

FIBER SCIENCE & APPAREL DESIGN (FSAD)

FSAD 1111 - Success in FSAD (1 Credit)

This course facilitates planning your experience in the College of Human Ecology and the Department of Human Centered Design as a Fashion Design and Management or Fiber Science major. Explore academic and extracurricular options within the department and across the university. The course is designed to help you set goals, plan for your time as an undergraduate, identify resources to help you achieve your goals, and allow you to get to know your peers in all FSAD majors.

Enrollment Information: Enrollment limited to: FSAD first-years and external transfer students.

Last Four Terms Offered: Fall 2023, Fall 2022, Fall 2021, Fall 2020

Learning Outcomes:

- Understand how the mission and learning outcomes of the College of Human Ecology and the FSAD major relate to you and your undergraduate experience.
- Explore resources for maximizing your undergraduate experience.
- Draft a four-year plan including course planning and strategy for including desired experiences potentially including research, study abroad, internships and other growth experiences.

Schedule of Classes (<https://classes.cornell.edu/>)

FSAD 1120 - Fashion Design and Visual Thinking (3 Credits)

This course balances theoretical and studio approaches in the design and two-dimensional representation of fashion. Lectures and readings accompany practical design exercises such as trend forecasting and collection development throughout the three-week semester. Students will explore various media and techniques to practice new skills, while creating a professional portfolio based on their individual design aesthetic. Students will be introduced to digital fashion design techniques and given access to online and design tools, such as Adobe Creative Suite, to aid in their development of a capsule collection. Course activities will include lectures and tutorials, readings, and assignments. This class does not substitute or fulfill any FSAD major or minor requirements.

Last Four Terms Offered: Summer 2025, Summer 2024, Summer 2023, Summer 2022

Learning Outcomes:

- To create a digital portfolio, suitable for college applications.
- To develop and present a digital collection of fashion designs.
- To achieve an understanding of fashion design concepts, processes, and research.
- To become familiar with the most important media of fashion and understand the limitations and opportunities offered to the designers.
- To achieve an understanding of new developments within the global fashion system.

Schedule of Classes (<https://classes.cornell.edu/>)

FSAD 1140 - Principles of Design Computing (3 Credits)

Crosslisted with DEA 1140

The course will cover foundational skills and best practices for design communication in terms of the underlying principles of computing technologies. This course will help students become versatile in utilizing various approaches and tools for tasks in Design and Environmental Analysis (DEA) and Fiber Science & Apparel Design (FSAD) programs. The first module will cover the foundations of 2D graphics and technical drawing. The second module will be an introduction to 3D modeling and rendering. Each module will start as one class with a focus on general principles and will be followed by the class dividing into two sections for applications specific to DEA and FSAD programs. The final module will include an introduction to Generative Artificial Intelligence techniques as a part of a collaborative final project where students will work in multidisciplinary teams to design, curate, and propose an exhibition (DEA) for a fashion collection (FSAD). Through lectures, class activities, homework and projects, the course will help students build confidence in digital design skills and be encouraged to explore further on their own.

Last Four Terms Offered: Summer 2025, Spring 2025, Fall 2024, Summer 2024

Learning Outcomes:

- Foundational skills in 2D and 3D digital media for design communication.
- Critical thinking in design communication.
- Put principles and elements of design into practice.

Schedule of Classes (<https://classes.cornell.edu/>)

FSAD 1170 - Fashion Graphics (3 Credits)

This foundational course is intended for students with demonstrable drawing skills. It introduces traditional and experimental approaches to visualizing the fashioned body and its expressive extensions. Fashion graphics are examined as essential communicative tools within the fashion development process.

Prerequisites: demonstrated skill at drawing.

Enrollment Information: Enrollment preference given to: FSAD majors, potential transfer students, and Fashion Studies minors.

Course Fee: Materials Fee, \$60.

Last Four Terms Offered: Fall 2024, Fall 2023, Fall 2022, Fall 2021

Learning Outcomes:

- Demonstrate flexible and lateral thinking.
- Employ image-making in its broadest sense.
- Use visual methods as research tools and modes of expression.
- Discover and develop contemporary image-making strategies.
- Generate innovative approaches to fashion visualization.
- Experiment with inventive presentation concepts.

Schedule of Classes (<https://classes.cornell.edu/>)

FSAD 1250 - Fashion, Art and Design Thinking (3 Credits)

Introduction to the visual arts and design that explores aesthetic and cross-cultural dimensions of fashion as a visual, material, and embodied practice. Lectures emphasize the intersections between fashion, art, and design through slide presentations, historical artifacts from the Cornell Fashion + Textile Collection, hands-on activities, and discussions. We consider social, cultural, political, aesthetic, scientific, economic, and historical aspects of fashion design, visual expression, and everyday embodied dressing.

Course Fee: Materials Fee, \$30. Embroidery supplies and natural dye scarf.

Last Four Terms Offered: Fall 2024, Fall 2023, Fall 2022, Fall 2021

Learning Outcomes:

- Enhance their ability to think visually, and communicate ideas in visual ways.
- Become familiar with the principles and elements of design, and be able to use design language to discuss and evaluate designed objects.
- Learn about the different media of fine arts and design, and understand the limitations and opportunities offered to the designer by various materials, techniques, and technologies.
- Understand important changes in fine arts, decorative arts, and design as they have occurred in various cultural, economic, and social contexts across time.
- Approach design from a critical perspective that centers questions of justice, equity, and inclusion.

Schedule of Classes (<https://classes.cornell.edu/>)

FSAD 1350 - Fibers, Fabrics, and Finishes (3 Credits)

This course introduces the properties and performance of textile materials and processes for FSAD majors and provides a general overview of the textile industry from a scientific perspective. Focus is on materials used in apparel and home furnishing markets. This course may also be used to fill a science requirement for non-FSAD majors in Human Ecology. Chemistry and mechanics of typical materials and processes used in the textile industry will be addressed with emphasis placed on the relationship between the materials and processes used and the final properties of the fabric.

Corequisites: Recommended corequisite for FSAD majors: FSAD 1360.

Distribution Requirements: (OPHLS-AG), (PBS-HE)

Last Four Terms Offered: Summer 2025, Spring 2025, Summer 2024, Spring 2024

Learning Outcomes:

- Gain knowledge to effectively communicate on the core principles of fibers, yarn, and textiles.
- Classify and describe the physical and chemical characteristics of fibers/yarns, and how their properties contribute to a textile's end use application.
- Relate the chemistry of fibers to dyeing processes.
- Apply mathematical principles to characterize fibers and yarns.
- Recognize methods of fiber/yarn production.
- Distinguish between the major methods of textile production and be able to predict how these textile structures will affect properties of the final fabric.
- Be aware of common finishing for fibers and textiles.
- Learn about the sustainability issues associated from fiber to finish.

Schedule of Classes (<https://classes.cornell.edu/>)

FSAD 1360 - Fiber and Yarn Analysis Laboratory (1 Credit)

This laboratory provides an opportunity for investigation of the physical and chemical structure and properties of fibers and yarns commonly used in apparel and home furnishing applications. Students completing this class will have a strong understanding of fiber and yarn structure, the differences between common fiber and yarn types and will know techniques for positive identification of textile fibers.

Corequisites: FSAD 1350.

Last Four Terms Offered: Spring 2025, Spring 2024, Spring 2023, Spring 2022

Learning Outcomes:

- Be able to identify unknown fibers using laboratory techniques including: Flammability Microscopy Solubility Dye staining (dyeing)
- Fiber types Ply structure S/Z twist Core structure Staple Filament

Schedule of Classes (<https://classes.cornell.edu/>)

FSAD 1450 - Introduction to Fashion Design (4 Credits)

This course covers the principles of garment assembly and flat-patternmaking for apparel design, as well as the use of mass production equipment and methods to analyze, develop, and assemble garments. Studio projects include an emphasis on innovative design and high-quality garment assembly techniques for upscale markets.

Corequisites: FSAD 1170 and FSAD 1250.

