FIBER SCIENCE (PHD)

Graduate School

Program Website (https://www.human.cornell.edu/hcd/academics/graduate-study/fiber-science-grad-programs/)

CIP: 15.0607 | **HEGIS:** 1303.00 | **NYSED:** 86385

Graduate Field

Fiber Science and Apparel Design (https://catalog.cornell.edu/graduate-school/fiber-science-apparel-design/)

Program Description

The common focus of the field is the study of fibrous materials and their use as apparel, as engineering structures (such as composite materials), in biomedical applications, and in home furnishings. The Field of Fiber Science and Apparel Design is applied and multidisciplinary, with faculty members drawn from the Colleges of Human Ecology and Engineering.

Students are expected to develop strength in their base discipline as well as gain appropriate breadth to support the area of specialization. Active research programs exist in high-performance fibers and fiber-reinforced composites; Green composites; detergency and surface chemistry; perfume treated fabrics; textile materials in biomedical and geotechnical applications; polymers for electronics; liquid-crystal polymers; textile-dye chemistry; crystal morphology of fibers; electrospin of fibers; cellulose; apparel and fashion design, design ethnography; sizing and fit of apparel; functional apparel; cultural and historic studies of clothing and textiles; mass customization and technology; and technology management in the apparel industry.

For Ph.D. students, a minimum of four committee members are required: one faculty member representing the major, one for each of the two minor areas, and a fourth member appointed by the Director of Graduate Studies to act for the field. The oral and written Admission to Candidacy examination and the final oral examination are required for the Ph.D. degree. The field does not require a foreign language.

Outstanding facilities for research and study are available in the College of Human Ecology and the College of Engineering. Textile and polymer science laboratories are equipped with modern instrumentation for chemical, physical, and mechanical analysis and with a controlled temperature and humidity room. Apparel design studios are equipped with industrial sewing equipment. Video image-capture and photography equipment is available in a visual analysis lab. The functional apparel lab houses a variety of human-factors testing equipment, including a full-body scanner.

Concentrations

- Fiber science
- Polymer science
- Textile science

Program Information

- Instruction Mode: In Person
- Location: Ithaca, NY
- Minimum Credits for Degree: 108

Program Requirements

- Minimum Semesters for Degree: 8

Graduate School Milestones

- Responsible Conduct of Research Training: Required
- Open Researcher and Contributor ID (ORCID): Required
- Student Progress Reviews (SPR) begin: First Year
- Examination for admission to candidacy (A Exam): After field-required written A Exam
- Defense of Dissertation (B Exam): Spring of fourth year

Field Specific Milestones

- Written A Exam, typically taken in the fourth or fifth semester

Course Requirements

Additional course requirements may be set by the student's Special Committee. Program specific requirements that apply to all students are included below. The Field of Fiber Science and Apparel Design recommends that all coursework be completed during the first two years of the program.

Before A Exam

Select four of the following:

- FSAD 6460 Nanotechnology in Fibers and Textiles
- FSAD 6400 Polymer and Fiber Characterization
- FSAD 6260 Advanced Textile Chemistry
- FSAD 6200 Physical Properties of Fiber - Forming Polymers and Fibers
- FSAD 6660 Fiber Formation: Theory and Practice
- FSAD 6160 Rheology of Solids: Dynamic Mechanical Analysis of Fibers and Polymers
- FSAD 6860 Mechanics of Fibrous Assemblies and their Composites

University Graduation Requirements Requirements for All Students

In order to receive a Cornell degree, a student must satisfy academic and non-academic requirements.

Academic Requirements

A student's college determines degree requirements such as residency, number of credits, distribution of credits, and grade averages. It is the student's responsibility to be aware of the specific major, degree, distribution, college, and graduation requirements for completing their chosen program of study. See the individual requirements listed by each college or school or contact the college registrar's office (https://registrar.cornell.edu/service-resources/college-registrar-directory/) for more information.

Non-academic Requirements

Conduct Matters. Students must satisfy any outstanding sanctions, penalties or remedies imposed or agreed to under the Student Code of Conduct (Code) or Policy 6.4. Where a formal complaint under the Code or Policy 6.4 is pending, the University will withhold awarding a degree otherwise earned until the adjudication process set forth in those

procedures is complete, including the satisfaction of any sanctions, penalties or remedies imposed.

Financial Obligations. Outstanding financial obligations will not impact the awarding of a degree otherwise earned or a student's ability to access their official transcript. However, the University may withhold issuing a diploma until any outstanding financial obligations owing to the University are satisfied.

Learning Outcomes

- Understand concepts and establish expertise in Fiber Science including:
  - Theory and practice of fiber formation
  - Rheology of solids: dynamic mechanical analysis of fibers and polymers
  - Physical properties of fiber- forming polymers and fibers
  - Chemistry of textile finishes and dyeing
  - Properties of fibrous systems
- Make an original and substantial contribution to an area of Fiber Science:
  - Think originally and independently to develop concepts and methodologies
  - Identify new research opportunities within the field of Fiber Science
  - Incorporate approaches, techniques, skills or knowledge connecting Fiber Science with other disciplines
- Demonstrate advanced research skills:
  - Synthesize existing knowledge via coursework and literature review
  - Master application of research techniques, technical skills and analysis
  - Present research motivation, methods and results in written and oral formats