

Welcome

to the Graduate Program of the Department of Physics and Astronomy at
The University of Texas at San Antonio!

The Department of Physics and Astronomy of the University of Texas at San Antonio provides opportunities for advanced studies and world-class research leading to the Doctor of Philosophy degree in Physics.

The PhD degree in Physics is awarded, by the University of Texas at San Antonio, to candidates who have 1) displayed an in-depth understanding of the subject matter and 2) demonstrated the ability to make a significant independent and original contribution to research in their field of specialty. This document describes the Policies and Procedures for the PhD in Physics.

We hope that it provides you with helpful information. Much of the information included here can be found in the Graduate Catalog or the Physics & Astronomy website.

Please be sure to check with the Graduate Advisor regarding information about program-specific policies and procedures.

We hope that you have a rewarding experience and wish you success! Please keep checking the Physics and Astronomy Department website: <http://utsa.edu/physics> often. There you will find useful information, such as, forms, guidelines, contacts you will need throughout your academic career with our department at UTSA.

On Behalf of the Faculty and Staff of Department of Physics and Astronomy!

Table of Content

Topic	Page
<i>GRADUATE FACULTY IN THE PHYSICS PHD PROGRAM</i>	4
<i>ORGANIZATION & ADMINISTRATION OF DOCTORAL PROGRAM</i>	5
<i>PHYSICS DEGREE REQUIREMENTS</i>	5
<i>Registration</i>	5
<i>Course Requirements</i>	5
<i>PROGRAM OF STUDY</i>	6
<i>Seminar Requirements</i>	7
<i>Seminar Credit Requirements</i>	7
<i>SUGGESTED COURSE SEQUENCE FOR THE PHD PROGRAM</i>	7
<i>Non-Credit Requirements</i>	7
<i>Independent Study</i>	8
<i>Transfer of Credits</i>	8
<i>99-Hour Credit Limitation</i>	8
<i>Selecting a Dissertation Advisor</i>	8
<i>Attendance Requirement</i>	9
<i>Leave of Absence</i>	9
<i>Enrollment</i>	9
<i>Annual Progress Report</i>	9
<i>Qualifying Examination</i>	10
<i>Comprehensive Requirement</i>	10
<i>Oral Qualifying Exam</i>	10
<i>Master's Degree Option</i>	11
<i>Interim Master's Degree</i>	11
<i>Advancement to PhD Candidacy</i>	12
<i>Dissertation Committee</i>	12
<i>Dissertation Proposal</i>	13
<i>Final Oral Examination (Dissertation Defense)</i>	13
<i>Progress Toward the Degree</i>	14
<i>Recommended Sequence of Events for Completion of PhD</i>	14
<i>Financial Assistance Information</i>	15
<i>Graduate Fellowships</i>	15
<i>Teaching Requirement</i>	15
<i>General Academic Regulations</i>	16
<i>Grade Point Average</i>	16
<i>Academic Probation and Dismissal</i>	16
<i>Guidelines for Advancement to Candidacy for Physics PhD Degree</i>	17
<i>Procedures for the Qualifying Examination</i>	17
<i>Procedures for Submitting a Doctoral Dissertation</i>	20
<i>Organization and Administration of Master's Program</i>	22

<i>Recommended Sequence of Events for Completion of M.S.</i>	22
<i>Master's Degree</i>	23
<i>Non-Thesis Option</i>	23
<i>Thesis Option</i>	23
<i>M.S. Program of Study</i>	24
<i>Courses for Master's Program</i>	24
<i>2-year program of study for full-time students-Non-Thesis</i>	25
<i>Timesheet Submission Process</i>	26
<i>Grievance Process (PhD & MS)</i>	28
<i>Other Sources of Support</i>	29
<i>For Underrepresented Minorities</i>	30
<i>For Women in Science</i>	30
<i>For Mexican Nationals</i>	30
<i>For other Latin American Nationals</i>	30

GRADUATE FACULTY IN THE PHYSICS PHD PROGRAM

The Core Faculty members of the Physics PhD program are divided into two campuses:

The Department of Physics & Astronomy at the University of Texas at San Antonio

Arturo Ayon, PhD	Katherine Mayer, PhD
Lorenzo Brancaleon, PhD	Kelly Nash, PhD
Andrey Chabanov, PhD	Xomalin Peralta, PhD
Chonglin Chen, PhD	Arturo Ponce Pedraza, PhD
Liao Y. Chen, PhD	Dhiraj Sardar, PhD
Zlatko Koinov, PhD	Eric Schlegel, PhD
Nicolas Large, PhD	Miguel Yacaman, PhD
Xochitl Lopez-Lozano, PhD	Christopher Packham, PhD
Marcelo Marucho, PhD	Robert Whetten, PhD
Carlos Monton, PhD	

Southwest Research Institute, Division of Space Science and Engineering

Frederic Allegrini, PhD
Mihir Desai, PhD
Stephen Fuselier, PhD
Jerry Goldstein, PhD
Mark Libardoni, PhD
Jörg-Micha Jahn, PhD

Stefano Livi, PhD
Peter Roming, PhD
Kurt Retherford, PhD
Kathleen Mandt, PhD
George Gladstone, PhD
Philip Valek, PhD
Jack H. Waite, PhD

Affiliated Research Faculty

Necip Guven, PhD (Texas Tech)
Larry Tankersley, PhD

ORGANIZATION & ADMINISTRATION OF DOCTORAL PROGRAM

The Physics doctoral program is administered through the Doctoral Studies Committee (DSC). The DSC is comprised of five core faculty members. The DSC elects its own chairperson, who is then appointed by the Department Chair to be the Graduate Advisor of Record (GAR) for the Physics PhD program. The DSC reviews and recommends the academic policies and the degree requirements to the Graduate faculty. The DSC also recommends students for admission to candidacy for the PhD.

The Graduate Advisor of Record (GAR) for the Physics PhD program advises all doctoral students, supervises the maintenance of records, and represents the Physics and Astronomy Department as well as the Space Science and Engineering Division at SwRI in most matters relating to Physics doctoral students. Questions about degree requirements and academic policies should be directed to the Graduate Advisor of Record. Final authority for the Physics PhD program rests with the Office of the Provost and Vice President for Academic Affairs.

PHYSICS DEGREE REQUIREMENTS

Registration

Rules recommended by the DSC and approved by the core faculty, the Department Chair, the Graduate Council and the Office of the Provost and Vice President for Academic Affairs govern the registration of the doctoral students. Students register for available classes through the ASAP online system <http://asap.utsa.edu/>. However, some courses require departmental approval. Students should register early enough in order to allow enough time to process the requests for those courses that require Departmental approval. The student should discuss selection of lecture courses with the graduate advisor or his/her Dissertation Advisor, once this faculty member is selected. First year students are strongly encouraged to register for two of the core classes in the Fall semester and the remaining two core classes in the Spring semester.

The Graduate Advisor of Record and the Dissertation Advisor (once appointed) must approve the Program of Study (POS). Students are therefore encouraged to review the POS with their advisor and their dissertation committee periodically.

Course Requirements

The doctoral degree requires a minimum of 81 semester credit hours beyond the Baccalaureate Degree. The coursework in the Program of Study includes a Core Curriculum (12 hours) and advanced electives (21 hours) which could include a total of 6 credits (2 graduate courses) taken in another program (e.g., chemistry, electrical engineering, etc.) upon approval of the DSC and/or the Dissertation Advisor. Research hours include Research Seminar (3 hours), Directed Research* (minimum of 9 hours), Doctoral Research** (minimum 27 hours) and Doctoral Dissertation (12 hours), and together total a minimum of 42 research credit hours. They complete the Program of Study as well as one of the requirements to graduate. The choice of classes beyond the 12 hours of Core courses must be coordinated with the dissertation advisor or the GAR.