Enrollment Information: Enrollment preference given to: FSAD majors, students transferring into FSAD, and Fashion Studies minors.

Course Fee: Materials Fee, \$30.

Last Four Terms Offered: Spring 2025, Fall 2024, Spring 2024, Fall 2023

Learning Outcomes:

- Develop basic fashion design and flat-patternmaking skills to prepare for further coursework in fashion design.
- Expand knowledge and skills with industrial garment construction methods.
- Create designer-quality garment for portfolios and display.

Schedule of Classes (<https://classes.cornell.edu/>)

FSAD 2190 - Fashion, Aesthetics and Society (2-3 Credits)

This course is an introduction to fashion, beauty and trends and their integral relationship throughout history. Students will learn and explore various aspects of contemporary fashion phenomena, such as fashion collaborations, media-effects on body image, the impact of new technologies on fashion and lifestyle trends, and other significant issues of society manifest in fashion of the 20th and 21st centuries.

Distribution Requirements: (CA-AG, HA-AG), (CA-HE, HA-HE)

Last Four Terms Offered: Spring 2025, Spring 2024, Spring 2023, Spring 2022

Learning Outcomes:

- Identify various fashion phenomena that can be observed in modern society and analyze their close relation to the perceived concept of beauty and predominant trends in terms of the socio-cultural contexts.
- Build their own intellectual resources for developing critical and creative insights based upon their understanding of past and contemporary fashion trends.
- Interpret the social changes or significant cultural phenomenon through the study of fashion trends and the perceived concept of beauty within time and place.
- Enhance literacy and critical thinking and develop innovative approaches for research subjects by reading a wide range of written references as well as through discussions related to the topics covered during the lecture.
- Develop and demonstrate teamwork and presentation skills by engaging in group projects.

Schedule of Classes (<https://classes.cornell.edu/>)

FSAD 2310 - Fashion Product Management (3 Credits)

This course is an overview of the fashion supply chain with emphasis on the U.S. apparel industry. Students will learn key concepts for managing the development, marketing, and distribution of fashion products including consumer behavior, trend forecasting, brand management, merchandise planning, and omnichannel distribution.

Enrollment Information: Enrollment preference given to: FSAD majors and Fashion Studies minors.

Last Four Terms Offered: Fall 2024, Fall 2023, Fall 2022, Fall 2021

Learning Outcomes:

- Describe the interaction between producers, retailers, and consumers in the apparel supply chain.
- Critically analyze the apparel product development process in view of current economic and social concerns.
- Formulate marketing, merchandising, and costing strategies for fashion products.

Schedule of Classes (<https://classes.cornell.edu/>)

FSAD 2370 - Structural Fabric Design (3 Credits)

This course provides a basic understanding of how fabrics are formed and the relationship between fabric structure and fabric performance. Students completing this class will have a strong understanding of common fabric structures, be able to identify fabric structure visually and appreciate the relationship between fabric construction and performance in apparel and other end uses.

Prerequisites: FSAD 1350 or permission of instructor.

Last Four Terms Offered: Fall 2024, Fall 2023, Fall 2022, Fall 2021

Learning Outcomes:

- Master the vocabulary of textile structures from fiber through finished fabric.
- Understand the basic processes used to form common textile materials.
- Learn to represent fabrics graphically and understand the relationship between actual fabric structures and computer drawings.
- Be able to identify the structure of a given fabric visually and describe that fabric using standard diagramming (graphing) techniques, notation and language.
- Calculate basic fabric properties such as cover and fabric weight.

Schedule of Classes (<https://classes.cornell.edu/>)

FSAD 2640 - Fashion Draping (4 Credits)

In this studio course we examine the process of creating a three-dimensional garment from the two-dimensional fabric. The principles and processes of draping, advanced flat-pattern making, and industrial construction methods using a variety of materials are investigated through project work. Assigned problems require students to make judgments regarding the design process, the nature of materials, body structure, function, and fashion.

Prerequisites: FSAD 1250 and FSAD 1450. Recommended prerequisite: drawing course.

Course Fee: Course Fee, \$30. Course fee.

Last Four Terms Offered: Spring 2025, Spring 2024, Spring 2023, Spring 2022

Learning Outcomes:

- Students will demonstrate basic draping skills and understanding of fabric properties, sewability, support structures, embellishment, and choice of suitable materials for apparel designs.
- Students will demonstrate understanding of the interactions among silhouette, line, materials, and construction choices to create quality apparel designs.
- Students will demonstrate the ability to create pattern shapes for any design.

Schedule of Classes (<https://classes.cornell.edu/>)

FSAD 2650 - Creative Patternmaking for Fashion Design (4 Credits)

The goal of this apparel studio course is to expand student confidence and competencies in flat pattern analysis, design, and fitting techniques. In this course, students learn the basic principles and methods of 2D flat patternmaking as well as creative patternmaking concepts. Exercises, assignments, and projects are designed to teach the knowledge and skills needed to create well-balanced and quality patterns for 3D garment designs. 2D/3D CAD technology for patternmaking and fit testing is introduced.

Prerequisites: FSAD 1450, and FSAD 1140 or FSAD 1250.

Last Four Terms Offered: Fall 2024, Fall 2023, Fall 2022, Fall 2021

Learning Outcomes:

- Demonstrate an understanding of basic and advanced pattern making techniques by completing exercises and projects.
- Create innovative and contemporary designs suitable for design competitions and exhibitions.
- Identify visual clues on garment fit and make corrections to improve fit on the dress form and on the body by going from 2D -3D and 3D-2D.
- Analyze garment images and technical sketches to generate patterns with exact proportions and details.
- Build your own aesthetics through design and construction practice.

Schedule of Classes (<https://classes.cornell.edu/>)

FSAD 2660 - Activewear Design and Product Development (3 Credits)

Project-based course in which students explore the relationship between technology and design, and the impact of production issues on manufactured activewear. Students learn computer-aided patternmaking, activewear construction methods, manufacturing technologies, communication of technical details, flats, specifications, and costing of garments. Designs are developed to various stages from conceptual work to full specification of the product and its production details, with a concentration on the iterative design process.

Prerequisites: FSAD 1140 and FSAD 1450.

Course Fee: Materials Fee, \$100. Bulk purchase of fabric needed.

Students pay for any additional materials they desire.

Last Four Terms Offered: Spring 2025, Spring 2024, Spring 2023, Spring 2022

Learning Outcomes:

- Students will learn distinctive characteristics of activewear design and construction methods.
- Students will learn ergonomic approach to activewear design based on an understanding of human performance, and environmental challenges.
- Students will learn technical concepts and communication processes that facilitate product development.
- Students will learn the process of product development in the apparel industry today.

Schedule of Classes (<https://classes.cornell.edu/>)

FSAD 3000 - Special Topics in FSAD (1-15 Credits)

Special topics offered as one-time courses or as pilot courses still in development.

Exploratory Studies: (CU-UG)

Last Four Terms Offered: Spring 2024, Fall 2023, Spring 2023, Fall 2021

Schedule of Classes (<https://classes.cornell.edu/>)

FSAD 3200 - Global Textile and Apparel Sustainability (3 Credits)

This course explores sustainability in the textile and apparel industries in relation to the 17 Sustainable Development Goals articulated by the United Nations Department of Economic and Social Affairs. Students will engage with industry challenges, practices, and successes in increasing sustainability via guest speakers, case studies, research reports and corporate reports. Aspects of sustainability impacting personal welfare of producers and consumers, environmental impacts and economic potential will be explored.

Distribution Requirements: (CA-AG, OPHLS-AG, SBA-AG), (CA-HE, PBS-HE, SBA-HE)

Exploratory Studies: (CU-CEL, CU-SBY)

Last Four Terms Offered: Fall 2024, Fall 2023, Fall 2022, Fall 2021

Learning Outcomes:

- Evaluate personal apparel consumption patterns from a sustainability perspective.

