF copies of the equation sheets given to students with each exam. (Note: For future summers, a decision on whether the courses PHYS 77031-77032 will be offered and on which text is to be used will be made before the recruitment weekend, which is typically in March.)

The courses PHYS 77031-77032 cannot be repeated. Students who did not take one or both of the prelim preparation courses before their first year may request to take them in the summer after their first year. Approval of such requests is at the discretion of the DGS and will require the student receive permission from their research advisor and that he or she have a record of two prior attempts to pass the portion of the prelim exam covered by the requested course (or one attempt and one medically excused absence). The Graduate School will pay the tuition for such students, but stipend support will be offered only if funds are available after covering the stipends of the new incoming graduate students.

5 Degree Requirements

5.1 Summary of PhD Requirements

(Reference: ACGS, Sec. 6.2)

Course Work. The required course work includes a core curriculum, introductory and advanced research area courses, and certain other specific requirements as detailed in this guide. Some of the requirements may be met by transfer of credit from another institution or waiver of the requirement by the department (see Sec. 3).

Credit Hours. At least sixty (60) credit hours are required for the Ph.D. degree. These hours are earned through a combination of coursework and research.

Foreign Language Requirement. The Department of Physics does not have a foreign language requirement for the Ph.D. degree.

Residency. The minimum residency requirement for the Ph.D. degree is full-time status for four consecutive semesters (may include summer session).

Responsible Conduct of Research and Ethics Training. All Ph.D. students must complete training modules for the Responsible Conduct of Research and Ethics requirement (see ACGS, Sec. 6.2.4).

Degree Eligibility. Students must fulfill all doctoral requirements, including the dissertation and its defense, within eight years from the time of matriculation. Failure to complete any of the Graduate School or departmental requirements within the prescribed period may result in forfeiture of the student's degree eligibility.

Required Examinations. There are three required examinations for Ph.D. students. First, students must pass the department's preliminary examination before the end of the second academic year. Second, students must pass the written and oral candidacy examinations by the end of the fourth academic year. Finally, Ph.D. students are expected to defend their dissertations by the end of the sixth academic year. It is Graduate School policy that all students must fulfill all doctoral requirements, including the dissertation and its defense, within eight years from the time of matriculation.

5.2 Summary of Master's Requirements

(Reference: ACGS, Sec. 6.1)

Introduction. The department does not normally accept students who plan to terminate their studies with a master's degree. Every beginning graduate student is considered a potential Ph.D. candidate who will complete a dissertation based on original research conducted under the direction of a faculty advisor. Thus, there is no option in the Physics Department for a research master's degree. Master's degrees are earned instead through the combination of course work and the master's comprehensive examination.

Course Work and Credit Hours. The Department of Physics requires 30 credit hours of course work for the master's degree. These credits are chosen from courses taken as part of the Ph.D. curriculum. Students in a research program may include up to 6 credit hours in research courses in their master's program.

Foreign Language Requirement. The Department of Physics does not have a foreign language requirement for the master's degree.

Residency. The minimum residency requirement for the master's degree is registration in full-time status for one semester during the academic year or for one summer session.

Degree Eligibility. Failure to complete all requirements for the master's degree within five years results in forfeiture of degree eligibility. A master's program that is pursued during the summer and the academic year must also be completed within five years.

Master's Comprehensive Examination. The master's comprehensive examination in the Department of Physics is an oral test on material covered in the basic graduate courses. The governing board consists of the research advisor of the student and two other faculty members. A majority vote of the three examiners decides the outcome. One retake is permitted if recommended by the board. The student is immediately informed of the results of the examination.

Award of Master's Degree to Doctoral Students. A doctoral student may receive the master's degree without taking the master's comprehensive examination on the recommendation of the department and completion of: (1) the 30 credit hours required by the department for the master's degree; and (2) all parts of the doctoral candidacy examination. (By passing the doctoral candidacy examination, the student is also considered to have passed the master's comprehensive examination.) Post-candidacy Ph.D. students should see the DGS to discuss this option.

Part II

Research, Candidacy, and Dissertation

6 Research Advisors and Co-Advisors

Research advisors are chosen from the list of the regular “tenure and tenure track” (T&TT) faculty of the department, including “concurrent” T&TT faculty from other departments. A list of eligible faculty is posted on the student section of the department web site. Of course, the likelihood that someone on that list will accept a graduate student will depend on their research funding and activity level and their assessment of the qualifications of the graduate student.

It is expected that all students will make at least a tentative choice of a research advisor by the start of the second semester of graduate study. To facilitate the choice of a research advisor, in the fall semester, the DGS organizes a series of talks, the “research orientation seminars,” in which professors in the department describe their research to the first-year class. Attendance of this program is mandatory. Students are also encouraged to talk individually to professors about research opportunities in the group and future opportunities for research assistant (RA) positions. Recognizing the importance of the research advising relationship, the department requires the student and the advisor to commit to each other by signing a research advisor contract (see at the end of this guide), which is given to the DGS for the department’s record. For first-year students, no research advisor contract may be signed until after the presentation of all of the research orientation seminars.

An increasingly common option is for the student to select two research advisors, or “co-advisors.” The two advisors may both be regular T&TT faculty in the department, or may include one T&TT faculty from the department plus a second researcher chosen from the physics research or emeritus faculty, from the faculty in another department or unit of the university, or a researcher chosen from outside the university. In the latter case, the external co-advisor must also be approved by the Committee on Advancement of Promotions (CAP). The DGS will initiate the approval process by requesting a CV and passing it on to the CAP. If a co-advisor is chosen, all parties (that is, both co-advisors and the student) must sign the research advisor contract.

Research advisor responsibilities include the suggestion of possible research problems and guidance and direction in the chosen problem. Research advisors will also advise the student on courses to supplement the required curriculum. They are expected to guide the student in professional development and to seek or provide the funding required to support the student (in the summer and also as soon as possible after the student’s course work is complete). Research advisors give feedback to the student through regular research meetings and grades in the research and dissertation course. If the student has co-advisors, the co-advisors will determine a system for jointly grading the student (e.g., a joint decision on the research grade or perhaps alternation of research sections between the two research advisors).

A frequent question with co-advisors concerns the roles and responsibilities of the two advisors. The following terminology is introduced to discuss this. At least one of the two advisors must be on the T&TT faculty in the student’s department; this advisor is denoted the “home-department advisor.” The second advisor may also be a “home-department advisor,” but if the second advisor is not on the T&TT faculty in the student’s department, then this person will be called an “external advisor.” A second designation, “primary advisor,” is used to denote the advisor primarily responsible for the student’s research. The primary advisor is generally the one who provides office or laboratory space and funding to the student. Primary advisors can be either home-department advisors or external advisors. There is no requirement that a primary advisor be designated, that is, it can be the case that the co-advisors take near equal roles in supporting and mentoring the student. Questions of research attribution should follow normal standards in research, e.g., papers submitted to journals and presentations at conferences should only include those who were actually involved in the research work. The home-department advisor always assumes the role of making sure that academic requirements are completed by the student according to the rules of the department. An external advisor should clearly understand that the jointly shared student is a Physics graduate student, following the requirements and policies of the department

as described in this guide, e.g., the student's required physics curriculum should be completed before electives are taken from the external advisor's department. Both co-advisors will be equal partners in the students written and oral candidacy exams and the Ph.D. defense, e.g., both ideally would contribute questions to the written candidacy exam. Both advisors will sign the final dissertation, so both will need to be in support of the work presented in the dissertation. And if there is a recognized primary external advisor, then the student's department chair may ask that advisor to assume responsibility for the support of the student, e.g., in the summer and after courses are complete. Clearly, both co-advisors should thoroughly discuss their roles before signing a co-advisor research contract.

The following are anticipated situations where the research contract may need to be re-negotiated or broken:

Voluntary change of research advisors or research area by the student. The initial choice of research area and an advisor by a student is considered to be somewhat tentative, requiring evaluation by all for an initial period of time. A six-month trial period is common; for theory students, the trial period might go through the end of the second year. If during this period, the student decides to change areas and/or advisors, common courtesy demands that the student first notify the current research advisor that they are thinking of a change. Changes of research advisor sometimes occur after the second year, but the new advisor and the student must both recognize that the student's "clock" does not restart after the change; a prime consideration should thus be how to accomplish the change without impacting greatly the student's time to degree. After the third year, if there is serious difficulty with a research advisor, a change can still be made, but a change of research groups will be problematic. It will be at the discretion of the DGS, chair, and new research advisor whether previous invitations to take candidacy or results of previous candidacy exams still hold for the new research situation. It is extremely important that funding opportunities be considered when making a change, since the department will not be obligated to provide support beyond what was promised when the student was first admitted. In all cases, after a new research advisor has been found, a new research advisor contract should be signed and filed with the DGS. The new research contract must include a releasing signature from the previous research advisor. This signature indicates that the change of research advisor has been discussed.

Termination of a research advisor contract by a research advisor. The research advisor contract implies significant responsibilities for the advisor, including mentoring in research and the securing of some sort of funding for that student (TA, RA, or fellowship). For the student, the research advisor contract implies a work commitment and a sacrifice of time and energy for the goal of obtaining research experience and an expected future Ph.D. So if there is a situation where the research advisor contemplates the termination of the student's contract, this must be handled in a professional way. This includes a history of clear communication of expectations by the advisor to the student. If there is dissatisfaction with the student's research performance, the student must be told how to improve and be given time to improve. It is recommended that the research advisor document the warning in writing (see Sec. 5.5 of ACGS). If the student has not been performing adequately in research, the student's research grades should reflect this. (Two grades of U in a row in research will result in the graduate student being placed on probation; see Sec. 5.6.3 of ACGS.) If the advisor ultimately decides to terminate the student, a notification of the breaking of the research advisor contract must be given to the chair and the DGS so that the student's future in the department can be discussed.

The "Divorce" of Co-Advisors. Either the student or the co-advisors may decide to terminate the co-advising contract. In the case that co-advisors decide to divorce, the first question to address is which co-advisor assumes sole responsibility for the student. Generally, this will be the primary advisor, but, of course, the student has a strong say in this. If the primary advisor is also external, a breaking of the

research advisor contract would then leave the student without a home-department advisor. A solution to this dilemma is that the external advisor can request that either the DGS or the department chair assume the role of the home-department advisor. It is best if all “divorces” can be amicably solved, but if this is not possible, the organizational chart of the university and its reporting lines will be used to find an arbitrator for the problem (department chair, dean, or provost or perhaps an officer in the Office of Research).

7 Candidacy

7.1 Invitations to Candidacy

Students must be invited by the department to take the candidacy examination. The department requires that: (1) The student has a positive recommendation from the research advisor. (2) The student has passed both parts of the preliminary examination; (3) The student has completed the Ph.D. course requirements (Students who have completed almost all requirements except 3 credits of breadth course(s), will still be considered for invitation to candidacy, contingent on completion of the requirement.); and (4) The student have a grade point average (GPA) of at least 3.000. The department gathers these four pieces of information from the advisor (item 1) and the DGS (items 2 to 4), placing them in a summary form.

Candidacy should be completed before the end of the fourth academic year. Students who delay taking the candidacy examination without good cause may find themselves without stipend or tuition support.

Invitation to candidacy is initiated by the research advisor, who informs the DGS of a student's readiness for candidacy and gives a summary of the student's accomplishments. The DGS reviews the faculty request and ensures the student has completed the appropriate classwork. After concurring with the faculty recommendation, the DGS formally invites the student to candidacy. At the end of each semester, the DGS sends a summary of the candidacy nominations to the faculty as a whole.

7.2 Assembling the Research Committee

Once a student has been invited to take candidacy, it is time to assemble the student's research committee. The DGS is responsible for asking faculty to serve on this committee. The research committee is generally the same as the oral candidacy examination committee. These faculty members will also normally be among the readers of the completed dissertation, and thus will also be the examination committee for the Ph.D. defense.

In assembling the research committee, the DGS also consults with the research advisor and the student on their preferences for faculty for the oral candidacy examination, and then makes the final choices of members. (Please also see discussion of the scheduling of oral candidacy exams, below.) A typical committee includes two faculty from the same research area as the advisor plus one faculty from outside the research area. For interdisciplinary students, one of the two faculty members from the student's research area can be from outside of the department. Committee members are normally chosen from the T&TT faculty of the university, although if approved by the department's CAP, a faculty member from another institution may also be appointed to the committee. Students, in consultation with their research advisor(s), are allowed to exclude three faculty from consideration, similar to what is done with journals and the choice of referees. The advisor(s) and the student may suggest people who would be appropriate from the student's research area, but should do this in such a way that there remains a group for the DGS to choose among. In choosing the third member of the committee, every attempt will be made to balance research committee loads among the T&TT faculty and also to spread membership among all the other research areas of the department.

