These notes are addressed to all current and incoming ScM students in Physics, to be used as a planning guide and a reference resource throughout the ScM year(s). Pertinent University web resources should be regarded as the primary references for degree requirements and options.
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A. INTRODUCTION

The Brown Physics graduate program provides students with both focused training and an opportunity to perform independent research in some of the most current areas of physics. The aim of the Master’s Degree Program in Physics is to train professional physicists, providing them with a mastery of the fundamental principles, facts and methods of the discipline and the opportunity to participate in original investigations. It certifies a command of certain intellectual tools of broad validity and physics’ modes of thought.

The Physics Master's program is suitable as both a means for professional development and preparation for further graduate study. The program offers enough flexibility to allow for completion of the degree in two, three, or four semesters of full time enrollment, depending on a student’s background and preferences.

Students admitted into the Master's program cannot automatically transition to the PhD track (see Section F below).

In this program, students develop a solid and broad base of physics knowledge through the core curriculum and departmental colloquia. Upper level courses and departmental seminar series subsequently provide more specialized exposure. Coursework constitutes the bulk of the program with participation in original research being strongly encouraged.

B. DIGEST OF PROGRAM AND REQUIREMENTS

The requirement for a ScM degree in Physics consists of successfully completing four of six core courses and four advanced courses. If a Master’s Thesis is included in the degree plan, two of the four advanced courses would be Research in Physics, in which the student performs original investigation under the sponsorship of a particular faculty member (research supervisor) leading to a Master's thesis.

The program has a standard structure with the prescribed course load of two courses per semester over four semesters (2-2-2-2), with two courses per semester being considered full-time enrollment. However, with pre-approval the degree may also be completed in two or three semesters. Deviation from the standard structure must be approved across multiple offices through the Department; as such action can affect time to completion and tuition cost, as well as producing visa implications for international students. Therefore, students need to seek approval from the Department when considering a deviation from the standard program structure. More information can be found on the Graduate School’s website here.

In the 2-2-2-2 structure, the first year is spent on coursework and acclimating to the Department. If a thesis or an application to the PhD track is being considered, time may also be spent investigating areas of research and prospective research advisors. In the second year, courses, and, if applicable, research, should be concluded.

**Academic Standing**

A student will be in Good Standing so long as he/she passes the required courses. It is expected that all core courses will be taught and taken ABC/NC. For any student who passes a core course with a grade of S, the instructor will prepare an evaluation form for the Chair. The evaluation will include an equivalent ABC letter grade for use in establishing standing.

A student may be placed on Warning for poor course performance in a course required for the degree that results in a grade of NC. Receipt of a second NC grade may result in the student
being advised to leave the program, unless the student provides the program director with a viable plan for correcting the issues contributing to the failure and re-establishing performance that will lead to success. A student who receives three grades of NC in required courses will very likely be withdrawn from the program, although it should be noted that the program director has the discretion to consider extenuating circumstances. In all cases, the student will be given written notification of academic standing with clear criteria for regaining good standing and consequences of not meeting the criteria.

Records of course grades will be kept by the Director of Graduate Studies, who will inform the faculty if a student is not performing satisfactorily in courses. These decisions will be communicated to the student and the Physics Faculty in writing as soon as possible.

C. COURSES

Degree requirements
The ScM degree recognizes a significant level of academic achievement beyond an undergraduate degree. A total of 8 credits in 2000 level courses form the main requirement for the ScM degree in Physics. Of the eight required courses, four will be selected from the six core courses of the PhD program (PHYS2010, 2030, 2040, 2050, 2060, 2140). Four additional credits at the 2000 level are required. These courses are to be selected from the remaining core courses or the large number of other upper level physics courses. Up to two of these can be taken in another department with approval of the program director. Preparation of a Master’s thesis is highly recommended as it forms an important pillar of the professional training.

Students with less rigorous physics backgrounds will be advised to take a mixture of 1000 level and 2000 level courses during their course of study, necessitating a 3 or 4 semester track to completion.

The six core courses are:

- Physics 2010 Techniques in Experimental Physics
- Physics 2030, 2040 Classical Theoretical Physics I & II
- Physics 2050, 2060 Quantum Mechanics
- Physics 2140 Statistical Mechanics

Beyond the core courses, ScM candidates are expected to pass four advanced courses, which can include research courses if a thesis will be prepared, to strengthen and update their knowledge of their chosen research fields while developing breadth.