* Directed Research can only be taken until a student advances to candidacy.

** Doctoral Research requires approval of the Chair of the DSC (or GAR) prior to advancement to candidacy.

PROGRAM OF STUDY (POS)

A. Core Curriculum (12 credit hours)

PHY	5103	Classical Mechanics I
PHY	5203	Electrodynamics I
PHY	5303	Statistical Mechanics
PHY	5403	Quantum Mechanics I

B. Advanced Physics electives (21 credit hours from the following)

PHY	6103	Classical Mechanics II
PHY	6113	Fluid Mechanics
PHY	6123	Plasma Physics and Magnetohydrodynamics (MHD)
PHY	6133	Scientific Writing
PHY	6203	Electrodynamics II
PHY	6303	Quantum Mechanics II
PHY	6313	Solid State Physics
PHY	6323	Nonlinear Optics and Lasers
PHY	6403	Fundamentals of Space Physics
PHY	6413	Fundamentals of Astronomy
PHY	6503	Mathematical Physics I
PHY	6513	Mathematical Physics II
PHY	6523	Computational Physics
PHY	6613	Methods of Experimental Physics
PHY	6623	Space Physics Laboratory

Topics courses may be repeated for credit as the topics vary. The student should consult her/his Graduate Advisor if in doubt.

PHY	7403	Topics in Biophysics and Biomedical Physics
PHY	7503	Topics in Experimental Physics
PHY	7603	Topics in Condensed Matter Physics
PHY	7703	Topics in Space Physics
PHY	7803	Topics in Theoretical Physics
PHY	7903	Topics in Astrophysics
PHY	7973	Special Topics in Physics
PHY	7983	Current Topics in Physics

C. DOCTORAL RESEARCH (48 credit hours from among the following)

PHY	7001-3	Directed Research (minimum 6 hours; prior to passing qualifying exam)
PHY	7013	Research Seminar (3 hours)
PHY	7101-3	Doctoral Research (27 hours)
PHY	7111-3	Dissertation (12 hours)

The final Program of Study must be approved by the student's Dissertation Committee, Dissertation Advisor, Doctoral Studies Committee, and submitted via the Department Chair to the Dean of the Graduate School. Students should periodically (at least once a year) review the POS with their advisor and, once it is formed, with their dissertation committee.

The satisfactory progress of each student is followed by the advisor and the qualifying exam committee, but also by the Chair of the Doctoral Studies Committee through annual audits that are requested by the annual progress report each August. If a student fails to make good progress, the student's advisor as well as the student will be required to meet with the chair of the DSC and/or the Chair of the Department.

Seminar Requirements

In order to promote general awareness of research activities and to share ideas between members of the Physics program, all students and faculty are expected to regularly attend Physics graduate program functions. Annual attendance is required at the following:

1. Physics Orientation.
2. Physics Seminar Series – every seminar given.

Since the level of students' PhD activity is mostly based on their research proficiency, all students are expected to attend as many seminars as possible beyond the required Research Seminar class that is taken for credits.

Seminar Credit Requirements

The Research Seminar course (PHY 7013) is a 3 hour course and the credit hours are earned in the semester when the student officially enrolls for the class. However in order to receive full credit a student must attend at least three semesters of PHY 7013. For example, a student could sign up in semester one, but is required to attend the seminars for at least two consecutive semesters after that. Failure to do so will result in an "incomplete" grade or an "F" grade which would prevent graduation of the student or cause dismissal from the program, respectively.

SUGGESTED COURSE SEQUENCE FOR THE PHD PROGRAM ***Important***

YEAR	TERM	PROGRAM OF STUDY
1	Fall	2 Core Courses (Electrodynamics And Classical Mechanics) + Research Seminar (9 hours)
	Spring	2 Core Courses (Quantum Mechanics I and Statistical Mechanics) + 1 Advanced Elective (9 hours) and attendance of Research Seminars
	Summer	Directed Research (3 hours) Complete the comprehensive requirement
2	Fall	2 Advanced Electives + Directed Research (9 hours) and attendance of Research Seminars Identification of Supervising Professor, Research topic and Qualifying committee.
	Spring	2 Advanced Electives + Doctoral Research (9 hours)
	Summer	Doctoral Research (3 hours) Passing Oral Qualifying Exam and advance to candidacy.
3	Fall	2 Advanced Electives + 1 Doctoral Research (9 hours)
	Spring	3 Doctoral Research (9 hours)
	Summer	1 Doctoral Research (3 hours)
4	Fall	2 Doctoral Research + 1 Doctoral Dissertation (9 hours)
	Spring	3 Doctoral Dissertation (9 hours) Dissertation completed & successfully defended by the end of summer of 4 th year

Non-Credit Requirements

The following is a summary of requirements that must be completed in order to obtain the PhD degree in Physics. A more thorough timeline is provided with the Milestone Agreement.

1. Continued attendance at Physics Seminars.
2. Meet the requirements to advance to the Oral Qualifying Exam.
3. Selection of Advisor and formation of Qualifying Exam/Dissertation committee by the end of year 1.
4. Advance to candidacy (i.e., pass the oral qualifying exam) by the summer of the second year.
5. Completion of Annual Progress Reports.
6. Semester reviews with Dissertation Committee.

7. Completion of written dissertation.
8. Oral defense of dissertation.

Independent Study

Up to six hours of independent study are allowed and can be used in place of Advanced Elective courses. However the recommendation is to limit the number of coursework taken as independent study to a minimum. Students based at UT Brownsville cannot use this mechanism to avoid the minimum number of credit hours required to be taken from courses taught by UTSA core faculty.

Transfer of Credits

Students matriculating with a Master's degree or transferring from another PhD program in Physics may request up to 30 credit hours to be transferred to the UTSA program. The request will be considered by the DSC which will recommend how many credit hours are approved for transfer. The application process requires the Transfer of Credit form as well as the syllabus of the courses for which the student requests transfer. The DSC will recommend approval/denial based on the material of the course compared to the material of the equivalent course at UTSA. If approved, the credit transfer request will be forwarded to the Graduate School for final approval. Note that the Graduate School has an independent evaluation process and may deny transfer even if the DSC has approved.

Typically, credit transfer (including grade) for the four core classes is allowed only from schools where a PhD program in Physics is in place. Students who transfer from schools that do not have a PhD program in Physics are required to either re-take the core classes or pass a placement exam for that class. Research credit hours (including seminars, directed or doctoral research) cannot be transferred. The following classes that have been used for Master's Degree credit cannot be applied toward the PhD: Directed Research and Independent Study. Conditions for transfer of credit:

1. Students must complete the form "Transfer of Graduate Credit towards Doctoral Degree" (located on the graduate school website).
2. The courses must have been completed with a "B" or better.
3. Coursework must be from an accredited university and have not been used in another degree program at UTSA.
4. An official transcript from the institution where the coursework was completed must be submitted.
5. All coursework must have been completed no more than six years before the degree was awarded.*
6. Coursework is subject to approval of the appropriate Graduate Program Committee and academic College in which the program is administered.
7. Courses must be defined as graduate-level work at the institution where the credit was earned.

* If courses exceed the six years limitation a separate Time Limitation Petition Form. This form is reviewed by the DSC that decide whether to approve or not the petition based on the material covered in the expired course.

Exceptions may be approved upon recommendation of the Graduate Advisor of Record and with the approval of the Graduate Program Committee, the Department Chair, and the Dean of the Graduate School.

99-Hour Credit Limitation

The 75th Texas Legislature placed a 99-hour limit on the number of doctoral semester credit hours a student can obtain while receiving/eligible for funding support. The 99 credit hours are counted after the first 30 credit hours in the program (considered Master-level credit hours).