7.3 The Written Candidacy Examination

The Ph.D. candidacy examination consists of two parts: written and oral. The written examination is given first. This examination, which is four hours in length, is confined to the student's area of specialization. Once the candidate has completed the written examination, copies of the questions should

be given to the department and then made available to all faculty members and to interested graduate students. A notebook of the examinations is made available to students through the department office. Each exam question is graded independently by two members of the T&TT faculty on a scale of 0.0-4.0, with 3.0 being a Ph.D. pass. When complete, a report summarizing the procedures used and the grades on the exam should be sent by email to the DGS, for the department's records. Results of the written examination are reported to the student by the research advisor.

Note: the department recommends that the written exam be given no later than 6 months after the invitation to take candidacy.

7.4 The Research Proposal

Part of the preparation for the oral candidacy examination is the creation of the research proposal describing the student's proposed thesis research. Preparation of this document is viewed as an important part of the "professionalization" of the graduate student. Advisors and students should work together to make sure that the research proposal reflects the student's readiness to become a candidate for the Ph.D. degree.

The student and research advisor must mutually agree upon the contents of the research proposal. The research proposal should clearly and concisely state the research problem, the research methods to be applied for its resolution, anticipated difficulties (and techniques for coping with these). It should include an introduction to the general research topic as well as citations to the relevant research literature. Since the fall 2003, copies of research proposals have been filed in a notebook available to students and the department through the department office.

Sufficient time must be given to oral exam committee members (the student's "research committee") to review the research proposal in advance of the oral candidacy exam. In the Department of Physics, this time period is 5 business days. (This is defined as the days when the office is staffed, that is, typically Monday through Friday excluding any official staff holidays such as Christmas break, Good Friday, etc.) Students should give a copy of the proposal to the department at the same time that committee members receive their copy. The office will then publicly post a copy of the research proposal on the department's bulletin board.

7.5 Scheduling the Oral Candidacy Examination

The department recommends that the oral examination be given no later than 6 months after the written exam is passed.

Due to the active professional travel schedules of many of the physics faculty, it can be difficult to schedule the oral candidacy exam. The following are rules agreed to by the faculty.

The primary responsibility for scheduling a tentative date for an oral-candidacy exam lies with the graduate student. The tentative date should take into account the 5 business-day period for readers of the research proposal. There are various ways to schedule a tentative date. The student may do this through individual conversations or emails with the advisor(s) and committee. Another suggestion is to use an on-line poll to suggest dates to the advisor and committee. (The student should first exclude all officially scheduled teaching times, seminars, and colloquium, and then construct a poll that can be finished quickly by all participants.) A third option is to ask office staff to assist in scheduling.

The faculty have agreed that a one-week period is a reasonable time for a request for scheduling information from a student to a faculty member. Polite reminders of the request may be sent within this week, but if no information is forthcoming in the week on scheduling availability, then the student should involve his/her research advisor. The research advisor is then asked to contact committee members about their availability for an exam.

It is unreasonable to ask faculty to tie up their schedules for candidacy-exam dates too far in advance. A month in advance is reasonable. It is not reasonable to request to schedule multiple dates for an exam.

When a tentative time is agreed upon, the time, date, and place should be recorded with the graduate student coordinator. The date the proposal is due to committee members and the office is determined at that time.

The office is responsible for scheduling the oral candidacy exam with the Graduate School at least three business days ahead of time.

Other rules agreed to by the faculty:

If at all possible, candidacy exams should be scheduled during the academic year. And while occasionally candidacy exams may occur during the summer, students must understand that this requires agreement and cooperation of all committee members. If a summer candidacy exam appears to be a necessity for a student, then the constraint of faculty availability should be taken into consideration at the time of assignment of the student's research committee.

If a faculty member commits to a particular date, it takes extraordinary circumstances to renege on this commitment. Examples include illness or family emergencies. In other circumstances, e.g., a forgotten or new conflict, the faculty member will need to arrange his/her own substitute from the T&TT faculty. The DGS should be informed of the substitution.

Finally, oral candidacy exams should occur before the end of the fourth year. Note: This is a Graduate School rule. Failure to comply may result in termination of any funding from the Graduate School.

7.6 The Oral Candidacy Examination

The oral examination takes approximately two hours (not less than 1.5 hours and not more than 2.5 hours). It starts with a 30-minute presentation by the student of the research proposal. The student or research advisor may invite guests to this presentation, but the guests are excused from the examination before questions from the research committee begin. The examining committee will first ask questions of the student that focus on the research laid out in the research proposal. A second round of questions is typical and may include more general physics questions in addition to further questions focused on the student's research proposal.

Only one committee member is allowed to participate in the examination from a distance (e.g., by web cam or teleconferencing). Arrangements for distance participation must be cleared in advance of the examination with the DGS.

The purpose of the oral candidacy examination is to certify that the student has sufficient command of background material and techniques to ensure successful completion of the proposed dissertation. The examining committee votes on the oral examination (pass/fail) immediately after the examination, with three passing votes required to pass the examination. If the committee has five members (e.g., including the co-advisor), four votes are required to pass. Successfully passing this examination constitutes approval of the dissertation proposal. After the exam is over, the committee's votes are reported on a recording form; the department office then sends this form to the Graduate School.

In case of failure in either or both parts of the doctoral candidacy examination, the department chair, on the recommendation of a majority of the examiners, may authorize a retake of the examination. The Graduate School must approve any such authorizations. Failing the candidacy exam a second time results in forfeiture of degree eligibility and is recorded on the candidate's permanent record.

The following quotes from the Graduate School web site:

The oral candidacy examination may serve several purposes. In part, it tests the candidate's readiness for advanced research in the more specialized area(s) of his/her field. It may also be comprehensive. Successful passage indicates that, in the judgment of the committee, the candidate has an adequate knowledge of the basic literature, problems, and methods of his/her field to proceed to a dissertation. If the proposal defense is part of the oral exam, it should be a defense of a proposal and not of a completed dissertation.

Prior to the examination, committees should review departmental regulations for the conduct of the exam, the process of the exam, and voting procedures. Before the exam begins, they should inform the candidate of the process of the exam. After completion of the examination, the candidate should be asked to leave the room. Discussion of the candidate's performance should then commence, with the committee ultimately voting on whether that performance merits a passing or failing grade. On a board of three, two votes are required to pass. On a board of four, three votes are required to pass. If a department chooses to have five members, four votes are required to pass. A written report of the results of the voting is sent immediately to the Graduate School by a member of the committee, normally the adviser.

In case of failure, the department chair, on the recommendation of a majority of the examiners, may authorize a retake of the examination if this is permitted by departmental regulations. An authorization for retake must be approved by the Graduate School. A second failure results in forfeiture of degree eligibility and is recorded on the candidate's permanent record.

A candidate has the right to appeal the result of the exam to the Dean of the Graduate School on procedural grounds only, not on its substance or on his/her performance. If a retake is granted, an outside monitor appointed by the Graduate School must be present.

7.7 Admission to Candidacy

Once the student has satisfactorily completed all course requirements, and passed the written and oral candidacy examinations, the student is admitted to candidacy. A student who has not completed the physics breadth requirement before taking the candidacy examinations will not be formally admitted to candidacy until this requirement is complete.

Admission to candidacy for a physics graduate student implies that all formal requirements for the Ph.D. have been completed with exception of the dissertation.

Admission to candidacy is a prerequisite to receiving any graduate degree. To qualify for admission to doctoral candidacy, the student must: Have provided proof of the conferral of an undergraduate degree; be in a doctoral program; have been continuously enrolled in the program; be in good standing; have passed the written and oral parts of the doctoral candidacy examination.

There is a form for applying for admission to candidacy. The department office prepares this form for the Graduate School after the oral candidacy examination has been passed.

A Ph.D. student who wishes to receive a MS degree must also apply for admission to master's degree candidacy. The department office can also prepare this form after the oral candidacy examination has been passed. The same form is also required for those students who wish to terminate with the MS degree (see Part I of this guide.)

8 Post-Candidacy Review Meetings

For post-candidacy students, annual research committee meetings are required. A form for reporting the results of this meeting is given on the department web site.

9 Doctoral Dissertation and Defense

9.1 Doctoral Committee

The DGS will appoint a dissertation committee consisting of the dissertation director (a.k.a., the research advisor) and three readers. Normally, the committee is drawn from the membership of the student's oral candidacy committee and is the same as the student's research committee.

In the event that the candidate's dissertation director departs the University, an additional co-director (co-advisor) from among the regular teaching and research faculty will be appointed to the dissertation committee. In exceptional circumstances, the department, by faculty vote, may recommend to the Graduate School that the former faculty member remain the sole advisor. Note: Co-directors cannot serve as readers, so if there are co-directors, the student's committee's size is increased by one in number.

9.2 The Reading of the Dissertation

The physics faculty have agreed that readers need sufficient time to read the thesis. The following has been agreed to by the faculty.

The dissertation is one of the most important documents that a Ph.D. physicist ever writes. The copy that is submitted to the readers should be a near final copy of the work. Specifically, readers are not expected to be editors of the thesis, so the copy that they review should have already been edited for spelling and grammatical mistakes. The research advisor(s) should also have approved the release of the dissertation to the readers.

Reading a dissertation is a serious responsibility for the faculty reader, taking a significant amount of time. The Graduate School suggests that readers be given a two- to four-week period to read and approve/reject a dissertation. The physics faculty discussed this requirement and agreed that the time period for physics should be set to 15 business days. (This is defined as the days when the office is staffed, that is, typically Monday through Friday excluding any official staff holidays such as Christmas break, Good Friday, etc.)

The office is responsible for setting the clock on the 15 business-day reading period. To clarify, suppose a student delivers a dissertation to readers on a Wednesday. The count starts on the next day, Thursday. If there are no official holidays in the time period, then the readers have through the Wednesday three weeks later to read the dissertation and decide whether it is approved or rejected. Readers should all be given a copy of the dissertation on the same day, in the format that each prefers (electronic or hard copy). For purposes of setting the clock, the office needs to receive an electronic copy on the same day.

Readers should not be given multiple drafts of the dissertation during the reading period. A reader has the right to ask the 15 business-day clock to be reset to 0 if students present a new draft or chapter(s). An insufficiently edited dissertation may also be returned to the student, again resetting the 15 business-day clock for the readers.

9.3 Scheduling the Defense

Due to the active professional travel schedules of many of the physics faculty, it can be difficult to schedule the defense. The following rules have been agreed to by the faculty and are similar to those for the oral candidacy exam.

The primary responsibility for scheduling a tentative date for a defense lies with the graduate students. The tentative date is based on the 15 business-day reading period plus the three business-day for scheduling with the Graduate School. There are various ways to schedule a tentative date. The student

may do this through individual conversations or emails with the advisor(s) and committee. Another suggestion is to use an on-line poll to suggest dates to the advisor and committee. (The student should first exclude all officially scheduled teaching times, seminars, and colloquium, and then construct a poll that can be finished quickly by all participants.) A third option is to ask office staff to assist in scheduling.

The faculty have agreed that a one-week period is a reasonable time for a request for scheduling information from a student to a faculty member. Polite reminders of the request may be sent with this week, but if no information is forthcoming in the week on scheduling availability, then the student should involve his/her research advisor. The research advisor is then asked to contact committee members about their availability for the defense.

It is unreasonable to ask faculty to tie up their schedules for defense dates too far in advance. A month in advance is reasonable. It is not reasonable to request to schedule multiple dates for a defense.

When a tentative time is agreed upon, the time, date, place, and title of the dissertation should be recorded with the graduate student coordinator. The coordinator will not schedule the defense with the Graduate School until all signed readers' reports have been received. Readers must make a decision on whether they sign the form by 15 business days after receipt of the dissertation.

Also agreed upon by the physics faculty were the following policies regarding defense scheduling:

Many of the physics faculty are involved in research both off-campus and abroad. The summer time is the prime season for scheduling off-campus experiments and conferences. It is also the time when faculty takes vacation. Students should not expect that faculty will be able to commit to a student defense during the summer. It is fine to try to schedule a defense in the summer, but it will take far more flexibility on the part of all committee members than during the academic year.

The department expects that the committee assigned at the time of oral candidacy will continue to track the student's progress through the defense. Thus, every scheduling effort should involve attempting to schedule a defense at a time convenient to all advisors and members of the committee.

Exceptions to this policy can exist, e.g., the illness or unavailability (e.g., due to sabbatical) of someone on the committee or a particularly awkward convergence of conflicts in proposed times of the defense. First, the student should explore conducting the defense with one faculty member present by "virtual link." If this does not work, then the student may request the replacement of someone on sabbatical. During the academic year, the responsibility for a sabbatical replacement lies with the DGS. During the summer, the responsibility for organizing a replacement lies with the student and research advisor, in consultation with the DGS. Every attempt should be made to keep the substitutes to just one.

If a faculty member commits to a particular date, it takes extraordinary circumstances to renege on this commitment. Examples include illness or family emergencies. In other circumstances, e.g., a forgotten or new conflict, the faculty member will need to arrange his/her own substitute from the T&TT faculty. The DGS should be informed of the substitution.

