

Student Handbook
PhD Degree

USU Physics Department

(Updated June 6, 2018)

INTRODUCTION

It is the responsibility of each graduate student to understand the policies, regulations, and procedures of the School of Graduate Studies and his/her department and program. This handbook is designed as a resource for guiding students through their graduate careers. It is not intended as a substitute for frequent meetings between the student and the Physics department faculty and staff, especially with the Department Advisor (DA), graduate student Tracking Committee (TC) and the student's Supervisory Committee (SC) (which includes the student's major professor).

This handbook is divided into the following sections.

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USU PhD PROGRAM GENERAL REQUIREMENTS

(Largely summarized from the USU General Catalog)

The USU requirements for any PhD program are summarized below. Most of this information has been gleaned from the Utah State University General Catalog, which is available online at <http://www.usu.edu/generalcatalog>. Some of the information here has been obtained from various Graduate School documents. Certain information (credit hours requirements, e.g.) is specific to the Physics Department. Keep in mind that if a conflict exists between the information found here and that provided by the General Catalog or Graduate School, then the General Catalog and Graduate School are the authoritative sources.

I. FULL TIME STATUS

The following summarize the requirements for maintaining status as a full-time PhD student.

- Acceptance by the Department with the concurrence of the Graduate Dean.
- Registered for 9 or more semester credits; or
- Registered for 6 or more credits if employed as a graduate assistant for 15 or more hours a week; or
- Registered for 3 graduate credits with all required coursework completed and only the research component of the degree remaining (the **Full Time at Three Credits Form** must have been submitted to the Graduate School); or
- Registered for at least 3 graduate credits during the semester of the Dissertation Defense Examination.
- Domestic doctoral students will be given until the last day of the next semester (known as a "grace" semester) following the defense to finish degree requirements. If a student has not completed all degree requirements by the end of the grace semester, the student must pay a \$100 Late Completion Fee for each semester following the grace semester. If working with faculty involves more than routine submission of the thesis or dissertation, registration for 3 or more credits is required. After one year redefense may be required. **If all degree requirements are not complete**

within two years of a successful defense, then the major professor must submit to the graduate dean a letter, signed by all members of the supervisory committee, justifying why the student should not be required to re-defend the dissertation.

- An equivalent of the grace period is available to international doctoral students. Please see the USU General Catalog for details.
- Graduate students who desire to defer a student loan should consult with the Financial Aid Office with regards to full-time-status requirements.

II. CREDIT / GRADE REQUIREMENTS

The following summarizes the semester credit requirements associated with the PhD program.

- 60 credit hour minimum (including minimum 18 hours dissertation research) beyond a bachelors degree; or
- 30 credit hour minimum (including minimum 12 hours dissertation research) beyond a master's degree;
- Graduate students are required to maintain at least a 3.0 GPA for degree-program courses. Grades of C- or lower will not be accepted for a graduate degree.
- Class credits must be revalidated if more than 8 years have elapsed before completion of degree. Any revalidation plan must be developed by the supervisory committee and approved by the Associated Graduate Dean.
- Up to 12 semester credit hours post master's degree obtained prior to USU matriculation may be transferred from another accredited institution. Transfer credits are subject to approval by the supervisory committee and the Graduate Dean. Transfer credit must not have been used for a previous degree. Generally, any credits older than 8 years at the time of matriculation must be revalidated according to the procedure described above.

III. RESIDENCY REQUIREMENTS

The following summarizes the residency requirements associated with the PhD program.

- Of the credits on the approved Program of Study, either 50% or 33 semester credits, whichever is fewer, must be from USU. The balance of credits may be from USU or from other institutions, subject to transfer credit limits and the approval of the student's supervisory committee. This aspect of the residency requirement is verified by the School of Graduate Studies as part of the check of the Program of Study.
- Meeting the residency requirement also means that doctoral students must take part in the academic community of their program. Participation could include collaborative scholarship with faculty or peers, working as a research assistant or graduate instructor, attending professional meetings, being involved with student or professional organizations, and participating in colloquia, orientation programs, etc. This participation may or may not coincide with the period of concentrated study. Departments have the responsibility to determine appropriate ways for their doctoral students to participate in the academic life of their field and to provide opportunities for this participation.
- Residency is certified by the graduate supervisory committee. The required credits and the student's participation in the academic and intellectual life of the program are noted as acceptable by signatures on the Application for Candidacy form (discussed below).

IV. SUPERVISORY COMMITTEE (SC)

The supervisory committee (i) specifies the student's Program of Study, (ii) supervises the student's Candidacy Exam, (iii) approves the dissertation proposal, (iv) reads the student's dissertation, and (v) conducts the final Dissertation Defense Examination. The major professor is the chairperson of the committee and usually directs the student's research. Continuation in a doctoral program is contingent upon the availability of a major professor. Requirements for the composition of the committee are as follows.