Selecting a Dissertation Advisor

This is the most important decision taken by any students in the program. During the first semester of residence, students have the opportunity to attend an introductory orientation to learn about research opportunities in individual faculty groups. In addition students are urged to meet with individual faculty to discuss research interests as early as the first semester. By the end of the first summer in the program or at the very latest by December of the second year, every student should have identified a faculty member who is willing to advise the student and to supervise research for

the dissertation. In order to make appropriate progress toward completion of the PhD, it is important that the student initiates dissertation research as soon as possible, no later than the middle of the second year.

A student must submit to the Graduate Advisor of Record the P1 form <http://www.utsa.edu/physics/resources/phd/P1-InterimProgramStudy.doc> selecting a Dissertation Advisor with the signed consent of that faculty member. **All students are expected to have selected the advisor and formed the QE/Dissertation committee before the end of the first year.** If extenuating circumstances have prevented a student from arranging a Dissertation Advisor by that time, the student can petition the DSC for up to a maximum of one semester additional time. **A student who is not awarded additional time, or who has not been approved for a Dissertation Advisor following completion of the additional time will not be allowed to continue in the PhD program.** The student may then petition the Department Chair for approval to transfer to the master program. See Master's Degree Option.

Attendance Requirement

Students must attend classes as required. For Doctoral Research a minimum of 4.5 hours per week per credit hour is required. If a student cannot attend classes or fulfill research commitments and does not notify the Chair of the DSC, then his/her stipend may be suspended, and procedures will begin to ascertain whether or not the student should be dismissed from the Doctoral Program.

Leave of Absence:

Continuous registration as a doctoral student is required unless a formal leave of absence is granted by the Dean of the college in which the student's program is administered. A leave of absence may be granted for military duty or medical reasons. A leave of absence may be granted for other reasons if additional approval is obtained by the Vice Provost and Dean of the Graduate School. No degree examinations may be taken while a student is on a leave of absence. If the student has not yet advanced to candidacy for the doctoral degree, this request must be approved in advance of the leave by the graduate advisor. If the student has advanced to candidacy, the application must be approved in advance by the graduate advisor and the graduate associate dean of the college and dean of the graduate school. A leave of absence is required for Fall and Spring semesters (and/or Summer if doctoral program mandates Summer enrollment). Under no circumstances may a leave of absence be applied retroactively.

A leave of absence will prevent the student from receiving student funding from his/her program and may affect ability to receive financial aid or loans and/or to defer payments on loans. Students should contact the Office of Financial Aid with questions regarding financial aid or loan status.

A student returning from a leave of absence must enroll for the following Fall or Spring semester or provide a written request for an extension of the leave of absence (a leave of absence may not exceed one year throughout the student's degree program). A student without an approved leave of absence who fails to register each semester will be considered to have withdrawn from candidacy for the degree. Approval of a Petition for Reinstatement will be required for reinstatement. For more information, visit the graduate school website (<http://graduateschool.utsa.edu/>).

Enrollment:

Students who receive support as Teaching Assistants or through most other forms of grants and support **MUST** be enrolled full-time. To fulfill this requirement a student must be enrolled for a minimum of 9 credit hours in each long semester and a minimum of 3 credit hours in the summer semester.

International students must be enrolled full-time throughout the course of study in order to maintain eligibility for their student visa status.

Students have a one-time option to petition to remain full time students at a reduced course load. This can be applied only once and for only one semester.

Students who do not receive financial support, typically, are not required to remain enrolled as full-time students.

Annual Progress Report

In order to assess student progress toward the Physics degree, an annual written progress report will be submitted to the DSC each year by the student and the Dissertation Advisor. This report should be submitted by August 15th and will be reviewed by the Physics DSC by September 30th.

The progress report ([PR1 form](#)) - must include an up-to-date list of all courses taken in the previous year and grades received along with courses taught as a TA, any research meetings/conferences attended, any publications and a narrative of the research progress. Before the due date the report is sent to the members of the QE (or Dissertation) committee and a meeting with the committee is arranged to discuss the yearly progress. The committee will then also complete a report with comments on the progress of the student.

The Qualifying Examination

The purpose of the Qualifying Examination (QE) is to determine if the PhD student has acquired the knowledge expected of a doctoral candidate in the area of physics and test the soundness of the research approach and skills. The QE has two parts: a comprehensive requirement and an oral qualifying exam. Satisfying the comprehensive requirement is a prerequisite to advance to the oral QE. Both parts need to be fulfilled in order to advance to candidacy.

Comprehensive Requirement.

- A student must obtain a minimum of 2 "A" grades + 2 "B" grades in the four core classes (Classical Mechanics I, Statistical Mechanics, Electrodynamics, Quantum Mechanics I).
 - If after the first year a student fails to meet this requirement, he/she will have to pass a written exam
 - *Scenario # 1.* 1 "A" and 3 "Bs" in the four core classes. The student has to pass with a grade of "B" or better at least one of the written exams in any of the three core topics where the student received a "B". A student can take one, two or all three written exams, but he/she will be required to pass at least one.
 - *Scenario # 2.* No "As" and 4 "Bs" in the four core classes. The student has to pass with a grade of "B" or better at least two of the written exams in any of the four core topics where the student received a "B". A student can take one, two, three or all four written exams, but he/she will be required to pass at least two.
- *For students* who are required to take the written exam, it will be administered in four parts (one for each core class) at the beginning of August of each year.
- Students who do not achieve a grade of "B" or better in a core class(es) will not be allowed to take the written exam for that/those core topics and will be required to re-take the class (or classes) and achieve a proficiency level of "B" or better.
- In case a student fails the written exam, he/she can re-enroll in the core class(es) for a chance of getting the grade(s) needed to fulfill the 2 "A" + 2 "B" requirement AND (in case they fail) take the written exam once more. *THE CORE CLASSES CANNOT BE RE-TAKEN FOR CREDIT.*
- A student cannot repeat each attempt more than once. If a student fails to achieve the 2 "A" grades + 2 "B" grades or pass the equivalent requirement for the written exam (Scenario # 1 or Scenario #2), he/she will not advance to candidacy and will be given the option to obtain a terminal MS degree.
- For students entering the program with a MS degree in Physics from another University or having taken the four required graduate core classes at other institutions, the requirement to take or not a written QE will be taken on a case by case basis by the admission committee.
- For students entering the program with a MS degree in Physics from the University of Texas at Brownsville the 2"A" + 2"B" rule will apply considering the equivalent core classes they have taken at UTB. The Physics program at

UTB has already aligned its syllabi in graduate Classical Mechanics, Statistical Mechanics, Quantum Mechanics and Electrodynamics to the ones used at UTSA.

Oral Qualifying Exam.

Once a student has successfully completed the comprehensive requirement, he/she will advance to the oral qualifying exam. A student will schedule the oral QE after having selected a Dissertation Advisor and assembled a Qualifying Exam Committee (QEC). The QEC must be composed of 5 members. At least 3 members (including the Chair of the committee) must be core faculty of the Doctoral Physics program at UTSA. At least one member must be external to the program. An external member from a prestigious academic institution other than UTSA is highly recommended. The fifth committee member can either be a core faculty member, from another department at UTSA or SwRI, or a second outside member. For students whose dissertation advisor is an adjunct faculty at SwRI or UTB, the dissertation committee MUST include at least one non-adjoint UTSA graduate faculty member of the Physics Department. The student should complete, acquire signatures from all QEC members and submit the QEC form as soon as the QEC is assembled (Form P2 - <http://www.utsa.edu/physics/resources/phd/P2-QualifyingExamCommittee.pdf>).

The oral QE should be scheduled within 12 months of the successful completion of the comprehensive requirement.

The oral QE will consist of the presentation of the student research plan and will test his/her depth of knowledge of his/her research field as well as his/her preparation to undertake the research project.

