GUIDE TO THE TECHNOLOGY, POLICY, AND INNOVATION PHD

Overview

The degree in Technology, Policy and Innovation (TPI) is the doctoral degree of the Department of Technology and Society (DTS) in the Stony Brook College of Engineering and Applied Sciences. The department is focused on the interface between Society and Technology, where the details of the technology make a difference; its Doctor of Philosophy in Technology, Policy, and Innovation is the highest level of degree a student can achieve in the US.

This document is a practical guide to the process by which students meet the requirements for this PhD. It is designed to help the student with advice and background on the requirements. The formal regulations are contained in the graduate bulletin[1] and on the DTS web page.[2] Deviations from any requirement must be approved by a review committee chaired by the PhD Program Director (Gerald.stokes@stonybrook.edu). The request for a deviation must come from the student's advisor and the student. Marypat Taveras (marypat.taveras@stonybrook.edu) is the departmental coordinator for the PhD program and can answer any questions you may have; she will assist you with obligatory actions, schedules, and paperwork.

A series of critical steps lead to a student's qualification to begin the process of preparing a dissertation. These steps are not "box checking" exercises. Writing an effective dissertation and representing DTS in the broader research community requires an extensive body of knowledge and advanced skill set. As the doctoral student progresses through the qualification process, it is extremely important that he/she begin to learn the craft of research as soon as possible.

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[1] See stonybrook.edu/sb/graduatebulletin/current/academicprograms/est/index.pdf.
[2] See stonybrook.edu/commcms/est/phd/requirements.php.

Suggested Course Sequence

The doctoral program of DTS expects TPI students to earn their PhD in 4 years. Hence, all entering students should work with their initial advisors on a 4-year-path to the PhD. The following is a sequence of classes suggested for incoming students for the Fall 2018 semester: **Semester 1:** EST 600, EST 601 and the social science methods class; **Semester 2:** EST 625, second social science methods, elective; **Semester 3:** EST 610 (Advanced Statistics), 692 Research Seminar (recommended), elective; **Semester 4:** elective (3); **Semester 5:** completion of part A paper and associated examination: EST 698 research class (for Part A research). Depending on the needs and interests of the student, variations in this sequence are possible.

Requirement	How met	Notes
Core Courses	EST 600, EST 625, EST 610, EST 601	3.0 GPA
Additional Technical Courses	15 additional credits with relevant technical focus	3.0 GPA
Analytic skills	Two Social Science Methods courses; EST 610	Part B 3.7 GPA for Soc. Sci. Methods; 3.0 for EST 610
Research Proficiency Exam	Written Paper and Presentation	Part A
Teaching Practicum	Varies	
Advancement to Candidacy	Written Proposal and Presentation	

Table 8.4-1: Summary of Requirements for Advancement to Candidacy

Required Courses

The student must maintain a GPA of 3.0 for the course work noted below. For those requirements that are different than those that appear in the current bulletin, the effective date for the requirement is the Fall of 2017. The details of the courses can be found in the catalog. The descriptions below describe the role of the obligatory classes in the doctoral education process. Exceptions to core course requirements will be rare and are discouraged.

Introduction to Policy is a two-course sequence (EST 600 and EST 625) introducing science, technology, innovation, and policy.

Analytic Skills Development (Part B requirement) means that all students must complete two analytic methods courses in social sciences departments (with a grade of at least A-; 3.7 GPA) and an advanced statistics class (EST 610) within the department (with a grade of B or better). DTS expects all students to develop strong analytic abilities, both in terms of practice and understanding a broad range of methods.

Additional Technical Courses provide DTS students with competence in the student's chosen technical domain. For this, DTS requires that all students take 15 additional credits with a technical focus to develop and document their technical expertise.

Grand Challenges in Technology and Society (EST 601) is intended to acquaint our students with knowledge about three things: big problems at the intersections of technology and society, the work of our faculty, and the importance of critical reception and discussion. Beginning in the Fall of 2018, this team-taught seminar will focus on the departmental topics of Smart Development, Smart Communities, Smart Technology, and Smart Ethics. Designed to be led in the future by the chair of DTS, faculty will present their own research and interests to the doctoral students who, in turn, will engage the professors in querying their research and approaches.

Three Required Passages

There are three major passageways to receiving your doctorate. The details of each of these three (Part A, Dissertation Proposal, and Dissertation itself) are described in what follows. It is critical to understand that the resulting documents are what is approved; they are part of your permanent record and must be prepared to the highest academic standards.

1. The Research Proficiency Exam (Part A) consists of the preparation of an original research paper, roughly 30-50 pages in length, which the student prepares and presents to a review committee. The four-member review committee is selected by the Department Chair and will not include the student's advisor on the Part A paper. This paper is meant to demonstrate the student's readiness for independent research; it should be completed and defended in the student's fifth or sixth semester. As noted previously, we recommend that students become engaged with research from the beginning. Thus, work on Part A should start as early as the first year of the student's tenure in the program.

