

**Geosciences 251    Physical Geology    Fall 2020**  
**PRELIMINARY VERSION (revised 24 August 2020)**

**Course Description**

Introduction to Earth's materials; surface and internal geologic processes; plate tectonics; and geologic time. Includes practical experience in rock and mineral identification, topographic maps, and applied problems in geosciences.

**Pre-requisites: none**

**Lecture**                      **Tuesday/Thursday, 11:00-12:15 AM; Chemistry 111**

**Lab Sections**                      Monday (includes Honor's Section) 12:00-2:50 (Caden) (14/20)  
Monday 3:00-5:50 (Dan) (20/20)  
Tuesday 12:30-3:20 (Anca) (22/20)  
Tuesday 3:30-6:20 (Anca) (20/20)  
Wednesday 12:00-2:50 (Emilia) (20/20)  
Wednesday 3:00-5:50 (Ken) (19/20)  
Thursday 12:30-3:20 (Alice) (11/20)  
Thursday 3:30-6:20 (Alice) (7/20)  
Friday 12:00-2:50 (Ken) (8/20)

**Instructors:**    George Gehrels: ggehrels@email.arizona.edu  
Office Hours: Tues & Thurs @ 12:30-2:00 in GS 529 and on Zoom  
Sarah George; swmgeorge@email.arizona.edu  
Office Hours: Tues & Thurs @ 8:30-10:00 in GS 348 and on Zoom

**Teaching Assistants:**

**Anca Barla** (1/2-time; ancabarla@email...; Office Hours \_\_\_-\_\_\_ on \_\_\_ in GS \_\_\_ or on Zoom; Teaching both Tues labs)

**Emilia Caylor** (1/4-time; emiliacaylor@email...; Office Hours \_\_\_-\_\_\_ on \_\_\_ in GS \_\_\_ or on Zoom; Teaching Weds 12:00-3:00 lab)

**Alice Chapman** (1/2-time; alicechapman@email...; Office Hours \_\_\_-\_\_\_ on \_\_\_ in GS \_\_\_ or on Zoom; Teaching both Thurs labs)

**Dan Collins** (1/4-time; dte1@email...; Office Hours \_\_\_-\_\_\_ on \_\_\_ in GS \_\_\_ or on Zoom; Teaching Monday 3:00-6:00 lab)

**Kenneth Gourley** (1/2-time; kengourley@email...; Office Hours \_\_\_-\_\_\_ on \_\_\_ in GS \_\_\_ or on Zoom; Teaching Weds 3:00-6:00 and Fri 12:00-3:00 labs)

**Caden Howlett** (1/4-time; cadenhowlett@email...; Office Hours \_\_\_-\_\_\_ on \_\_\_ in GS \_\_\_ or on Zoom; Teaching Monday 12:00-3:00 lab)

**Preceptors: (in Geos 397A, section 6, for 2 units if lab-only, 3 units if lab & two field trips):**

Ahmed Sami Al Shams; asa4@email.arizona.edu  
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Anna Teresa Miller; annamiller@email.arizona.edu  
Qasem Abdulhamid Musallam; musallamq@email.arizona.edu  
Kailyn Nicole Teel; kteel@email.arizona.edu

### **Textbook (required):**

*Understanding Earth* by Grotzinger & Jordan (8th edition preferred, 7th or 6th is OK). You will need this text for both lecture and lab. You will also need to access additional printed materials posted on D2L for lecture and lab.

### **IT requirements**

You will need an internet connection and a device that provides access to D2L (to both download and upload files). No assignments will be turned in on paper. You will also need occasional access to Excel or software that provides similar calculation/graphing capabilities. If you have IT issues, please seek assistance from: <https://student.it.arizona.edu/resources>

### **Course Communication**

Communication for this course will take place using D2L, university email addresses, and Slack. Slack is a messaging platform that can be used on smartphones or on any computer with an internet connection. To join the Slack workspace, follow this link:  
[https://join.slack.com/t/geos251fall2020/shared\\_invite/zt-gq7286i8-7LDsbF0kFj5RLBIVSy~WQ](https://join.slack.com/t/geos251fall2020/shared_invite/zt-gq7286i8-7LDsbF0kFj5RLBIVSy~WQ)

Students are encouraged to use these systems to correspond with instructors, TA's, and preceptors, but not with other students or groups of students.