To fulfill the requirements for the oral QE the student must provide a research proposal that conveys the motivation for the research undertaken, the depth and breadth of knowledge of the student in the subject, the state-of-the-art regarding the research topic, preliminary results obtained prior to the QE and a research plan. The members of the QEC will be presented with the completed form of the proposal two weeks prior to the scheduled oral exam. Each committee member will test the examinee on the proposal and the student will be required to defend it. A majority passing vote by the committee is needed for the student to pass and advance to candidacy. The QEC may also suggest remediation steps to be taken by the student to correct deficiencies perceived during the oral portion of the exam. These will be put into written form and the Dissertation Advisor, the student's Qualifying Exam will oversee progress with a final report being sent to the GAR upon completion.

Upon successful completion of the oral QE the student will advance to candidacy (upon submission of the formal paperwork for the advancement to candidacy). If a student fails the oral QE, he/she will have six months to re-attempt it. In case the student fails it a second time, he/she will not advance to candidacy and will be given the option to obtain a terminal MS degree. The student may also pass conditionally, in which case the student may be required to take additional coursework or satisfy other requirements determined by the QEC and approved by the GAR.

Individual Dissertation Advisors may have more restrictive rules to allow students to advance to candidacy (e.g., require one or more manuscript publications in peer reviewed journals). Students should discuss these requirements with the faculty before selecting the dissertation advisor.

Master's Degree Option

A doctoral student who has failed either component of the QE or the dissertation defense may petition the Department Chair for approval to transfer to the MS Program in Physics, to receive a Master Degree. The student must complete all degree requirements for the MS degree, including the comprehensive examination.

Interim Master Degree

Students who are admitted to doctoral programs directly from the bachelor's-degree level (without the requirement of a master's degree) and who want to obtain a Master's degree as part of the PhD program, must meet the following requirements:

1. Complete the appropriate set of 30 semester credit hours of coursework, matching to the satisfaction of the appropriate Graduate Program Committee, the 30 hours required for regular master's degrees at UTSA in the specified area.
2. Pass a qualifying examination related to the above 30-semester-credit-hour program, administered under the standard UTSA regulations. (If the Doctoral Qualifying Examination has been administered and passed, this requirement has been met.)
3. Apply for the master's degree at the time and in the manner prescribed for regular master's degrees at UTSA
 - a. Present to the graduate school, through COS-Dean's office.
 - i. An approved program of study for the master's degree <http://www.utsa.edu/physics/resources/phd/P1-InterimProgramStudy.doc>
 - ii. Certification of having passed the Qualifying Examination (Form P3) <http://www.utsa.edu/physics/resources/phd/P3-QualifyingExamCompletion.pdf>
 - iii. A transcript (or certification from the Office of the Registrar) showing a grade point average of 3.0 or better and current good academic standing.
 - iv. Certification of removal of any conditions imposed on admission (if applicable)

Courses counted as indicated above toward the master's degree may also be included in the overall requirements for the doctorate degree. More information can be obtained at <http://graduateschool.utsa.edu/current-students/interim-masters-degree/>

Advancement to PhD Candidacy

Upon completion of the Qualifying Examination and receipt of the signed Approval form (P3) from the QEC and Dissertation Supervisor, the student can advance to candidacy for the PhD. The Physics DSC Chairperson will notify the student of his/her advancement to candidacy. If advancement to candidacy is not recommended by the QEC and the Dissertation Supervisor, the student will be notified by the Physics DSC within two days, and the student may make a written appeal to the Physics DSC within two weeks of the recommendation.

As soon as the student is notified of the recommendation to advance to PhD candidacy, the student should apply for advancement to candidacy (form P4). The application forms can be obtained from the Program Manager in the Physics Department or downloaded from the Physics Department website. <http://www.utsa.edu/physics/resources/phd/P4-CandidacyApplication.pdf>

The criteria for admission to candidacy are:

1. Completion of all required core course work.
2. Fulfillment of the Comprehensive Requirement and successful completion of the oral Qualifying Exam.
3. Approval by the Physics DSC, the Department Chairman, and the Dean of the Graduate School and the Office of the Provost and Vice President for Academic Affairs.

Any student who is admitted to the program to earn the PhD should be advanced to candidacy within two years after enrollment. Any student who has not been advanced to candidacy within two years can continue in the program only after individual review and recommendation by the Physics DSC to the Department Chairperson, and the Dean of the Graduate School.

Dissertation Committee

Upon advancement to candidacy the student must appoint his/her Dissertation Committee (Form C1) <http://www.utsa.edu/physics/resources/phd/C1-DissertationCommittee.pdf>. The Dissertation Committee has the responsibility for general supervision of the student's research and ultimately for certifying to the Dean of the Graduate School that an acceptable dissertation has been submitted and that all degree requirements have been completed. The committee is selected by the student in consultation with his/her Dissertation Advisor and with approval of the Physics DSC, the Department Chairman, and the Dean of the Graduate School and should be appointed soon after the Qualifying Examination is passed. The requirements for the composition of the dissertation committee are the same as those applied to the QE committee. The Dissertation Advisor chairs the committee. The formal approval of the Dissertation Committee is included in the Application for Advancement to Candidacy (Form P4 - <http://www.utsa.edu/physics/resources/phd/P4-CandidacyApplication.pdf>

Important: Although the QEC and the Dissertation Committee can technically be different it is **strongly recommended** that the membership of the committee be the same. Thus when assembling the QEC the students and advisors should keep in mind that such committee should carry on as the Dissertation Committee.

While the supervising professor provides day-to-day guidance to the student, all members of the committee should be available for consultation, and the student should feel free to ask for advice. The Dissertation Committee also has general responsibility for monitoring the student's research progress whereas the Physics DSC will continue to monitor progress through the Program of Study. As stated in the Milestone agreement the student must meet with the dissertation committee at least once per year (Students are responsible for setting up these meetings). During these reviews the student will provide a progress report to the dissertation committee. The dissertation committee will provide written feedback and suggestions to the student about his/her progress and submit a report to the Physics DSC for each of these meetings.

Regular reminders of the meetings will be sent out by the Program Manager in the Department, however the student and his/her advisor should be proactive with ensuring these meetings take place in a timely fashion.

If it is necessary to change the membership of the dissertation committee prior to completion of the dissertation, such procedure involves a petition to the Physics DSC and approval through administrative channels. The student should consult with the Graduate Advisor of Record before initiating any action. Changes in the committee should be completed well in advance of the final oral examination.

Dissertation Proposal

As part of the Qualifying Examination, the student must present a dissertation proposal to the Dissertation Advisor and the Qualifying Exam/Dissertation Committee for approval. The dissertation proposal will in most cases coincide to the proposal written for the oral component of the qualifying examination, with revisions suggested by the QEC. The Dissertation Research Proposal format should be followed according to section 14.1.2. The Dissertation Committee must sign the title/signature page of the approved Dissertation Research Proposal (Form C2 - <http://www.utsa.edu/physics/resources/phd/C2-DissertationProposal.pdf>). This signed form page is submitted along with the Dissertation Proposal, the signatures of the Physics DSC Chair, and the Department Chair, to the Dean of the Graduate School.

Final Oral Examination (Dissertation Defense) and Graduation

When the dissertation is in final form, it is circulated to the Dissertation Committee. The Dissertation has a specific format required by the Graduate School, thus contact the Graduate School's office for information about the format requirements (information can also be obtained from the following website, <http://graduateschool.utsa.edu/current-students/category/thesis-dissertation/>).

When all members of the committee agree, the final oral exam (defense of dissertation) should be scheduled. The request for scheduling of the final oral exam is to be submitted to the Physics DSC at least 15 days prior to the defense and should be advertised as extensively as possible to the public.