- The student's **Supervisory Committee (SC)** must include five faculty with doctoral degrees who are approved by the Department Head and the Dean of the School of Graduate Studies.
- At least three members of the SC must be from within the student's department.
- At least one member of the SC must be from outside the student's department.
- Adjunct faculty can be committee members with the approval of the Dean of the School of Graduate Studies.
- Upon recommendation of the Department Head, emeritus faculty may serve on supervisory committees, but may not chair new committees.

V. GRADUATE SCHOOL FORMS

During a student's tenure a number of Graduate Schools forms must be filled out and signed in order to document the student's passage through the program. Here we briefly discuss the four forms that are required prior to the end stages of the degree when a student defends their thesis.

- Supervisory Committee Approval Form.** This form must be submitted to the School of Graduate Studies for approval **by the end of the student's third semester in the program.** Committee changes are not to be made during the six weeks prior to the final defense.
- Program of Study Signature Form.** In conjunction with the SC, a student develops a program of study, which details all of the course work and dissertation research credits that the student shall take. This information is transmitted to the Graduate School via the Program of Study Signature Form.
- Full Time at Three Credits.** This form allows a student to take only three credits of research and maintain full-time status, only after completion of all required coursework on the student's Program of Study.
- Application for Candidacy for a Doctoral Degree.** After (i) successful completion of the Physics Department's Candidacy Examination and (ii) approval of the dissertation proposal by the SC, this form is used to inform the Graduate School that the student has passed all formal requirements – short of the dissertation and its defense – for the degree. Submission of the form should occur shortly after the student has passed the Comprehensive Exam. (In the Physics Department the Comprehensive Exam is known as the Candidacy Exam.) Submission of the form must occur a **minimum** of three months before the dissertation defense.

VII. THE DISSERTATION

No research is complete until it is published. In many cases the PhD work of the student will be published as articles in journals and/or presented at conferences and meetings appropriate to the field of study. In addition, the student is required to write a dissertation on their research.

VIII. DEFENSE OF DISSERTATION

The PhD candidate must defend his/her dissertation before his/her supervisory committee. This is an oral defense. The following summarizes details regarding the defense.

- **No** changes in the supervisory committee are allowed during the **six** weeks prior to defense.
- The student must register for a minimum of three credits during the semester of the defense.
- The student should distribute the dissertation to the SC such that the committee members have sufficient time (a two-week minimum is strongly suggested) to review the dissertation **before they commit to the proposed time and place of the defense.**
- An **Appointment for Examination** form must be completed by the student and signed by the committee, indicating approval of the proposed time and place for the examination and defense, and submitted by the student to the School of Graduate Studies a **minimum of ten working days** prior to the exam.
- All SC members must attend the defense and sign the **Record of Examination Completion** form.
- **Failure to complete degree requirements within one year of the defense requires the student to redefend his/her dissertation.** The student must register for at least 3 credits the semester of the redefense of the dissertation.
- A number of other forms are associated with completion of the degree. These forms are detailed below.

IX. TIME LIMIT

All work for the PhD degree should be completed within eight years of entry into the program. Any course work older than eight years must be revalidated.

PHYSICS PhD PROGRAM REQUIREMENTS AND GUIDELINES

I. INTRODUCTION

The purpose of this section is to help students and faculty understand the specific requirements associated with the Physics Department's PhD program. Section II summarizes the steps involved in obtaining the PhD degree. Sections III – X describe each aspect of the PhD program in detail. The information in this document describes Physics Department requirements for PhD students and elaborates upon the general Graduate School requirements discussed in the preceding section.

II. SUMMARY OF THE PHYSICS PhD PROGRAM

The PhD program consists of the following elements, in roughly chronological order.

- Matriculation and an initial advisement meeting with the Department Advisor (DA) and the Graduate Student Tracking Committee (GSTC) to discuss PhD course requirements and outline a preliminary program of study.
- Continued advisement/tracking with the GSTC, DA, and Supervisory Committee (SC) (throughout the student's time at USU).
- A set of 10 required core courses, **to be completed during the first two years of graduate study.**
- Completion of the Physics Department's Colloquium attendance requirement (four semesters of attendance).
- Qualification, which consists primarily of an evaluation of the student's performance in physics graduate courses taken during the first year.
- Establishment of the student's major professor and Supervisory Committee.
- A Program of Study to be filed with the Graduate School.
- A research-format Candidacy Examination.
- Research with the student's major professor, including the dissertation proposal, actual research, writing of the dissertation, presentation of two public research seminars, and defense of the dissertation.
- Completion of post-defense paperwork.
- The time limit for completion of a PhD degree is eight years after matriculation.