9.4 Doctoral Defense

In defending the dissertation, the student supports its claims, procedures and results. The defense is the traditional instrument that enables the doctoral candidate to explore with the dissertation committee the dissertation's substantive and methodological force. In this way, the candidate and the committee confirm the candidate's scholarly grasp of the chosen research area.

The format of the defense is determined by the department with the Graduate School's approval. At the defense, the student starts by giving a 30 minute presentation of his or her research. The time and location of the first 30 minutes of the defense will be advertised, with the talk open to all interested parties. Guests are excused from the defense once the questions begin. The student will be questioned on the research by the dissertation committee. A dissertation defense must last at least 1.5 hours and end before 2.5 hours. After the examination is completed, the chair calls for a discussion followed by a

vote of the dissertation committee. At least three votes out of four will be required to pass a candidate, and four votes on a five-person committee. The chair sends a written report of the overall quality of the defense and the voting results immediately to the Graduate School. After the exam is over, committee votes are reported on a recording form; the department office then sends this form to the Graduate School.

Only one committee member is allowed to participate in the examination from a distance (e.g., by web cam or teleconferencing). Arrangements for distance participation must be cleared in advance of the examination with the DGS.

In the case of failure of the defense, on the recommendation of a majority of the examiners, another opportunity to defend may be authorized. An authorization for a second defense must be approved by the Graduate School. A second failure results in forfeiture of degree eligibility and is recorded on the candidate's permanent record.

The following quotes from the Graduate School web site:

Overview — Defense of the Doctoral Dissertation

The purpose of a dissertation defense is to offer the doctoral candidate an opportunity to support the claims, procedures, and results of the dissertation. The defense is the traditional instrument that enables the candidate to explore with the committee the dissertation's substantive and methodological force. In this way, the candidate and the committee confirm the candidate's scholarly grasp of the chosen research area and original contribution to knowledge.

Dissertation defenses will not be allowed to proceed until all reader's reports have been received in the Graduate School at least two business days before the defense takes place.

Prior to the defense, committees should review departmental regulations for the conduct of the exam, the process of the exam, and voting procedures. Before the exam begins, they should inform the candidate of the process of the defense. After completion of the examination, the candidate should be asked to leave the room. Discussion of the candidate's performance should then commence, with the committee ultimately voting on whether that performance merits a passing or failing grade. On a board of three, two votes are required to pass. On a board of four, three votes are required to pass. If a department chooses to have five members, four votes are required to pass. A written report of the results of the voting is sent immediately to the Graduate School by a member of the committee, normally the adviser.

In case of failure, the department chair, on the recommendation of a majority of the examiners, may authorize a retake of the defense if this is permitted by departmental regulations. An authorization for retake must be approved by the Graduate School. A second failure results in forfeiture of degree eligibility and is recorded on the candidate's permanent record.

A candidate has the right to appeal the result of the defense to the Dean of the Graduate School on procedural grounds only, not on its substance or on his/her performance. If a retake is granted, an outside monitor appointed by the Graduate School must be present.

9.5 Submission of the Doctoral Dissertation

Before a Ph.D. student can submit his or her dissertation to the Graduate School office, he or she must have successfully defended it. Even though the dissertation has been approved for defense, revisions may be required. If defects in the dissertation come to light at the defense, the student may be asked to revise the dissertation before it is accepted by the Graduate School and the degree is conferred. In that

case, it will be the responsibility of the research advisor(s), or such person as the defense committee may appoint, to report to the Graduate School that such revisions have been completed satisfactorily.

Formatting and submission instructions, forms and links are available via the Current Students page at <http://graduateschool.nd.edu>.

The Graduate School will check dissertations to ensure that they conform to the UMI guidelines for formatting. (See the Graduate School website for details.) Beyond these minimum requirements, the Graduate School requires that students use the formatting guidelines of their discipline. Since the Department of Physics does not have its own established formatting guidelines, the department will continue to follow the guidelines in the Graduate School's Guide for Formatting and Submitting Dissertations and Theses. The Guide and a sample LaTeX document are available at the Graduate School office or through its web site.

When you click the "Submit for Review" button on the ETD site, your research director(s) will receive a message asking them to review and approve your submission online. Only faculty with an active NetID will be able to access the approval system. If your director cannot access the website, s/he may email a note of approval to Shari Sweet, or the student may submit a printed title page with the research director's original signature; in both cases, we will note the director's approval and sign off on the submission on their behalf. It is required that the student submit a printed or PDF copy of the dissertation to the Graduate School for a preliminary format check well in advance of the deadline, optimally at the same time he or she delivers copies to the readers. The student must comply with the formatting requirements listed in the ProQuest booklet, "Publishing Your Doctoral Dissertation with UMI Dissertation Publishing" Additional formatting guidelines are available in the Graduate School's "Guide for Formatting and Submitting Dissertations and Theses."

One print-quality PDF of the dissertation must be submitted to the Electronic Thesis and Dissertation (ETD) website (<http://etd.nd.edu>) by the date listed on the Graduate School calendar. Along with the required submission fees and forms, the student must also submit two printed title pages with his or her adviser's original signature. The date at the bottom of the title page must match the month and year of formal submission to the Graduate School.

10 Graduation: Master's and Ph.D.

When registering for classes in the fall, spring and summer students are asked if they plan to graduate. When indicating yes then those students are added to the graduation list. The graduation list includes those who are expected to graduate with a master's degree, those receiving a master's degree and continuing on as Ph.D. candidates, and the names of those who expect to defend their Ph.D.

Deadlines for the graduation list are posted on the Graduate School's web site. If deadlines are missed, then typically the graduation date shifts to the next semester (or to summer session).

The following quotes from the Graduate School:

Graduation List

Requests for graduation lists are sent out to the departments three times a year.

The Registrar's Office posts the graduation list on its website. Students are expected to check the site to verify that all graduation information (name, hometown, degree, adviser) is correct.

Commencement

Commencement is held once a year, in May. Students who graduate in August and January may participate in Commencement exercises and are included in the Commencement program in May. Graduate degrees are awarded during the Graduate School ceremony, but students may also attend the University ceremony if they wish.

Graduate School Requirements

The following is a list of Graduate School requirements that must be met in order to be eligible for graduation: Submission of an original undergraduate transcript (or diploma for international students) showing conferral of an undergraduate degree; enrollment and registration for at least 1 credit hour during the semester of graduation (or for a zero-credit course, during the summer session); a cumulative GPA of at least 3.0; no "I" grades in any course during the final semester of a terminal degree; accumulation of the minimum number of courses required for graduation in the department; accumulation of the minimum number of credit hours required for graduation in the department; passage of the oral candidacy exam (for Ph.D. students); submission of two reader's reports for the master's thesis, and at least two for the doctoral dissertation; passage of the master's comprehensive exam (if applicable) or the dissertation defense by the deadline posted on the Graduate School calendar; submission of an admission to master's or doctoral degree candidacy form; submission of one PDF copy of the final version of the thesis or dissertation, along with two original signed title pages, relevant forms and fees, on or before the final submission deadline prior to the graduation date.

Part III

Administrative policies

11 Financial Support

In order to be eligible for University funding, the student must be enrolled full-time, seeking a graduate degree at Notre Dame, and be in academic good standing (defined below).

Financial support allotted by the Graduate School for distribution by the department includes academic year tuition scholarships, graduate assistantships, and departmental fellowships, as well as summer session tuition scholarships and University fellowships.

All entering graduate students and some continuing students in good academic standing are awarded graduate assistantships (or fellowships) from the University. In physics, all graduate assistantships (GAs) are teaching assistantships (TAs) and have duties and responsibilities as discussed below.

Students are expected to transition to research assistantship (RA) funding once they are fully engaged in research, as soon as their research advisor's funding permits. This transition should occur no later than the end of the student's second year, except in unusual circumstances. For research advisors without external financial support, the department has typically committed GA support through the student's fifth year. Students are expected to transition to research assistantship (RA) funding once they are fully engaged in research, as soon as their research advisor's funding permits. This transition should occur no later than the end of the student's second year, except in unusual circumstances.

11.1 Teaching Assistantships

Teaching assistants (TAs) typically assist in undergraduate and graduate laboratories, tutorial sessions, or with grading problems or examinations. The time required for these duties is normally 15 hours per week. Detailed TA information is posted on the department web site.

Before teaching assignments are made, the supervisor of teaching assistants will ask the faculty their needs and preferences for TAs and also ask the TAs for their preferences for teaching duties. Preferences are considered, and honored when possible, subject to the constraint of meeting the department's needs. Minimal revisions to assignments are made during the first week of classes when scheduling conflicts occur. Problems with the teaching assignments, the supervisor, the TA, or the TA's teaching load should be called to the immediate attention of the DGS.

At the end of each semester, every teaching assistant is rated by the faculty on the manner in which he or she has performed these duties. The student will receive periodically or on request a summary of those ratings. A student who has performed his or her assigned duties poorly will receive a letter of warning. If his or her performance has not improved by the end of the period specified, then that person risks being not in good standing with the department on the basis of service and will either lose the TA stipend or have the TA stipend reduced.

11.2 Research Assistantships

Post-candidacy students may be supported by research grants made to their research advisor from agencies outside the University. The duties required for such grants are defined by the research director and the continuation of such support is subject to the availability of funds and the advisor's discretion. Not all professors have such grants.

11.3 University and External Fellowships

The department and University also award fellowships to a number of highly qualified graduate students. Notification is by letter.

Information on fellowships available from inside and outside of the University is shared periodically with the students and advisors via the department e-mail list-servs. Students and advisors are also urged to do their own searching for academic-year and summer fellowship opportunities. Information is also posted on the Graduate School and the department websites.

11.4 Loss of Graduate Assistantship Stipend

A student placed on probation will lose financial support from the Graduate School (stipend, full tuition, health subsidy, and professional development funds) except for a tuition scholarship that covers eight of the nine credit hours required to maintain full-time status (see ACGs, Sec. 5.6.2).

It is Graduate School policy that students beyond six years of enrollment are ineligible to receive a GA stipend.

The department through its admission letter guarantees five years of academic-year support for those students in good standing. This support will be removed if the student has a history of performing his or her assigned TA duties poorly; in those cases the student will be designated as being not in good standing in the department on the basis of service and may lose their financial support.

11.5 General Rules

Assistants and fellows who receive a full stipend should not be employed elsewhere either on or off campus. Graduate students are provided stipends so that they can devote full time to their studies. Therefore, they are discouraged from taking part-time employment. If students have a personal or professional reason to claim exception, part-time work must be approved by the graduate advisors (the DGS and research advisor), the primary employer, and the Graduate School.

Assistants and fellows who receive a full stipend should also take a full-time academic schedule, defined to be at least 9 credit hours per semester. Details of courses appropriate for this schedule are given earlier in this guide.

Recipients of federal financial aid must comply with the standards of progress set by their respective departments for their particular programs of study. The director of financial aid will notify students in writing when failure to maintain progress will result in the loss of financial aid. Appeals indicating mitigating circumstances must be made in writing to the director of financial aid.

11.6 Tuition Scholarships

All entering graduate students and all continuing students in good academic standing and on stipend support are awarded academic year tuition scholarships. These cover full-time schedules (9 credits or more) for students in years one to eight. A graduate student cannot receive more than eight academic years of tuition support from the Graduate School or from funds allotted by the Graduate School to departments.

After the eighth year of graduate study, the student will require both a Graduate School approval for continued Ph.D. eligibility (ACGS, Sec. 6.2.6) and will need non-graduate school funds for tuition for courses. The minimal registration to remain a graduate student is 1 credit during the academic year (part-time). Students completing graduation requirements early in the semester and those completing their degree away from campus may save on tuition by being non-resident (see ACGS, Sec. 3.3). Students needing campus facilities (e.g., laboratories, computers) to complete their research work should retain resident status.

11.7 Summer Tuition

The Graduate School requires that students who wish to request tuition for a credit-bearing course taught in Summer Session complete their form:

<http://graduateschool.nd.edu/forms/summer-tuition-scholarship-application/>.

Generally approved requests include courses appropriate for the student's research that are not taught during the academic year. More details are given under the section, Summer Session.

11.8 Summer Funding

Summer funding is provided primarily through external funding obtained by the research advisors. A limited number of TA positions and fellowships exist for summer. The department develops a list of those graduate students desiring summer TA support. In consultation with the chair, the DGS then makes the summer TA assignments.

11.9 Student Health Insurance Subsidy

For the 2016-17 academic year, the cost for a single student for health insurance will be completely covered by the University. Graduate student eligibility is set at the lowest standard 9-month stipend. The academic year threshold is 19,000 *over 9 months* or 21,500 over 12 months. Doctoral students must be in their first 8 years of study to be eligible for a health subsidy.

Students who plan to graduate in January have the option to enroll in insurance for the fall term only. This allows those transitioning to a job to enroll in their employer's plan starting January 1. Students should contact Connie Morrow in Health Services (Morrow.22@nd.edu or 1-1882) to indicate fall only enrollment. Students will receive a prorated Graduate School health insurance subsidy based on the number of fully funded pays they receive before leaving the University. There is no financial penalty for enrolling in the fall only plan. Those who enroll in fall only but return in spring (do not graduate) will be automatically enrolled in the year-long insurance plan in the spring. The fall charge will be removed, and the full \$2,200 premium charge added.