In order to defend their dissertation students must have at least one manuscript published in a peer-reviewed journal, where they are listed as first or main author.

The defense of the doctoral dissertation consists of two parts. The first is a public seminar that is open to all faculty and students. The Program Manager posts notices of the seminar at least one week prior to the exam. Immediately following the seminar, the student meets privately with the Dissertation Committee to answer any questions that the committee members may have. Once the dissertation is approved by the Dissertation Committee, the committee chairperson notifies the Department Chair and the Dean of the Graduate School of successful completion of the exam (defense) and that all degree requirements have been met using the appropriate form (Form C3- <http://www.utsa.edu/physics/resources/phd/C3-DissertationRequirementsCompletion.pdf>). This must be done no later

than three weeks prior to the end of the semester to include the completion of final POS (Form C4 - <http://www.utsa.edu/physics/resources/phd/C4-FinalProgramStudy.doc>).

The Graduate School Office provides guidelines on the format of the dissertation and all signature pages and forms for notification of successful completion of all degree requirements and submission of the dissertation to the library.

Prior to approving the forms for graduation the Chair of the DSC will complete the following steps which must be fulfilled by all students:

- 1. Carry out an exit interview**
- 2. Provide the most current CV to the Chair of the DSC**
- 3. Provide the information regarding employment after graduation (when available)**
- 4. Progress Toward the Degree**

All students are expected to make reasonable progress toward the degree in a timely fashion. It is the responsibility of the students and their dissertation advisors that substantial progress towards the degree is made and monitored periodically. Each year the student and Dissertation Advisor must submit an annual written progress report by August 15th, and once a student has advanced to candidacy for the PhD, the student must schedule periodic meetings with the Dissertation Committee.

Based on the students annual progress report, the Physics DSC will recommend what actions, if any, are required and will then transmit its recommendations to the Department Chairman and the Dean of the Graduate School, who will decide the actions needed to be taken. These actions may include:

1. Student is in good academic standing and sufficient progress is being made towards defending dissertation thus continuation is recommended.
2. Student is in good academic standing but insufficient progress being made towards defending dissertation, thus the student will be referred to academic and dissertation coaching.
3. Student is in good academic standing but insufficient progress being made toward defending dissertation thus student should be dismissed from program

Students receiving one of the above recommendations would typically have been enrolled in the program either full time or part time more than 7 years. Student should consult their ASAP account to verify their year of admission. Consideration is made for students who have filed leave of absence during the first 7 years of their program of study.

Recommended Sequence of Events For Completion of PhD Requirements

YEAR ONE

1. Arrival at UTSA – Meet Department Chair, Physics & SwRI core faculty & hear about faculty research programs at the PhD Student Orientation.
2. Meet with Physics Graduate Advisor of Record for the PhD Program.
3. Submit any graduate level classes to be transferred to the Physics DSC for preliminary approval & take placement exams (if necessary).
4. Complete requirements for unconditional admission (if necessary).
5. Fulfill the core classes' requirements for the qualifying exam.
6. Select Dissertation Advisor and form the (partial) Dissertation Committee before end of Fall semester.
7. Submit annual progress report by August 31st.

YEAR TWO

1. Complete the majority of course work.
2. Form Dissertation Committee – at least 5 members, including one external member.
3. Initiate research project for dissertation.
4. Write Qualifying Examination proposal and submit to Dissertation Advisor & Dissertation Committee for approval.

5. Schedule, take & pass Oral Qualifying Examination administered by Qualifying Examination Committee before August.
6. Be recommended for Advancement to Candidacy by the Physics DSC.
7. Submit annual progress report by August 31st.

YEAR THREE

1. Make constant and substantial progress in the research project.
2. Schedule at least one Dissertation Committee meetings.
3. Submit annual progress report by August 31st.

YEARS FOUR & BEYOND (if necessary)

1. Make constant and substantial progress in the research project.
2. Continue to meet with Dissertation Committee twice yearly.
3. Submit annual progress reports each August 31st.
4. Complete research.
5. Prepare dissertation.
6. Complete dissertation, get Dissertation Committee approval.
7. Set date for Dissertation Defense.
8. Work with the Department Program Manager to notify Graduate School Office and publish the time, date, place and title of Defense.
9. Submit copy of dissertation to Dissertation Abstracts for publication.
10. Submit required and personal copies of dissertation for binding.
11. Schedule exit interview with GAR.

FINANCIAL ASSISTANCE INFORMATION

Graduate Fellowships

Students accepted into the program may receive support in three forms:

1. University support of ~\$27,000 for first academic year, including tuition and some fees; this stipend has both research and teaching responsibilities. The stipends are awarded competitively. The stipend is paid monthly contingent upon satisfactory progress toward the PhD degree. The stipend cannot be received simultaneously with other forms of support.

2. Teaching assistantship. With this support the students are expected to fulfill their teaching responsibility of 2 introductory laboratories per semester or equivalent teaching assignments. Support for tuition is not provided to Teaching Assistants beyond the first year in the program.

3. Research assistantship. This form of support is typically provided by external funds available to individual advisor and the dollar amount may vary depending on the funding agency. The terms of this support depend on the type of funding (scholarship, fellowship, etc.) and the funding agency (e.g., NSF, NIH, DoE, etc.) This form of support requires the students to dedicate their time to research and their coursework.

Students receiving University support or research assistantships **MUST be registered full time**; 9 hours per long semester and 3 hours per summer. Students supported by external funds can be registered for a variable number of credit hours each semester. In order to receive any type of assistantship students **MUST** maintain good academic standings and they have to make good progress towards the obtainment of their degree.

Outside employment for students receiving University support is not permitted, except under conditions of substantiated hardship. Approvals for outside employment must be obtained from the Dissertation Advisor, the Doctoral Studies Committee (DSC), the Department Chair and the Office of the Provost and Vice President for Academic Affairs.

Teaching Requirement

During the first year, students who are not supported by an external grant will be required to provide Teaching Assistantships which may include at least two introductory Physics laboratory or recitation for various classes, and/or assisting an instructor in organized lecture classes (e.g., grader, tutor, etc.). The teaching duty effort will correspond to the equivalent of 19 hours/week.

Teaching assistantship is one possible way for students to receive support for their studies. However, since the post-degree careers of Physics graduates are likely to involve some teaching, students are encouraged to be involved as Teaching Assistants before obtaining their degree.

Becoming a teaching assistant should be considered a great and rewarding responsibility. As a TA, you will be granted access to an office located in the MS building for grading and storing any supplies/papers, a separate location for office hours. Also, you will have a chance to improve your public speaking skills, refreshing the foundation of physics, and improve your time management skills. On the other hand, as a Teaching Assistant, there are some requirements that are expected of you consisting of weekly meetings, maintaining a good GPA, and maintain good evaluations from your students.

GENERAL ACADEMIC REGULATIONS

Rules concerning registration, late registration, adding classes, dropping classes, and auditing classes are all found in the schedule of classes. Academic standing, cancellation of enrollment, withdrawal procedures, reinstatement in the University and student classification are also addressed in the Graduate catalog.

Grade Point Average

To remain in good academic standing a minimum grade point average of 3.0 (on a 4.0 scale) must be maintained in each of the following:

1. all coursework completed at UTSA
2. graduate courses in the student's major
3. graduate courses in the student's support field.

In computing grade point averages, grades from other institutions are not used.

Academic Probation and Dismissal

Academic Probation

Academic probation describes the standing of a student at the graduate level who is in one of the following categories:

1. A student who fails to achieve a grade point average in any term at UTSA of 3.0 or higher, irrespective of level of courses taken.
2. A student who received a grade of "D" in any course in a term.
3. A student who does not meet all requirements for unconditional or regular admission and who, by special action, is admitted on academic probation.
4. A student who has been reinstated following academic dismissal.
5. To graduate, all graduate students must have a grade point average of at least a 3.0 (on a 4.0 scale).