In selecting a topic for Part A, the guiding goal should be the submission of an academic article to a peer-reviewed journal. Several courses – EST 600, EST 625, and the grand challenge course, for example – are good sources for topics. The research seminar EST 692 is a central place to discuss one's Part A and learn doing research.

The Part A review consists of four steps. *First step*, a written report of typically 30-50 pages and ca. 50-100 citations. This report must a) identify a research question of interest to some research community; b) provide an overview of related background research; c) describe a reasonable approach to evaluate the research question; and d) present the results of the research project.

Second step, an oral presentation of approximately 45 minutes. The presentation must a) provide a motivation for conducting this line of research; b) summarize the background material, emphasizing the most important related work; c) give an overview of the methodology, emphasizing why this approach was taken; and d) deliver and discuss the relevance of the results.

Third step, questions posed by members of the committee related to any aspect of the presentation or the written report follow the presentation.

Fourth step, the committee concludes the research proficiency exam with its findings. There are three possible results of the examination: pass, fail, and contingent pass. The third of these is the most likely outcome, which leads to an extended review and reconciliation process. The committee asks the student to provide answers to written questions or make modifications to the Part A manuscript. The response to these requests is filed with the graduate program coordinator. Upon acceptable completion, the answers and/or the modified manuscript are also filed with the program coordinator. At the end of the process the Part A form is completed and filed.

At the latest, DTS expects the Part A exam to be concluded at the end of a student's third year. Financial support during the fourth year is contingent on that achievement.

2. The Dissertation Proposal comes next, after the successful completion of the Research Proficiency Exam and fulfillment of all course and teaching practicum requirements. Now, the student moves toward identifying a dissertation topic. The university requires that the time between completion of requirements and the approval of a dissertation topic does not exceed 18 months. There are three things to bear in mind when developing a thesis proposal.

First, the nature of the topic: Students are strongly encouraged to develop their own research topics. At present, 75-80 per cent of the thesis topics are in the domains of "Energy and Environmental Policy" and "Engineering Education, Management, and Policy."

Second, the dissertation advisor: The student must have an advisor from within the department. When someone from another part of the University might better advise on a topic, that individual can be a co-advisor, but the student still is required to have a DTS faculty as advisor.

Third, the dissertation committee: This committee consists of at least four individuals. The advisor is a member but cannot chair the committee. The chair and one other member of the

committee must come from within the department. A fourth member of the committee must come from outside DTS and we strongly recommend that there be a fifth member from outside the University. The student and his or her advisor should work together well prior to the presentation of the proposal to identify an appropriate committee. The student generally asks the prospective members of the committee to serve. It is in the student's best interest to assemble the strongest possible committee. The Department Chair approves the committee and may add additional faculty to serve on a proposal committee.

The dissertation proposal is the roadmap of the dissertation. It specifies the intended contribution and context of the work as well as methods, approach, and schedule for completion. A typical proposal (or prospectus) is approximately 30-50 pages long. It should be written at the technical level of a funding proposal for the NSF or a similar foundation. The committee needs to be convinced of the uniqueness and novelty of the work, the student's knowledge of the literature, the clarity of the research questions and associated hypotheses, and the efficacy of the proposed research methods.

The process associated with the presentation and defense of the dissertation topic is as follows. *First*, the written proposal is sent to the committee at least 2 weeks ahead of the presentation. *Second*, the student provides copies of both the written proposal and presentation material to the PhD Program Director prior to the presentation. *Third*, the student presents the proposal for 45-60 minutes, after which the committee poses questions and discusses the proposal. *Fourth*, the committee judges the presented proposal with either pass, fail, or contingent pass. In case of the third result, the committee asks the student to answer written questions and/or make modifications to the proposal. The additional requirements are filed with the PhD Program Director. *Fifth*, upon their acceptable completion, these documents are also filed with the program coordinator.

After acceptance of the proposal, the department notifies the Graduate School of the approval of the topic and make-up of the dissertation committee. The committee must be approved by the

Graduate School before the defense of the dissertation (see below). The Graduate School approves the student's advancement to candidacy upon receipt of this request and review of the student's file. The Graduate School checks that you are advancing to candidacy within 18 months of your Part A exam and have completed your teaching practicum (see Miscellanea below).

3. Dissertation Preparation and Defense. A dissertation is intended to advance the state of knowledge in an area of study. It is a significant and substantial piece of scholarship. Students should read a number of dissertations, monographs, and scholarly books in their area to gain insight into the required scope of work. The department expects a dissertation to be at least 200 pages long. Further, the level of detailed discussion must be significantly broader than that of an article in a refereed journal.

