

Approval Chart for Curriculum Changes

A = Approve I = Information Item¹ R = Advise & Respond²

Course Number CHEM 483 or Degree Plan(s) _____

State the requested change and reason. A memo may be attached if more space is necessary.

CHEM 483 (Polymer Chemistry) currently meets three times a week for 50 minutes for three (3) credit hours. An associated laboratory course has been offered in Spring 2017 and Fall 2018 as a Special Topics course in order to allow students to put lecture subject matter into practice. The American Chemical Society has increasingly suggested that the topic of polymers be incorporated into undergraduate curricula because of the role these materials play in modern society. By providing students a hands-on experience in synthesizing, characterizing, and testing polymeric materials, it will increase their understanding of these materials and the functions that they have in our world. It is therefore proposed that the current course be modified to an integrated lecture/lab course. The content of the lecture course will remain unchanged, while the laboratory activity will allow for topic expansion and practical application of the lecture material. The lecture portion of the course will continue to meet as described above and an added laboratory section will meet for four hours in one afternoon each week. It is requested that the modified course be assigned four (4) credit hours, in keeping with convention of other integrated lecture/lab courses within the department. Catalog credit hours should read: (3-4-4).

Circle the number that corresponds to the requested change. Degree plan changes are on the second page.

		COUNCIL ¹								
		President	Provost	GRAD	UUAC	UGEC	TEC	Deans	College Academic	Dept./School
Change to a Course										
1.	Title (description unchanged)	I	I		I			A	A	A
②.	Description (not affecting content)	I	I		I			A	A	A
3.	Course term(s)	I	I		I			A	I	A
④.	Content (substantive change)	A	A		I			A	A	A
⑤.	Number of hours (lecture, lab, contact)	A	A		A			A	A	A
6.	Course number within the hundred	I	I		I			A	A	I
7.	Course number beyond the hundred	A	A		A			A	A	A
8.	Prerequisites	I	I		I			A	A	A
⑨.	Course fee(s)	I	A		--			A	--	A
10.	From U to G <i>or</i> G to U	A	A		A			A	A	A
11.	Cross list with another department: U or G level	A	A		A			A	A	A
12.	Department of record	A	A		A			A	A	A
13.	Open or close a course	A	A		A			A	A	A
14.	New course — See website for application and process. This change includes combining or splitting a course(s).	A	A		A			A	A	A

Note: When an academic unit does not have a council, the UGEC and/or UUAC will serve as its academic council, depending on the nature of the issue.

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		COUNCIL ³							Board of Trustees
Change to a Degree Plan		Dept./School	College Academic	Deans	TEC	UGEC	UAC	GRAD	
1.	University Requirements — Change in approved course content ⁶	A	A	A		A		A	--
2.	University Requirements — Add or drop a required course from the University Requirements chart ⁶	A	A	A		A		A	A
3.	University Requirements — Add or drop a course from a menu within the University Requirements ⁶	A	--	--		A		A	--
4.	University Requirements — Change hours within a menu on the University Requirements chart ⁶	A	A	A		A		A	A
5.	Major — Revision of major ^{4,5}	A	A	A		A		A	--
6.	Major — Adopt or change admission requirements	A	A	A		A		A	--
7.	Major — Add ^{4,5}	A	A	A		A		A	A
8.	Major – Discontinue (proposed by the department or college)	A	A	A		A		A	A
9.	Major – Discontinue (proposed by the Provost)	See below.							
10.	GPA — Revise major or cumulative requirement	A	A	A		A		A	A
11.	Minor — Revise course selection	A	A	A		I		I	--
12.	Minor — Add	A	A	A		A		A	--
13.	Minor – Discontinue (proposed by the department or college)	A	A	A		A		A	--
14.	Minor – Discontinue (proposed by the Provost)	See below.							
15.	Degree — Add	A	A	A		A		A	A
16.	Degree – Discontinue (proposed by the department or college)	A	A	A		A		A	A
17.	Degree – Discontinue (proposed by the Provost)	See below.							
18.	Any change to a graduate degree program	A	A	A		A		A	--