The student's own taste and the supervisor's recommendations are both vital guides in their selection and it should be possible to accommodate both. These courses are expected to be from the 2000 level. The rest can be from offerings of other departments subject to the approval of the Director of Graduate Studies. The Department's offerings at this level vary from year to year. The student should consult the Department's annual listing of course announcements. Special courses can sometimes be arranged in response to student requests, given sufficient numbers and sufficient lead time. Reading courses can only be counted towards the advanced course requirement upon approval by the Director of Graduate Studies using the Advanced Course Permission Form. A generic research course cannot be used to satisfy the advanced course requirement.

The sequence of advanced courses in the various fields of specialization shades almost imperceptibly into the various weekly series of topical seminars and departmental colloquia.
These are a major constituent of the graduate program, and regular attendance and occasional participation would be of benefit to all students. They provide not only contact with the current literature but also a first-hand experience in professional Physics research. (It is possible to learn from less exciting visiting speakers as well as the most stimulating ones.)

Individual course registrations are submitted online via the University's Banner registration system.

D. RESEARCH & MASTER'S THESIS

Participation in research is highly recommended as it helps students to acquire practical knowledge and skills useful for future employment. Not all ScM students will participate in research, as the thesis is optional. However, for those considering research in their degree plan, the following should be noted:

Many students enter graduate school without a clear preconception of a specific research field which attracts them most strongly. It is an important function of the first year to evoke such a preference, through courses, colloquia and seminars, and informal discussions with faculty and other graduate students.

Establishment of a research connection obviously requires not only concentrated thought but substantial initiative on the part of the individual concerned. Three steps are involved:

- learning what kinds of work are going on and, hence, what is available
- estimating what opportunities, duties and daily life might be in those groups of interest
- establishing a personal connection

Interdepartmental research projects carried out entirely in a related department are possible. In all stages of the work, the supervisor has the primary role in evaluating the quality of the research. It is expected that the primary advisor as well as a second reader will evaluate the thesis.

E. ADVISING & COMMUNICATION

The Department has traditionally been distinguished by a relaxed and informal interaction among its faculty members and graduate students. We count this tradition as one of our assets and consciously seek to preserve it but in order to do so, we rely on student initiative and participation. In-course contact, seminars, and colloquia are convenient occasions for students to become acquainted with faculty members.

The formal mechanism for faculty advising is as follows: one faculty member is designated as the Director of the Master’s Program (Master’s Program Director of Graduate Studies, or DGS). He/she will meet with each incoming student to review preparation and goals, discuss the choice of the first year course program, and recommend a tentative degree plan and course progression. The DGS will continue to advise the student on his/her progress throughout the period of study by:

- maintaining an open line of communication with the faculty as a whole on matters of general or individual concern
- being available for individual advising, as needed or requested
- monitoring each student's progress within the graduate program, and
- communicating on relevant issues.
The DGS also serves as a liaison with the Graduate School (DGS).

A member of the department administrative staff, the Student Affairs & Programs Manager, is available to assist students with all graduate matters.

F. PROFESSIONAL DEVELOPMENT

The University provides a multitude of resources for professional development, including:

- Sheridan Center for Advanced Teaching and Learning
- CareerLab
- Writing Center

Students are encouraged to participate in the programs offered as suits their professional development.

Transitioning to the PhD track

Students who intend to apply to the PhD program in order to transition to the PhD track within the department are advised to:

- Excel in their core course work. Three core courses are recommended during the first semester.
- Take advantage of their ability to make a favorable impression upon program faculty. Discuss research interests with as many faculty members as possible.

H. FOR INTERNATIONAL STUDENTS

The following University offices and programs are devoted to supporting the unique needs of international students at Brown:

- Office of International Student and Scholar Services (OISSS)
- Center for Language Studies
- English For International Teaching Assistants

There is also the local and independent

- International House of Rhode Island

Fluency in English is an important skill for physicists and professionals. The Department encourages students whose native language is not English to take advantage of the opportunities and assistance provided by the above offices and organizations.