Schedule of Classes (<https://classes.cornell.edu/>)

FSAD 3250 - Color and Surface Design of Textiles (4 Credits)

Studio experience in the surface design of textiles combined with exercises in color theory. Textile projects use techniques such as natural dyes, block printing, silk painting, shibori, silk screen, and embroidery to produce a portfolio of textile designs. Studio work is augmented by lectures on pattern and color theory illustrated by slides and textile examples.

Prerequisites: Recommended prerequisite: FSAD 1140 and FSAD 1350.

Enrollment Information: Enrollment preference given to: FSAD Apparel Design majors.

Exploratory Studies: (CU-SBY)

Last Four Terms Offered: Fall 2024, Fall 2023, Fall 2022, Fall 2021

Learning Outcomes:

- Develop a better understanding of the principles of color in design.
- Apply these principles to the surface design of textiles.
- Learn techniques of textile surface design: natural dyes; silk screen (direct, resist and discharge printing); tied, stitched, and clamped resist dyeing (shibori); embroidery; and block printing.
- Produce a surface designed length of yardage sufficient for a garment (3 yards).
- Develop a portfolio of surface design work.

Schedule of Classes (<https://classes.cornell.edu/>)

FSAD 3320 - Product Quality Assurance (3 Credits)

This is a “hands on” class exploring the process of assuring and evaluating sewn product quality at each step of the supply chain, from fiber to consumer. Students will evaluate textiles and garments employing industry standard practices and explore expectations for product performance as well as the influence of fiber and fabric on tested properties.

Prerequisites: FSAD 1350.

Last Four Terms Offered: Spring 2025, Spring 2024, Spring 2023, Spring 2022

Learning Outcomes:

- Explain the functions of fashion and textile industry standards organizations, certification systems, and government regulatory agencies.
- Assess textiles and garments using industry standard performance evaluation methodology. Interpret product testing data and relate it to performance parameters.
- Communicate quality issues in industry terms within the fashion industry and to the consumer.

Schedule of Classes (<https://classes.cornell.edu/>)

FSAD 3330 - Retail Buying and Merchandising (3 Credits)

This course builds on the knowledge around product development, consumer research, and pricing from FSAD2310: Fashion Product Management by focusing on the fashion product cycle at the buying, planning, and merchandising stages. Students will learn the steps of the retail buying process and how to interpret financial and consumer data to make buying decisions. This course is specific to retail in the fashion and beauty industries. During the semester, students will develop their Excel skills through retail math exercises and create buying, assortment, and merchandising plans for a season.

Prerequisites: FSAD 2310.

Last Four Terms Offered: Spring 2025, Spring 2024

Learning Outcomes:

- Interpret financial reports and inventory data to make strategic buying, planning, and merchandising decisions.
- Apply retail math skills to manage inventory and understand supply chain dynamics.
- Create buying plans and assortments informed by consumer preferences, market trends, and retailer investments.

Schedule of Classes (<https://classes.cornell.edu/>)

FSAD 3350 - Fiber Science (3 Credits)

Covers both natural and synthetic fibers commonly used in various engineering, medical, and apparel applications. Topics include the nature of polymer molecules and their syntheses, chemical structures of organic fibers, inorganic fibers, micro-macro structures of fibers, fiber dimensions, environmental effects, and mechanical, optical, thermal, and frictional properties of fibers. Many fiber uses are discussed including composites in aerospace and other structural components, circuit boards, bulletproof vests, sutures, artificial arteries, geotextiles, sporting goods, apparel, and others polymers.

Prerequisites: college basic chemistry and physics courses.

Last Four Terms Offered: Spring 2024, Fall 2022, Fall 2021, Fall 2020

Learning Outcomes:

- Understand the basic chemistry of polymers used for forming fibers for various applications from composites to textiles.
- Understand the basic structure/morphology relation in polymers and fibers.
- Understand the formation of fibers and control of structure and properties.
- Understand various fibers used for different applications and the basis for their use in those applications.
- Be able to recognize different fibers and characterize their mechanical, moisture and optical properties.

Schedule of Classes (<https://classes.cornell.edu/>)

FSAD 3370 - Introduction to Knit Textile Structure and Design (4 Credits)

This course covers the design and creation of weft knit fabrics with a focus on machine-knit fabric structures chosen for desired aesthetic and performance results. Students will learn hand flat machine knitting as well as the basic principles of knit programming. Students are required to develop design ideas, knit swatches and garment panels, and make verbal/visual presentations of their work at regular critiques.

Prerequisites: FSAD 2370.

Last Four Terms Offered: Spring 2025, Spring 2024, Fall 2023, Spring 2023

Learning Outcomes:

- Understand both the aesthetic and performance qualities of basic knit fabric structures.
- Learn the mechanics of knit machines.
- Learn to program knit patterns for the Shima Seiki computer driven knitting machine.
- Translate sketchbook exploration, visual and structural research, swatch exploration, mood boards, and schematic drawings into knit fabric and shaped garments.

Schedule of Classes (<https://classes.cornell.edu/>)

FSAD 3420 - Engineering Textiles: Integrating the Design and Manufacture of Textile Products (3 Credits)

This course synthesizes and builds on pre-requisite courses. Aspects of textile design for purpose including performance, cost, production method and sustainability to match end use requirements will be explored.

Prerequisites: FSAD 1350, FSAD 2370, and FSAD 3320.

Last Four Terms Offered: Spring 2024

Learning Outcomes:

- Examine the relationships among textile raw materials, structure and end use requirements.
- Design textiles to meet requirements with improved sustainability.
- Compare textile structures for optimized cost, performance and sustainability.

Schedule of Classes (<https://classes.cornell.edu/>)

FSAD 3650 - New Technologies for Fashion Design (3 Credits)

The focus of this course is to create one-of-a kind and innovative fashion products by using 2D/3D software programs as well as methods (e.g., 3D printing, laser cutting & engraving). During the semester, experimental design samples will be prepared, and students will create full scale garments for their final projects. Readings and discussion topics will explore methods, creativity, and critical thinking.

Prerequisites: FSAD 1450, FSAD 2640, or FSAD 2650 or similar studio course experiences.

Last Four Terms Offered: Spring 2025, Spring 2024, Spring 2023, Spring 2022

Learning Outcomes:

- Demonstrate an understanding of the digital technologies and production methods introduced in the class.
- Study a wide range of fashion design techniques and technologies to present your own knowledge and innovative ideas.
- Produce sample books and multiple prototypes as examples of iterative design thinking.
- Build your own aesthetics through design and construction practice.

Schedule of Classes (<https://classes.cornell.edu/>)

FSAD 3770 - Experimental Fashion (3 Credits)

This course challenges students to create a visual narrative through a collection of fashion-related objects responding to a global design challenge. Students may work across various media, including garments, textiles, accessories, photography, film, digital platforms, visual journalism, and show direction. The goal is to develop expertise in a chosen medium or mode of presentation.

Prerequisites: FSAD 1170.

Course Fee: Materials Fee, \$50.

Last Four Terms Offered: Fall 2024, Fall 2023, Fall 2022, Fall 2021

Learning Outcomes:

- Develop a transferable aesthetic across artifact types.
- Produce targeted collections for distinct market sectors.
- Analyze local and global fashion discourse.
- Engage with fashion design beyond visual language.
- Apply appropriate methods throughout the design process.
- Employ fabrics, finishes, and fittings intentionally.
- Conceptualize themes and connect them to larger ideas.
- Generate ideas through iterative development.
- Solve design challenges creatively.
- Cultivate a personal design signature.

Schedule of Classes (<https://classes.cornell.edu/>)

FSAD 3990 - Smart Clothing: Design and Programming (3 Credits)

This course is a project-based course in which design students and non-design students collaborate to develop a wearable interface to seek solutions to real-world design challenges through an iterative design process and the use of electronics operated by programming.

Prerequisites: for Design students: FSAD 2660 or DEA 1150 and DEA 2200, or submission of portfolio. For non-design students: CS 1110.

Course Fee: Course Fee, \$200. Course fee.

