

Abilene Approval Chart for Curriculum Changes

A = Approve I = Information Item R = Respond in Writing

Course Number CHEM 134 or Degree Plan(s) _____

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

necessary.

This request is to add CHEM 134, General Chemistry II, to the Life and Physical Sciences Menu

Indicate the requested change.

	Change to a Course	Dept./School ¹	College	Dean	TEC	UGEC	AUAC/Grad	Provost	President
1.	Title (description unchanged)	A	A	A	I	–	I	I	I
2.	Description (not affecting content)	A	A	A	I	–	I	I	I
3.	Course term(s)	A	I	A	I	–	I	I	I
4.	Content (change of course outcomes)	A	A	A	I	–	I	A	I
5.	Number of hours (lecture, lab, contact)	A	A	A	A	–	A	A	I
6.	Course number within the hundred	A	A	I	I	–	I	I	I
7.	Course number beyond the hundred	A	A	A	A	–	A	A	I
8.	Prerequisites	A	A	A	I	–	I	I	I
9.	Course fee(s)	A	–	A	–	–	–	A	I
10.	From U to G or G to U	A	A	A	A	–	A	A	I
11.	Cross-list course	A	A	A	A	–	A	A	I
12.	Department of record	A	A	A	A	–	A	A	I
13.	Close a course	A	A	A	A	–	A	A	I
14.	New course (includes combining or splitting courses)	A	A	A	A	–	A	A	I

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	Change to the University Requirements (All Campuses)	Dept./School¹	College	Dean	TEC	UGEC	AUAC/Grad	Provost	Faculty	President	Trustees
1.	University Requirements — Change course outcomes of an included course ²	A	A	A	–	A	–	A	–	A	–
2.	University Requirements — Add or drop a required course from the University Requirements ²	A	A	A	–	A	–	A	A	A	–
3.	University Requirements — Add or drop a course from a menu within the University Requirements ²	A	–	–	–	A	–	A	–	A	–
4.	University Requirements — Change hours within a menu in the University Requirements ²	A	A	A	–	A	–	A	A	A	–
	Change to Catalog Information (for Campus)										
1.	General Requirements for Bachelor's Degrees and Associate's Degrees	–	–	–	–	–	A	A	A	A	–
2.	Policies governing academic probation and suspension	–	–	–	–	–	A	A	A	A	–
3.	Requirements for graduating with honors	–	–	–	–	–	A	A	A	A	–
	Change to a Degree Plan Proposed by Faculty or College										
5.	Educational Program — Revise ³	A	A	A	A	–	A	A	–	A	–
6.	Educational Program — Adopt/change admission requirements	A	A	A	A	–	A	A	–	A	–
7.	Educational Program — Add ³	A	A	A	A	–	A	A	A	A	I
8.	Educational Program — Discontinue	A	A	A	A	–	A	A	A	A	I
9.	GPA — Revise program-required GPAs	A	A	A	A	–	A	A	–	A	–
10.	Minor — Revise	A	A	A	I	–	I	I	–	I	–
11.	Minor — Add	A	A	A	A	–	A	A	–	A	–
12.	Minor — Discontinue	A	A	A	A	–	A	A	–	A	–
13.	Degree — Add	A	A	A	A	–	A	A	A	A	I
14.	Degree — Discontinue	A	A	A	A	–	A	A	A	A	I
	Change to a Degree Plan Proposed By Provost										
15.	Educational Program — Discontinue	R	–	R	A	–	A	A	A	A	I
16.	Minor — Discontinue	R	–	R	A	–	A	A	–	A	–
17.	Degree — Discontinue	R	–	R	A	–	A	A	A	A	I

¹ 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.

² Courses that satisfy ACU's University Requirements 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.

³ For undergraduate majors, a minimum of 30 hours is required. These programs must have a minimum of 6 elective hours, unless the requirements of external accrediting bodies make it impossible.