### **Scheduled Topics/Activities**

Please refer to the accompanying Lecture and Lab Schedule to keep track of all due dates and assignments. We will also be using the Calendar feature in D2L.

### **Course Objectives**

This course provides an introduction to many of the primary topics in Earth Science, such as:

- the characteristics and origin of common rocks and minerals
- how rocks are deformed and the structures that are produced
- important processes operating in the atmosphere, in the oceans, and on the land surface; and how these processes impact humans and are impacted by human activities
- origin and use of mineral and energy resources
- geologic history of the world, North America, and Arizona

### **Expected Learning Outcomes**

On completion of this course, students will:

1. Graduates will have a working knowledge of common Earth materials including their composition, origin, and uses.

2. Graduates will be able to describe how Earth surface processes operate and how they impact humans.
3. Graduates will be able to describe processes in the Earth's interior.
4. Graduates will know the geologic time scale and major Earth events.
5. Graduates will acquire specific skills required for the study and interpretation of geological materials, history, and features.
6. Graduates will be able to use scientific, including being able to read and critically evaluate primary Earth science literature and data, and effectively communicate geologic information both orally and in writing.

### **Course Modalities**

Geos 251 is designated as "Flex In-Person" (as described at: <https://covid19.arizona.edu/>, link to Class Options). This means that the course will be available both in-person and on-line, with a mix that is determined by UofAZ policy, the type of activity (e.g., field trip versus lab versus lecture), and the preferences/needs of individual students. Some aspects of the course will also change during the semester given the UofA announcement that activities for large courses will begin and end the semester on-line.

Given that all lecture, lab, and field trip activities will be available both in-person and on-line, it will be possible for students to complete this course entirely on-line. We encourage your participation in the in-person activities, but realize that this may not be possible for some students.

Following is our very preliminary plan for lectures, labs, and field trips. As plans change, we will let you know with D2L announcements, and with revised versions of the syllabus (posted on D2L).

**Lecture activities** will be conducted on-line-only prior to Sept 7 and after Nov 26. Between Sept 8 and Nov 25, lectures will be available both in-person (if UA allows) and on-line. We are planning for on-line lectures to be both synchronous (so you can participate, ask questions, etc.) and asynchronous.

Lectures will follow the schedule on the accompanying Lecture Schedule. This schedule notes the topics covered in each lecture, and also the chapters in your text that should be at least skimmed prior to the lecture. Various activities (e.g., problem solving, drawing, debating, estimating, calculating, etc.) will take place during each lecture. You will be able to participate in these activities if you attend lectures in-person, or if you attend the synchronous on-line sessions (using Zoom). Lectures will be posted for asynchronous as soon as possible after each lecture.

Following each lecture there will be a short assessment activity that relates to lecture material. These will be worth 20 points each, and you will have ~2 days to complete the assignment after each lecture.

**Lab activities** will take place between Sept 7 and Nov 26. Please see the accompanying Lab Schedule for the topics covered in each lab.

Labs can be completed in-person if we are confident that this can be done in a manner that is safe for everyone (students, preceptors, TA's, instructors). It will also be possible to complete the labs on-line/synchronous (conducted with TA using Zoom) or on-line/asynchronous (utilizing a pre-

recorded session led by a TA). TA's and preceptors will be available during their office hours (utilizing Zoom). Whether in-person, on-line/synchro, or on-line/asynchro, all labs will need to be completed during or soon after the scheduled week -- make sure you keep up with your labs!