Last Four Terms Offered: Fall 2023, Fall 2022, Fall 2021, Fall 2020

Learning Outcomes:

- Students will develop interactive smart clothing responding to human need through design and programming process.

Schedule of Classes (<https://classes.cornell.edu/>)

FSAD 4000 - Directed Reading (1-15 Credits)

For study that predominantly involves library research and independent reading by and individual student or a group of students in a field of FSAD not otherwise provided through course work in the department or elsewhere at the university.

Exploratory Studies: (CU-UG)

Last Four Terms Offered: Spring 2025, Fall 2024, Spring 2024, Fall 2023

Schedule of Classes (<https://classes.cornell.edu/>)

FSAD 4010 - Empirical Research (1-15 Credits)

For study that predominantly involves data collection and analysis, or laboratory or studio projects by an individual student or a group of students in a field of FSAD not otherwise provided through course work in the department or elsewhere at the university.

Exploratory Studies: (CU-UG)

Last Four Terms Offered: Spring 2025, Fall 2024, Spring 2024, Fall 2023

Schedule of Classes (<https://classes.cornell.edu/>)

FSAD 4020 - Supervised Fieldwork (1-15 Credits)

For study that involves both responsible participation in a community setting and reflection on that experience through discussion, reading, and writing by an individual student or a group of students in a field of FSAD not otherwise provided through course work in the department or elsewhere at the university.

Last Four Terms Offered: Spring 2025, Fall 2024, Spring 2024, Fall 2023
Schedule of Classes (<https://classes.cornell.edu/>)

FSAD 4021 - Textile and Apparel Production in India (3 Credits)

Acquaint students with the major issues and problems in international textiles and apparel production to demonstrate how problems in development are addressed in India and Sri Lanka. The lectures/discussions establish the global and regional contexts for sustainable agricultural development and focus on development challenges in Asia through cases in India and Sri Lanka. Students will be automatically enrolled in the field trip component. The field trip consists of a two to three week field study trip designed to provide students with an opportunity to observe the apparel and textile industry abroad to promote interdisciplinary exchange among faculty, staff, students and their international counterparts.

Enrollment Information: Enrollment limited to: FSAD majors and by application.

Course Fee: Course Fee, \$2700. Course fee.

Exploratory Studies: (CU-ITL, CU-SBY)

Last Four Terms Offered: Winter 2024, Fall 2023, Fall 2019, Fall 2017
Schedule of Classes (<https://classes.cornell.edu/>)

FSAD 4025 - Design for Change: Imagining Decolonial Futures (3 Credits)

Crosslisted with DEA 4025

This course explores the role of design in reshaping the world towards social justice and sustainability. Designing for change requires creating different cultural patterns and worldviews - examining taken-for-granted assumptions, narratives, and myths of the hegemonic cultural model (known as Modernity) that limit our capacity to imagine the world differently. As the world is enmeshed in colossal interconnected crises, it seems that imagination has been funneled to two avenues: techno-solutions to the symptoms of the crises and dystopic futures. This course explores two main ideas: a) alternatives are possible, b) the area of design for change would benefit from exchanges with different cultures and knowledge systems. Designing decolonial futures is about weaving together knowledge from multiple cultures, thus recognizing and creating alternatives based on different ways of understanding the world.

Distribution Requirements: (CA-AG, D-AG, HA-AG), (CA-HE, D-HE, HA-HE, LAD-HE)

Exploratory Studies: (CU-SBY)

Last Four Terms Offered: Fall 2024, Fall 2023, Fall 2022

Learning Outcomes:

- Students will be able to understand what is at stake in the international movement to "decolonize design" and the importance of detaching design from the assumptions, promises, and values of Modernity/Coloniality to generate significant change. Students will be introduced to the main theories and approaches used in decolonial design: decoloniality, pluriversality, epistemologies of the South, transition discourses/design, speculative design, and design for social innovation.
- Students will be able to recognize structural features of the Eurocentric Modernity at the root of social inequities and unsustainability (which connect social and environmental crises). Without examining these structures, designers keep trying to solve the symptoms instead of addressing the causes. Particularly, students will reflect upon the legacy of colonialism on society and the natural environment.
- Students will be able to recognize that narratives frame the way we design. Creating different futures requires new narratives and visions to reframe the design practice and the meaning of technological innovations. Students will be asked to create new narratives to reframe their design practice/research.
- Students will be able to recognize taken-for-granted assumptions and myths of Modernity that hinder the understanding of other cultures, epistemologies, and ontologies—i.e., even when designers want to listen to the Other, the understanding is very limited. Therefore this course aims to enhance the student's capacity to listen to and collaborate with people from other cultures— recognizing and respecting differences in worldviews, cultural patterns, ways of knowing—to generate change.
- Students will be asked to create compelling visual communications, knowledge visualizations, and narratives to communicate the topics discussed in class and their visions of alternative futures to other people. The creative outputs will be assembled into an exhibit that will take place in one of CHE galleries and on a website.

Schedule of Classes (<https://classes.cornell.edu/>)

FSAD 4030 - Teaching Apprenticeship (1-5 Credits)

For study that includes teaching methods in the field and assisting faculty with instruction.

Enrollment Information: Enrollment limited to: upperclass students demonstrating a high level of performance in the subject to be taught and in the overall academic program.

Last Four Terms Offered: Spring 2025, Fall 2024, Spring 2024, Fall 2023
Schedule of Classes (<https://classes.cornell.edu/>)

FSAD 4051 - Dairy Chemistry Applications (1 Credit)

Schedule of Classes (<https://classes.cornell.edu/>)

FSAD 4360 - Fiber Materials (3 Credits)

This course covers the chemical structure, physical and thermal properties of commercially important synthetic and natural fibers. This course also emphasizes the structure-property relationship of fibers and their end-use. This course focus on chemistry throughout the fiber production and the recycle/upcycle path of textile fibers in the market. The functionalization of fibers, dyeing and finishing processes of textile fibers with experimental component are also included. This course provides understanding of suitable approaches for dyeing and finishing processes of textiles based on their chemistry and investigate more sustainable approaches/processes for the textile industry.

Prerequisites: FSAD 1350 and FSAD 1360 or equivalent.

Exploratory Studies: (CU-SBY)

Last Four Terms Offered: Spring 2025, Spring 2024, Spring 2023, Spring 2022

Learning Outcomes:

- Identity and classify textile fibers with respect to their chemical structure/nature.
- Evaluate the structure-property relationship of the fibers in relation to their chemical structures and predict the ultimate properties of the textile fibers and their end-uses.
- Understand the role of chemistry throughout the fiber production and the recycle/upcycle path of textile fibers in the market.
- Develop creatively/critically thinking and solve real-life scientific challenges in textile/fiber industry by learning how to apply interdisciplinary approaches by combining fiber science, chemistry, materials science and textile engineering.
- Discuss the environmental issues and the sustainability aspects regard to chemistry used in fibers and textiles.
- Propose suitable approaches for dyeing and finishing processes of textile fibers based on their chemistry and propose more sustainable approaches/processes for the textile industry.
- Build teamwork skills, scientific writing skills and oral presentation skills.

Schedule of Classes (<https://classes.cornell.edu/>)

FSAD 4370 - Knitwear Design and Other Knit Applications (4 Credits)

This course covers the design and creation of knit garments and other knit products via a variety of machine-knit shaping techniques. Students will work on hand-flat and electronic software driven machines to program and create shaped knit panels for a variety end-uses. Draping, blocking, and linking techniques will be covered. Students are required to develop design ideas via mood board and sketchbook research and to make verbal/visual presentations of their work at regular critiques. Students will have access to equipment and supplies such as yarn, but should expect to purchase bring in supplies such as drawing materials, scissors, a tape measure and dot grid notebook.

Prerequisites: FSAD 3370.

