Faculty Senate Course Form

Effective Date: **Fall 2025** Submission Date: 10/28/2024

Department: Chemistry College of: **Arts & Sciences**

Contact Person: Mazeyar Parvinzadeh Gashti Prefix: **CHEM**

Create New, Revise, Inactivate, or Reactivate: **New** Course #: **CHEM 633**

Course Form:
- Used to create new course numbers or new prefixes.
- Used to change Name, Grading, Hours, Description, Reactivate
- Used to inactivate a course from the current catalog. Courses are never deleted. They are made inactive and can be legislated to become active again.

1. Purpose/Justification for the Changes:

Offering new course on fiber chemistry based on faculty expertise in the area. From cellulose to carbon, fibers have utmost importance in technological applications, industrial developments and sustainability. Fibers are identified as useful energy resources, water treatment mediums, supercapacitors in electronic devices and wearable e-textiles. Therefore, knowing the chemistry behind fiber manipulation for advanced applications is beneficial for the students in Chemistry/Polymer Chemistry programs.

2. Is this related to, and/or affect, any other department/college/unit curricula or programs at Pittsburg State University? ***If "Yes", please provide an explanation. Provide documentation of any discussions (e.g. copies of emails, memos, etc.) that have occurred.***

◯ Yes ◉ No

3. Is this course to be considered for General Education?
If "yes" this requirement will need approval of the General Education Committee after the revisions have been approved by Faculty Senate. The General Education Course Approval form will also need to be submitted.

◯ Yes ◉ No

4. Will this course be required of any education majors?
If "yes," this requirement will need approval of the Council for Teacher Education before upload to " College Curriculum Legislation" in SharePoint.

◯ Yes ◉ No

5. Will additional resources or costs be required?

◯ Yes ◉ No

If so, what will be needed?

6. Will any additional course fees be required (e.g. equipment, clothing, travel, licensing, etc.)?
If "yes," complete the Course Fee Form on the Faculty Senate website, it will need to gain approval of the President's Council.

○ Yes ◉ No

7. Objectives/Student Learning Outcomes for NEW courses only, as it will appear in the syllabus:
Attach with upload.

8. Assessment Strategies (e.g. exams, projects, university rubric, etc.), as it will appear in the syllabus:
Attach with upload.

Course Numbers cannot be changed, only created.

	Exsisting	New/Proposed
Title:		Fiber Chemistry
Course Number:		**CHEM 633**
Credits:		**3**
Grading System:	**Select One**	**A-F, IN**
Pre/Co-Requisite(s):		Intro to Polymer Sci & Tech (CHEM 360)
Course Description:		Fibers are a key part of organic and inorganic substances and are a major part of polymer science. Their unique structures and diversity make them important for many studies and applications including apparel, floor coverings, biomedical, aeronautics, medicine, the military, electronics and forensics. They are also used as energy resources, water treatment mediums, and as supercapacitors in electronic devices. Study fiber chemistries is important for developing renewable fibers as alternatives to cotton and polyester. Chemistry also helps with efficient production processes that save water and energy. This course is aimed at a wide audience of students to enter in different fields in their future career including scientists, technologists, and engineers in chemistry, physics, biology, medicine, agriculture, materials, textiles, and polymers. It will also help students as future experts working in these various disciplines to understand the vigorous and complex field of fibers, and as a result, to interact with scientists working on fibers to provide new, better routes for developing novel and innovative products and technologies.

Authorization Sign-Off

Checklist

- [x] Required fields completed.
- [x] Syllabus attached for new courses
- [x] Assignment Strategies Attached

-Approved: Department Chair/Director
Date: 10/28/2024 Signature, Chair/Director: _____

-Approved: College Curriculum Committee
Date: 12/2/24 Signature, Committee Chair: Christopher Chilsis

-Approved: Dean of College
Date: 12/2/24 Signature, Dean: Christopher Chilsis

-Approved: Council for Teacher Education (if applicable)
Date: _____ Signature, Council Chair: _____

-Approved: University Undergraduate Curriculum Committee
Date: _____ Signature, Committee Chair: _____

-Approved: Faculty Senate
Date: _____ Signature, Recorder Faculty Senate: _____

Originating Departments(s): After completing this form, please upload it to the SharePoint, within the appropriate College folder, "Preliminary Legislation", to allow for review and questions. Any modifications should be saved as "original file name.v2.docx" and uploaded as well.

Following final College Curriculum Committee approval, please apply the appropriate signatures, and send them to your College Administrator.

PITTSBURG STATE UNIVERSITY

Course Syllabus

Fall 2025

CHEM 633: Fiber Chemistry

Instructor: Dr. Mazeyar Parvinzadeh Gashti

Office: 105-C Heckert-Wells Hall

e-mail: mparvinzadehgashti@pittstate.edu

Phone No: (620) 235-4453

Lecture room: Yates 118

Number of credits: 3

Prerequisite: Intro to Polymer Sci & Tech (CHEM360)

Course description: Fibers are a key part of organic and inorganic substances and are a major part of polymer science. Their unique structure and diversity make them important for many studies and applications including apparel, floor coverings, biomedical, aeronautics, medicine, the military, electronics and forensics. They are also used as energy resources, water treatment mediums, and supercapacitors in electronic devices. Studying fiber chemistry is important for developing renewable fibers as alternatives to cotton and polyester. Chemistry also helps with efficient fiber production processes that save water and energy.

This course is aimed at a wide audience of students entering different fields in their future career including scientists, technologists, and engineers in chemistry, physics, biology, medicine, agriculture, materials, textiles, and polymers. It will also help students as future experts working in these various disciplines to understand the vigorous and complex field of fibers, and as a result, to interact with scientists working on fibers to provide new, better routes for developing novel and innovative products and technologies.

