

Fiber and Polymer Science (FPS)

FPS 696 Summer Thesis Res (1 credit hours)

FPS 710/TC 710 Science of Dye Chemistry, Dyeing, Printing and Finishing (3 credit hours)

The primary course purpose is to gain a strong fundamental understanding of the chemistry and technology of preparation, dyes, dyeing and finishes. Emphasis will be on the chemistry of different bleach activators, surfactants, photophysics and photochemistry of FWAs, modulations of dyes structures to influence color, tinctorial strength, light fastness, wash fastness and aggregation. Chemistry of different dye classes will be studied with emphasis on structure-property relationships and dye-fiber interactions. Dyeing isotherms (Nernst and Langmuir), kinetics of dyeing with emphasis on derivation of Nernst and Langmuir based on thermodynamics and kinetics principles will be covered with practical examples of dyeing at different temperature and how to calculate thermodynamic parameters of dyeing (entropy, standard affinity and isotherm constants of Nernst and Langmuir). Chemistry of different finishes, including soil release, chemistry of flame retardants and mechanisms of flame retardancy, antimicrobial and water and oil repellency, will be covered with emphasis on structure-property relationships.

Prerequisite: Graduate Standing and C or better in CH221 or CH225 and CH223 or CH227

Typically offered in Fall and Spring

FPS 720/TTM 720 Textile Technology - Fibers and Yarns (3 credit hours)

The course covers advanced aspects of processing fibers or filaments into yarns and the interrelation between the yarn mechanics and structure, geometry, and properties of fiber assembly. The theme is the influence of fibers' measured properties on the quality of subsequent yarns and fabrics. The issues associated with the development of a universal model for the prediction of yarn properties, including the role of test methods on reported values, the impact of fiber blends, various parameters associated with quality in textile products including difficulties associated with a definition of "quality" and how all of these impact yarn costs.

Typically offered in Spring only

This course is offered alternate even years

FPS 750/TTM 750 Advances in Fabric Formation, Structure, and Properties (3 credit hours)

The course covers different aspects of the processing of yarns to products (braided, knitted, woven, and their composites) and the interrelation between the production mechanics and structure, geometry and properties of fiber assembly. Topics in the field are assigned and each student is expected to thoroughly study the topics and write critical papers based on structured assignments and specific questions. Conduct projects from concept to fabric formation, analyses, and evaluation.

Corequisite: TT 550 or TT 551 (or TT 451) or equivalent

Typically offered in Spring only

FPS 770 Advances in Polymer Science (3 credit hours)

This course provides an overview of the unique features of polymer materials that distinguish them from those composed of small-molecules or atoms (Polymer Physics) and the connections between their detailed molecular structures and their properties which produce distinctions between them (Polymer Chemistry).

Restriction: Graduate Standing in Fiber and Polymer Science, Textile Chemistry, Textile Engineering, Material Science and Engineering, Chemical Engineering, Chemistry and Physics, or by permission of the instructor.

Typically offered in Fall only

FPS 792 Special Topics in Fiber Science (1-6 credit hours)

FPS 801 Seminar (1 credit hours)

Typically offered in Fall and Spring

FPS 830 Independent Study (1-3 credit hours)

Typically offered in Fall and Spring

FPS 876 Special Project in Fiber and Polymer Sciences (1-12 credit hours)

Typically offered in Fall only

FPS 885 Doctoral Supervised Teaching (1-3 credit hours)

Teaching experience under the mentorship of faculty who assist the student in planning for the teaching assignment, observe and provide feedback to the student during the teaching assignment, and evaluate the student upon completion of the assignment.

Prerequisite: Doctoral student

Typically offered in Fall and Spring

FPS 890 Doctoral Preliminary Exam (1-9 credit hours)

For students who are preparing for and taking written and/or oral preliminary exams.

Prerequisite: Doctoral student

Typically offered in Fall and Spring

FPS 893 Doctoral Supervised Research (1-9 credit hours)

Instruction in research and research under the mentorship of a member of the Graduate Faculty.

Prerequisite: Doctoral student

Typically offered in Fall, Spring, and Summer

FPS 895 Doctoral Dissertation Research (1-9 credit hours)

Dissertation research.

Prerequisite: Doctoral student

Typically offered in Fall and Spring

FPS 896 Summer Dissertation Research (1 credit hours)

For graduate students whose programs of work specify no formal course work during a summer session and who will be devoting full time to thesis research.

Prerequisite: Doctoral student

Typically offered in Summer only

FPS 899 Doctoral Dissertation Preparation (1-9 credit hours)

For students who have completed all credit hour, full-time enrollment, preliminary examination, and residency requirements for the doctoral degree, and are writing and defending their dissertations.

Prerequisite: Doctoral student

Typically offered in Fall and Spring