Last Four Terms Offered: Fall 2024, Spring 2024

Learning Outcomes:

- Learn a range of knit shaping techniques including fully fashioned garments, flechage (short rowing), and knit structure variation.
- Develop the skill of translating aesthetic design ideas into fabric and garments via an abstract mathematical process, including schematic drawings and knit textile specific vocabulary and instructions.
- Learn how to program shaped panels on the Apex 3 computer to be knit on the Shima Seiki electronic knitting machine.
- Enhanced design and critique skills from regular class critiques and presentations of your work.
- Learn draping techniques for knit fabrics.

Schedule of Classes (<https://classes.cornell.edu/>)

FSAD 4390 - Introduction to Color Science: Physics and Chemistry of Color (3 Credits)

Color science is key to many industries such as food, automotive, interior and fashion design, electronics, polymer materials, imaging science, medical devices, forensics, cosmetics, photography, architecture, and textiles. Color is often one of the main parameters defining the appeal and sale of many products. Through lectures, demonstrations, and class assignments this course is designed to provide an in-depth analysis of our current understanding of how colors is created and how humans perceive and control color, and it may prepare students for future involvement in color technology as a career as well as in everyday life.

Prerequisites: one of the following courses or their equivalents:

FSAD 1350 or PHYS 1101.

Distribution Requirements: (OPHLS-AG), (PBS-HE)

Learning Outcomes:

- Understand the principles of light, as a wave and as a particle, and its many interactions with objects including diffraction, reflection and absorption.
- Understand color vision/perception and associated phenomena as well as the physical and chemical origins of color.
- Select appropriate measurement techniques for visual assessment of color and current standards to quantify color.
- Examine numerical specification of color and apply numerical methods to determine color differences using several color models including XYZ, xyY, L*a*b*, metamerism, color inconstancy index, and color difference equations (e.g., DECMC and DE2000).
- Understand colorimetry and other techniques to measure color. Describe how spectrophotometers, colorimeters, displays and printers do interpret color.

Schedule of Classes (<https://classes.cornell.edu/>)

FSAD 4440 - Global Fashion Management (3 Credits)

This course is an introduction to the global textile and apparel complex, particularly the roles of global sourcing and supply chain management, and international trade and strategic management of global fashion brands.

Prerequisites: FSAD 2310 and economics.

Enrollment Information: Enrollment preference given to: FSAD majors and Fashion Studies minors.

Distribution Requirements: (HA-AG), (HA-HE), (OCE-IL)

Exploratory Studies: (CU-SBY)

Last Four Terms Offered: Spring 2025, Spring 2024, Spring 2023, Spring 2022

Learning Outcomes:

- Describe the structure, conduct, and performance of the global fashion industry.
- Assess current global factors that inform and influence multinational fashion firms.
- Explain the implications of international regulations, alliances, and trade policies on the apparel industry.
- Recommend strategies for fashion production and distribution based on economic, environmental, economic, and political factors.

Schedule of Classes (<https://classes.cornell.edu/>)

FSAD 4444 - Fiber Science and Apparel Design Futures (3 Credits)

In this course, students will work in cross-disciplinary teams to synthesize knowledge and skills from their prior courses into new ideas and products. Projects will be developed and led by students with faculty mentorship. These projects should build on work from previous courses or projects and allow students to explore multiple aspects of design, performance, use, production, and marketing.

Enrollment Information: Enrollment limited to: FSAD majors and minors with senior standing.

Last Four Terms Offered: Spring 2025, Spring 2024, Spring 2023, Spring 2022

Learning Outcomes:

- Develop a problem statement for their project.
- Construct new ideas and products building on prior course work and research.
- Develop justification and implementations for new ideas and products.
- Defend the developed ideas and product via written, poster, oral, or runway presentations.
- Build skills for working in professional teams.

Schedule of Classes (<https://classes.cornell.edu/>)

FSAD 4460 - Nanotechnology in Fibers and Textiles (3 Credits)

This course covers the development of functional fibers and textiles thru nanotechnology. This course introduces nanomaterials, nano-finishes and nanocoating processes used for functional fibers and textiles. This course also emphasizes the structure-property of the nanofibers and nanotextiles and predict their end-use. Examples of nanotechnological products based on nanofibers and nanotextiles in the market are included. This course also discusses environmental issues and the sustainability aspects regard to nanotechnology used in fibers and textiles. Through lectures, readings, discussion, projects and presentations, this course highlights the role of nanotechnology for the development of functional fibers and textiles.

Prerequisites: FSAD 1350 and FSAD 1360 and FSAD 3350, or ENGRI 1200/AEP 1200, or MSE 2610 or MSE 3010, or equivalent.

Last Four Terms Offered: Fall 2024, Fall 2023, Fall 2022, Spring 2021

Learning Outcomes:

- Understand the role of nanotechnology for the development of functional fibers and textiles.
- Be familiar with the nanomaterials, nanofinishes, and nanocoating processes used in fibers and textiles.
- Interpret scientific data to evaluate the functionality of nanofibers and nanotextiles.
- Select and apply appropriate nanotechnologies for fibers and textiles for specific performance and functionality.
- Predict the end-use of nanofibers and nanotextiles in relation with their structure-property.
- Discuss the environmental issues and the sustainability aspects regard to nanotechnology used in fibers and textiles.
- Propose new ideas to develop functional fibers and textiles by applying nanotechnology.
- Build teamwork skills, scientific writing skills, and oral/poster presentation skills.

Schedule of Classes (<https://classes.cornell.edu/>)

FSAD 4660 - Textiles, Apparel, and Innovation (3 Credits)

Designed for students in all FSAD options. Explores the relationship between materials and design with a concentration on the use of innovative textile materials in apparel. Both aesthetic and functional issues are addressed. The course consists of a combination of lectures, discussion of readings, oral reports, a research paper, and project work. The class engages elders from the local community to solve real-life problems using design thinking methodologies.

Prerequisites: FSAD 1360 and FSAD 2370.

Enrollment Information: Enrollment limited to: seniors.

Exploratory Studies: (CU-CEL)

Last Four Terms Offered: Fall 2024, Fall 2023, Fall 2021, Fall 2020

Learning Outcomes:

- Understand technical specifications for fibrous materials.
- Select appropriate materials for specific performance requirements.
- Perform calculations regarding fiber and fabric properties and predict the properties of these materials under specific conditions.
- Learn to present project information graphically in a poster format as well as orally.
- Perform reverse engineering studies on fibrous materials and propose technical and design solutions to performance issues.

Schedule of Classes (<https://classes.cornell.edu/>)

FSAD 4700 - Online Fashion Promotion and Presentation (3 Credits)

This capstone course prepares students for professional pursuits such as job interviews, graduate school applications, and exhibitions. Using three pre-existing stories as a foundation, students will refine and curate their work for submission across three distinct formats: online platforms, print media, and physical exhibitions. Emphasis is placed on contemporary graphic design practices, encompassing fashion design, illustration, photography, styling, and art direction. Instruction includes practical demonstrations and critical feedback aligned with industry standards.

Prerequisites: FSAD 1170, FSAD 2640, and FSAD 2650.

Enrollment Information: Enrollment preference given to: FSAD majors and transfer students.

Last Four Terms Offered: Spring 2025, Spring 2024, Spring 2023, Spring 2022

Learning Outcomes:

- Develop a personal fashion direction.
- Create fashion images that are contemporary and globally relevant.
- Organize a professional portfolio for industry review.
- Integrate personal fashion direction with current trends.
- Produce fashion illustrations, presentation boards, and technical worksheets.

Schedule of Classes (<https://classes.cornell.edu/>)

FSAD 4770 - Negotiated Fashion (3 Credits)

This second course builds on FSAD 3770; students must retain the big ideas and themes developed in the first course. Motifs will be finalized and applied to collections. The primary ambition is to demonstrate a range of expert skills necessary to articulate and operate as creator and director of fashion within the global fashion system. Students will consolidate previous explorations and experiences to create a philosophical position about fashion driven by concept. Objects and scenarios will be completed to a professional standard worthy of exhibition at an international 'young creator' level. Much of the course will be spent developing concepts, proposing ideas and finally fabricating fashion objects that are relevant to fashion markets 6 months hence.