It is possible to waive the student insurance plan. The deadline for doing this is September 15, 2016. Please consult Student Health Services for details.

12 Assessment of Student Progress

(Reference: ACGS, Secs. 5.5-5.6)

The Academic Code of the Graduate School (ACGS) has established two status definitions for graduate students: in good standing or on probation. In summary, a student is in good standing if enrolled and making satisfactory progress towards their degree.

The Graduate School also requests that all students receive written feedback from the program. It is expected that this feedback will call attention any problems that might lead to the student not being in good standing. The department has developed two assessment forms, the pre-candidacy and post-candidacy review forms (see at the end of this guide). In addition, all graduate students are required to submit a copy of their Curriculum Vitae (CV) to the department with the review form.

The focus of the pre-candidacy form is on the student's progress to becoming a Ph.D. candidate. Information is provided on that form by the department, to be checked by the student and research advisor. The student is also asked to meet formally with the research advisor to discuss progress towards degree.

The focus of the post-candidacy review form is on the student's progress towards completing the Ph.D. The annual review meeting is with the student's research committee. This is discussed in greater detail in the next section of this guide.

12.1 Defining Good Standing

The following is a description of the evaluation standards applied by the department to each pre-candidacy student at the end of each academic year.

At the end of the first year, to be in good standing, the student should have a minimum GPA of 3.0, have completed a minimum of 18 credits in the core curriculum, and should have made a preliminary selection of a research advisor. (Students who entered with advanced standing will take three 3-credit classes per semester until core curriculum requirements are met.)

For a second-year student, to be in good standing, he/she should have a minimum GPA of 3.000, should have completed a minimum of 33 credits in the required graduate curriculum, should have passed the preliminary examination, and should have taken at least two credits of research with the research advisor.

The next step is for the student to be invited to take candidacy exams. The process of being invited and descriptions of the written and oral candidacy examinations are given in the next section of the guide.

To be in good standing, the student must also comply with the established time frame for each step through the graduate program: Step 1, courses according to the schedule described previously in this guide. Step 2, be accepted into a research group by a research advisor. Step 3, pass the preliminary exam before the end of the third year. Step 4, be invited to take the candidacy exam. Step 5, pass the written candidacy exam. Step 6, write a candidacy proposal and pass the oral candidacy exam before the end of the student's fourth academic year. The annual pre-candidacy review form is thus designed to show progress on these steps, so that all may verify that the student is "on track."

12.2 The Warning Letter

A student who is in danger of losing good standing should not be surprised by the situation. The student and research advisor should both be aware of the "clock" of time elapsed, summarized by the "rule of even years" — pass the prelim exam before the end of the second academic year, pass candidacy by the end of the fourth academic year, know that there is no possibility of receiving a GA stipend past the

end of the sixth academic year, and be aware that Ph.D. eligibility can be lost at the end of the eighth academic year. The department will also periodically remind students and advisors of the approach of a time frame deadline.

Students may also lose good standing by failing to make progress towards degree. Research progress can be hard to assess for anyone but the research advisor, through the use of the annual review committee meeting for post-candidacy students and collection of their CV is meant as one way to keep the department informed of the student's progress towards degree. Warning letters, as described in Sec. 5.5 of the ACGS, are the preferred mechanism to inform students of concerns about their progress to degree.

12.3 Probationary Status

As described in Sec. 5.6 of the ACGS, either the department or the Graduate School may place a student on probationary status. On probation status is intended to offer a student the final opportunity to correct deficiencies. Normally, a student will be on probation for one, or at most, two semesters.

Note: Students on probation are ineligible for financial support from the Graduate School, see Sec. 5.6.2 of the ACGS for details.

12.4 Dismissal of a Student

Reference: ACGS, Sec. 5.7

A student may be dismissed from the physics program for failure to complete requirements by the established timeframe for them. Examples include failure to pass the preliminary exam before the end of the second academic year, failure to pass the candidacy exam by the end of the fourth academic year, and failure to meet the stipulations of a warning or probationary letter by the timeframe established in that letter. Students will be notified in writing of the decision to dismiss them. The student may appeal the decision as described in Sec. 5.8 of the ACGS.

13 Grievance and Appeal Procedures

Reference: ACGS, Sec. 5.8

The Graduate School has developed a Grievance and Appeal Procedure to give students the opportunity to resolve complaints dealing with academic issues such as dismissal, being placed on probation, denial of readmission, and any other program decisions that terminate or impede progress to degree. The Graduate School also requires each program to have a formal grievance program approved by them.

13.1 Department Grievance Procedures and Appeal Process

In the event that a student has an unresolved complaint or grievance with the department, he or she may appeal in writing to the department chair and/or the DGS. The department chair (or DGS) will then appoint an ad hoc appeals committee of three faculty members to investigate the complaint. All faculty members on this committee must be unconnected factually with the case or reasons for appeal. This committee may include the DGS or department chair, unless the DGS/department chair has been involved in the case.

The student's written statement should include details of the nature of the problem, the date(s) the problem occurred, the grounds upon which the appeal is based, background information that the student considers important, and the relief requested.

The appeals committee will promptly and thoroughly investigate the appeal to determine whether the relief requested is warranted. The investigation may include interviews and/or written statements from the student, any student witnesses, faculty or staff members who may be able to provide pertinent information about the facts, as well as a review of pertinent documents. In most situations, the appeals committee will complete the investigation in 30 business days (Note: Business days do not include weekends or employee holidays as recognized by the University.) There may be some reports that cannot be investigated within 30 business days. In such cases, the chair of the appeals committee will communicate to the student that the investigation is going to take longer than 30 business days and will also include a statement indicating when the committee anticipates completing the investigation. The DGS/department chair will notify the student in writing of his/her decision. If the DGS/department chair has been involved in the case, the notification will be from the designated chair of the appeals committee.

14 Communication

14.1 Formal Communication

The department communicates important decisions to students via letters. The actual offer of admission comes to the student from the Graduate School, but is always associated with a letter of intent, sent first by the department to the student. Fellowship notifications are also sent by letter.

Generally, results of examinations are sent to students by letter. Preliminary examination results are sent by the DGS to the students. The result of written candidacy examinations is communicated to the student by the research advisor. The result of oral candidacy examinations, the master's comprehensive examination, and the Ph.D. defense is sent to the student by the Graduate School.

For students who are not in good standing, or for those in danger of losing good standing, warning letters are sent by the Graduate School and/or the department.

14.2 Support Notification

For the first-year of graduate studies, support notification occurs through the student's admission letter. After the first year, the student is required to have a research advisor. It is the responsibility of the research advisor to communicate support commitments for a given year (e.g., RA or TA) directly to his or her students.

Due to the cyclical nature of external funding, support arrangements can change for a student through the course of a year. If an advisor gains a source of new external support, the appropriate time to change the student from TA to RA is before the next semester begins. The department assumes that the advisor discusses this change in funding directly with the student. Questions on support status should be brought to the Business Manager, the research advisor, the DGS, or the chair, as appropriate.

14.3 General Communication

Much of the department's day-to-day communication is done by electronic mail sent to the student's Notre Dame email address. Students are expected to check their Notre Dame email on a daily basis during the academic year.

The department maintains a list-serv of all of its graduate students. Regular messages will be sent using this list-serv by the department chair, the Business Manager, Graduate Student Coordinator, and the DGS. These emails will include reminders of deadlines and special opportunities for graduate students.

A request for the distribution of a list-serv message to the graduate students can be made by sending a message directly to the list-serv. The message will be distributed if it is judged to be in the best academic interests of the students.

Occasionally, students do not receive email due to mistakes in email configuration or forwarding. It is the student's responsibility to ensure that the department's email can be received.

Important messages to graduate students will also be distributed in written form to graduate student mailboxes in the Department of Physics. Students should also check their mailboxes on a daily basis during the academic year.

The chair and DGS will periodically hold "town hall" meetings with the graduate students. General questions and concerns of graduate students should be discussed at these meetings. Additionally, students are urged to bring individual questions and concerns directly to the attention of the DGS or chair.

There is a bulletin board outside the main Physics Office that is exclusively for graduate students. Please refer to the bulletin board for information on job opportunities, career training opportunities, course information, upcoming events, etc.

14.4 Department Web Site

The department will maintain a copy of this guide on its web site, <http://physics.nd.edu/>. The DGS will work with the department on maintaining up-to-date information in that location for graduate students. Suggestions for new topics to be posted there can be brought to the DGS.

14.5 Calendars

The Academic Calendar for the university is maintained on the Registrar's web site. Also found in that location is the schedule for department examinations and final examinations.

The GSU and the Graduate School also maintain calendars of events for graduate students. Also maintained on the Graduate School web site is a calendar of important deadlines for graduate students.

Schedules of the department's research seminars and colloquia are maintained on the department's web site.

15 Miscellaneous policies

15.1 Leaves and Related Options

Students considering a leave of absence should see ACGS, Sec. 5.1.

Students needing a temporary interruption of the physics graduate program should see graduate school policy on medical separation from academic duties, ACGS, Sec. 5.2

The childbirth and adoption accommodation policy can be found in ACGS, Sec. 5.3.

Withdrawal policy is described under ACGS, Sec. 5.4.

The DGS is available to discuss the meaning of these different options with any interested student.

15.2 Family Support

The Graduate School's statement on family support:

“A Catholic University, Notre Dame is committed to fostering a family-friendly environment for its graduate students, one that makes it possible for those students to balance successfully their parenting responsibilities and their academic pursuits. To that end, the Graduate School at the University of Notre Dame offers the following policies and initiatives. . . ” (See the family support section of the Graduate School's web site).

Faculty and graduate students are in particular directed to the Childbirth Accommodation Policy (see ACGS, Sec. 5.3). Note: new mothers associated with the department are welcome to use the Stepan Lactation Lounge, located in the ladies room on the 4th floor of Stepan Chemistry.

Note that the spouses and children of graduate/professional students are eligible to use the Notre Dame Wellness Center. This center includes pediatric care.

The department does not have written policy on visits to the department of family members. Generally, family members are welcome to visit offices within Nieuwland Science Hall. Visitors are not allowed in teaching and research labs without the permission of the lab director and/or anyone else responsible for laboratory safety.

Also of interest is the reference on the Graduate School's web site to information on how to create a family-friendly department.

15.3 Policy for Pregnant Graduate Students in Labs

The following is the Graduate School's policy for pregnant students working in lab settings:

“Exposure to certain chemicals, biological agents and radiation has proven harmful to fetuses, especially in the first three months. For those pregnant graduate students whose research requires them to be present in laboratories where there is a potential biological, chemical or radiation risk to her unborn child, the Graduate School strongly recommends that they immediately inform their advisers of their pregnancy, and then contact the Office of Risk Management. This Office is dedicated to providing professional advice in the areas of safety, occupational health, environmental protection and risk management. Safety professionals can advise the student (and the adviser) about the effects of harmful materials on the development of the fetus, particularly in the critical first three months, and recommend that the woman avoid the laboratory for a certain period of time.”

15.4 When a Student is Ill

When a student is ill, he/she should seek any needed medical attention and notify anyone in the department who may be affected by the student's absence from campus. For illnesses of short duration, the student's TA supervisors, instructors and research advisor(s) should be notified, as appropriate. If possible, TAs should attempt to find their own substitutes for their TA duties, and then notify the supervisor of the arrangement. For classes, instructors will be able to help students in various ways, e.g., by giving extensions of homework deadlines. If the illness is of long duration, the student should consult with the DGS on whether a leave or another option is appropriate (see part II).

15.5 Problems

Students should feel welcome to contact the DGS in the event that they experience difficulty in coping with the course work or other aspects of graduate student life. Likewise, instructors in graduate courses, research advisors, and research committees are urged to contact the DGS if they observe that a graduate student is having difficulties.

The DGS will help the student explore options for the resolution of these difficulties. In the event that the student has a conflict or problem with the DGS, he or she should bring the concern to the attention of the department chair.

15.6 Professional Travel

If a student is travelling professionally, e.g., to a workshop or meeting or to do research, then a Memorandum of Proposed Travel form must be filed with the department office in advance of that travel. There are sometimes occasions when students still in classes will need to travel professionally; in those cases, instructors should be consulted on whether arrangements can be made for making up the work missed. If a student is on TA, then TA responsibilities take priority over research responsibilities. Thus if a TA is considering professional travel, he/she will need to make acceptable arrangements with his/her supervisors for covering his/her duties before committing to the trip.

Travel reimbursements are processed through the Physics Department Office. At the time that the Memorandum of Proposed Travel form is submitted you will also need to submit the Student Business Travel Certificate form. This form is required by Accounts Payable in order to be reimbursed. Both forms are available through the Physics Department Office.