Academic probation is cleared only when none of the above criteria apply and when the student achieves an overall grade point average of 3.0 as a graduate student at UTSA. Students on academic probation are encouraged to discuss their status with their academic advisors.

Important!! A student on academic probation cannot be supported as a Teaching Assistant or as a Graduate Research Assistant.

Academic Dismissal

Academic dismissal occurs:

1. when a student at the graduate level earns a grade point average of less than 2.0 in any term
2. when a student at the graduate level earns a grade of "F" in any course
3. when a student at the graduate level is admitted on probation with conditions and fails to meet a condition
4. when a student at the graduate level who is on academic probation during a term would again be placed on academic probation under the provisions of academic probation set forth above in the subsequent term. If, however, the student's UTSA grade point average for the term is at least 3.0, he or she will continue on academic probation.

Important!! A student on academic dismissal cannot be supported as a Teaching Assistant or as a Graduate Research Assistant.

**GUIDELINES FOR ADVANCEMENT TO CANDIDACY
FOR THE PHYSICS PHD DEGREE**

PROCEDURES FOR THE QUALIFYING EXAMINATION

I. CHRONOLOGY OF EVENTS

The Qualifying Examination is based on a comprehensive requirement based on the performance in the four core graduate classes as well as the student's oral defense of a written research proposal. The chronology of events is:

1. The student fulfills the comprehensive requirement for the 4 core classes (see page 10). [Month: May, Year: 1]
2. The student selects a dissertation advisor and forms, in consultation with the selected advisor, a "partial" (i.e. 3 or 4 members) dissertation/QE committee. The committee is partial, in that it may not include the required external member yet. The student contacts the members of his/her Qualifying Examination/Dissertation Committee to obtain their agreement to serve and then submits the names to the Physics GPC for approval. [Month: August, Year: 1]
3. The student initiates his/her research project(s). [Month: September, Year: 2].
4. The student writes a proposal based on dissertation interests discussed with the advising professor and committee in terms of general feasibility. It is recommended that the Qualifying Examination Committee be composed of faculty who will become part of the student's Dissertation Committee. The chair of the Qualifying Examination Committee must be a faculty member other than the Dissertation Advisor. The dissertation advisor can be the Chair of the Dissertation committee. [Month: May, Year: 2].
5. If not done in step 2, the student and the advisor expand the committee to include at least 1 or 2 external members. The final committee should include 5-6 members. Students who selected an advisor in the Department of Physics and Astronomy (UTSA) are encouraged to include in their committee one adjunct faculty from SwRI. [Month: May, Year: 2].
6. If requested by the committee members The student may write an abstract (maximum of 200 words) and an outline (maximum of one page) of the proposal and distributes copies to the committee members. The committee members should inform the chair of the committee within three days of any significant reservations about the proposal. The student should consult with the chair of the committee after the third day. [Month: May, Year: 2].
7. The student writes the full proposal taking into consideration any of the initial concerns of the committee members [Month: June, Year: 2].
8. The student distributes the full proposal to the committee members. Within seven days after receipt of the proposal the committee members inform the chair of the committee whether or not the proposal is acceptable for the purpose of the oral examination. The student consults with the chair for this information. If the proposal is not acceptable, the student re-writes the proposal based on recommendations from each of the committee members. [Month: June, Year: 2].
9. When the committee unanimously agrees that the proposal is acceptable or if no concerns are raised by the committee members, the student and advisor can schedule the date of the QE and make sure that all committee members can participate. If necessary one of the members who might be unable to attend the QE in person can participate via video conference (or similar medium e.g., Skype). The student may discuss with the committee members areas of knowledge for which he/she will be held responsible during the examination. [Month: July, Year: 2].
10. During the oral examination, the committee examines the student on the written proposal and related areas to assess the breadth and depth of knowledge he/she possesses as a doctoral student. [Month: August, Year: 2].
11. Approval by a majority of the committee members is required for the student to pass the oral examination. Advancement to candidacy also requires approval of the supervising professor who substantiates the student's potential for independent and productive research. The supervising professor makes this determination by the

completion of the oral exam. Signatures of the committee members and the supervising professor are required on the Approval statement.

12. If the student fails the oral examination, he/she will be allowed to repeat the examination. The chair of the committee will give the student a written explanation for the basis of the failure and provide guidelines to prepare for the re-examination. Unless there are unusual circumstances, the re-examination must be completed within six months of the first examination. If the student fails the re-examination, he/she will be dismissed from the PhD program. The Physics DSC will decide whether the student will be permitted to proceed towards a Master's degree.
13. Upon successful completion of the Qualifying Examination and receipt of the signed Approval statement from the qualifying examination committee and supervising professor, the student will be advanced to candidacy for the PhD degree. The Chair of the QE/dissertation committee will notify the student of his/her advancement to candidacy. If an unfavorable recommendation is made, the student will be notified by the DSC Chair in writing and the student may make a written appeal to the Physics DSC within two weeks of the recommendation.

II. THE STUDENT'S WRITTEN PROPOSAL

The student's written research proposal will be in the same area as his/her dissertation studies. The student may give an original interpretation of literature data, propose a series of experiments to test one or more hypotheses, present a new theoretical approach to a problem. The format of the proposal is suggested to follow that of an NSF grant proposal. The proposed research has to be original and conducive to peer-reviewed publication.

The proposal should have a cover page with a title and names of the student, dissertation professor, and committee members. When the committee has agreed that the proposal is acceptable for oral examination, the student should give a copy of the proposal with the cover page containing the signatures of the committee members to the Physics DSC along with the date scheduled for the oral examination. In the proposal, the cover page should be followed by an abstract, statement of the hypotheses to be tested, specific aims, background information from the literature, preliminary studies (if applicable), research design and methods to test the hypotheses, and a discussion of potential experimental outcomes of significance to the hypotheses. A bibliography should be included. Only background information and references most relevant to the proposal should be included. The written proposal does not have to follow any specific format but must be considered sufficient, by the QEC, to convey the student's understanding of the research undertaken and the research plan and timeline. The proposal must be typewritten and include the bibliography. The bibliography should include titles and inclusive of page numbers. The proposal must also include a timeline/statement of work describing time to completion. For more information on formatting the proposal, see the guidelines posted here. <http://www.utsa.edu/physics/resources/WritingProposals.pdf>

The faculty strongly emphasizes that the responsibility for the quality of the proposal in terms of originality, approach to solving the problem or testing the hypotheses, and significance rests completely with the student. The student prepares the written proposal entirely by him- or herself. The student may ask the supervising professor to read and correct the proposal prior to submission to the examination committee. The supervising professor may suggest changes with respect to general organization of the document, English (grammar, spelling, etc.), and general aspects of the science. It is the responsibility of the examination committee to evaluate the scientific merits of the proposal.

III. THE ORAL EXAMINATION

The oral examination begins with an approximately thirty-minute presentation by the student in which he/she summarizes the proposal. The presentation is open to the public. The summary presentation is followed by questions from the public. After this section has finished the public is excused and the committee members proceed to question the candidate until they decide they have evaluated the student's performance. The written proposal and related scientific areas will be the basis of the committee's questions, but questions of general physics knowledge are allowed by the committee members. A three-hour period should be scheduled for the examination.

IV. POSSIBLE OUTCOMES OF THE QUALIFYING EXAMINATION

Unconditional Pass: For an unconditional pass the student must pass the written comprehensive exam and there must be a majority passing vote of the members of the QEC.