Each lab will consist of about one hour of hands-on activities and one hour of hands-off activities. If you attend in-person, you will be able to handle the specimens or materials and make direct observations. There will be a maximum of ten students in the lab, and Plexiglas partitions between students provide separation. All materials and common surfaces will be sanitized with alcohol between lab sections. If you attend on-line/synchro (during a lab session), you will work through the lab with a TA (using Zoom). They will handle the materials and assist you in making the observations. If you attend on-line/asynchronous, you will follow a recorded session that shows a TA working with the materials and providing the information that you need. TA's and preceptors will be available during office hours for consultation.

Following each lab, there will be an assessment activity that is worth 10 points. This will need to be completed with several days after each lab session.

**Field trips** will happen between Sept 7 and Nov 26. Each student will be required to participate (either in-person or on-line) in one all-day field trip. Preliminary dates for these trips are shown on the Lecture Schedule. You will be able to sign up in advance using the Field Trip Sign-up Option on D2L (not yet available).

Field trips can be completed in-person (if allowed by UofA) or on-line (asynchronous). For in-person trips, students will be transported in UofA vans, with an open seat separating students. Masks will be required in the vans and while in the field. Vans will be sanitized between trips. We are also exploring the possibility that students will be able to drive their own vehicles on the class trip. You can learn about UA policy at <https://risk.arizona.edu/faq/personal-vehicles>. Please hold off requesting permission until we find out if requests will be approved.

### **For All In-Person Activities:**

#### **1. Attendance Policies related to COVID-19:**

- If you feel sick, or have any of the symptoms of COVID-19, do not come to lecture or lab.
- If you have recently had close contact with a person with COVID-19, do not come to lecture or lab.
- If you are not able to attend class, and miss up to one week of courses-work, there is no need to contact your instructors. But you will be responsible for completing any work missed due to illness or the need to quarantine/isolate, including assignments, quizzes, tests and exams. All materials will be available on-line.
- If you miss more than one week of classes, please contact your instructors, and you also need to send a doctor's note of explanation to [DOS-deanofstudents@email.arizona.edu](mailto:DOS-deanofstudents@email.arizona.edu).

**2. Face Covering:** Face coverings are required in all UofA buildings and vehicles. Per UofA's Administrative Directive (<https://deanofstudents.arizona.edu/welcome/face-coverings>), face coverings that cover the nose, mouth, and chin are required to be worn in all learning spaces at the University of Arizona (e.g., in classrooms, laboratories and studios). Any student who violates this directive will be asked to immediately leave the learning space, and will be allowed to return only when they are wearing a face covering. Subsequent episodes of noncompliance

will result in a Student Code of Conduct complaint being filed with the Dean of Students Office, which may result in sanctions being applied. The student will not be able to return to the learning space until the matter is resolved.

### **3. Classroom Behavior:**

- The UofA "Threatening Behavior by Students" Policy prohibits threats of physical harm to any member of the University community, including to oneself. See <http://policy.arizona.edu/education-and-student-affairs/threatening-behavior-students>.
- Please refrain from engaging in non-course-related activities during lecture, (e.g., texting, chatting, reading a newspaper, making phone calls, web surfing, etc.).
- Using devices (e.g., laptops, tablets, cell phones) to follow lecture materials and take is fine. Please avoid using devices in a way that other students may find disruptive or distracting.

### **Grading Policies**

#### **Course grade**

Following is the distribution of points for each of the course activities. Note that all scores will be entered in D2L as points (not as grades). You will be able to monitor your grade in D2L during the semester.

**Lecture Activities:** 28 homework assignments @ 20 points each (with three lowest scores dropped) = 500 points

#### **Lab Activities:**

9 labs, each worth 20 points = 180 points

9 lab assessments, each worth 10 points = 90 points

**Field Trip:** Worth 30 points

**Total = 800 pts**

Note that we will not have any quizzes or exams during the semester.