The Graduate School has dedicated the earnings from three endowments (Joseph F. Downes Memorial, Notebaert Professional Development and Zahm Research Travel) to help support the professional development of graduate students. The Graduate Student Union's Conference Presentation Grant also may be used to support students traveling to present their research. Students can submit applications before receiving conference presentation notifications, but prior to travel, awardees must send conference acceptance letters to whichever institutes provide funding.

GSU Conference Presentation Grant applications are due by the first of the month prior to the start date of the conference (e.g., if the conference starts in August, the application should be submitted by July 1). Refer to The Graduate School website section on professional development award application. (See http://graduateschool.nd.edu/professional_development/professional-development-award-application/).

15.7 Vacations

Note: The department does not have written policy on vacation scheduling by graduate students (or by the faculty). For students on TA support, it is expected that the students will be present on campus

during the time when classes and finals are held. The breaks between semesters are generally viewed as research time; it is assumed that graduate students will consult with their research advisors on any plans to take time off during those breaks (this excludes university scheduled holidays). Similarly, students on RA or fellowship support are expected to consult with their research advisor(s) on their work schedules during the time period for which they are paid.

15.8 Conflicts in Responsibilities

Graduate students are frequently in positions where they hold multiple responsibilities, often reporting to multiple people, e.g., TA supervisors and research advisor(s). If there are issues that result in conflicts of responsibility, the student should consult with the DGS or department chair for advice on how to resolve that conflict. In situations involving course work, teaching, and research, generally course work takes priority over teaching (e.g., a student should not be asked to grade exams during the time when a class is held) and teaching over research (e.g., the student should not be asked to attend a group meeting that conflicts with a teaching assignment).

15.9 International Students

Notre Dame sponsors most international graduate students for the purposes of their visa applications, providing the appropriate visa application documents, e.g., the I-20 for the F-1 visa and the DS-2019 for the J-1 visa. International students should be aware that there are academic circumstances where they may need to consult with the local Immigration Services Office (ISO) in order to remain in lawful immigration status.

The department is required to notify ISO when a graduate student changes his/her degree level or status. Situations included in this are additions of new degree programs, a change from a Ph.D. program to a MS program, or a change of academic program. Additionally, the department is required to report to ISO within two days of occurrence when any F-1 or J-1 visa holders: Are suspended, dismissed, or terminated from the program; terminate their programs early for any reason at all (withdrawal, leave of absence, etc.); engage in research or study abroad; engage in research at another location in the United States outside of Notre Dame; will complete their degrees from outside the United States.

International students may occasionally run into difficulty with visa issues when travelling outside the United States. Occasionally, a physics student receives a visa check. If the visa check occurs between semesters, the student may be delayed returning to campus to either take or teach classes. Students in such situations should notify the department immediately of their status so that contingency plans can be made.

15.10 Academic Integrity Policy

Please see Secs. 5.9 and 5.10 of the ACGS for the university's policy on academic integrity and on falsification of academic credentials.

15.11 Other Graduate School and University Policies

Physics graduate students are students in the Department of Physics, in the Graduate School, and also in the University. Students are bound by a series of codes, rules, and policies which regulate student life at Notre Dame. Some of these are rules and policies created by the Department of Physics. Others are rules and policies of the Graduate School. And others are rules of the University itself.

Students are bound throughout their stay by the version of these regulations in effect at the time they were first admitted for graduate work. However, if a new regulation is adopted which is less stringent than the one previously in effect, the new regulation applies also to the graduate students currently enrolled in the department. If, in unusual circumstances, a student's program or status is at variance with these regulations so that an exception must be made, such an exception must be approved by the physics faculty upon the recommendation of the DGS.

This guide is the primary source of information for rules and policies specific to graduate students in the Department of Physics.

A primary source of information for Graduate School rules and regulations is the Academic Code of the Graduate School (ACGS) (included at the end of this guide) and other information posted on their web site. If there is any contradiction in policy between this guide and the ACGS, then the ACGS's statement of the rule takes precedence.

A primary source of information for the University's rules is du Lac, which is available through the web site of the Office of Residence Life and Housing. If there is any contradiction in policy between this guide and the Grad Handbook, then the Grad Handbook's statement of the rule takes precedence.

Graduate students should refer first to the section of du Lac entitled "University Standards of Conduct." This section describes a number of university policies, including those for sexual harassment, sexual misconduct, smoking, and use of alcohol and controlled substances. Students should become familiar with this entire section of du Lac. Unless otherwise noted, the policies and procedures of du Lac apply to all students, undergraduate, graduate, or professional, on or off campus. In reading these sections, please remember that these policies are in place for the benefit of the University community as a whole. For example, harassment policies list types of behaviors that could get a graduate student into trouble (e.g., when acting as a teaching assistant) and also provide steps to follow if he or she believes that he or she is the victim of either discriminatory or sexual harassment.

Finally, there are many helpful sections in du Lac describing university services that are available to graduate students.

16 Other Resources

Graduate students will find helpful information through the Graduate School web site (<http://graduateschool.nd.edu/>). Worth visiting is the section entitled the “Graduate Student Life,” which includes references to family support, health and spiritual resources, recreational and athletic opportunities.

The section of the Graduate School web site entitled “Professional Development” is organized according to four components: Research, teaching, ethics, and career. Many interesting workshops are organized by the Graduate School; it is possible to synchronize a student’s google calendar to the Graduate School’s schedule of events. All new graduate students will be required to attend an ethics training workshop. This workshop will be held in January, at a time and place to be announced.

The Department of Physics typically has two student representatives to the Graduate Student Union (GSU) (<http://gsu.nd.edu/>). GSU meetings are generally open for all interested graduate students.

Within the department, the Graduate Physics Students (GPS) organization provides help and support to graduate students.

A Standard Syllabi for the Core Courses

PHYS 70003: **Mathematical Methods in Physics**

A study of the methods of mathematical physics.

- Linear vector spaces
- Matrices
- Group theory
- Complex variable theory
- Infinite series
- Special functions
- Differential equations

Text: George B. Arfken and Hans J. Weber, *Mathematical Methods For Physicists*

PHYS 70005: **Classical Mechanics**

- Mechanics of a particle
- Systems of particles
- Rigid bodies
- Lagrangian formulation of classical mechanics
- Hamiltonian formulation of classical mechanics
- Theory of small oscillations
- Central force motion and harmonic oscillators
- Continuum mechanics

Optional topics:

- Non-linear dynamics and chaos
- Hamilton-Jacobi Theory
- Special Relativity

Text: Herbert Goldstein, Charles P. Poole, and John L. Safko, *Classical Mechanics* (3rd edition)

PHYS 70006: **Electromagnetism**

- Electrostatics
- Laplace's and Poisson's equations
- Legendre's and Bessel's equations
- Green's functions and boundary value problems
- Static multipole expansions
- Magnetostatics
- Magnetic vector and scalar potentials

- Maxwell's equations
- Plane waves

Text: John D. Jackson, *Classical Electrodynamics* (3rd edition)

PHYS 70007: **Quantum Mechanics I**

- General Hilbert Space formulation of Quantum Mechanics
- Schrödinger vs. Heisenberg picture
- Harmonic oscillator
- Coulomb problem
- Bohm-Aharonov effect
- Theory of angular momentum
- EPR correlations and Bell's inequality

Text: J. J. Sakurai, *Modern Quantum Mechanics* (revised edition)

PHYS 70008: **Quantum Mechanics II**

Continuation of Quantum Mechanics I.

- Symmetries and conservation laws
- Bose-Einstein and Fermi-Dirac statistics
- Elementary approximation methods
- Scattering theory
- Realistic hydrogen atom
- Advanced approximation methods
- Partial wave expansions
- Optical theorem
- Introduction of Feynman rules
- Relativistic quantum mechanics and the Klein-Gordon theorem

Text: J. J. Sakurai, *Modern Quantum Mechanics* (revised edition)

PHYS 70010: **Experimental Methods in Physics**

A lecture and laboratory course on methods of all aspects of modern experimental physics designed around ten experiments in different areas of physics.

- Instrumentation
- Data acquisition
- Statistical treatment of data
- Equipment design
- Various detection systems

- Electronic pulse-processing
- Computer interfaces
- Ethics in physics research
 - Acquisition, management, sharing, and ownership of data.
 - Conflict of interest
 - Research misconduct (fabrication, falsification, plagiarism)
 - Publication practices and authorship
 - Peer review
 - Questionable research practices

PHYS 80001: **Electrodynamics**

- Scattering and diffraction
- Special relativity
- Covariant formulation
- Radiation from charges
- Multipole expansions
- Radiation damping
- Wave guides and RF cavities
- Basic elements of a classical field theory

Text: Charles A. Brau, *Modern Problems in Classical Electrodynamics*

Supplemental text: John D. Jackson, *Classical Electrodynamics* (3rd edition)

PHYS 80002: **Statistical Thermodynamics**

- Review of basic elements of phenomenological thermodynamics
- Kinetic theory
- Transport equation
- Dilute gases in equilibrium
- Classical statistical mechanics
- Ensemble theory: Microcanonical, canonical, grand canonical ensembles
- Quantum statistical mechanics
- Phase transitions

Optional topics:

- Renormalization group
- Critical phenomena
- Ising model

Text: L. E. Reichl, *A Modern Course in Statistical Physics*

B Teaching Assistant Rights, Responsibilities, and Procedures

TEACHING ASSISTANT RIGHTS, RESPONSIBILITIES, AND PROCEDURES UNIVERSITY OF NOTRE DAME, DEPARTMENT OF PHYSICS

I. Purpose

Undergraduate teaching is an essential and important part of a graduate education in the United States, and at Notre Dame in particular. Teaching assistantships fulfill many important needs: (1) They pay the bills, allowing you to have fun studying physics and get paid for it! (2) They are a transition from your role as student to your role as teacher and researcher. (3) They provide valuable experience in front of a classroom, training which is useful if you plan to teach after graduation, or if you ever plan to give research presentations to colleagues.

There are four primary kinds of teaching assistantships which are available in the physics department, and you will probably gain experience with all four:

Teaching tutorials or help sessions: Some of the lower level undergraduate courses meet for an hour each week in small groups (called “tutorials”) with a graduate student. Others have “help sessions” in the evenings for students who need assistance in understanding the material. TAs are responsible for getting up in front of the tutorial or help session and leading it. The specific task varies by course, but may include providing homework help, working sample problems, organizing group learning exercises, or giving advice about how to do physics problems.

Grading problem sets: Most undergraduate and graduate courses have weekly problem sets which are assigned by the professor, completed by the students, and graded by a TA. Each week you will get a pile of homeworks to grade and you will be expected to return them to the professor graded within a few days. You may or may not be given solutions to the problems by the professor, but if you aren’t then you will also have to complete the homework assignment yourself.

Grading exams: Almost all of our courses assess their students through exams. Our courses offer 1–4 exams during a semester. In many cases the exams are graded in part by TAs. Assignments involving exam grading require TAs be available to grade exams promptly. In the case of our large introductory physics courses, this can mean being available the day of an exam for grading. For smaller courses, this may mean being available to grade the exams within a few days or a week of the exam date. It is important to discuss the expectations for exam grading with the professor at the beginning of the semester.

Assisting in labs: Most lower level undergraduate courses also meet for 2–3 hours per week for a laboratory experience. While the lab will usually be organized by a faculty member or senior graduate student, TAs attend the labs and are responsible for helping students complete the labs and for grading the student lab reports.

More experienced TAs may be asked to actually run the lab sessions for a particular course, or to run the undergraduate Help Center. These jobs carry extra responsibilities beyond those discussed below.

II. Responsibilities

Each course will be organized differently and your responsibilities will be determined primarily by the professor in charge of the course, but here are some general rules:

1. At the beginning of each semester, find out your TA assignments, make sure that they are consistent with your background and abilities (*e.g.* experimental solid state students shouldn’t be asked

to TA courses in particle theory), and make sure they do not interfere with your own class meetings. Then contact the professor for each course. You and the professor should meet to discuss his/her expectations of you as early as possible. For large courses, it is normal to have a group meeting for all TAs — attendance at this is mandatory.

2. **Be prepared!**

- For teaching tutorials: Know the material which has been covered in that week's lecture, look over the homework assignment which the professor has given them. If there are special problems that are to be worked in tutorial, make sure you have prepared them.
- For teaching labs: The head TA or professor will organize a weekly session for you to practice on the laboratory equipment and do the lab yourself. It is very important that you attend this! You need to familiarize yourself with the lab setup, the computers and software, and the goals for each lab.

3. **Stay on top your job.**

- For tutorials, don't let students' work pile on your desk. Make sure all collected assignments are quickly passed on to the professor or the graders.
- For graders, complete your grading on time and return to the professor without delay. Don't let grading pile up from one week to the next – students need quick feedback on their assignments to help them judge their own progress and understanding.
- For labs, complete grading them so they are ready to be returned the next time the lab meets.