You want to have the strongest possible committee you can assemble. As you and your advisor identify the committee, it is important to establish a relationship with its members and keep them apprised of your progress. They can be a great asset for early review and comment on your work. Note that it is not unusual for a student's committee to change membership while the dissertation is in preparation. However, the committee that approved your dissertation proposal can also continue to be your final committee. In any case, the Department Chair may or may not add additional members to it.

Ultimately, you and your dissertation advisor determine when the manuscript is ready to be defended. Once that point has been reached, the student submits the dissertation to the PhD Program Director at least four weeks prior to the planned defense to allow the Graduate School to approve the composition of the final committee and authorize proceeding with the dissertation defense.

The review and approval of the dissertation is in the hands of the dissertation committee. The final step in the process involves the oral defense of the dissertation in an open meeting, after which the dissertation committee renders its judgment. All members of the committee are required to approve the dissertation in writing in order for the degree to be awarded.

Again, there are three possible outcomes: pass, fail, and contingent pass. For the third of these, the committee asks that student to provide answers to written questions or make modifications to the dissertation. These additional requirements are filed with the PhD Program Director. Upon their acceptable completion, the responses and/or the modified dissertation are also filed with the program coordinator. The final step for the student is the submission of the approved dissertation to ProQuest per the rules of the Graduate School.[3]

Miscellanea

Financial Support and Associated Work Assignments. When the department provides financial support for full-time students, the maximum limit for that support is four years. Continuation of support after the first year is dependent on the student making satisfactory academic progress. Academic progress is formally assessed by the faculty each year in a review meeting held in January. The student receives a written summary of that discussion in February. The scope of the review includes (but is not limited to): grades and assessments of class work; progress to Part A (which must be completed by the end the third year to be eligible for fourth year funding); and general participation in the life of the department, including meeting work assignments.

Supported students are mainly involved in one or more of the following three obligations. *First*, as Teaching Assistants. The primary assignment of a supported student is to serve as a TA. Depending on the class and preferences of the professor this may entail grading, managing recitation sections, giving an occasional lecture, and other activities that advance the goals of the class.

Second, as Research Assistants. Since 2015, supported students have also been assigned to work with a faculty member on the professor's research. Junior faculty members are given first choice in these assignments. These assignments are intended to benefit both the faculty and the student, but in

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[3] See Dissertation & Thesis Submission at grad.stonybrook.edu/academics/thesis_dissertation_guidelines.php.

general, the faculty member chooses the research, especially if the student is supported by a research

grant. A research assistantship represents the simplest way for many students to become engaged with

research early on in their course of study. In some cases, this work can lead to a Part A or even

dissertation project.

Third, Computer Lab Support. The Department maintains a computer lab, which is designed for

the support of Masters and some undergraduate students. PhD students are assigned to monitor the lab

and its usage, providing assistance or tutoring as may be required during the hours of their duty. Some

support of the lab may be associated with a teaching assistantship.

Advisors and Advising. Advisors, and mentors in general, are an important part of the education

process. While the students will develop a special relationship with their advisors, they should become

familiar with the work and interests of all members of the faculty. At various stages of your progress

toward the PhD, advisors take on formal roles (including the following three in particular):

First, as initial advisor. Upon admission, every student is assigned an advisor from the

department for guidance through the early part of their time as a DTS student. These advisors are

assigned because of aligned interests and other factors. This advisor's role is to provide advice and

counsel as the student begins the process of course selection and qualification. The initial advisor may

be, but is not necessarily, the advisor for the student's part A paper.

Second, as Part A advisor. This individual is a faculty member from the department who advises

the student through the creation of an original piece of research known as Part A. As noted above, Part

A may or may not evolve into a dissertation. Similarly, the Part A advisor may or may not be the

student's dissertation advisor.

Third, as dissertation advisor. You will identify a DTS professor willing to work with you,

especially as you prepare to submit a proposal for your dissertation research. This faculty will help you in

research topic selection and work with you throughout the development of your thesis. He or she will also be helpful to identify a strong dissertation committee.

Residence Requirement. The Graduate School requires that students complete two consecutive semesters of full-time graduate study, which is 12 credits per semester until 24 graduate credits have been earned. Students who have earned 24 graduate credits at another school may be assigned advanced status and are required to take only nine credits per semester for full-time status. The purpose of this requirement is to ensure that the graduate student participates in the professional life of the program beyond class attendance.

Teaching Practicum. The Graduate School requires that students demonstrate teaching ability through a teaching practicum. This requirement can be met in a variety of ways and the student should work with Marypat Taveras to identify the most effective way to demonstrate that skill.

Guidance for Part Time Students. The requirements for the degree remain the same whether the student is enrolled full-time or not. Establishing a sequence of courses to take is the most important task for a part-time student. Working with your initial advisor the student should aim to complete all required courses as early as possible, being mindful of the time key classes are taught, because not all classes are offered every semester. Also, the interaction with other students in the program is helpful in many ways. So, as you arrange your presence in the department, please make sure that you leave time for interaction with your peers.