Table of Contents includes:

- Polyester Fibers (Polymerization, processing, applications, dyeing);
- Polyamide Fibers (Polymerization, processing, applications, dyeing);
- Polypropylene Fibers (Polymerization, processing, applications);
- Vinyl Fibers (Polymerization, processing, applications);
- Wool and Related Mammalian Fibers (Chemistry, processing, applications, dyeing);
- Silk (chemistry, processing, applications, dyeing);
- Jute and Kenaf (Polymerization, processing, applications);
- Other Long Vegetable Fibers: Abaca, Banana, Sisal, Henequen, Flax, Ramie, Hemp, Sunn, and Coir;
- Cotton Fibers (Chemistry, processing, applications, dyeing);
- Regenerated Cellulose Fibers (Chemistry, processing, applications, dyeing);
- Cellulose Acetate and Triacetate Fibers (Chemistry, processing, applications, dyeing);

- Acrylic Fibers (Polymerization, processing, applications, dyeing);
- Aramide Fibers (Polymerization, processing, applications, dyeing);

Textbook/Materials Required:

- "Handbook of Fiber Chemistry". Edited by Menachem Lewin, CRC Press, 2007.

Note: Selected parts of this textbook will be specifically treated in classes. The instructor reserves the right to extract and modify from the textbook for better learning experience of the students.

Course objectives: The course is designed to:

1- Identify and classify textile fibers with respect to their chemical structure.
2- Evaluate the structure-property relationship of the fibers in relation to their chemical structure and predict the ultimate properties of the textile fibers and their end-uses.
3- Understand the role of chemistry throughout the fiber production and the recycled/upcycle path of textile fibers in the market.
4- Develop creativity/critically thinking and solve real-life scientific challenges in the textile/fiber industry by learning how to apply interdisciplinary approaches by combining fiber science, chemistry, materials science and textile engineering.
5- Discuss the environmental issues and sustainability aspects regard to chemistry used in fibers and textiles.
6- Propose suitable approaches for dyeing and finishing processes of textile fibers based on their chemistry and propose more sustainable processes for the textile industry.
7- Spark students' interest in textile science, fiber science and nanotechnology and provide them with foundation for creative thinking in developing new fibers, new processes and new applications.
8- Build teamwork skills, scientific writing skills and oral presentation skills during the semester.

Course Requirements: Regular participation is very important for successful completion of course work. It is every student's responsibility to attend classes regularly and keep up to date with the lecture material in order not to fall behind. Much of the exam materials that performance will be evaluated by will be based on slides presented and explanations given in the class. Understanding of the course material will depend heavily upon an understanding of the preceding material. Understanding of the subject matter is strongly encouraged over mere memorization of facts since the latter will almost certainly guarantee a poor performance in the course and application of the knowledge acquired in the subsequent career. Therefore, the goal of each exam will be to evaluate understanding of the course material as opposed to mere memorization. This means that each student will ultimately be expected to utilize the basic principles taught in the course in the solution of new problem situations.

Course delivery method: face-to-face,

Faculty office hours: 2 and a half hours per week. Students may access course grades and notification of their grades/progress in the course through Canvas.

Evaluation of Performance: The grade on this course will be determined by examinations every two weeks (assignments and a literature review presentation). Exams will be given during the class period and will cover material discussed in the class from the previous exam. Students will be informed about the exam time after each chapter is completed. The exam will be in a week later. Exams will be closed book, closed notes, closed any other helping tool, unless differently specified by the instructor. No makeup exams will be given unless prior permission is granted for absence. If showing up late to an exam, no extra time will be allowed. Assignments will be take-home assignments. Plenty of time (ca 4 weeks) will be given to complete and present a power point in the class. Points for all exams will be added for 100% grade. There will be no final comprehensive exam.

- Overall letter grade for the course will be determined using the following *relative scale*:

A > 85%

B 70-85%

C 55-70%

D 40-55%

F < 40 %

Tentative Calendar: Tentative course calendar for the fall semester 2025 will be presented on Canvas before the beginning of the course and will regularly be updated during the semester. Please do not make any travel plans that conflict with your exam schedule.

Note that the schedule and examination topics that will be given in the Course calendar in the first class are approximate only. The material that will be covered in each examination will be announced in the lecture class.

Academic Misconduct: If needed, it will be allowed to use a non-programmable calculator during the quizzes and examinations on this course. No other help will be allowed and the use of other materials, information (unless specifically stated by the instructor) or substitute person during exam will be viewed as cheating. "Collaborative efforts" to answer exam questions are strictly forbidden, since your answers to exam questions must be the result of strictly individual efforts. Evidence of cheating as defined above will result in a grade of zero for that exam for the first offense, even if the cheating activity involves only one question. In the second instance of such an activity, the instructor will proceed with formal charges against the student, to effect, at least, a failing grade in the course. **Please consult the policy on Student Academic Dishonesty.**

Please consult The PSU academic honesty policy that can be found at the following URL address:

(http://www.pittstate.edu/office/registrar/syllabus-supplement.dot

Other: Students are expected to dress and behave according to generally accepted societal norms of decency for all course events, including classes and exams. Wearing sunglasses, sleeping or disturbing other students in the class is not permitted. Use of cell phones, tablets, computers or any other communication device during the class period is not permitted. Any of the above will result in ejection from the class after ONE warning.

Disclaimer: Instructor reserves the right to revise the content of this syllabus (including the Course Calendar) as needed throughout the semester for better learning experience of the students.

References considered:

Curriculum for current Fiber Chemistry course at Cornell University

Curriculum for current Fiber Chemistry course at North Carolina State University