4. **Complete your duties.** There will be occasions when a time conflict will prevent you from completing one of your duties. *It is your responsibility to find another graduate student to stand in for you!* It is common practice among the grad students to trade favors. If you can't attend your own tutorial, you must find someone else to do it for you. (Under no circumstance can you cancel or reschedule a lab or tutorial without permission from the professor!) Any arrangements you make need to be explained to and cleared by the course professor.

5. **Stay in communication with the professor.** If an issue arises in tutorial, in lab, or in grading that you think the professor should know about, tell him/her. If you notice the students are having particular problems with a certain concept, say something. If a student is falling behind or is frequently absent, report it. You are the first line of contact with the students and you will often see problems weeks before the professor does. The sooner you let the professor know, the more likely it is that a solution can be found. In a lecture of several hundred students, it is too easy for the professor to not notice one student falling behind – it is your job to help keep that from happening. *Special note:* if a student misses a lab, report it immediately to the course professor!

6. **Stay in communication with the students.** Lab TAs are expected to have office hours each week to help students with the lab reports. Tutorial TAs may or may not be expected to have office hours, though it is always a good idea. (Graders are almost never expected to hold office hours.)

7. **Give useful feedback to the students.** At all times, strive to help the students without doing their work for them. When grading, clearly mark where points were subtracted and, where appropriate, give a short explanation of why the student's work was incorrect. If possible, try to pinpoint their error.

8. **Keep careful records.** Graders should keep copies of all assignment grades for the duration of the semester. If attendance is taken in tutorials or group projects are completed, TAs should keep

copies or originals of these documents. Lab TAs will keep grades on special 3×5 cards which are to be held until the end of the semester then turned over to the professor.

9. **Know the Honor Code.** The undergraduates at Notre Dame are bound by an Honor Code that disallows cheating and lays out clear penalties. You should find out from the professor how the Honor Code applies to each course (*e.g.* are the students allowed to work together? Can they turn in group homework assignments? etc.) and report to him/her any suspected violations. *It is not your job to deal with violations*, just to report them to the course professor.
10. **Don't act as paid tutor to students in your courses.** Graduate students often make extra cash by tutoring students one-on-one. This is allowed only if the student being tutored is not enrolled in the course for which you are a TA. So a TA in Physics 30210 may be a paid tutor for students in Physics 10320, but *may not* tutor students in 30210. (Grad students running the Help Center should talk to the department about what rules apply to them.)
11. **Auxiliary duties.** From time to time, TAs may be asked to complete other duties which are auxiliary but still a necessary part of their position. These may include maintaining a database of homework grades, helping to set up and run lecture demonstrations, and setting up for/proctoring/grading exams. For large courses, it is the usual practice to set aside a block of several hours for grading exams. All graders, and sometimes all tutors, are expected to come to the grading session and help. Graders may also be asked to write up solutions to the homeworks for distribution to the students.

III. Rights

There are some things which are specifically **not** the responsibilities of teaching assistants. Some you may be willing to do, or even want to do, but you don't have to if you don't want to. And some are simply inappropriate for you to do even if you want to. (If for some reason you are the primary instructor for a course, these won't apply to you.) You *don't* have to:

1. Work more than 12 – 16 hours a week on your TA assignments. This time limit is for all your TA assignments combined, not for a single course. Some weeks may be more than 16 hours, but then that should be averaged out with weeks with fewer hours.
2. Lecture for the professor. If the professor cannot lecture, he/she is supposed to find another faculty member to take the lecture. The department does not want graduate students teaching lectures, except in special circumstances which require permission from the department. Similarly you should not, on more than the rare occasion, have to hold office hours for the professor.
3. Buy the course textbook. If you need a textbook for the course (usually this applies only to tutorials), the department will provide one to you. Please ask!
4. Photocopy course material. It is not your job to photocopy exams, homework assignments, etc for the course. That job belongs to the faculty and the clerical staff.
5. Write exams. You may be asked to suggest problems for exams, but the exam itself is the responsibility of the professor.
6. Assign midterm or course grades. Although you will often be asked to grade individual assignments, and you may even be asked to record and total students' grades in a spreadsheet, it is the responsibility of the course professor to assign a letter grade to each student and to record that letter grade for the registrar. This is true both for final course grades and also for midterm course grades (which are given in the lower level courses).

Again, some things on this list you may want to do for the experience, such as lecturing. And it is generally considered acceptable for you to give a couple lectures, usually in upper level courses. If you want more experience than that, or want to lecture in lower level courses, talk to the course professor and a representative of the department about what kinds of opportunities may be available.

If you feel that you are being asked to do things which are outside the realm of your responsibilities, or if your TA load is too heavy, talk to the course professors, the faculty member in charge of coordinating TA duties, and/or the Director of Graduate Studies.

IV. Advice

Students often struggle with one of two temptations: either to let their TA responsibilities consume all their time, or conversely, to ignore their TA responsibilities. Both are very bad ideas. Being a TA is an important part of your graduate education, but it is only a part. You need to strike a balance among teaching, research and coursework, just as the faculty do.

There are distinct advantages to being a good TA. First off, there are yearly university awards for the best TAs, awards that are very valuable on a professional resume (and sometimes come with cash!). Good TAs also tend to get the choice teaching assignments from semester to semester (while bad TAs get stuck with the worst). And TAs who are particularly irresponsible risk losing their assistantships completely, which means loss of income and a big tuition bill!

Set aside a time slot each week for completing your TA assignments. And look far ahead for conflicts in your schedule (travel, exams, etc) that will prevent you from doing your job. The sooner you make other arrangements, the smoother it will go.

Finally, try to have fun. The students here at Notre Dame are actually a smart group of kids and when you get to know them and talk to them, it can be a very rewarding experience. And perhaps for the first time in your life, you are on the other side of the desk — it's your turn to explain the mysteries of the universe to a group of students anxious to learn them. What could be better!

C Academic Code of the Graduate School

ACADEMIC CODE OF THE GRADUATE SCHOOL



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1. INTRODUCTION

The following academic code contains the policies and regulations governing the attainment of academic credit and degrees from the Graduate School of the University of Notre Dame. These policies and regulations do not apply to the Schools of Architecture, Business, or Law. The responsibility to abide by this code resides with graduate students, faculty, and administrators who are required to know and observe its regulations.

The following information represents the minimum standards established by the Graduate School. Individual programs may require higher standards. Students are expected to be aware of and to be in compliance with their program's requirements.

No exceptions to the following policies and procedures will be valid without the formal written approval of the Graduate School. Further elaboration and clarification of these policies may be found in the *Graduate School Bulletin of Information* published each academic year.

2. ADMISSION TO THE GRADUATE SCHOOL

2.1 Degree Applicants

Applicants for admission to a degree program in the Graduate School must hold a bachelor's degree or its equivalent from an accredited American college or university or from a foreign institution of acceptable standing by the time of graduate matriculation. If at that time an admitted applicant does not hold a bachelor's degree, the Graduate School admission is void. The applicant should have earned at least a B average (3.0 on a 4.0 G.P.A. scale) in her or his undergraduate major courses and should meet the level of academic achievement that implies a developed ability for advanced study and independent scholarship.

An applicant may seek admission to degree-seeking status in either a master's or doctoral program, or to non-degree status.

Admission to a graduate degree program is not equivalent to admission to candidacy for the degree; see section 6.1.6 Admission to Candidacy (master's degree requirements) and section 6.2.8 Admission to Candidacy (Ph.D. degree requirements). It should also be noted that admission to the master's program does not mean admission to the associated doctoral program upon completion of the master's program. A separate decision is required for admission into the doctoral program.

2.2 Admission to Multiple Degrees

Students seeking admission to more than one program (whether they intend to enroll in only one or both programs) must submit separate applications for each program and be accepted by each. Admission to one program does not guarantee admission to another program. Applicants may seek admission to two programs prior to enrolling, or apply to an additional program after they have begun an initial program. It is possible for a student to enroll in two master's degree programs, a master's degree program and a Ph.D., or a program in the Graduate School and a professional degree in one of the other colleges or schools in the University. The Graduate School does not allow students to enroll in two Notre Dame doctoral programs simultaneously. The Graduate School will consider only applicants whose past academic performance indicates the potential for success in each of the programs. No more than nine credit hours of classes from any one master's degree may be counted toward any other graduate degree.

All funding arrangements and degree requirements must be approved in advance by the student's adviser (if he or she has one), the respective program administrators, and the Graduate School.

2.3 Non-Degree Applicants

A non-degree applicant may seek admission as a departmental non-degree student or as an unclassified student in the Graduate School. A graduate student who is dismissed from his or her program of study for academic reasons cannot be admitted as a non-degree student.

A departmental non-degree student is one who has been admitted to a program but does not seek an advanced degree from the University. An applicant with degree intent who lacks one or more admission requirements may be admitted temporarily to this non-degree status at the discretion of the program and with the approval of the associate dean of recruiting and admissions. The student may register for one to 15 credit hours in any graduate courses for which he or she meets the course prerequisites. However, no student initially admitted to non-degree status will be admitted to degree status until all admission requirements have been satisfied. No more than 12 credit hours earned by a student while in non-degree status may be counted toward a degree program. Admission as a departmental non-degree student does not guarantee later admission as a degree-seeking student.

An unclassified student is one who is admitted to the Graduate School in a non-degree status, but who is not a member of a particular department or program. Such a student may, with the approval of the Graduate School, take courses in any graduate program, subject to approval by the program. This category is usually open to non-degree-seeking students who wish to take courses in more than one program or students who have completed their degree programs but wish to continue at the University with graduate student status. No more than 12 credit hours earned by a student while in non-degree status may be counted toward a degree program. Admission as an unclassified non-degree student does not guarantee later admission as a degree-seeking student.

2.4 Visiting Students, Research Visitors, and Auditors

A visiting student is normally a degree-seeking student at another university who enrolls for credit in select courses at Notre Dame. Unless otherwise arranged by the home university and Notre Dame, the visiting student is considered a non-degree student at Notre Dame and follows the same application and enrollment procedures as a non-degree student. Unless the student is a part of a university approved exchange program, the student is not eligible for tuition support.

A research visitor is normally a degree-seeking student in another university who comes to Notre Dame to conduct research with a faculty member, but does not register or enroll in any courses at Notre Dame. The researcher is not a student at Notre Dame, and is therefore not required to apply to the Graduate School for admission. The appointment process is completed at the request of the program in which the supervising faculty member is appointed. Research visitors may receive a stipend, but are not eligible for benefits.

An auditor is a non-degree student who meets the course prerequisites but receives no academic credit. With the permission of the instructor a degree-seeking student may also audit courses. Audited courses are recorded on a student's permanent record only if the student is properly registered as an auditor and attends the course throughout the entire semester. A recorded audit is graded V. Incomplete audits are not recorded. The audit grade of V cannot be changed to a grade with credit after the sixth class day.

2.5 Acceptance

Only the Graduate School grants official acceptance to Graduate School programs. Applicants will be officially informed of the decision on their application by a letter from the Graduate School.

3. REGISTRATION

3.1 Enrollment in the University

All degree and non-degree graduate students must both register and complete the ND Roll Call process each semester during the dates and times announced by the University Registrar. Any admitted student who fails to register and complete the ND Roll Call process for one semester or more must seek readmission through their department and then the Graduate School. (See section 3.5 Continuous Registration.)

3.2 Assignment of Credit in the Graduate School

The Graduate School adheres to the same principles set forth in the Undergraduate Academic Code governing the award of credit for coursework.

A student may receive credit only for classes for which the student is duly registered.

Credits for all courses are reported in "semester hours." A semester hour of credit represents approximately 750 minutes of classroom instruction, which is equal to one 50-minute class period per week or its equivalent throughout a fifteen-week semester ($1 \times 50 \times 15 = 750$), plus a minimum of two hours of out of class student work per week or its equivalent throughout a fifteen-week semester. A semester hour of credit for laboratory, drafting, or studio work represents approximately double the time required for a semester hour of credit for classroom instruction.

3.3 Full-Time and Part-Time Status

A full-time student is one who registers for at least nine credit hours per semester. All degree-seeking students are expected to maintain full-time status and to devote full time to graduate study. No degree-seeking student may be employed, on or off campus, without the express permission of his or her program and the Graduate School.

A non-degree student must register for at least nine credit hours per semester, or six in the summer session, to claim full-time status.

A student who registers for less than nine credit hours per semester will be considered part-time. Part-time students are not eligible for financial support from the institution.

During the academic year, students who are enrolled in summer-concentrated degree programs with year-round training (programs in which a predominance of credit hours are taken during the summer term) are considered full-time if they register for a program-required course in the fall or spring semester.

3.4 Residency and Non-Residency Status

Residency status is determined by a student's continual presence or non-presence on campus. If a student is on campus a majority of the days of a week or a majority of weeks per month, he or she will be considered in residence. If a student is not present on campus in this fashion, he or she will be considered a non-resident student. With the exception of library privileges, a student classified as a non-resident cannot use University services, such as meal plans, student housing, and athletic facilities. The student determines resident status when registering for courses, which is then verified by their program.