Department/School Chair(s)	
	9/6/2022
_____ <i>Signature</i>	_____ <i>Approval date</i>
_____ <i>Signature</i>	_____ <i>Approval date</i>

College Academic Council(s)	
_____ <i>Signature</i>	_____ <i>Approval date</i>
_____ <i>Signature</i>	_____ <i>Approval date</i>

Dean(s)	
_____ <i>Signature</i>	_____ <i>Approval date</i>
_____ <i>Signature</i>	_____ <i>Approval date</i>

Teacher Education Council	
_____ <i>Chair's signature</i>	_____ <i>Approval date</i>

University General Education Council	
_____ <i>Chair's signature</i>	_____ <i>Approval date</i>

Abilene Undergraduate Academic Council	
_____ <i>Chair's signature</i>	_____ <i>Approval date</i>

Graduate Council	
_____ <i>Chair's signature</i>	_____ <i>Approval date</i>

Provost	
_____ <i>Signature</i>	_____ <i>Approval date</i>

Faculty	
_____ <i>Chair of Faculty Senate</i>	_____ <i>Approval date</i>

President	
_____ <i>Signature</i>	_____ <i>Approval date</i>

Application for Life and Physical Sciences Menu

Guidelines For All General Education Courses

1. All general education courses must be 100-level or above.
2. General education courses should present a breadth of knowledge, not focusing on skills, techniques, and procedures specific to a particular occupation or profession.
3. Individual courses will fulfill only a single general education requirement.
4. Courses free of prerequisites are preferred. Applications to add courses with prerequisites must provide additional evidence that the course contributes to a student's breadth of knowledge and is not specific to a particular occupation or profession.
5. Each course may appear on a maximum of two menus that accept applications (arts and humanities, cultural literacy, life and physical sciences, and social and behavioral sciences).

Life and Physical Sciences Description

Courses within this domain use the methods and models of the natural sciences to describe, explain, and predict phenomena in the physical world; they employ empirical evidence, scientific principles, and interactions among natural phenomena to understand the world around us.

Instructions

Complete this form and submit it with a course syllabus and approval chart to the University General Education Council. Faculty submitting an application should be prepared to perform annual assessment for their course. The assessment will be conducted with the rubric included in this course application.

Subject code, course number, and title of course:	CHEM 134 - General Chemistry II
Terms offered:	Spring
Catalog description:	Continues with basic chemical concepts including thermodynamics, equilibrium, and electrochemistry.
Course prerequisites:	Chem 133
Cross-listed courses: *Note: Many gen ed courses are cross-listed between the Abilene and Dallas campuses.	N/A
Other general education menus on which the course appears or you are applying for:	N/A

Prerequisites

The council understands that many of the courses on this menu will have corequisites and that the second course in a sequence may also have a prerequisite.

1. Is the course a lower-division (100- to 200-level) course in astronomy, biology, chemistry, physics, agricultural science, environmental science, or geology?

☒ Yes ☐ No

If yes, continue to 2. If no, please explain how this course meets the description of life or physical sciences above. Applications for courses originating in other disciplines will be considered.

2. Does the course have more than one prerequisite and/or more than one corequisite?

☒ Yes ☐ No

If no, continue to 3. If yes, please explain why an exception should be made to include this course in the Life and Physical Sciences menu.

This course is a continuation of CHEM 133, therefore CHEM 133 is a prerequisite. This course also has a lab co-requisite. The lab supports the learning that occurs in the lecture.

3. If the course has prerequisites, provide evidence that the course contributes to a student's breadth of knowledge. Also provide evidence that the course content is not specific to a particular occupation or profession (200 words or less).

As the second semester of general chemistry, this course introduces students to a broad view of chemistry. It begins to train students how to approach chemical and other scientific questions so that they will be prepared to address new questions as they come along.

Relevant Outcomes

- C2: Analyze quantitative data, published writing, or observable phenomena to draw informed conclusions.
- C3: Interpret mathematical and/or logical models such as formulas, graphs, tables and schematics, and draw inferences from them; and
- C4: Integrate new data into their existing knowledge.

Describe how the course meets the C2 outcome (100 words or less).

Students learn how physical measurements of chemical phenomena are collected. They also learn how to tabulate data related to physical phenomena, suggest hypotheses that describe expected relationships and test those hypotheses through experimentation.