Prerequisites: FSAD 3770.

Last Four Terms Offered: Fall 2024, Fall 2023, Fall 2022, Fall 2021

Learning Outcomes:

- Utilize a personal design philosophy and market dictates to create a range of culturally important artifacts.
- Innovate their practice and strategically attenuate it in terms of competition, creative and commercial.
- Organize and act upon what is important to fashion sensibilities for the market they operate.
- Finalize experimentation and practice design and understand fashion at a professional level.

Schedule of Classes (<https://classes.cornell.edu/>)

FSAD 4800 - Ethical Design: Engine of Positive Change (3 Credits)

Crosslisted with DEA 4800

Design has the power to change how we view and interact with the world which can cause positive or negative impacts. Modern society faces various issues which are all closely related to the ethical aspects of design: humanitarian crises, labor exploitation, injustice in the workplace, loss of diversity, overconsumption, pollution, lack of transparency and pseudo-solutions to name a few. This course will discuss various ethical issues in design that impact individuals, community/society, economies, cultures, social dynamics, and the environment.

Distribution Requirements: (CA-AG, D-AG, LA-AG, SBA-AG), (CA-HE, D-HE, SBA-HE)

Last Four Terms Offered: Spring 2025, Spring 2024

Learning Outcomes:

- Think critically about the main fields of design practice, identifying the ethical challenges of each in terms of current environmental, social, and health crises.
- Investigate the impact of unethical design, production, and marketing practices on individuals, social groups, and the environment.
- Identify the difference between pseudo-solutions that mitigate the symptoms of harmful practices and those initiatives and approaches that address the harm caused by the current production and consumption systems.
- Examine how to enhance, improve, and amplify social innovation initiatives that address the harm caused by unethical design, production, and marketing practices.

Schedule of Classes (<https://classes.cornell.edu/>)

FSAD 4990 - Honors Thesis Research (1-8 Credits)

The student prepares a thesis, based on independent research, including a research statement, background, approach, results (which could be a description of a creative work), and discussion. The student may also produce creative work. Students make an open presentation of work, either a seminar or an exhibition, and an oral defense with the committee. Interested students should obtain a FSAD Honors Program application form from the FSAD undergraduate office (T57 HEB) and submit the application to the department before the end of the fall semester of junior year. For more information students should contact the Director of Undergraduate Studies at fsad-dus@cornell.edu.

Prerequisites: minimum GPA of 3.3.

Exploratory Studies: (CU-UG)

Last Four Terms Offered: Spring 2025, Fall 2024, Spring 2024, Fall 2023

Schedule of Classes (<https://classes.cornell.edu/>)

FSAD 6000 - Special Problems for Graduate Students (1-15 Credits)

Independent advanced work by graduate students recommended by their chair and approved by the department chair and instructor.

Last Four Terms Offered: Spring 2025, Fall 2024, Spring 2024, Fall 2023

Schedule of Classes (<https://classes.cornell.edu/>)

FSAD 6021 - Textile and Apparel Production in India II (1 Credit)

This course is designed to provide students with an opportunity to observe the apparel and textile industry in India and to promote interdisciplinary exchange among faculty, staff, students and their Indian counterparts. A three week field study trip in January is followed by discussions, written projects, and oral presentations dealing with issues in the apparel and textile industry in the context of social and economic conditions of India.

Course Fee: Course Fee, \$2700. Travel award.

Exploratory Studies: (CU-ITL)

Last Four Terms Offered: Winter 2024, Fall 2023, Spring 2020, Spring 2018

Schedule of Classes (<https://classes.cornell.edu/>)

FSAD 6025 - Design for Change: Imagining Decolonial Futures (3 Credits)

Crosslisted with DEA 6025

This course explores the role of design in reshaping the world towards social justice and sustainability. Designing for change requires creating different cultural patterns and worldviews - examining taken-for-granted assumptions, narratives, and myths of the hegemonic cultural model (known as Modernity) that limit our capacity to imagine the world differently. As the world is enmeshed in colossal interconnected crises, it seems that imagination has been funneled to two avenues: techno-solutions to the symptoms of the crises and dystopic futures. This course explores two main ideas: a) alternatives are possible, b) the area of design for change would benefit from exchanges with different cultures and knowledge systems. Designing decolonial futures is about weaving together knowledge from multiple cultures, thus recognizing and creating alternatives based on different ways of understanding the world.

Distribution Requirements: (CA-HE, D-HE, HA-HE, LAD-HE)

Exploratory Studies: (CU-SBY)

Last Four Terms Offered: Fall 2024, Fall 2023, Fall 2022

Learning Outcomes:

- Students will be able to understand what is at stake in the international movement to "decolonize design" and the importance of detaching design from the assumptions, promises, and values of Modernity/Coloniality to generate significant change. Students will be introduced to the main theories and approaches used in decolonial design: decoloniality, pluriversality, epistemologies of the South, transition discourses/design, speculative design, and design for social innovation.
- Students will be able to recognize structural features of the Eurocentric Modernity at the root of social inequities and unsustainability (which connect social and environmental crises). Without examining these structures, designers keep trying to solve the symptoms instead of addressing the causes. Particularly, students will reflect upon the legacy of colonialism on society and the natural environment.
- Students will be able to recognize that narratives frame the way we design. Creating different futures requires new narratives and visions to reframe the design practice and the meaning of technological innovations. Students will be asked to create new narratives to reframe their design practice/research.
- Students will be able to recognize taken-for-granted assumptions and myths of Modernity that hinder the understanding of other cultures, epistemologies, and ontologies—i.e., even when designers want to listen to the Other, the understanding is very limited. Therefore this course aims to enhance the student's capacity to listen to and collaborate with people from other cultures— recognizing and respecting differences in worldviews, cultural patterns, ways of knowing—to generate change.
- Students will be asked to create compelling visual communications, knowledge visualizations, and narratives to communicate the topics discussed in class and their visions of alternative futures to other people. The creative outputs will be assembled into an exhibit that will take place in one of CHE galleries and on a website.

Schedule of Classes (<https://classes.cornell.edu/>)

FSAD 6160 - Rheology of Solids: Dynamic Mechanical Analysis of Fibers and Polymers (3 Credits)

Introduces students to Dynamic Mechanical Analysis (DMA) and its relevance in the characterization of polymer fibers and films. DMA is a materials characterization technique that supplies information about major transitions as well as secondary and tertiary transitions not readily identifiable by other methods. It also allows characterization of bulk properties directly affecting material performance. DMA can also be used to predict the behavior of polymeric materials as a function of time and their exposure to liquids and gases over a wide range of temperatures. Advanced use of Matlab™ programming is necessary for modeling rheological behavior.

Prerequisites: calculus and differential equations. Computer programming highly encouraged

Last Four Terms Offered: Spring 2023, Spring 2021, Spring 2020, Fall 2018

Learning Outcomes:

- Calculate velocity and pressure profiles for polymeric flows.
- Perform mathematical modeling of rheological behavior of polymers.
- Operate a rheometer under steady and transient modes.
- Interpret rheological measurements and translate these values into product specifications.
- Develop a basic understanding of tensorial calculus and the use of tensors.

Schedule of Classes (<https://classes.cornell.edu/>)

FSAD 6200 - Physical Properties of Fiber - Forming Polymers and Fibers (3 Credits)

This course covers physical properties of fiber-forming polymers and fibers. This course introduces requirements for fiber formation, and highlights the rubbery, glassy, and crystalline states of polymers and fibers. This course also emphasizes the structure-property relationship in fibrous polymers. This course discusses fiber structure, relationship between chemical structure and physical properties of fibers; thermal and mechanical properties of fibers, and fiber surface properties, and characterization methods. This course also discusses environmental issues, sustainability and the recycling/upcycling/circularity of textile fibers.

Prerequisites: FSAD 3350, FSAD 4360, any polymer courses, or equivalent courses.

