California State University San Marcos • NEW COURSE • FORM C CHEM 533

ORIGINATOR'S SECTION:

1. College:

☐ **CHABSS** ☐ **CoBA**
☐ **CoEHHS** ☒ **CSM**

Desired Term and Year of Implementation (e.g., Fall 2008):

Fall 2018

2.Course is to be considered for G.E.? (If yes, also fill out appropriate GE form*) ☐ Yes ☒ No

3. Course will be a variable-topics (generic) course? ☐ Yes ☒ No
("generic" is a placeholder for topics)

4. Course abbreviation and Number:* CHEM 533

5. Title: ***(Titles using jargon, slang, copyrighted names, trade names, or any non-essential punctuation may not be used.)***
Polymer Chemistry

6. Abbreviated Title for PeopleSoft:
(no more than 25 characters, including spaces)
Polymer Chemistry

7. Number of Units: 2

8. Catalog Description: ***(Not to exceed 80 words; language should conform to catalog copy. Please consult the catalog for models of style and format; include all necessary information regarding consent for enrollment, pre- and/or corequisites, repeated enrollment, crosslisting, as detailed below. Such information does not count toward the 80-word limit.)***

Introduces the basics of polymer synthesis, including traditional polymerization techniques, such as free-radical and anionic chain polymerizations, and step-growth polymerization. Newer methods of polymer synthesis, such as ring opening metathesis polymerization will also be discussed. The course continues with preparation of advanced polymer structures, such as block, star and brush copolymers, semi-conducting and biodegradable polymers. Fundamentals of structure and physical properties of polymers, and methods of characterization will also be covered. *Prerequisite: A minimum grade of C (2.0) in CHEM 202L or classified graduate standing.*

9. Why is this course being proposed?

This course is being proposed as part of the new Masters in Chemistry program. This course will serve as an elective course.

10. Mode of Instruction*
For definitions of the Course Classification Numbers:
http://www.csusm.edu/academic_programs/curriculumschedulling/catalogcurricula/DOCUMENTS/Curricular_Forms_Tab/Instructional%20Mode%20Conventions.pdf

Type of Instruction	Number of Credit Units	Instructional Mode (Course Classification Number)
Lecture	2	C-02
Activity		
Lab		

11. Grading Method:*
☒ Normal (N) *(Allows Letter Grade +/-, and Credit/No Credit)*
☐ Normal Plus Report-in-Progress (NP) *(Allows Letter Grade +/-, Credit/No Credit, and Report-in-Progress)*
☐ Credit/No Credit Only (C)
☐ Credit/No Credit or Report-in-Progress Only (CP)

12. If the (NP) or (CP) grading system was selected, please explain the need for this grade option.

13. Course Requires Consent for Enrollment? ☐ Yes ☒ No

☐ Faculty ☐ Credential Analyst ☐ Dean ☐ Program/Department - Director/Chair

14. Course Can be Taken for Credit More than Once? ☐ Yes ☒ No
If yes, how many times? (including first offering)

15. Is Course Crosslisted: ☐ Yes ☒ No

If yes, indicate which course and check "yes" in item #22 below.

16. Prerequisite(s): ☒ Yes ☐ No CHEM 202L or classified graduate standing.

17. Corequisite(s): ☐ Yes ☒ No

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* If Originator is uncertain of this entry, please consult with Program/Department Director/Chair.

18. Documentation attached:
☐ Syllabus ☒ Detailed Course Outline

19. If this course has been offered as a topic, please enter topic abbreviation, number, and suffix:*

20. How often will this course be offered once established?* In a 2.5 to 3-yar rotation of elective courses

PROGRAM DIRECTOR/CHAIR - COLLEGE CURRICULUM COMMITTEE SECTION:
(Mandatory information – all items in this section must be completed.)

21. Does this course fulfill a requirement for any major (i.e., core course or elective for a major, majors in other departments, minors in other departments)? ☒ Yes ☐ No

If yes, please specify:
Elective course in the Masters of Science in Chemistry.

22. Does this course impact other discipline(s)? ***(If there is any uncertainty as to whether a particular discipline is affected, check "yes" and obtain signature.)*** ☐ Yes ☒ No

If yes, obtain signature(s). Any objections should be stated in writing and attached to this form.

Discipline _____ Signature _____ Date _____ Support _____ Oppose

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SIGNATURES : (COLLEGE LEVEL) :

J. Trischman 8/4/2016
1. Originator (please print or type name) Date

8/9/16
2. Program Director/Chair Date

12/14/16
3. College Curriculum Committee Date

12/14/16
4. College Dean (or Designee) Date

(UNIVERSITY LEVEL)

5. UCC Committee Chair Date

6. Vice President for Academic Affairs (or Designee) Date

7. President (or Designee) Date

Office of Academic Programs Banner: PS Catalog Revised 3/28/2007

* If Originator is uncertain of this entry, please consult with Program/Department Director/Chair.

RP ____ Tracker ✓

Chemistry 533–Polymer Chemistry
PROSPECTIVE COURSE OUTLINE

Dr. Jacqueline A. Trischman
trischma@csusm.edu
Science Hall 1-119
760-750-4206

Course Description: Introduces the basics of polymer synthesis, including traditional polymerization techniques, such as free-radical and anionic chain polymerizations, and step-growth polymerization. Newer methods of polymer synthesis, such as ring opening metathesis polymerization will also be discussed. The course continues with preparation of advanced polymer structures, such as block, star and brush copolymers, semi-conducting and biodegradable polymers. Fundamentals of structure and physical properties of polymers, and methods of characterization will also be covered. Prerequisite: CHEM 202L.

Student Learning Outcomes:

Students will

- Name polymers using common and IUPAC nomenclature
- Relate the geometrical, mass, thermal, mechanical, viscometric and crystalline properties of polymer to polymer structure and the characterization methods to find such properties
- Understand the mechanisms of condensation, chain, ionic, ring-opening and Ziegler-Natta synthesis
- Know common commercial polymers by their names, properties and syntheses.
- Relate properties and applications of polymers to methods of polymer processing and mechanisms of polymer degradation
- Know common polymer additives and their role in the control of desired properties

Possible Textbooks:
Harry R. Allcock, Frederick W. Lampe and James E. Mark, *Contemporary Polymer Chemistry, 3rd ed.* Prentice-Hall (2003)
Petr Munk and Tejraj M. Aminabhavi, *Introduction to Macromolecular Science, 2nd ed.* John Wiley and Sons (2002)
Seymour/Carraher's Polymer Chemistry, 9th ed. by Charles E. Carraher, Jr. (2013)

Course Activities: Students will do graded homework for each 2-week period.

There will be a written take-home midterm exam and a take-home final exam.

A research paper reviewing the application of a specific technique to an interesting problem will be used to fulfill the All-University Writing Requirement. The paper will be presented to the class as well.

Grading Scheme:

	# of Items	Pts. Per Item	Total Points
Homework	7	25	175
Research Paper	1	50	50
Midterm Exam	1	100	100
Final Exam	1	100	100
			425

Anticipated schedule: (subject to change)

Lectures	Topics
Week 1-2	Introduction to polymers – stretching our definitions
Week 3	Nomenclature and molecular weight considerations
Week 4	Structure and morphology
Week 5	Methods of polymer characterization
Week 6-8	Traditional polymerization methods with modern applications
Week 9-11	New methods of polymerization in the lab and in industry
Week 12	Self-assembly and its applications
Week 13	Controlling polymers with additives
Week 14	Polymers in special applications: medicine & semi-conductors
Week 15	Student presentations