Using outcomes of experiments, they learn how to make claims and support those claims with evidence from the data.

Describe how the course meets the C3 outcome (100 words or less).

Measurements and data are analyzed using typical statistical methods, including determining the mean and standard deviation, median, and looking for linear and non-linear relationships. Formulas and graphs that describe known physical and chemical phenomena are used to evaluate measurements and predict outcomes.

Describe how the course meets the C4 outcome (100 words or less).

Throughout this course students are encouraged to compare and contrast their growing chemical understanding with personal experience in nature. For example, when discussing buffer systems, students are asked to compare the pH values of common solutions when small amounts of acid or base are added. This leads to observable patterns in nature.

Outcomes assessment should occur within one or two exams/assignments. Please indicate which exams or assignments will be used for each outcome. Provide assignment prompts if available.

Area to Be Assessed	Assessment Artifact
Outcome C2	ACS Standardized Final Exam
Outcome C3	ACS Standardized Final Exam
Outcome C4	ACS Standardized Final Exam

Please use the following rubric to perform assessment each year.

Student Learning Outcome C2

Students will be able to:	Shortcomings	Meets Expectations	Points of Excellence
Analyze data to draw conclusions	Lacks sufficient analysis of data or published writing.	Analyzes data and/or published writing in an effective manner.	Analyzes data and/or published writing in an exemplary manner.

Student Learning Outcome C3

Students will be able to:	Shortcomings	Meets Expectations	Points of Excellence
Interpret mathematical and/or logical models such as formulas.	Little to no demonstrated ability to interpret relationships and/or data in models.	Demonstrates ability to interpret relationships and/or data in models.	Exceptional ability to interpret relationships and/or data in models.

Student Learning Outcome C4

Students will be able to:	Shortcomings	Meets Expectations	Points of Excellence
Integrate new data into their existing knowledge	Shows little to no grasp of new information and/or does not demonstrate adequate connection to previous learning.	Grasps new information and makes connections to previous learning.	Exceptional grasp of new information and/or demonstrates outstanding ability to connect to previous learning.

GENERAL CHEMISTRY II

SPRING 2022 SYLLABUS



CHEM-134.02
3 credit hours

Days/Time: TR 8:00 – 9:20 AM
Class Location: Halbert-Walling 303A

Professor: Dr. Perry Reeves
Office: Halbert-Walling Rm 312
Office hours: **Tues. 1:30-4:00 pm**
Wed. 1:30-4:00
Thur. 1:30-4:00

Office phone: (325) 674-2003
Cell phone: (325) 370-9704
Campus mail: ACU Box 28132
Email: reevesp@acu.edu

Mission of Abilene Christian University

To educate students for Christian service and leadership throughout the world.

Mission of the Department of Chemistry and Biochemistry at ACU

To prepare students for careers in chemistry, biochemistry, chemical education, and health professions by displaying high professional standards and by modeling Christian values, leadership, and service.

Course Description

The goals of this course are to help the student 1) to understand and describe matter's structure and behavior and 2) to develop analytical and critical thinking skills, including the ability to solve both numerical and conceptual problems.

Prerequisites: Chem 133 and 131 with a grade of "C" or higher, concurrent enrollment in Chemistry 132 (General Chemistry Lab II). You must pass Chem 134 and Chem 132 with a grade of "C" or higher before enrolling in Chem 221/223 (Organic Chemistry).

Course Format

Class time will be divided among lecture, discussion, and occasional demonstrations/videos. Class discussion and questions are always welcomed, but no class participation grade or group grades will be given. Students are expected to take accurate notes, to fully participate in class activities, and to read the assigned materials. Students are encouraged to ask for clarification on any material covered in class and are encouraged and welcomed to visit the instructor during office hours.

Resources

Required:

- Required: (a) *Chemistry*, 2nd edition, Atoms First available for FREE DOWNLOAD at <https://openstax.org/details/books/chemistry-atoms-first-2e> or print copy purchasable at the bookstore or through independent suppliers
- (b) Chem101 homework system can be purchased through the bookstore or on the site: <https://support.101edu.co/hc/en-us/articles/360034901254-How-do-I-pay-for-my-course-access->
- You will need access for each semester you enroll in a General Chemistry course
- (c) A scientific calculator (preferably a Texas Instruments TI-30XIIS)

Students will use the Canvas LMS system to examine or download the syllabus and other course documents (including problem sets and class notes in PDF format).