Pass with Conditions: The student may also pass conditionally, in which case the student may be required to take additional coursework or satisfy other requirements. The QEC may suggest remediation steps to be taken by the doctoral student to correct deficiencies perceived during the oral portion of the exam. These will be put into written form by a report from the Chair of the QEC to the Physics DSC and the student. The Dissertation Supervisor will oversee progress along with the student's Dissertation Committee, and the Graduate Program Committee with a final report being sent to the QEC upon completion. Application for Advancement to Candidacy is not allowed until all conditions have been satisfied.

Fail: If the student does not pass the oral exam he/she will be allowed to repeat the examination within 6 months. For additional time the student should write a petition, approved by the QEC, to the GPC to justify the need for additional time. The Chair of the QEC will give the student a written explanation for the basis of the failure and provide guidelines to prepare for the re-examination. If the student fails either the written or oral exam on a second attempt, he/she will be dismissed from the PhD program. The Physics DSC will decide whether the student will be permitted to proceed towards a Master's degree.

V. RESPONSIBILITIES OF THE STUDENT

1. Fulfill the requirement for the core classes (see page 10).
2. Start the research project early and be persistent and steady in carrying out the various research tasks.
3. Select the advisor within 12 months of starting the program.
4. Request that the Physics DSC review his/her graduate record for approval to take the oral examination.
5. Discuss your ideas about a proposal and potential faculty members for a qualifying examination committee with your supervising professor.
6. Submit the names of the qualifying examination committee to the Physics DSC for approval and initiate the paperwork to appoint any external member to the graduate faculty(*).
7. Write an abstract and outline of a proposal for initial approval by the examination committee.
8. Write a complete, original proposal that is approved by the examination committee in terms of its acceptability for an oral examination.
9. Present a copy of the proposal with a signed cover page to the chairperson of the Physics DSC when the committee has approved the proposal.
10. Successfully defend the proposal in an oral examination by the committee.
11. Make sufficient progress in research to warrant a positive recommendation from your supervising professor.

(*) Appointment of an external member as a Special Member of the Graduate Faculty is approved by the Graduate Council. The Graduate Council meets the first Thursday of each month (except in June, July, August, September and January) and application for special memberships has to be filed with the Graduate School (through the Physics Department office) by the 15th of the month preceding the meeting of the Graduate Council.

VI. RESPONSIBILITIES OF THE SUPERVISING PROFESSOR

1. Provide the student with general guidance in preparation of his/her proposal.
2. Attend the oral examination of the student as a voting member of the committee.
3. Participate in the evaluation of the student for Advancement to Candidacy by substantiating, or not substantiating, the student's potential for independent and productive research.
4. Provide guidance and supervision of the student towards a successful completion of their degree. This includes ensure that the advised students proceeds in a timely manner through the program. The Advisor should be aware of the deadlines and general procedures for the completion of the steps towards graduation.

VII. RESPONSIBILITIES OF THE EXAMINATION COMMITTEE

1. The qualifying examination committee can be composed by the same members that form the Dissertation Committee, but they could be composed of different faculty members. The QEC will consist

- of at least 5 members including at least 2 Physics core graduate faculty members, and the dissertation advisor. At least one member (but no more than 2) should be external to the Program. The presence of internationally renowned scientists in the QEC is encouraged. The chair of the qualifying examination committee must be a faculty member other than the Dissertational Advisor.
2. For students advised by UTSA faculty it is encouraged to include an adjunct faculty from SwRI. Students advised by adjunct faculty at SwRI must include a UTSA core faculty in their committee.
 3. If the committee decides the proposal is not acceptable, the student must re-write the proposal based on recommendations from each member of the committee.
 4. The committee examines the student on the written proposal and related areas. The chair of the committee acts as moderator for the examination.
 5. Upon completion of the examination, the committee evaluates the performance of the student and decides whether or not the student passed the examination. Passing the exam requires a positive vote from a majority of the committee members. Advancement to candidacy also requires approval of the supervising professor.
 6. The chair of the committee will inform the student of the committee's decision immediately after the committee's deliberations.
 7. The chair of the committee will inform the chairperson of the Physics GPC of the committee's decision and give him/her the signed Approval statement.

Procedures for Submitting a Doctoral Dissertation

The following are the steps to be followed by doctoral students in submitting a doctoral dissertation (please also refer to the following website: <http://graduateschool.utsa.edu/current-students/category/thesis-dissertation/>) :

1. After passing your qualifying exam, you should continue working with your Dissertation Supervisor and Dissertation Committee. You are eligible at this time to enroll in doctoral Dissertation research. You should enroll in the appropriate doctoral research courses with your Dissertation Supervisor as the instructor.
2. Enroll in a total of at least 27 semester credit hours of Doctoral Research and 12 semester credit hours of the appropriate Doctoral Dissertation course with your Dissertation Supervisor as the instructor over the total time that you work on the dissertation. Students should enroll in at least one doctoral dissertation course each semester that they are working on the writing of the dissertation itself. Students are required to be enrolled in a doctoral dissertation course the semester in which the dissertation is defended and submitted for final approval. Your final transcript will have a grade for only 12 hours of doctoral dissertation, no matter how many additional hours you take.
3. Successfully defend the dissertation. Allow yourself **at least** a month before the end of the semester to do any changes or corrections to the dissertation for your committee. Arrange with the Program Manager in the Physics Department Office to process your paperwork. The date and time of the dissertation defense must be announced at least one week prior to the scheduled defense of the dissertation. The steps leading to the defense include:
 - a. Write the dissertation in the format required by the Graduate School (<http://graduateschool.utsa.edu/current-students/category/thesis-dissertation/>). This may take several weeks. The writing of the dissertation is a multiple revision process between the student and the advisor. Completion of a satisfactory Dissertation typically requires several iterations.
 - b. Once the Dissertation is complete the student and the advisor should send it to the committee members for review.
 - c. The student and the advisor should schedule a defense and advertise its date, time and location at least a week before the event.
 - d. The first part of the defense is a public seminar. The second part is the defense in front of the Dissertation committee.
4. Submit the dissertation which conforms to the format prescribed in the approved formatting template (<http://graduateschool.utsa.edu/current-students/formatting-requirements>) .

5. Fill out the top portion of the “UTSA Form for Transmittal of Doctoral Dissertation to the Vice President for Academic Affairs” and the [Certification of Completion of Dissertation Requirements for Doctoral Degree](#).
6. Obtain the signatures required from your dissertation committee and submit to the program manager for forwarding of signatures.
7. Copies of the “Certification of Completion of Dissertation Requirements” to the Department Office are placed in your student file.

ORGANIZATION & ADMINISTRATION OF MASTERS PROGRAM

RECOMMENDED SEQUENCE OF EVENTS FOR COMPLETION OF THE M.S. DEGREE

REQUIREMENTS. The following sequence summarizes some of the landmarks of progress that should be followed as closely as possible.

SEMESTER 1

1. Arrival at UTSA- Meet with graduate program Advisor (i.e. GAR)
2. Prepare and submit a Preliminary Program of Study with the GAR
3. Complete requirements for unconditional admission (if necessary)
 - A) BS in Physics or at least 18 undergraduate hours in upper-division physics courses (the catalog says 18 hours, at least 12 being upper-division)
 - B) 550 on TOEFL, if not native English language
 - C) Satisfactory score on the basic GRE (subject Physics GRE-highly recommend)
 - D) Three letters from qualified professionals
 - E) 3.0 GPA in last 60 credit hours earned

SEMESTER 2

4. Select research advisor & consult about Program of Study
5. Form Supervisory Committee: Comprehensive Exam -3 members, including a majority of tenured or Adjoint tenure-track faculty from the Core faculty of Physics & SwRI.