Last Four Terms Offered: Spring 2025, Spring 2024, Spring 2022, Spring 2021

Learning Outcomes:

- Understand the physical properties of fiber-forming polymers and fibers.
- Be familiar with the polymeric properties critical for fiber formation.
- Be familiar with the characterization techniques for polymers and fibers, to characterize thermal and mechanical properties of fibers, and fiber surface properties.
- Interpret scientific data to evaluate the structure-property of the polymers and fibers and develop a strong knowledge on the thermal, mechanical, and surface properties of fibers.
- Develop critical thinking for problem solving in developing or modifying desired fiber properties.
- Predict the end-use of fibers in relation with their structure-property.
- Propose new ideas to develop non-conventional fibers.
- Build scientific writing skills and oral presentation skills.

Schedule of Classes (<https://classes.cornell.edu/>)

FSAD 6219 - Fashion and Beauty (3 Credits)

This seminar equips students with the analytical tools to critically engage with the complex and multifaceted dimensions of fashion and beauty in a globalized world. Drawing from a diverse range of texts, including scholarly monographs, theoretical essays, literary works, and cultural analyses, we will examine how appearance norms and ideals are constructed, negotiated, and contested across various contexts. By integrating theoretical analysis with practical research methodologies and skills development, this course provides a well-rounded understanding of current issues in the fashion and beauty industries as well as the tools necessary to conduct rigorous and insightful research on apparel, fashion, and beauty.

Last Four Terms Offered: Spring 2018

Schedule of Classes (<https://classes.cornell.edu/>)

FSAD 6260 - Advanced Textile Chemistry (3 Credits)

This course covers chemical aspects of textiles and fibers with emphasis on functional finishing and dyeing of textile materials. This course examines various chemical and nanotechnological approaches and recent advances on functional finishing and modification of textile materials. This course emphasizes the structure-property relationship, end-user influences, interaction with fabrics and fibers, sources, and synthetic routes in functional textiles. This course briefly discusses the environmental effect and sustainability issues of these functional finishes and textile chemicals.

Prerequisites: at least one of the following: CHEM 3530, CHEM 6250, CHEM 6650, CHEM 6660, CHEM 6400, FSAD 4360, MSE 5810, or permission of instructor.

Exploratory Studies: (CU-SBY)

Last Four Terms Offered: Fall 2021, Fall 2019, Spring 2013, Spring 2011

Learning Outcomes:

- Understand the chemistry and chemical processes involved in functional finishes of textiles.
- Evaluate the structure-property of the functional finishes and their chemical/physical interaction with fibers/fabrics.
- Interpret scientific data to evaluate the structure-property of the functional textiles based on their finishing chemistry and develop a strong knowledge on the chemical, physical, thermal, mechanical, and surface properties of textiles.
- Develop critical thinking for problem solving in developing or modifying desired textile properties.
- Predict the end-use of functional textiles in relation with their structure-property and finishing process.
- Discuss the environmental effect and sustainability issues of the functional finishes used in textile industry.
- Propose new ideas to develop functional finishes and functional textiles.
- Build scientific writing skills and oral presentation skills.

Schedule of Classes (<https://classes.cornell.edu/>)

FSAD 6370 - Research Seminar in Apparel Design (1 Credit)

This course for graduate students in apparel design offers a new topic every semester as supervised by a rotating team of professors.

Last Four Terms Offered: Spring 2025, Spring 2024, Fall 2023, Spring 2023

Schedule of Classes (<https://classes.cornell.edu/>)

FSAD 6390 - Introduction to Color Science: Physics and Chemistry of Color (3 Credits)

Color science is key to many industries such as food, automotive, interior and fashion design, electronics, polymer materials, imaging science, medical devices, forensics, cosmetics, photography, architecture, and textiles. Color is often one of the main parameters defining the appeal and sale of many products. Through lectures, demonstrations, and class assignments this course is designed to provide an in-depth analysis of our current understanding of how colors is created and how humans perceive and control color, and it may prepare students for future involvement in color technology as a career as well as in everyday life.

Prerequisites: one of the following or their equivalents: FSAD 1350 or PHYS 1101.

Exploratory Studies: (EUAREA)

Learning Outcomes:

- Understand the principles of light, as a wave and as a particle, and its many interactions with objects including diffraction, reflection, and absorption.
- Understand color vision/perception and associated phenomena as well as the physical and chemical origins of color.
- Select appropriate measurement techniques for visual assessment of color and current standards to quantify color.
- Examine numerical specification of color and apply numerical methods to determine color differences using several color models including XYZ, xyY, L*a*b*, metamerism, color inconstancy index, and color difference equations (e.g., DECMC and DE2000).
- Understand colorimetry and other techniques to measure color. Describe how spectrophotometers, colorimeters, displays and printers do interpret color.

Schedule of Classes (<https://classes.cornell.edu/>)

FSAD 6400 - Polymer and Fiber Characterization (3 Credits)

This class is to establish a foundation and baseline understanding of polymers, fibers, yarns, and textiles. This course will focus and ready students to execute experiments as well as practice research presentation skills. Students will become experts in polymer and fiber characterization and analysis and gain software knowledge to ready them for writing per-reviewed research papers.

Course Fee: Course Fee, \$100. Course fee.

Last Four Terms Offered: Fall 2023

Learning Outcomes:

- Gain knowledge to effectively communicate on core principles of polymers, fibers, yarns, and textiles.
- Become experts in characterizing and analyzing polymers and fibers by various techniques.
- Learn software (e.g., ChemDraw, Origin).
- Create, through techniques learned, a presentation on work relevant to one's research with relevant background.

Schedule of Classes (<https://classes.cornell.edu/>)

FSAD 6410 - Research Seminar in Fiber Science (1 Credit)

This class will comprise two main components. The first component will include presentations from FSAD graduate students summarizing their research experiences. Additionally, students will learn how to effectively communicate their research work, learn the structure of academic organizations and their role in their operations. In the second component, concepts and principles related to design will be discussed and utilized to find a solution to a pertinent problem that affects our society. This exercise will include developing a problem statement, envisioning of a multidisciplinary solution, planning a time schedule and allocating a budget. Students will present their work to their peers and create a rubric for evaluation.

Distribution Requirements: (PBS-HE)

Last Four Terms Offered: Fall 2023, Fall 2021

Learning Outcomes:

- Enhance scientific communication skills.
- Learn how to construct a problem statement.
- Gain an appreciation for different design concepts.
- Recognize elements of the administrative and academic structure of universities.
- Understand students' role in the research community.

Schedule of Classes (<https://classes.cornell.edu/>)

FSAD 6451 - Curating Fashion Exhibitions (3 Credits)

Curated fashion exhibitions are fabricated sites where research practice, creative design, material culture, histories, and aesthetics converge in public display. In this course, students will learn about curatorial practice broadly, and the display of fashion artifacts more specifically, through theory and practice. We explore curation as research practice, while considering conceptual, political, economic, and aesthetic aspects of display. Research methods, archival research, analysis of primary sources, oral histories, and other forms of information gathering will be discussed and explored. In addition to individual assignments and readings, students will work collaboratively throughout the semester to curate a fashion exhibition using the Cornell Fashion + Textile Collection along with other archives and collections across campus.

Prerequisites: Recommended prerequisite: FSAD 1250, HIST 2792, AMST 2792, VISST 2000, AMST 2000, ARTH 2000.

Distribution Requirements: (CA-HE, D-HE, HA-HE, LAD-HE, SBA-HE)

Last Four Terms Offered: Fall 2022

Learning Outcomes:

- Students will learn to conduct original research for curated exhibitions (e.g., historical method, archival research, object-based research, material culture analysis, oral histories, and visitor surveys) and develop primary source literacy.
- Students will learn to work collaboratively to research, curate, install, and promote a public fashion exhibition.
- Students will learn to think critically about fashion exhibitions and evaluate their strengths and weaknesses in terms of content, quality of research, argument, aesthetics, and material display (e.g., conservation and preservation concerns).
- Students will learn about management of museum, archive, and teaching/study collections and how to enhance diversity, inclusion, and social justice initiatives in these spaces.
- Students will learn about the historical development of fashion exhibitions, current and past debates about curation and display in the field of fashion studies, and differing approaches to exhibition research, design, and installation across time and cultural contexts.