3.5 Continuous Registration

All students must enroll each semester in the academic year and register for at least nine credits to maintain full-time status. Continuous enrollment is normally met by completion of the ND Roll Call process and registration in graduate-level courses relevant to the student's program. A student who is concurrently pursuing degrees in the Graduate School and in another program in the University meets the continuous enrollment requirement by registering for courses in either program. The Graduate School must approve any exception to this rule, including a leave of absence. (See section 5.1 Leave of Absence.)

A student who fails to complete the ND Roll Call process and registration for one semester or more must complete the readmission process upon their return.

3.6 Summer Registration Requirements

Continuing students, i.e., degree-seeking students who are eligible to continue their studies in the fall semester and are not receiving an academic stipend during the summer months have access to University facilities and services from May through August without registering for academic credit or completing the ND Roll Call process. Students who are enrolled full-time during the academic year are considered full-time continuing students in the summer. Graduate students receiving a summer stipend and conducting independent research must register for their program's zero-credit "Independent Summer Research" section. Registering for this course will ensure proper classification for tax purposes. Only those students both actively engaged in research and receiving a stipend are eligible for this course.

3.7 Semester of Graduation

Degree students must register and complete the ND Roll Call process during the semester in which they plan to graduate; this includes the summer session.

3.8 Maximal Registration

During each semester of the academic year, a graduate student should not register for more than 15 credit hours of graduate courses, i.e., 60000 through 90000-level courses. In the summer session, a graduate student should not register for more than 10 credit hours.

4. COURSES

4.1 Course Numbers

Courses numbered 60000 and above are typically taken by graduate students. Courses numbered 70000 and above are advanced graduate courses open only to students who have completed the prerequisites.

It is the expectation of the Graduate School that all full-time graduate students enroll in graduate-level coursework. Therefore, full-time students are expected to register for at least 3 hours of credit at the 60000 level or higher every semester that they are enrolled, except with the permission of the associate dean for academic affairs in the Graduate School.

The advanced undergraduate courses numbered 40000 – 59999 may, with the approval of the program chair or the director of graduate studies and the Graduate School, be taken to satisfy up to six hours of graduate credit requirements. Grades in these courses will count towards the student's G.P.A. Programs may place additional constraints on the use of 40000 – 59999 level courses to meet their degree requirements.

For purposes of progress within a graduate department or program of study or admission to degree candidacy, no graduate credit is allowed for courses below the 40000 level.

4.2 Add/Drop Policy

A student may add courses through the first six class days of the semester. A student may add courses after this time only on the recommendation of the program and with the approval of the Graduate School dean or authorized designee and only up until the end of a term. No courses may be added once a semester has been completed.

A student may drop courses at his or her discretion through the first six class days of the fall or spring semester. To drop a course after this period and up to the last day for course discontinuance (see the Graduate School calendar for the exact date), requires the approval of the chair or the director of graduate studies of the program offering the course, the student's adviser, and the Graduate School dean or authorized designee. A course may be dropped after the last day for course discontinuance only in cases of serious physical or mental illness incurred by the student or an immediate family member of that student. Courses dropped after this period will be posted on the student's permanent record with the grade of W.

A course taken for credit can be changed to an audit course after the last day for course discontinuance only in cases of serious physical or mental illness and only until the end of the term. No changes can be made once a semester has been completed.

4.3 Grades

Listed below are graduate grades and the corresponding number of quality points per credit hour. It is the expectation of the Graduate School that all courses taken at the graduate level will be graded by the level of the course, not by the status of the enrolled student.

A	4.000
A-	3.667
B+	3.333
B	3.000
B-	2.667
C+	2.333
C	2.000
C-	1.667
D	1.000
F	0.000
I	0.000 (until Incomplete is removed)
NR	Not reported
S	Satisfactory
U	Unsatisfactory
V	Auditor
W	Discontinued with permission

Grades of C- and D are awarded in the Graduate School and are used to calculate both semester and cumulative G.P.A.; however, they will not be accepted for completion of graduate degree requirements, specific required coursework, and/or total credit hours for completion of coursework. If a student receives lower than a grade of C in a required course, he or she must either retake the same course or its equivalent as determined by the program.

Under exceptional circumstances, a student receives the temporary grade of I when he or she has not completed the requirements for a 60000 or higher-level graduate course within the semester or summer session (See section 4.4 Incomplete Coursework). No grade of I can be given for courses below the 60000 level or to graduating students in the final semester or final summer session of a terminal degree program.

The grades of S and U (Satisfactory and Unsatisfactory) are used in courses without semester credit hours, as well as in research courses, departmental seminars, colloquia, workshops, directed studies, field education, and skills courses. An S grade factors into a student's earned semester credit hours but does not factor into the computation of the G.P.A. No credit is given for a grade of U.

The grade of V (Auditor) does not have quality-points associated with it. It is the only grade available to the registered auditor. The audit must be requested before the sixth class day of the semester. The audited class is made part of the student's permanent record, and the auditor should attend the course throughout the entire semester. The grade of V cannot be changed to

a credit-earning grade. Normally, graduate students are limited to auditing a maximum of two courses per semester.

The grade of W (discontinued with permission) is given for a course that a student is allowed to drop after the last date for course discontinuance. Approval of the grade of W is granted by the associate dean for academic affairs in the Graduate School or other authorized officer.

4.4 Incomplete Coursework

Students should complete the work of graduate courses at the 60000-90000 level during the regular academic term in which they are taken. This expectation of students should also guide faculty members who teach graduate courses. That is, faculty are obligated to evaluate and grade graduate work by the end of the term in which the course is offered.

A grade of "Incomplete" (I) should be given *only in exceptional circumstances* and only for compelling reasons. When a student receives a grade of I, he or she has 30 days from when grades were due (for the semester in which the I was given) to complete the coursework. If the coursework is not completed by this date, the grade of I will be changed permanently to a grade of F. Extensions for Incompletes require formal approval from the associate dean for academic affairs in the Graduate School.

4.5 Grade Point Average

Quality point values are used to compute the student's G.P.A. The G.P.A. is the ratio of accumulated earned quality points to the accumulated graded semester credit hours. Only courses taken at Notre Dame are used to calculate a student's G.P.A.

Continuation in a graduate degree program, admission to degree candidacy, and graduation require maintenance of at least a 3.0 (B) cumulative grade point average (G.P.A.).

An adequate G.P.A. is only one factor taken into consideration in determining a student's qualifications for an advanced degree. Degree students should be aware of their program's performance criteria. The program and the Graduate School evaluate each graduate student's overall performance annually on the basis of these criteria.

4.6 Transfer Credits

A student may transfer credits earned at another accredited university only if: 1) the student has degree-seeking status at Notre Dame; 2) the courses taken were graduate courses appropriate to the Notre Dame graduate program, and the student had graduate student status when he or she took these courses; 3) the courses were completed within a five-year period prior to admission to a graduate degree program at Notre Dame, or while enrolled in a graduate degree

program at Notre Dame; 4) grades of B (3.0 on 4.0 scale) or better were achieved; and 5) the transfer is recommended by the program and approved by the Graduate School.

These five requirements also apply to the transfer of credits earned in another graduate program at Notre Dame.

A student transferring from an unfinished master's program may not transfer more than six (6) semester credit hours into either a Notre Dame master's or Ph.D. program.

If the student has completed a master's or Ph.D. program, he or she may transfer up to nine (9) semester credit hours to a Notre Dame master's program and up to 24 semester-credit hours to a Notre Dame Ph.D. program. Grades for transferred courses do not factor into the student's Notre Dame G.P.A.

With advanced approval from the graduate program of study, a Notre Dame undergraduate who is registered for graduate courses at Notre Dame may use this coursework to meet graduate program requirements. These credits cannot be used to satisfy both undergraduate and graduate degree requirements. However, students in an integrated bachelor's/master's degree program may count up to six graduate-level credits toward both degrees.

5. GRADUATE STUDENT STATUS

5.1 Leave of Absence

For exceptional reasons and on the recommendation of the program, a student in good academic standing may request a leave of absence for a maximum of two consecutive semesters. A request for a leave of absence can be made for study, athletic training, military, mission work, medical, and personal reasons. A request for a leave of absence must be made before the semester in which the leave is taken, and be approved by the Graduate School. If, for some urgent reason a student chooses to leave the University after the beginning of the semester, the student must officially withdraw from the University (see section 5.4 Withdrawal from the Program). If the student does not return at the end of the leave of absence period, he or she is no longer considered a student at Notre Dame and must go through the readmission process if he or she decides to return.

In the case of a medical leave of absence, the Graduate School may require a recommendation from the University Health Center or University Counseling Center regarding the student's readiness to resume academic work prior to readmission.

5.2 Medical Separation from Academic Duties

Students enrolled in the Graduate School who wish to temporarily interrupt their programs for medical reasons must make an official request to the Graduate School. Students are eligible under this policy if they have a “serious medical condition.” For purposes of this policy, “serious medical condition” is defined as a medical condition that (1) requires a multiple-day hospitalization OR (2) renders the student unable to engage in coursework and all other Graduate School-related duties for a period of at least ten (10) calendar days. Written certification by a physician that the student has a serious medical condition as defined in this policy must be submitted to the Graduate School as soon as the need arises (for emergency requests). In situations involving childbirth or adoption, see section 5.3 Childbirth and Adoption Accommodation Policy. In all cases, regardless of the nature of the medical condition, the duration of the separation will be as certified by the physician up to a maximum of six weeks. Students may utilize this medical separation policy two non-consecutive times during their graduate studies. Should students need more than six weeks at any one time, they must withdraw from the University. The Graduate School approves leaves of absence for one or more semesters for medical or other reasons (see section 5.1 Leave of Absence).

5.3 Childbirth and Adoption Accommodation Policy

The childbirth and adoption accommodation policy is intended to assist graduate students who are new parents. Unlike the medical separation policy that covers any medical condition, this accommodation policy addresses a single set of circumstances: new parenthood. It is not a leave of absence; it is an accommodation. Students maintain their standing as students, are provided relief from full-time responsibilities and academic deadlines for up to one semester, and are eligible for financial support.

Programs are encouraged to work out specific arrangements with students on a case-by-case basis within the broad framework of this policy. The policy can be found at <http://graduateschool.nd.edu>.

5.4 Withdrawal from the Program

To withdraw from the University before the end of the semester, a student must inform the program and the Graduate School, and complete the Registrar’s Separation from the University Form.

Grades of W are given when a student withdraws after the mid-semester course discontinuance deadline. If a student withdraws before this deadline, the courses in which the student was registered will not be recorded. If a student drops out of the University without following the procedure described above, a grade of F is recorded for each course.

To re-enter a program, the student must follow the readmission process. Credit for any course or examination will be forfeited if the student interrupts his or her program of study for five years or more.

In the case of a health withdrawal, the Graduate School may require a recommendation from the University Health Center or University Counseling Center regarding the student's readiness to resume academic work prior to readmission.

The University reserves the right to require the withdrawal of any student when academic performance, health status, or general conduct may be judged clearly detrimental to the best interests of either the student or the University community (see section 5.7 Dismissal of a Student).

5.5 Assessment of Student Progress

All students should receive written feedback annually. This may come from the adviser, the area coordinator (or faculty member responsible for the area in which the student is working), or the director of graduate studies.

If an adviser has serious concerns about a student's academic performance or progress to degree, he or she should communicate this to the student in written form. This should be copied or forwarded to the director of graduate studies. If the adviser's recommendation calls into question the student's suitability for the program, the director of graduate studies will issue a warning letter to the student that specifies the concerns and the steps necessary to correct the situation, as well as the consequences of continued sub-standard academic performance. If the student's adviser happens to be the director of graduate studies, the chair of the department will initiate this letter. The warning letter should specify a specific date when the student's progress will be re-evaluated. A copy of the warning letter should be sent to the associate dean for academic affairs in the Graduate School.

If the student does not meet the stipulations outlined in the warning letter within the timeframe specified, the student will be either put *on probation* or dismissed from his or her program of study. See section 5.6 Graduate Student Status Designations for additional details.

5.6 Graduate Student Status Designations

There are two status designations available to graduate students: *in good standing* and *on probation*. A graduate student can only have one designation, per program, at any given time.

5.6.1 In Good Standing

Graduate students who are enrolled and making satisfactory progress in their program of study are considered *in good standing*.

5.6.2 On Probation

A student who does not meet the stipulations within the timeframe outlined in the warning letter may be placed *on probation*. *On probation* status is intended to offer a student a final opportunity to correct deficiencies in his or her academic progress. Normally, a student will be *on probation* one or, at most, two semesters.

A student *on probation* must complete the stipulations outlined in the probation letter within the required timeframe or will be dismissed from his or her program of study.

Students *on probation* are ineligible for financial support from University sources (stipend, full tuition, and professional development funds) except for a tuition scholarship that covers eight of the nine credit hours required to maintain full-time status. The student will be financially responsible for the remaining one credit. While *on probation*, if a student meets the stipulations within the timeframe outlined in the probation letter, the student will return to *in good standing* status the next semester of enrollment.

