

University of South Dakota

Department of Physics - Master's Physics-Analytics for Large Data Sets specialization Program Handbook

2019-2020 Academic Year

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2. Introduction

The university catalog contains general information concerning the graduate education, the Physics Master's Program, graduate degree requirements, and detailed listings of graduate courses. All graduate students should familiarize themselves with pertinent information contained in the catalog. This handbook lists departmental requirements for the Plan A Master's with a specialization in Large Data Sets Program that are in addition to requirements set by the Graduate School. The following guide describes specific requirements of the Physics Master's Program and is intended to supplement the catalog information. All Master's students in this program should carefully study the guide and become familiar with the requirements described herein.

3. Graduate Student Advisor and Program Coordination

The Physics Graduate Coordinator serves as faculty advisor to each new Master's (MS) graduate student until a student selects an advisor to supervise their graduate research. The student must select an advisor that is a professor in their department. The Graduate Coordinator will assist all new graduate students with course registration and provides each student with information about the MS program. In case a student needs to change advisor, the Graduate Coordinator will also serve as their temporary faculty advisor until a new advisor is identified. Master's students are expected to identify a research advisor before completion of their first two semesters as a graduate student, as defined by USD, in the program and before taking any research credits.

4. Teaching Assistantships

Many students work as Teaching Assistants (TAs). The primary purposes of a Teaching Assistantship are to provide students with professional experience and the necessary financial resources to attend a graduate program. The TA workload is split between paid work and educational experience. The compensable portion of the Teaching Assistant position may not exceed 19 hours per week during the fall and spring semesters (.5 FTE). Therefore, a TA may not report more than 19 hours of work per week in USD's time/effort reporting software (currently SNAP). Any additional TA work is part of a student's educational experience.

A student enrolled in the Accelerated Masters program is not eligible for a TA position until after that student's undergraduate institution awards her/his bachelor's degree.

Extended Personal Leave

Graduate students responsible for teaching courses are expected to be present and engaged during the fall and spring semesters from one week before the start of the semester until one week following the end of the semester. Graduate students engaged solely in research are expected to be fully engaged in research during the entire time they are paid. During the summer, graduate students are generally report labor on a daily basis; a graduate student wishing to take extended time off should not expect to be paid during their absence.

5. General Program of Study Requirements

The general requirements for a Plan A thesis-based Master's degree in physics are:

1. File a Program of Study within the first year of study in coordination with your research advisor. Students in the accelerated program should file a Program of Study within the first year of being deemed a graduate student by USD.
2. For students in the accelerated program, completion of all coursework that satisfies their undergraduate institution resulting in the award of a bachelor's degree.
3. Completion of all required [Plan A specialization in Analytics for Large Data Sets Master's coursework](#) at a level that satisfies [USD's academic standards](#).
4. Completion of at least two consecutive semesters as a full-time student.
5. A thesis-based MS degree also requires
 - a. completion of a thesis that represents results that are original and relevant to the field of study and
 - b. successful oral defense of the student's thesis.

6. Program of Study

Master's students must file a proposed Program of Study that includes a list of courses the student intends to take. Necessary training for special skills that are needed for the student to fulfill research goals must be indicated and explained. The Program of Study must be filed with

the Graduate Coordinator and then the Office of Graduate Education during the first year of study. Students in the accelerated program should file a Program of Study within the first year of being deemed a graduate student by USD.

In approving a proposed Program of Study, the Physics Graduate Coordinator will take into account acceptable graduate-level courses taken by the student at other institutions or other demonstrations of competence in a particular area. The student should summarize any previous relevant material, and submit it along with their Program of Study for review. The Program of Study form can be found at the [Graduate School's list of Course/Program Forms](#).

7. Plan A - Selection of Research Topic

All new students are encouraged to make appointments with faculty in the Department of Physics to discuss possible research topics for their degree project and whether they would be a good fit to join a specific research group as early as possible.

Each student should match with an advisor in accordance with the interests of both sides and determine the research topic. Following the guidelines from the graduate school, a thesis committee, consisting of the advisor and two other faculty members, must be formed to guide the student progress. The thesis committee must include:

1. one professor from the Department of Physics that is not their advisor and
2. one professor from the student's institution that is not in the physics department.

8. Plan A - Thesis and Thesis Defense

The student's research is of major importance. The written research results are expected to be of publishable quality. The student's advisor may specifically require publication of one or more peer-reviewed journal articles based on the student's research results. Instructions concerning the thesis are given in the graduate catalog.

Information on guidelines for writing and formatting a thesis are available from the Office of Graduate Education. Student should obtain a free copy of "Instruction for the Preparation of Thesis and Dissertation" from the Office of Graduate Education. All students are expected to follow the guidelines in the manual. [The Graduate School provides resources for writing your thesis at this link](#). The final version of the thesis must be submitted by the candidate to each member of his/her thesis committee no later than two weeks before the scheduled thesis defense date. Students are encouraged to provide a final copy of their thesis to their thesis committee as early as possible. Students are encouraged to provide copies of their thesis to their advisor as early as possible.

Thesis Defense

The student will be required to give an oral presentation (40-50 minutes) on the major findings of his/her research. An oral examination will follow the presentation and questions from the

public. It will be conducted by the student's advisor with only the student's thesis committee members in attendance. The student's thesis committee members will question the student to test both the quality and completeness of the research and the student's mastery of the her/his thesis topic. Upon successful completion of the thesis defense and incorporation recommended thesis changes, the student will both file a Graduation Approval Form and submit the thesis to ProQuest. Submission of the thesis to ProQuest is required for graduation.

9. Plan B - Non-Thesis Defense

The Department offers a non-thesis Masters' degree in recognition that a research thesis based degree is not a good fit for all students and in recognition that some PhD students wish to obtain a Plan B Masters' degree en route to their PhD. In place of a research-based thesis, a shorter technical report is expected. It is recommended that the technical report adheres to the Plan A thesis formatting guidelines. Technical reports will be submitted to the Graduate Coordinator for review at least one week before the graduation deadline.

10. Standard of Conduct

The University of South Dakota and the Graduate Program strive to foster a positive environment that enables all students to have their best opportunity for a successful and positive graduate experience. Students are expected to be courteous and respectful to other students, faculty and other members of the USD community. The Graduate Program expects students to at a minimum abide by the University of South Dakota's [Code of Student Conduct](#). In addition, graduate students are training and working within the community of professional physicists and are expected to adhere to the [Ethics and Values of the physics community as stated by the American Physical Society](#).