

## Geology 3311 Geochemistry

Fall, 2023,

12-12:50 MWF

Instructor: Kevin Urbanczyk; 432-8937-8110, [kevinu@sulross.edu](mailto:kevinu@sulross.edu)

Office hours: MWF 10-11, TR 9-11

### Course Description

This course is an introduction to the basic chemical concepts necessary to understand Earth processes. It begins with a review of chemical and thermodynamic concepts and kinetics. It then covers aquatic chemistry, trace elements in magmas, aspects of isotope geochemistry, cosmic chemistry, organic chemistry, weathering and the chemistry of oceans. This course is a solid review of these important geochemical concepts and prepares the student to understand these topics and to be able to apply the knowledge to natural Earth system problems.

### Learning Objectives

- Understand basic geochemical principles
- Be able to apply geochemical knowledge to natural systems

### Student Learning Objectives

- Understand the geochemical aspects of mineralogy and petrology
- Understand the geochemical processes involved in Earth formation and changes in Earth evolution / differentiation

### Marketable Skills

- The student will be able to perform field water quality assessment
- The student will be able to use modern analytical techniques such as Scanning Electron Microscopy with Energy Dispersive X-Ray analysis
- The student will be able to communicate geochemical topics via written assignments

### Course content

We will have periodic quizzes and homework assignments that will comprise 20% of the course grade. There will be 2 midterms and a final worth 20% each and a term project for the last 20%. The project will be a paper and presentation on a geochemical topic of your choice.

	percent
quiz/homework	20
midterm 1	20
midterm 2	20
final exam	20
term project	20

week	date	Book	Chapter
1	8/28	Introduction	1
	8/30		
	9/1		
2	9/4	<b>Labor day holiday</b>	
	9/6	Concepts	2
	9/8		
3	9/11		
	9/13	Solutions	3
	9/15		
4	9/18		
	9/20	Applications of thermodynamics	4
	9/22	<b>Exam 1</b>	
5	9/25		
	9/27	Kinetics	5
	9/29		
6	10/2		
	10/4	<b>Aquatic chemistry</b>	6
	10/6		
7	10/9		
	10/11	Trace elements in igneous processes	7
	10/13		
8	10/16		
	10/18	Radiogenic isotopes	8
	10/20		
9	10/23		
	10/25	Stable Isotopes	9
	10/27		
10	10/30		
	11/1	Cosmic chemistry and Solid Earth	10, 11
	11/3		
11	11/6	<b>Exam 2</b>	
	11/8	Organic	12
	11/10		
12	11/13		
	11/15	Weathering	13
	11/17		
13	11/20		
14	11/27	Oceans	14
	11/29		
	12/1	Applied	
15	12/4	Presentation	15
	12/6	Presentation	
	12/7	<b>Final Exam, Tuesday 12/12 12:30</b>	

## ADA Statement

SRSU Accessibility Services. Sul Ross State University (SRSU) is committed to equal access in compliance with the Americans with Disabilities Act of 1973. It is SRSU policy to provide reasonable accommodations to students with documented disabilities. It is the student's responsibility to initiate a request each semester for each class. Students seeking accessibility/accommodations services must contact Mrs. Mary Schwartze Grisham, LPC, SRSU's Accessibility Services Director at 432-837-8203 or email [mschwartz@sulross.edu](mailto:mschwartz@sulross.edu). Our office is located on the first floor of Ferguson Hall, room 112, and our mailing address is P.O. Box C122, Sul Ross State University, Alpine, Texas, 79832.

## SRSU Distance Education Statement

Students enrolled in distance education courses have equal access to the university's academic support services, such as library resources, online databases, and instructional technology support. For more information about accessing these resources, visit the SRSU website.

Students should correspond using Sul Ross email accounts and submit online assignments through Blackboard, which requires a secure login. Students enrolled in distance education courses at Sul Ross are expected to adhere to all policies pertaining to academic honesty and appropriate student conduct, as described in the student handbook. Students in web-based courses must maintain appropriate equipment and software, according to the needs and requirements of the course, as outlined on the SRSU website. Directions for filing a student complaint are located in the student handbook.

## Libraries

The Bryan Wildenthal Memorial Library in Alpine offers FREE resources and services to the entire SRSU community. Access and borrow books, articles, and more by visiting the library's website, [library.sulross.edu/](http://library.sulross.edu/). Off-campus access requires logging in with your LoboID and password. Librarians are a tremendous resource for your coursework and can be reached in person, by email ([srsulibrary@sulross.edu](mailto:srsulibrary@sulross.edu)), or by phone (432-837-8123).

No matter where you are based, public libraries and many academic and special libraries welcome the general public into their spaces for study. SRSU TexShare Cardholders can access additional services and resources at various libraries across Texas. Learn more about the TexShare program by visiting [library.sulross.edu/find-and-borrow/texshare/](http://library.sulross.edu/find-and-borrow/texshare/) or ask a librarian by emailing [srsulibrary@sulross.edu](mailto:srsulibrary@sulross.edu).

New for Fall 2023: Mike Fernandez, SRSU Librarian, is based in Eagle Pass (Building D-129) to offer specialized library services to students, faculty, and staff. Utilize free services such as InterLibrary Loan (ILL) and ScanIt to get materials delivered to you at home or via email.

## Academic Integrity

Students in this class are expected to demonstrate scholarly behavior and academic honesty in the use of intellectual property. Students should submit work that is their own and avoid the temptation to engage in behaviors that violate academic integrity, such as turning in work as original that was used in whole or part for another course and/or professor; turning in another person's work as one's own; copying from professional works or internet sites without citation; collaborating on a course assignment, examination, or quiz when collaboration is forbidden. Students should also avoid using open AI sources

*unless permission is expressly given* for an assignment or course. Violations of academic integrity can result in failing assignments, failing a class, and/or more serious university consequences. These behaviors also erode the value of college degrees and higher education overall.

### **Classroom Climate of Respect**

Importantly, this class will foster free expression, critical investigation, and the open discussion of ideas. This means that all of us must help create and sustain an atmosphere of tolerance, civility, and respect for the viewpoints of others. Similarly, we must all learn how to probe, oppose and disagree without resorting to tactics of intimidation, harassment, or personal attack. No one is entitled to harass, belittle, or discriminate against another on the basis of race, religion, ethnicity, age, gender, national origin, or sexual preference. Still, we will not be silenced by the difficulty of fruitfully discussing politically sensitive issues.

### **Supportive Statement**

I am to create a learning environment for my students that supports various perspectives and experiences. I understand that the recent pandemic, economic disparity, and health concerns, or even unexpected life events may impact the conditions necessary for you to succeed. My commitment is to be there for you and help you meet the learning objectives of this course. I do this to demonstrate my commitment to you and to the mission of Sul Ross State University to create a supportive environment and care for the whole student as part of the Sul Ross Familia. If you feel like your performance in the class is being impacted by your experiences outside of class, please don't hesitate to come and talk with me. I want to be a resource for you.