Schedule of Classes (<https://classes.cornell.edu/>)

FSAD 6460 - Nanotechnology in Fibers and Textiles (3 Credits)

This course covers the development of functional fibers and textiles by nanotechnology. This course introduces nanomaterials, nanofinishes and nanocoating processes used for functional fibers and textiles. This course also emphasizes the structure-property of the nanofibers and nanotextiles and predict their end-use. Examples of nanotechnological products based on nanofibers and nanotextiles in the market are included. This course also discusses environmental issues and the sustainability aspects regard to nanotechnology used in fibers and textiles. Through lectures, readings, discussion, projects and presentations, this course highlights the role of nanotechnology for the development of functional fibers and textiles.

Prerequisites: FSAD 1350 and FSAD 1360 and FSAD 3350 or equivalent or ENGRI 1200/AEP 1200, MSE 2610, MSE 3010 or equivalent.

Last Four Terms Offered: Fall 2024, Fall 2023, Fall 2022

Learning Outcomes:

- Understand the role of nanotechnology for the development of functional fibers and textiles.
- Be familiar with the nanomaterials, nanofinishes, and nanocoating processes used in fibers and textiles
- Interpret scientific data to evaluate the functionality of nanofibers and nanotextiles.
- Select and apply appropriate nanotechnologies for fibers and textiles for specific performance and functionality.
- Predict the end-use of nanofibers and nanotextiles in relation with their structure-property.
- Discuss the environmental issues and the sustainability aspects regard to nanotechnology used in fibers and textiles.
- Propose new ideas to develop functional fibers and textiles by applying nanotechnology.
- Build teamwork skills, scientific writing skills, and oral/poster presentation skills.

Schedule of Classes (<https://classes.cornell.edu/>)

FSAD 6640 - Digital Anthropometry and Design in Fashion (3 Credits)

This course is designed to introduce students to the concepts and practices of digitally-measuring human body, sizing and fit, and digital product development. Discussions will be on technology solutions to improve fit and design process, and digitally-enabled manufacturing concepts. Readings and discussion topics will cover a variety of qualitative, quantitative, and mixed methods research examples; and include theories and models from other disciplines such as computer sciences and consumer behavior.

Enrollment Information: Enrollment limited to: seniors and graduate students.

Last Four Terms Offered: Fall 2023, Fall 2021, Fall 2019, Fall 2015

Learning Outcomes:

- Demonstrate the ability to read and analyze research and other publications critically.
- Improve skills in critiquing various research approaches, theories, and trends to define gaps and needs for future research in apparel product development and retail.
- Improve skills in conducting research and manuscript writing as well as submitting work to conferences and journals.
- Learn and practice using a 3D body scanner to collect anthropometric data, and various techniques to evaluate the data.
- Demonstrate an understanding of virtual prototyping and 3D visualization technologies.

Schedule of Classes (<https://classes.cornell.edu/>)

FSAD 6660 - Fiber Formation: Theory and Practice (3 Credits)

This course covers the rheological and mechanical behavior of polymeric melts and solutions undergoing fiber formation processes. Students completing this class will have a strong understanding of fiber formation including mathematical modeling of flow lines, polymer and solution properties necessary for fiber formation, and relationships between fiber formation process and resulting fiber properties. Fiber formation methods including melt spinning, gel spinning, dry spinning, wet spinning and electrospinning will be addressed.

Prerequisites: polymer chemistry, college physics, FSAD 4360, FSAD 6200, or permission of instructor.

Last Four Terms Offered: Spring 2023, Spring 2021, Spring 2019, Spring 2017

Learning Outcomes:

- Understand the physical and chemical processes involved in fiber formation including rheology, polymer chemistry and polymer physics.
- Understand the fundamentals of melt spinning, wet spinning, gel spinning, dry spinning, force spinning and electrospinning process.
- Perform experimental characterization to determine thermal and mechanical properties of the fibers.
- Interpret experimental data to characterize the thermal and mechanical properties of the fibers.
- Predict the end-use of fibers in relation with their structure-property.
- Build scientific writing skills and scientific oral presentation skills

Schedule of Classes (<https://classes.cornell.edu/>)

FSAD 6800 - Ethical Design: Engine of Positive Change (3 Credits)

Crosslisted with DEA 6800

Modern society faces various issues which are all closely related to the ethical aspects of design: humanitarian crises, labor exploitation, injustice in the workplace, loss of diversity, over-consumption, pollution, lack of transparency and pseudo-solutions to name a few. This course will discuss various ethical issues in design that impact individuals, community/society, economies, cultures, social dynamics, and the environment. Students will identify and analyze critical ethical problems and explore solutions through class activities.

Last Four Terms Offered: Spring 2025, Spring 2024, Spring 2023

Learning Outcomes:

- Think critically about the main fields of design practice, identifying the ethical challenges of each in terms of current environmental, social, and health crises.
- Investigate the impact of unethical design, production, and marketing practices on individuals, social groups, and the environment.
- Identify the difference between pseudo-solutions that mitigate the symptoms of harmful practices and those initiatives and approaches that address the harm caused by the current production and consumption systems.

Schedule of Classes (<https://classes.cornell.edu/>)

FSAD 6860 - Mechanics of Fibrous Assemblies and their Composites (3 Credits)

This class introduces mechanics of fibers, yarns and fabrics in a way that allows students to grasp the role of each constituent and their interaction in the overall response of fabrics under load. Types of fibrous composites will be discussed, and advantages and disadvantages of each type articulated to bring attention to their role as important structural materials. Mechanical models for fibrous composites will be introduced.

Prerequisites: MAE 3270, MATH 2210, or similar courses.

Distribution Requirements: (PBS-HE)

Last Four Terms Offered: Fall 2022, Fall 2020

Learning Outcomes:

- An ability to use different mechanics models to quantify the response of fibrous assemblies under load.
- An understanding of the role fiber hierarchy plays in the mechanical response of yarns and fabrics.
- Basic information on polymer and ceramic matrix composites.
- An ability to design, manufacture and test fibrous composite.
- An appreciation of the role fiber architecture plays in strength and toughness of composites.

Schedule of Classes (<https://classes.cornell.edu/>)

FSAD 6900 - Understanding Functional Aspects of Clothing and Design (3 Credits)

A holistic approach to the study of apparel design with the emphasis on integrating 1) knowledge of human performance, environmental challenges and the functional demands for apparel products, 2) prototype design, and 3) scientific design evaluation using the latest technologies.

Enrollment Information: Enrollment preference given to: FSAD majors and transfer students.

Last Four Terms Offered: Fall 2021, Fall 2019, Fall 2016, Fall 2014

Learning Outcomes:

- Students will understand the needs and functions of the human body that interact with clothing in environmental challenges.
- Students will apply the analytical approach to identifying consumers' needs for the protection, mobility, and thermal comfort of clothing systems.
- Students will understand the dynamics of heat, moisture transfer, and physical properties of textiles and clothing systems.
- Students will apply a scientific approach toward prototype design development and evaluation using the latest human performance simulation technologies.

Schedule of Classes (<https://classes.cornell.edu/>)

FSAD 8990 - Master's Thesis and Research (1-15 Credits)

A course for Fiber Science or Apparel Design Graduate Students doing research related to completing their Master's degree.

Last Four Terms Offered: Spring 2025, Fall 2024, Spring 2024, Fall 2023

Schedule of Classes (<https://classes.cornell.edu/>)

FSAD 9990 - Doctoral Thesis and Research (1-15 Credits)

Dissertation research for PhD candidates in Fiber Science or Apparel Design.

Last Four Terms Offered: Spring 2025, Fall 2024, Spring 2024, Fall 2023

Schedule of Classes (<https://classes.cornell.edu/>)