Academic Integrity

The full policy, ACU's Academic Integrity Policy, is available for review at the Provost's office web site.

Attendance Policy

Students are strongly encouraged not to miss class. The instructor may drop any student with **more than 6 absences** from the course, regardless of the reasons for the absences. You should inform the instructor at least *one week in advance* concerning university-approved events that will cause you to be absent and provide the university form completed by the event sponsor and signed by the dean and provost. For absences due to illness or emergency, inform the instructor *no later than 48 hours* after the class period you missed. You are responsible for the material covered in class when you are absent and all assignments are due on the assigned date regardless of class attendance. The student is responsible to contacting the professor to get any materials missed due to absence.

Electronic devices

Please bring your iPhone, iPad or iPod to class, but make sure they are in silent mode (OFF during testing). Students are not allowed to wear headphones during class. No electronic devices, phones or smart watches will be allowed on student desks during quizzes or exams. You will need a computer or iPad for some class assessments and may need to be able to use LockDown browser with Respondus software.

Dress Code and social distancing requirements

Students should conform to the dress code as outlined in the Student Handbook. If at any point the university requires that face masks covering your mouth and nose be worn at all times when in campus buildings including during class, you will be expected to comply. In this case, food should not be consumed during class, as this would require removal of your mask. Students wearing inappropriate attire or not abiding by any health or safety protocols will be asked to leave class.

Course Competencies

In General Chemistry II, competence is expected with regard to:

1. Understanding and describing matter's structure and behavior;
2. Developing analytical and critical thinking skills;
3. Solving both numerical and conceptual problems;
4. Understanding that chemistry is a fundamental part of our everyday life!

Grade

The following is the *strict* grading scale by which all grades will be determined:

A = 90-100, B = 80-89, C = 70-79, D = 60-69, F = below 60
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Your grade in this course will be determined from homework assignments, in-class quizzes, exams, class participation and a final exam as detailed on the next page of this syllabus.

No make-up exams will be given without a physician's note or dean's notice for a university-related trip or ACU notification of required self-isolation due to COVID exposure. Exams, assignments, and quizzes missed because of university-approved trips should be completed and turned in prior to the trip (make arrangements with the instructor). If you are ill you must notify the instructor within 24 hours of any missed exam or quiz.

No late homework will be accepted as assignments can be completed online, but the lowest four homework/quiz scores will be dropped.

NOTE: Students must make a "C" or better in CHEM 133 in order to take CHEM 134 (General Chemistry II).

Homework and Exam Schedule

Assignment	Details	Date	Percentage Points
Online Homework/ In-class quizzes	Daily Chem101 homework	Homework due at times and dates posted in Canvas Quizzes will be given as announced	15% (lowest 2-3 scores dropped)
Exam 1*	Ch 10 – “Liquids and Solids” Ch 11 – “Solutions and Colloids”	Tuesday, February 1	65% (14% each for four high scores, 9% for lowest score)
Exam 2*	Ch 12 – “Thermodynamics” Ch 13 – “Fundamental Equilibrium Concepts”	Thursday, February 17	
Exam 3*	Ch 14 - “Acid-Base Equilibria”	Thursday, March 10	
Exam 4*	Ch 15 – “Equilibria of Other Reaction Classes” Ch 16 – “Electrochemistry”	Tuesday, April 12	
Exam 5*	Ch 17 – “Kinetics”	Thursday, April 28	
Final Exam	“ ACS standardized exam”	Block Exam Check Final Exam Schedule	20%

Total Percentage Points: 100%

* Combination of multiple choice, true/false, matching, fill in the blank, and/or short answer questions

The instructors reserve the right to adjust the schedule as needed.

The study of science is the study of God's creation. Every calculation and observation is a glimpse into the creative mind of the Master of the universe. It is with awe that we approach any study of the Almighty and His works, and our response should be worship.