III. MATRICULATION AND INITIAL ADVISEMENT

Matriculation into the program includes an initial advisement meeting with the DA and TC. A preliminary Program of Study is outlined at that time. **This initial meeting shall take place in the week before the start of classes.**

IV. CONTINUED ADVISEMENT AND TRACKING

The purpose of continued advisement and tracking is to make sure that the student is satisfactorily progressing toward a Physics PhD degree. Advisement and tracking of the graduate students takes place continually while the student is in the program. Before the student has established his/her SC the majority of advising is done by the DA. After establishment of the Supervisory Committee the primary advising role is naturally assumed by the student's major professor. In order to help ensure that the student is making satisfactory progress the TC will meet with each student on at least a yearly basis, typically early in the spring semester. **These meetings are mandatory for each student.** If the student is located away from the university during the spring semester, a phone interview with the TC may be conducted.

V. PhD COURSES AND COLLOQUIUM REQUIREMENT

A. Required Courses and Colloquium

A total of 10 core physics courses are required of all PhD students (see Table I). All required coursework is to be completed in the first two years of graduate study. Table I summarizes the required courses.

Each PhD student must also attend each Physics Department Colloquium (Tuesdays at 3:00 PM) during the first four semesters that they are enrolled in the graduate program.

Table I. Courses required for the Physics PhD program. Core course are each 3 credits.

Course Title	Course Number
Methods Theoretical Physics I and II	Phys 5340 and 5350
Classical Mechanics I	Phys 6010
Electrodynamics I and II	Phys 6110 and 6120
Quantum Mechanics I	Phys 6210
Statistical Mechanics I	Phys 6410
Plasma Physics	Phys 6330
Solid State Physics	Phys 6530
Relativity	Phys 6910

B. Grade Requirement for PhD Courses

A minimum B average (GPA ≥ 3.0) is required in the PhD courses listed above. A grade of C- or less will not be accepted for a graduate degree.

C. Possible Waiver of Course Requirements

Students who have previously taken graduate courses at another institution that are equivalent to courses required in Sec. V.A may (1) ask to have their Supervisory Committee petition the graduate school to transfer up to 12 credits as part of their Program of Study (see Sec. X below) and/or (2) ask that the previously taken courses fulfill appropriate course requirements in Sec. V.A. Any credits transferred to the Program of Study cannot have been used towards a previous degree. Such a student should assemble a Supervisory Committee as early as possible so that the Program of Study can be completed. The student should not assume that any previously taken graduate courses will automatically be substituted for USU courses. It is entirely up to the student's SC to make this determination. **Any such waivers to taking USU graduate courses should be preliminarily discussed with the DA and TC upon entering the graduate program.**

D. Program of Study

A Program of Study form must be filled out and filed with the Graduate School. This form is filled out with help from the DA, TC, and the Supervisory Committee (which includes their major professor). **It should be filed with the Graduate School by the end of the student's third semester.**

VI. COURSE TEACHING SCHEDULE

In Table II indicates teaching schedule for graduate physics courses. The schedule is designed so that a student can easily start in the fall semester of either an odd or even calendar year.

Table II. Sequence of physics graduate courses

Fall (odd years)	Spring (even years)	Fall (even years)	Spring (odd years)
MTP (5340)	MTP (5350)	CM I (6010)	QM I (6210)
E&M I (6110)	E&M II (6120)	SM I (6410)	SS I (6530)
	Plasma I (6330)		Rel I (6910)

VII. QUALIFICATION

Each student enrolled in the PhD program is evaluated for qualification for PhD work. Generally, consideration of qualification occurs at the **end of the spring semester of the first year**. Qualification of the student is primarily based on coursework taken during the first year. The qualification process may also include an evaluation of the student's work as a teaching or research assistant. **A standardized *Application for Qualification (AQ) Form* must be submitted to the faculty by the student before the faculty meet to discuss the student's qualification.**

If satisfactory progress is being made by the student, the student shall continue in the PhD program. If not, the faculty may (i) decide to reconsider qualification the following semester or (ii) remove the student from the Ph.D. program, in which case the student may apply to the masters program.

VIII. THE SUPERVISORY COMMITTEE (SC)

The student's SC consists of a major professor (who usually is the main advisor to the student during the research phase of PhD degree) and at least four other faculty members. Details of the composition of this committee can be found in section above entitled USU PhD Program General Requirements. The student's SC is the key connection between the student and the student's successful completion of the PhD degree.

The basic timeline regarding the student's SC is outlined as follows.