Letter Grades will be assigned as usual, with:

89.5% (716 points) to 100% (800 points) = A

79.5% (636 points) to 89.4% (715 points) = B

69.5% (556 points) to 79.4% (635 points) = C

59.5% (476 points) to 59.4% (555 points) = D

< 59.5% (<555 points) = F

A few tips for doing well in this course:

- 1) make sure that you stay current lectures and labs. Do not fall behind!
- 2) take notes during every lecture. This will reinforce the material.
- 3) keep up with the required reading
- 4) see your instructors or TA's (in person or on Zoom) if you have questions or need assistance.

### **Code of Academic Integrity**

Students are encouraged to share intellectual views and discuss freely the principles and applications of course materials. However, graded work/exercises must be the product of independent effort unless otherwise instructed. Students are expected to adhere to the UA Code of Academic Integrity as described in the UA General Catalog. See: <http://deanofstudents.arizona.edu/academic-integrity/students/academic-integrity>.

**Dispute of Grade Policy:** Three deadlines for reporting issues are shown on the Lecture Schedule. Please email your instructors or TA before these deadlines to address a grading issue.

### **Incomplete (I) or Withdrawal (W):**

Requests for incomplete (I) or withdrawal (W) must be made in accordance with University policies, which are available at <http://catalog.arizona.edu/policy/grades-and-grading-system#incomplete> and <http://catalog.arizona.edu/policy/grades-and-grading-system#Withdrawal> respectively.

### **Final Examination**

The date and time of the scheduled final exam are available from:

<http://www.registrar.arizona.edu/schedules/finals.htm>. Final Exam Regulations are described at: <https://www.registrar.arizona.edu/courses/final-examination-regulations-and-information>

### **Honors Students**

Honors students in this class will have an opportunity participate in a research project, which will involve helping build a "Wall of Time" at Saguaro National Park (East). As you will learn during the semester, the Rincon Mountains (east of town) are one of the world's classic examples of a "core complex" mountain range. Geologists from all over the world come to see this geology, which is spectacularly displayed in SNM. Our job (opportunity) is to work with Park scientists to build an exhibit that explains this geology in terms that the public can appreciate.

Our plan is to collect some large specimens of the classic rocks that make up this core complex, and arrange them in their true positions on a rock wall. Park employees will build the wall, we will provide the rocks and the information (on plaques).

Proceeding with this project requires that we receive permission from the University to travel to SNM (about 20 miles east of campus), and permission from the Park to work together in the field. If either is not possible, we will develop another project that explores some aspect of our local geology. Unfortunately, any project we do will require in-person activities, so on-line-only participation will not be possible.

To receive Honor's credit, you will need to be engaged in all aspects of the project, and you will need to be enrolled in the Monday lab section (although you need not attend this lab section). Please contact Shawna Matteson ([smatteson@email.arizona.edu](mailto:smatteson@email.arizona.edu)) or Anne Chase ([achase@email.arizona.edu](mailto:achase@email.arizona.edu)) to enroll in the Monday lab.

### **UA Nondiscrimination and Anti-Harassment Policy**

The University is committed to creating and maintaining an environment free of discrimination; see <http://policy.arizona.edu/human-resources/nondiscrimination-and-anti-harassment-policy>

### **Accessibility and Accommodations**

It is the University's goal that learning experiences be as accessible as possible. If you anticipate or experience physical or academic barriers based on disability or pregnancy, please let your instructors or TA's know immediately so that we can discuss options. You are also welcome to contact Disability Resources (520-621-3268) to establish reasonable accommodations.

**Websites**

Course materials will be posted on D2L.

U of A Geosciences Department: [www.geo.arizona.edu](http://www.geo.arizona.edu)

**Subject to Change Statement**

Information contained in the course syllabus, other than the grade and absence policy, may be subject to change with advance notice, as deemed appropriate by the instructor.

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