SEMESTER 3

6. Complete the majority of course work

SEMESTER 4

7. Schedule, take and pass Comprehensive Examination, administered by Supervisory Committee
8. Apply for Graduation

Master's Degree

All candidates for the M.S. degree in Physics must satisfy the university-wide master's requirements. To qualify for the M.S. degree in Physics, the M.S. candidate is required to take a minimum of 30 semester credit hours in coursework approved by the Graduate Program Committee (exclusive of coursework or other study required to remove deficiencies).

There is no University stipend support for Master's Degree students. Positions as Teaching Assistants or Research Assistants *may* be available for (salary only) support.

A candidate for the master's degree must, in addition to other requirements, pass a comprehensive examination comprised of oral and written components. The comprehensive examination will be administered by the Comprehensive Exam Committee. The Comprehensive Exam depends on the choice of option by the student.

Non-thesis Option

For a MS degree under the Non-thesis Option, a student can meet requirements without defending a thesis. Instead, the student is required to complete 30 Semester credit hours of formal graduate coursework approved by the Graduate Program Committee. A student who selects the non-thesis option is still required to enroll in 6 credit hours of Directed Research. In this case the Directed Research course can be taken twice with the same faculty or with a different faculty for each of the three credit hours. **His/her Comprehensive Examination is constituted by a written report that describes the activity and results obtained in the Directed research classes as well as the understanding of the research topic.** The written report is then followed by a seminar presentation of the research activity carried out during the Directed Research hours.

In order to successfully defend the Comprehensive Examination a student must:

- a. Prior to the exam, student should complete and interim program of study (Form MS1 - <http://www.utsa.edu/physics/resources/ms/MS1-InterimProgramStudy.pdf>).
- b. Select a Comprehensive Examination chair. This is typically selected among the faculty with whom the student enrolled for the Directed Research course.
- c. In consultation with the faculty, the student then assembles a Comprehensive Examination Committee which includes a minimum of three members. The absolute majority of the members of the committee **MUST** be composed of core (or adjoint) faculty members. At least one member of the committee **MUST** be a non-adjoint faculty of the Physics Department at UTSA. Student must complete the appointment of the advisor and comprehensive exam committee form after consultation with advisor and in the semester before defending (Form MS2 - <http://www.utsa.edu/physics/resources/ms/MS2-NT-AdvisorExamCommittee.pdf>).
- d. Provide the report to the committee, at least a week prior to the defense. After providing the report the student in consultation with the committee members selects a date for the defense.
- e. The defense is typically made in front of only the committee members (but general public is allowed to participate) and consist of a seminar where the student discusses and demonstrates sufficient understanding of the research and topic investigated during the Directed Research hours.
- f. The student will submit completion and program of study forms to the program

manager.

MS3- [Report of Comprehensive Examination for the Master's Degree](#)

MS4- [Completion of Comprehensive Examination](#)

MS5- [Program of Study for the Master's Degree](#)

Thesis Option

For a MS degree under the Thesis Option, a student must defend a thesis. The student is required to complete 30 Semester credit hours of formal graduate coursework approved by the Graduate Program Committee. A student carries out research for the obtainment of a MS Thesis. Instead of enrolling in Directed Research, students who select the Thesis Option can enroll in either 3 credit hours of Directed Research or 3 hours of Master's Thesis and, in the semester in which they defend, enroll in Comprehensive Exam. The Comprehensive Examination is constituted by the thesis itself and by the thesis defense.

In order to successfully defend the Comprehensive Examination a student must:

- a. Prior to the exam, student should complete and interim program of study (Form MS1 - <http://www.utsa.edu/physics/resources/ms/MS1-InterimProgramStudy.pdf>).
- b. Select a Comprehensive (or MS Thesis) Examination chair. This is typically the faculty with whom the student enrolled for research.
- c. In consultation with the faculty, the student then assembles a Comprehensive (or MS Thesis) Examination Committee which includes a minimum of three members. The absolute majority of the members of the committee MUST be composed of core (or adjoint) faculty members. At least one member of the committee MUST be a non-adjoint faculty of the Physics Department at UTSA. Student must complete the appointment of the advisor and comprehensive exam committee form after consultation with advisor and in the semester before defending (Form MS2 - <http://www.utsa.edu/physics/resources/ms/MS2-T-AdvisorSupervisoryCommittee.pdf>).
- d. Provide the thesis to the committee at least three weeks prior to the defense. After providing the thesis the student in consultation with the committee members selects a date for the defense.
- e. The defense is typically made in front of only the committee members (but general public is allowed to participate) and consist of a seminar where the student discusses and demonstrates sufficient understanding of the research carried out.
- g. The student will submit completion and program of study forms to the program manager.

MS3- [Completion of Oral Examination](#)

MS4- [Certification of Completion of Thesis Requirements for Master's Degree](#)

MS5- [Program of Study for the Master's Degree](#)

The typical program of study for MS students is presented below.

Category	Semester Credit Hours
Non-Thesis option	Non-Thesis
Core courses (4)	12
Physics electives (3)	9
Directed Research (2)	6
Research Seminars	3

Category	Semester Credit Hours
Thesis option	Thesis
Core courses (4)	12
Physics electives (2)	6
Master Thesis (2)	6
Directed Research	3
Research Seminars	3

Courses for Master's Program

Core courses	12 SCH required
PHY 5103 – Classical Mechanics I	3 SCH
PHY 5203 – Electrodynamics I	3 SCH
PHY 5303 – Statistical Mechanics	3 SCH

General Physics Electives	9 SCH required
PHY 6003 – Quantum Mechanics I	3 SCH
PHY 6103 – Classical Mechanics II	3 SCH
PHY 6113 – Fluid Mechanics	3 SCH
PHY 6123 – Plasma Physics and Magnetohydrodynamics	3 SCH
PHY 6203 – Electrodynamics II	3 SCH
PHY 6303 – Quantum Mechanics II	3 SCH
PHY 6313 – Solid State Physics	3 SCH
PHY 6323 – Non-linear Optics and Lasers	3 SCH
PHY 6403 – Fundamentals of Space Physics	3 SCH
PHY 6413 – Fundamentals of Astronomy	3 SCH
PHY 6503 – Mathematical Physics I	3 SCH
PHY 6513 – Mathematical Physics II	3 SCH
PHY 6523 – Computational Physics	3 SCH
PHY 6613 – Methods of Experimental Physics	3 SCH
PHY 6623 - Space Physics Laboratory	3 SCH
PHY 7403 – Topics in Biophysics and Biomedical Physics	3 SCH – can be repeated for total of 6 SCH
PHY 7703 – Topics in Space Physics	3 SCH – can be repeated for total of 6 SCH
PHY 7803 – Topics in Theoretical Physics	3 SCH – can be repeated for total of 6 SCH
PHY 7973 – Special Topics in Physics	3 SCH – can be repeated for total of 6 SCH

Research	
PHY 7003 – Directed Research	3 SCH
PHY 6983 – Master's Thesis	3 SCH
PHY 6961 - Comprehensive Examination	1 SCH (only if enrolled in no other classes)

Typical 2-year program of study for full-time students – Non-Thesis MS

Year	Term	Program of Study
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1	Fall	2 Core Courses + Research Seminars. (9 hrs)
	Spring	2 Core Course + 1 General Electives. (9 hrs)
2	Fall	2 General 1 Directed Research (or Master's Thesis) (9 hrs)
	Spring	1 Comprehensive Examination (3 hrs)

Grievance Process (PhD & MS):

Students who wish to discuss problems, concerns or file a formal grievance in regards to academics or research matters, should in general follow this line of contacts:

1. Dissertation Advisor
↓
2. Program Manager
↓
3. Graduate Advisor of Record
↓
4. Associate Chair of the Department
↓
5. Chair of the Department
↓
6. Associate Dean for Graduate Studies (College of Sciences)

In case the complaints or grievance is in regard to one of the individuals listed above the students should contact the subsequent person in the list.