- The student chooses a major professor and forms his/her SC **near the beginning of the third semester** (if not earlier). At this time the student should meet with the SC to discuss the **Program of Study**, including, perhaps, the transfer of credits or waiver of certain course requirements as discussed in Sec. V.C.
- **No later than the end of third semester** the SC approves the Program of Study [which must be filed with the Graduate School via the department's Graduate Program Coordinator (GPC)].
- During the **fourth semester** the SC selects the specific material to be the focus of the Candidacy Examination.

- After successfully passing the Candidacy Exam, the student prepares a Dissertation Proposal, which must be approved by the SC. Following this approval, the Application for Candidacy form is filed with the Graduate School (via the GPC).
- The SC, especially the major professor, mentors the student in his/her dissertation research.
- The SC reads the dissertation and participates in the student's Dissertation Defense Examination.

Many of the above steps require that a form be submitted to the School of Graduate Studies. These forms can be found at the School of Graduate Studies website and are detailed in the last section of this handbook.

IX. CANDIDACY EXAMINATION

The Candidacy Exam consists of (1) a written report and (2) an oral presentation, and (3) deliberation and voting by the faculty. The *Intent for Candidacy (ICE) Form* is used (i) to set the topic of the exam and (ii) later to schedule the time of the exam. **The examination topic should be set during the fourth semester of the student's program, and the examination should take place during the student's fifth semester.** Detailed requirements and guidelines for the examination can be found in the document *A Guide to the Physics Candidacy Exam*, which can be found on the Physics Department's website.

X. RESEARCH PROGRAM

The major component of the PhD degree is the undertaking of original research. Usually this occurs as part of the major professor's overall research program, but often has significant input from the student with regards to the scope and direction of the research. There are four formal components associated with this aspect of the student's program, as discussed in the following subsections.

A. Dissertation Proposal

The first stage of the research process is to become acquainted enough with a specific area of research that a Dissertation Proposal can be drafted and submitted to the student's Supervisory Committee. Part of this acquaintance may come via preparation for the Candidacy Examination. **The Dissertation Proposal must be approved by the student's committee. Approval of the Dissertation Proposal should occur no later than the end of the third year of study.**

B. Research with the Major Professor

After approval of the Dissertation Proposal the student should focus on his/her research project. Completion of the research project can take anywhere from two to four years, typically. Utah State University has a policy of 8 years maximum for completion of the PhD degree from the date of matriculation.

C. Seminar Requirement

The Physics Department requires each PhD student to present at least two research seminars associated with his/her research (neither of which can be the Candidacy Examination oral presentation). One of these is associated with the dissertation defense (see below). The other seminar can be a local seminar given to members of a local research group, a presentation at a regional, national, or international conference, or an invited talk at another institution.

D. Dissertation and Defense

After completion of the research the student is required to write a dissertation on the research. **As part of the Dissertation Defense, a public seminar on the material in the dissertation will be presented.** Immediately following the public seminar, the dissertation is defended before the student's Supervisory Committee. Much paperwork is associated with the dissertation and its defense; see below for details.

PHYSICS-DEPARTMENT AND GRADUATE-SCHOOL FORMS

During a PhD student's tenure, there are a myriad of forms that must be filled out and submitted along the way. Graduate-School forms are filed with the Graduate School via the Physics Department's GPC. Tables III – V summarize these forms and indicate when each form should be filled out and submitted.

The Physics Departments forms can be found on the [Physics Department Website](#), while those of the Graduate School can be found on the Graduate School's [Forms Webpage](#).

Table III. Physics Department Forms associated with Qualification and Candidacy Exam.

Physics Department Form	Timeline
Application for Qualification (AQ)	End of second semester
Intent for Candidacy (ICE)	Exam topic set end of third semester Exam scheduled during fourth semester

Table IV. Graduate School forms associated with progression of the PhD degree.

Graduate School Form	Timeline
Supervisory Committee Approval	By end of third semester
Program of Study Signature	Third or fourth semester
Full Time at Three Credits	After completion of all coursework
Application for Candidacy for a Doctoral Degree	After passing the Candidacy Exam

Table V. Graduate Schools forms associated with Dissertation Defense Examination and completion of the PhD degree.

Graduate School Form	Timeline
Appointment for Examination	At least 2 weeks before proposed defense date
Record of Examination	At defense
Authorship	After Application for Candidacy; typically near time of dissertation defense
Data and Copyright	After Application for Candidacy; typically near time of dissertation defense
Committee-Signed Title Page	After dissertation has been approved by SC
Thesis/Dissertation Format and Style	After dissertation is approved by departmental reader; before submitting dissertation to Graduate School
Electronic Thesis / Dissertation	When submitting dissertation to USU Library