		COUNCIL ³							Board of Trustees
Provost-Proposed Change		Provost	Department	Dean	TEC	UAC	Graduate	Faculty	
1.	Major/Graduate Program – Discontinue (proposed by the Provost)	A	R	R		A		A	A
2.	Minor – Discontinue (proposed by the Provost)	A	R	R		A		--	A
3.	Degree – Discontinue (proposed by the Provost)	A	R	R		A		A	A

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COUNCIL ³										
	Change to the Catalog Information	Dept./School	College Academic	Deans	UGEC	UUAC	GRAD	Provost	Faculty	President
1.	General requirements for graduation including course requirements that are common to all majors for all degrees ⁷	--	--	--	A			A	A	A
2.	Admission requirements	--	--	--	A			A	A	A
3.	Policies governing academic probation and suspension	--	--	--	A			A	A	A
4.	Requirements for graduating with honors	--	--	--	A			A	A	A
5.	Other academic policy changes	--	--	--	A			A	--	A

¹ Councils may request additional information about “Information” items. These items are approved as “Consent Agenda.”

² The Dean and Department should respond to the Provost’s recommendation to close a program in writing. Advise & Respond (R) requires that the voting body should receive the written responses at least one week prior to the vote.

³ All courses that meet University Requirements for general education must go through UGEC. Courses or degrees offered only to students seeking teacher certification must go through the Teacher Education Council. All undergraduate changes must go before the UUAC. All graduate degree plan changes must go through the Graduate Council.

⁴ A minimum of 30 hours is required for a major. A maximum is specified for each degree (e.g., BA, BS). The university minimum for elective hours is 6, unless the requirements of external accrediting bodies make it impossible.

⁵ Program or course changes that apply to any major that includes Teacher Certification will be reviewed by the college, the Teacher Education Council (TEC), and then the UUAC.

⁶ Courses that satisfy ACU’s University Requirements (General Education) will normally have lower-level numbering, be free of prerequisites and co-requisites, appeal to more than one or two majors, and “not narrowly focus on those skills, techniques, and procedures specific to a particular occupation or profession” (SACS 2.7.3). Departments may request exceptions to the first three criteria.

⁷ The UUAC approved the clarification that “general requirements for graduation” means the enumerated items in the “General Requirements for Bachelor’s Degrees” section of the catalog.

Revised 3-8-17

Curriculum/Catalog Changes Signature Page

 Signature	Department/School Chair(s) 11/9/18 Approval date
_____ Signature	_____ Approval date

 Signature	College Academic Council(s) 2-22-19 Approval date
_____ Signature	_____ Approval date

 Signature	Dean(s) 3/1/19 Approval date
_____ Signature	_____ Approval date

Teacher Education Council	
_____ Chair's signature	_____ Approval date

General Education Council	
_____ Chair's signature	_____ Approval date

Undergraduate Academic Council	
_____ Chair's signature	_____ Approval date

Graduate Council	
_____ Chair's signature	_____ Approval date

Provost	
_____ Signature	_____ Approval date

Faculty	
_____ Chair of faculty senate	_____ Approval date

President	
_____ Signature	_____ Approval date

Syllabus and Course Policies
Abilene Christian University Department of Chemistry & Biochemistry
Chemistry 483 - Polymer Chemistry (4 semester hrs credit)
Fall Semester 2020

Instructor: Dr. Brad Rix
Office: Halbert-Walling Research Center (HAL) 322
Telephone (office): 325-674-2159
Email: brad.rix@acu.edu

Office Hours:	M	1:00 – 3:00 PM
	T/R	8:30 - 10:30 AM
	F	10:00 – 11:00 AM

ACU Mission Statement: To educate students for Christian service and leadership throughout the world.

Departmental Mission Statement: "We prepare students for careers in chemistry, biochemistry, chemical education, and health professions with rigorous educational standards and a commitment to Christian leadership and service." <http://www.acu.edu/academics/undergraduate/college-of-arts-and-sciences/chemistry-and-biochemistry.html>

Course Catalog Description: CHEM 483. Presents fundamental chemical study of the structure and properties of the general classes of high polymers, including synthesis, mechanism of formation, characterization, and morphology. The course includes laboratory experiments that are relevant to the understanding of polymers. Prerequisite: Senior standing or consent of instructor.

