TECHNOLOGY AND SOCIAL BEHAVIOR PHD

Degree Requirements

The following requirements are in addition to, or further elaborate upon, those requirements outlined in The Graduate School Policy Guide (https://catalogs.northwestern.edu/tgs/academic-policies-procedures/).

PhD

Total Units Required: 20

The TSB doctoral program admits students from a variety of backgrounds and gives them rigorous training in social science and engineering methodologies, allowing them to understand technological developments in their broadest possible contexts. The implementation and production of media, information and communication technology--as well as the study of their contexts of use--is an expected part of the program of study. Accordingly, students should either have a technological background already, or be prepared to acquire the relevant skills early in their graduate program.

To complete the PhD in Technology and Social Behavior, students must complete coursework, pass qualifying examinations, and complete a thesis as detailed below:

Course Requirements

Critical evaluation of disciplinary perspectives, as well as integration of disciplinary methodologies, is a key goal of the TSB doctoral program. The required courses therefore provide theoretical, historical, psychological, and sociological perspectives on technology, along with classes in research methods. For the remaining courses, each student must work with an advisor to create a course of study that approaches a single theme within technology and social behavior from multiple disciplines.

Because PhD students are encouraged to create a course sequence that best supports their research, dissertation, and teaching plans, each student will be assigned to a temporary advisor upon arrival, who will help design a research plan. Students need not, however, feel obliged to choose this person as a thesis advisor. The research plan will incorporate course requirements from both the School of Engineering programs and School of Communication, however since these degree requirements are quite flexible, students can expect to engage in hands-on research starting in their first year.

Computer Science and MTS both have flexible course requirements, demonstrating both departments' support of independent programs. In the TSB combined degree program, 2 additional units are added to the overall PhD requirements: students must take qualifying examinations in both departments, and students must submit their PhD theses to a committee composed of faculty from both departments.

- The usual computer science requirements are as follows:
  - You are required to take 18 units for the PhD:
  - 16 departmental courses, and 2 COMP_SCI 590-0 Research Research units.
  - Of the 16 departmental courses six must be taken at the 400 or 500 level.
  - Exams and other requirements are defined by the track one is in (e.g., Interfaces, Artificial Intelligence, etc.).

- Courses from other departments (such as Learning Sciences, Psychology, etc) are often substituted for departmental courses.
- The usual MTS requirements are as follows:
  - You are required to take 18 units for the PhD:
  - 4 of the 18 units will be from courses internal to MTS.
  - 2 of these units must be taught by two different faculty.
  - The 3rd unit must be the MTS core course, "The Practice of Scholarship."
  - 4 out of the remaining units will be from a minor area and may come from either within MTS or another department.
  - 1 course will be in implementation (from Computer Science, Learning Sciences, Engineering, Art & Technology, etc.).
  - The remaining units need not be confined to courses within MTS, but can be taken from other tracks within MTS or in departments across the University.

The TSB program combines the requirements of these departments in a 20-unit curriculum that includes the following:

- The MTS 501-0 Introduction to Grad Research in MTS first year research practicum.
- Two MTS courses taught by 2 different faculty members.
- The MTS 503-0 course on "The Practice of Scholarship."
- Two units of COMM_ST 499-0 Independent Study and two units of COMP_SCI 499-0 Projects.
- A concentration in either the *Interfaces* (previously called Graphics and Interactive Media) or *Artificial Intelligence* track. This concentration will be composed of 4 courses taken from one of those concentrations, and will define which qualifying exams the student takes in CS. This concentration will ensure that the student has a mastery of computing concepts and skills sufficient to pass the qualifying exams, and to subsequently write a thesis acceptable to CS. Examples of acceptable courses for *Artificial Intelligence* are Artificial Intelligence Programming, Intelligent Information Systems, Knowledge Representation. Examples of acceptable courses for *Interfaces* are Human-Computer Interaction, Design of Interactive Learning Environments, Computer Graphics, or Computer Game Design.
- The remaining 8 course units can be taken in Computer Science, MTS or departments across the University (Learning Science, Engineering, Art & Technology, etc), including Independent Studies in Computer Science or MTS.

Qualifying Exam

Students in the TSB combined degree program will complete two qualifying exams, one related to each of the constituent programs of CS and MTS.

Students take the CS qualifying exam in either the *Interfaces* or *Artificial Intelligence* track. See the CS PhD Graduate Manual for details on the qualifying exam for each track: https://phd.cs.northwestern.edu/

Students take the MTS exam in two parts, by completing one major field exam and one minor field exam. See additional details on the qualifying exams structure in MTS: https://mts.northwestern.edu/resources/

The Examination Chair will help establish the details of the exams. Full details are available in the program handbook. Qualifying exams must be completed before the beginning of the student's 4th year in the program.

Thesis

Theses in Computer Science are mostly composed of an implemented system, while theses in Communication require empirical research that adduces evidence for a hypothesis. PhD theses in TSB, the combined PhD in Computer Science and Communication, will comprise two parts that are not often found together – an implementation, and a hypothesis about how the implemented system affects social behavior, with an empirical evaluation of that hypothesis.

In order to ensure that the PhD thesis represents dual competence in Computer Science and Communication, thesis committees are composed of four faculty members, of whom two are in Communication and two are in Computer Science. Three of the committee members must be faculty at Northwestern University. The thesis must be judged acceptable by all four of these committee members.