5.6.3 Probation Initiated by the Graduate School

In addition to the probation letter initiated by the student's program of study, there are three ways in which the Graduate School may place a student on probation. These are:

1. A cumulative grade point average below 3.0 in any two semesters;
2. A failure to pass candidacy exams by the end of the eighth semester;
3. Earning a U in research for two consecutive semesters.

Students who are placed *on probation* by the Graduate School will receive an official letter from the associate dean for academic affairs in the Graduate School informing them of their status change.

5.7 Dismissal of a Student

Failure of a student to meet the stipulations within the timeframe outlined in either the warning letter or the probation letter may lead to dismissal from the program.

In addition, a student can be immediately dismissed from his or her program of study without a warning letter or probationary status for the following reasons:

Extreme Under-performance: This dismissal will be applied to a student whose performance is deemed wholly unacceptable by the student's adviser, director of graduate studies, or program faculty. A G.P.A. below 2.5 in any single semester, or below 3.0 for two consecutive semesters; three consecutive U grades in research are examples of extreme underperformance.

Inability to Secure a Laboratory/Adviser: In some cases, a student may not be able to secure a laboratory and/or adviser. Normally, the student will be given funding for the remainder of the semester in which the student has registered. If the student and the director of graduate studies are unable to find an adviser, the student may be dismissed from the program.

Threat to Health and/or Safety: In rare circumstances, continued enrollment of a graduate student may constitute a serious disruption of the residential community or the academic environment. A student may be dismissed if: (a) The student poses a direct threat to the health or safety of himself or herself or others, or has seriously disrupted others in the student's residential community or academic environment; or (b) the student's behavior or threatening state is determined to be the result of a medical condition, or the student refuses to cooperate with efforts deemed necessary by the University Health Services and/or the University Counseling Center to evaluate the cause of the student's behavior or threatening state. In some circumstances, the level of care and accommodation recommended may exceed the resources or appropriate staffing capabilities of the University or may be beyond the standard of care that University Health Services can be expected to provide or monitor.

The Graduate School is responsible for monitoring and assessing the academic progress of its students. However, there are other reasons for which a student can be disciplined. For more details on these policies, please consult *du Lac: A Guide to Student Life* at <http://dulac.nd.edu>.

Students will be notified in writing by the director of graduate studies of the decision to dismiss them from their program of study for academic reasons. This notification will also be sent to the associate dean for academic affairs. The student may appeal the decision per the grievance and appeal procedures, which can be found at graduateschool.nd.edu.

5.8 Academic Integrity

Integrity in scholarship and research is an essential characteristic of the academic life and social structure in the University. Any activity that compromises the pursuit of truth and the advancement of knowledge besmirches the intellectual effort and may undermine confidence in the academic enterprise. A commitment to honesty is expected in all academic endeavors. Mentors and academic leaders should continuously emphasize this to students, research assistants, associates, and colleagues.

Violation of integrity in research/scholarship includes, but is not limited to: plagiarism; deliberate fabrication or falsification in proposing, performing, or reporting research; or other deliberate misrepresentation in proposing, conducting, reporting, or reviewing research. Misconduct in research/scholarship does not include errors of judgment; errors in recording,

selection, or analysis of data; differences in opinions involving interpretation; or conduct unrelated to the research process. Misconduct includes practices that materially and adversely affect the integrity of scholarship and research.

Plagiarism is a form of misconduct. A person's words and ideas are his or her own; they belong to the individual and should be considered the individual's property. Those who appropriate the words and/or ideas of another, and who attempt to present them as their own without proper acknowledgement of the source, whether intentional or not, are committing plagiarism or intellectual theft. It is assumed that all work submitted by a student represents the student's own ideas and work. Verbatim copying, paraphrasing, adapting or summarizing the work of another, regardless of the source – whether books, journals, periodicals, websites, or other forms of media – must be properly cited. Any representation of the work of another that is not properly referenced is considered to be plagiarism. Ignorance of what constitutes plagiarism is not a defense to an allegation of a violation of the academic integrity policy. It is the responsibility of students to familiarize themselves with this definition of plagiarism and to learn proper citation techniques.

Any student who is found in violation of integrity in research and/or scholarship can be dismissed from the University. The appeal procedure for academic integrity can be found at <http://graduateschool.nd.edu>.

5.9 Falsification of Academic Credentials

A student who has been admitted to a graduate degree program based in part upon a previously earned academic degree and is found to have intentionally misrepresented this information will be immediately dismissed from his or her program of study and will be barred from future graduate work at the University.

A current student or a student who has recently left the University without completing a degree who then claims to have earned said degree will be immediately dismissed from the program of study (if applicable) and barred from future graduate work at the University.

5.10 Grievance and Appeal Procedure

Students follow the grievance and appeal procedures of the program in which they are studying. Appeals beyond the program are made directly to the dean of the Graduate School.

The purpose of this procedure is to afford graduate students the opportunity to resolve complaints dealing with academic issues such as dismissal from graduate standing, placement on probationary status, denial of readmission to the same program (if the student was previously in good standing), and other program decisions that terminate or impede progress toward the degree.

This procedure is not to be used to address issues of sexual or discriminatory harassment (see grievance procedure available through the Office of Institutional Equity), of academic fraud (see the 'Academic Integrity' section of the *Graduate School Bulletin of Information*), or for disability-related grievances (see grievance procedure available through the Office of Disability Services).

6. DEGREE REQUIREMENTS

6.1 The Master's Degree

The goal of the University master's programs is to address all aspects of a student's development as he or she transitions from a student to a professional. To this end, the Graduate School expects that the student will become knowledgeable of the broad scope of the discipline. The student should also have the capacity to think through ethical issues raised by their coursework and/or research, and to weigh important implications within value systems. Finally, students should be professionally prepared so that when they assume their careers, they can do so with confidence. These goals should be reflected in the requirements for the degree.

In addition to the following Graduate School requirements, individual programs may have higher standards. Students are expected to know their program requirements.

6.1.1 Credit Hours

At least thirty (30) credit hours are required for the master's degree. Some programs may require more. These credit hours are earned through a combination of coursework and/or research. (See also section 4.6 Transfer Credits.)

6.1.2 Residency

The minimum residency requirement for the master's degree is registration at full-time status for one semester during the academic year, or for one summer session.

6.1.3 Foreign Language Requirement

The Graduate School does not require foreign language reading proficiency for the master's degree. However, some programs do have this requirement. Students should consult their programs concerning this requirement.

6.1.4 Time Limits

All requirements for the master's degree must be completed within five years.

A master's program that is pursued in residence during the summer and the academic year must also be completed within five years.

A student attending summer session only must complete all requirements within seven years.

6.1.5 Comprehensive Examination

By the end of the term following completion of the coursework required by the program, the degree candidate must have taken an oral and/or written master's examination demonstrating mastery in his or her field. Failure in either one or both parts of the examination results in automatic forfeiture of degree eligibility, unless the program recommends a retake. If a retake is recommended, it must be completed by the end of the following semester. The Graduate School allows only one retake of the master's examination.

Some programs have an equivalent requirement in lieu of the master's examination. Students are advised to be cognizant of their respective program requirements with regard to the master's examination or its substitute.

6.1.6 Admission to Candidacy

To qualify for admission to candidacy, a student must be in a master's degree program. He or she must be registered and enrolled in the program and must maintain a minimum cumulative G.P.A. of 3.0 in approved coursework. A student who seeks admission to candidacy in a research master's program must also demonstrate research capability and receive program approval of his or her thesis.

Admission to candidacy is a prerequisite to receiving any graduate degree. It is the student's responsibility to apply for admission by submitting the appropriate form to the Graduate School office through either the program chair or the director of graduate studies. The applicable deadline is published in the Graduate School calendar.

6.1.7 Thesis Requirement

The thesis is the distinctive requirement of the research master's degree. With the approval of his or her adviser, the student proposes a thesis topic for program approval. The approved topic is researched and the results presented under the supervision of a thesis director.

6.1.8 Submitting the Thesis

To receive the degree at the next graduation, the master's candidate who is completing a thesis must submit it to the Graduate School on or before the deadline published in the Graduate School calendar. Candidates should be cognizant of deadlines for graduation established by the Graduate School and the program.

The format of the thesis should follow the guidelines established by the Graduate School. These guidelines can be found online at <http://graduateschool.nd.edu>. The Graduate School reserves the right to reject theses not properly formatted.

6.2 The Doctor of Philosophy Degree

The goal of the University in its Ph.D. programs is to address all aspects of a student's development as he or she transitions from a student to a professional. To this end, the Graduate School expects that the student become an expert in a specific area within her or his discipline. In addition, the student should also become fully competent in the broad scope of the discipline, and be able to engage with others in professional society meetings at a sophisticated level. The student should have the capacity to think through ethical issues raised by his or her research and to weigh important implications within value systems. Finally, students should be professionally prepared so that when they assume their careers, they can do so with confidence. These goals should be reflected in the requirements for the degree.

In addition to the following Graduate School requirements, individual programs may require higher standards. Students are expected to know their program's requirements.

6.2.1 Credit Hours

At least sixty (60) credit hours, or a minimum of 30 credit hours beyond a previously awarded master's degree, are required for the Ph.D. Some programs may require more. These credit hours are earned through a combination of coursework and/or research. (See section 4.6 Transfer Credits.)

6.2.2 Residency

The minimum residency requirement for the Ph.D. degree is normally full-time status for four consecutive semesters.

6.2.3 Foreign Language Requirement

The Graduate School does not have a foreign language requirement, but some programs do. Students should consult their program concerning this requirement.

6.2.4 Responsible Conduct of Research and Ethics Training

As part of its holistic approach to graduate education, the Graduate School requires all Ph.D. students to complete any and all training modules for the Responsible Conduct of Research and Ethics requirements. All students supported by federal grants must be certified in accordance with national guidelines and the policies of the Office of Research. For more information, please consult the Professional Development portion of the Graduate School website at <http://graduateschool.nd.edu>.

6.2.5 Award of Master's Degree to Doctoral Students

A doctoral student may receive the master's degree without taking the master's examination on the recommendation of the program and completion of: (a) the coursework required by the program for the master's degree, and (b) all written and oral parts of the doctoral candidacy or Ph.D. qualifying examination. Programs may have additional criteria, or may choose not to offer a master's degree in this manner; students should consult the program's guidelines.

6.2.6 Time Limit

The student must fulfill all doctoral requirements, including the dissertation, its defense, and the official submission within eight years from the time of matriculation, unless interrupted by approved medical leave(s) and/or approved childbirth accommodation(s). Failure to complete any of the Graduate School or program requirements within the prescribed period results in forfeiture of degree eligibility.

6.2.6.1 Dissertation Completion Status

If, after the eighth year of study, a student has not fulfilled all doctoral requirements, he or she may apply for *dissertation completion status* for up to two semesters. Students who are granted this status are considered part-time and must register each semester for the equivalent of one credit hour of resident tuition, payable by the student.

6.2.7 Candidacy Examination

The examination consists of two parts: a written component and an oral component. The written part of the examination normally precedes the oral part. It is designed, scheduled, and administered by the program. The oral part of the examination is normally taken after the completion of the coursework requirement. If the proposal defense is part of the oral, it should be a defense of a proposal and not of a completed dissertation.

Normally, the candidacy examination is passed, and the dissertation topic approved, by no later than the student's eighth semester of enrollment. A student who fails to meet this deadline will be placed *on probation* and University funding will be discontinued.

6.2.8 Admission to Candidacy

Admission to candidacy is a prerequisite to receiving a doctoral degree. To qualify for admission to doctoral candidacy, a student must: be in a doctoral program, complete the program coursework and language requirements with a cumulative G.P.A. of 3.0 or better, pass the written and oral parts of the doctoral candidacy examination, and have the dissertation proposal approved (if this is not part of the candidacy exam).

It is the responsibility of the student to apply for candidacy admission by submitting the appropriate form to the Graduate School office through the program chair.

6.2.9 The Dissertation

In continuing consultation with the dissertation director, the candidate explores research areas in his or her field to formulate a dissertation proposal. The methods of approval of the dissertation proposal are determined by the student's program of study.

6.2.10 Defense of the Dissertation

In defending the dissertation, the doctoral candidate supports its claims, procedures, and results. The defense is the traditional instrument that enables the candidate to explore with the dissertation committee the dissertation's substantive and methodological force. In this way, the candidate and the committee confirm the candidate's scholarly grasp of the chosen research area.

6.2.11 Submitting the Dissertation

To receive the degree at the next graduation, the doctoral candidate who has successfully defended his or her dissertation must submit it to the Graduate School on or before the deadline published in the Graduate School calendar. Candidates should be cognizant of deadlines for graduation established by the Graduate School and the program.

The format of the dissertation should follow the guidelines established by the Graduate School. These guidelines can be found online at <http://graduateschool.nd.edu>. The Graduate School reserves the right to reject dissertations not properly formatted.