Primary Participants:

Students majoring in Biochemistry and Chemistry.

Class Times and Locations:

HAL 303B, 9:00-9:50 MWF; HAL 273, 1:00-4:50 R

Class Format:

Lecture format supplemented with experiments that utilize lecture course concepts and provide practical application of said concepts.

Course Objectives:

- Recognize and name the various classes of polymer compounds
- Learn various synthetic techniques for making polymers, and the differences between them. Several of these synthetic techniques will be used by students in the laboratory to produce commercially important polymers.
- Learn the effects of structure on polymer properties. Spectroscopic analysis will be used in the laboratory to examine the structure of various commercial polymers.
- Characterize polymers based on physical and mechanical properties. Commercial polymers, as well as student-produced polymers, will be subjected to various test procedures in order to characterize these materials.
- Learn about the morphologies of various polymers and how they are affected by polymer structure. Mechanical and spectroscopic methods will be used in combination to evaluate these effects in the laboratory.

Determination of Grades:

1. **Three major examinations** will be given during the course of the semester. No test grades will be dropped.
2. **Makeup Exams:** Makeup exams are strongly discouraged and will be allowed only if the student can submit a written statement from a physician, nurse, or parent documenting the illness or family emergency. Otherwise, a missed exam will count as a "0". An unavoidable planned absence or university excused absence must be arranged with the instructor in advance of the exam day.
3. **Laboratory Reports:** Laboratory reports will be prepared that clearly outline the work that was performed in the laboratory, including the data that was obtained and the conclusions that were drawn from the experiments. Any lab that is missed will be required to be made up within one week.
4. **Homework:** There will be some assigned homework problems. A late homework assignment will be penalized 10 points for each day it is late.
5. **Final Exam:** There will be a final comprehensive exam that covers material from both the lecture portion of the course, as well as the laboratory portion.
6. **Final course grade calculation:**

Laboratory reports	20%	Grading scale:	
Homework	10%	90.0-100	A
Major examinations	50%	80.0-89.9	B
Final examination	20%	70.0-79.9	C
		60.0-69.9	D
		below 60	F

7. **Academic integrity:** Review the Academic Integrity Policy (<http://www.acu.edu/community/offices/administrative/office-of-the-provost/academic-integrity-policy.html>) for the regulations applicable to all courses. A first instance of cheating will result in a grade of "0" for that assignment. A second incident will result in a grade of "F" for the course.
8. **Attendance Policy:** Class attendance is extremely important. To receive credit for the course, you must attend a minimum of 75% of the classes. This means that after the ninth absence you may be dropped from the class, regardless of your grade at the time. Absences due to University approved trips as well as absences due to illness will count toward your total absences. For school approved trips, please bring the Dean's signed form a week prior to the absence, as per ACU policy.

NOTE: November 13 is the last day to withdraw with a W (WP).

SYLLABUS AND CALENDAR OF EVENTS

Text: Young, R.J., *Introduction to Polymers* (paperback), 3rd Edition, CRC Press, ISBN: 9780849339295

Approximate Dates for Major Exams

1. September 23 (Wednesday)
2. October 21 (Wednesday)
3. December 2 (Wednesday)

FINAL EXAMINATION: December 9, Comprehensive

Laboratory Schedule:

September 2	Radical Polymerization – Synthesis of PMMA
September 9	Condensation Polymerization – Synthesis of Nylon
September 23	Anionic Polymerization – Synthesis of Polyisoprene
October 7	Determination of Molecular Weight via Dilute Solution Viscometry
October 14	Spectroscopic Methods in Polymer Identification
October 28	Mechanical Testing of Polymers – Creep and Stress Relaxation
November 4	Mechanical Testing of Polymers – Tensile and Compression Testing
November 11	Preparation of Polymer Composites
November 18	Mechanical Testing of Polymers – 3-Point Bend Testing