

# GEL 105, SPRING 2021

## EARTH MATERIALS: IGNEOUS ROCKS

### Meeting times

Lectures: Monday and Wednesday 9:00-9:50 am PST, via Zoom

Labs: Both in-person and virtual labs:

*In-person*: Earth and Physical Sciences 1316

Section A01: Tues. and Thurs. 1:10-4:00 pm

Section A02: Mon. and Weds. 4:10-7:00 pm

*Virtual*: via Zoom

### Instructors and Contact Information

**Instructor**: Barbara Ratschbacher **Email**: [bratschbacher@ucdavis.edu](mailto:bratschbacher@ucdavis.edu)

**Lab TAs**: Paige Cary (A01, [pacary@ucdavis.edu](mailto:pacary@ucdavis.edu)); Dylan Vasey (A02, [davasey@ucdavis.edu](mailto:davasey@ucdavis.edu))

**Lecture TA**: Kate Hewitt, ([kchewitt@ucdavis.edu](mailto:kchewitt@ucdavis.edu))

### Office Hours/Locations

Ratschbacher: Tuesday 9 to 10 am and after appointment, via Zoom

Vasey: Th 10-11 am, via Zoom

Cary: Fri 11am-12pm, via Zoom

Hewitt: MW 3-4 PM, via Zoom

Important dates

Lectures and Labs will begin on Monday, March 29th

Memorial Day Holiday, May 31st, no lecture and no labs

### Course format

#### **Lectures**:

Due to Covid-19, the lectures will be held synchronous (live) via Zoom. Lectures will not be recorded; therefore it is absolute essential that you come to class. Lectures will have interactive parts to encourage students to participate. I will provide lecture slides to some lectures to help you make notes during the lectures. I highly encourage you to take notes in any case. Lecture slides will be posted under 'Files'.

#### **Labs**:

Labs this year will include both an in-person component and an online component. The laboratory sessions meet twice a week. These sessions are an integral part of this course and you are **required** to attend. We will have in-person labs and online lab exercises (see schedule for details). For the in-person labs, the lab TAs will provide pre-recorded introductions to watch on Canvas **before coming to lab** in order to use in-person time more efficiently. For online labs, the lab TAs will introduce the lab exercise

during the lab period on Zoom and remain on Zoom to answer questions for the first hour of the lab period. The TAs will remain available via e-mail and Canvas chat for questions during the remainder of the lab period.

**All labs are due at the beginning of the first session of a new lab exercise and should be uploaded as a PDF or Word document to Canvas.**

The final weeks of the laboratory section will be devoted to your term project. The final project report is due to the TAs on **Wednesday, June 7 by 5 pm on Canvas. No late projects will be accepted.**

A 10x hand lens is essential for this course. If you do not already own one, now is the time to buy one. Amazon sells them for example.

Please read the safety protocol below carefully; it is **absolutely essential** that you follow these rules to keep yourself and anyone else safe.

### ***Required Text and Reading***

- Winter, D., An Introduction to Igneous and Metamorphic Petrology (digital version available via bookshelf)
- Laboratory Exercises & Problem Sets (see lab syllabus for details; these will be uploaded on Canvas)
- Additional reading is optional and will be introduced during the lectures
- The book 'Rock-forming Minerals in Thin section' has been uploaded to the 'Files' section and is highly recommend using during the labs to assist with mineral identification.

### **Grading**

Grading will be based on the following percentages. For the Exams and Problem Set, both lecture and lab content is important to know. Lab Exercises, Problem Sets, and Exams will be posted on Canvas on the dates indicated in the schedule at the end of the document.

Mini- Exams	20%
Problem Sets	15%
Labs	50%
Final Project	15%

### **Problem Sets**

You are responsible for completing and submitting solutions to topical problems. There are a total of four problem sets that will be posted on the class Canvas site. They are due at **5 pm on the day indicated in the class schedule at the end of this document**. You have to upload your filled out Problem Set to the Canvas website. You can fill it out by hand and then either scan it or take a (high-resolution) picture or answer the question using Word or another program. You are welcome to turn in your problem set early; however, no credit will be given for problem sets turned in late. Problem sets are open book but you cannot work together on problem sets. Solution keys will not be posted, though every effort will be made to grade and hand them back before the next problem set is assigned. I highly recommend you take advantage of office hours to review the problem sets after they have been graded. Problem Sets will build on lectures and reading by giving you some experience working through problems and calculations related to the course material, as well as having some questions that are similar to exam questions.

### **Mini-Exams**

There will five mini-exams, which are shorter than regular midterms or final exams. The exams for the course will be online, asynchronous exams, which will be open for approximately 48 hours during a time window that includes the scheduled exam time. Both lecture and lab content will be important to know in order to answer exam questions. More details will be provided closer to the first exam.

### **Final term project:**

The final project will have a in-person and virtual component. The final weeks of the laboratory section will be devoted to your term project. The final project report is due to the TAs on **Monday, June 7 by 5 pm on Canvas. No late projects will be accepted**.

### **COVID-19 Safety Protocols**

Due to the ongoing Covid-19 pandemic, strict safety protocols will be in place for the in-person lab components. These are necessary in order to maintain the health and safety of everyone involved in the lab. Any students who don't follow these protocols will be required to leave the lab. The following requirements apply to all faculty, staff and students while on campus (see full Campus Policy 290-01 at <https://campusready.ucdavis.edu/public-health-policies-requirements> )

1. Face coverings are required both indoors and
2. Maintain six feet of physical distance from others whenever
3. Wash or disinfect your hands
4. Monitor your symptoms, stay home if you're sick and report positive
5. Disinfect your personal and shared spaces

Based on these requirements, the following specific rules will be strictly enforced:

- Each TA, instructor, and student entering the building will complete the COVID-19 Symptom Survey at: <https://campusready.ucdavis.edu/symptom-survey>

- The results of this survey must be emailed to [gel-survey@ucdavis.edu](mailto:gel-survey@ucdavis.edu) for record-keeping.
- Students will wait outside the north entrance to the EPS building (the door to the lobby and main stairwell) until the TA opens the building doors to let them in. Students will not be allowed in the building without showing the TA an email with the results of their UCD symptom survey.
- If students are feeling sick or have been in contact with known cases of COVID, they will be asked to stay home.
- Students and instructors must report any cases of COVID as per campus' reporting requirements (see <https://safetyservices.ucdavis.edu/coronavirus/reporting-concerns-confirmed-cases> )
- If any positive test results or suspected infections are reported, all attendees of that lab section will be notified and asked to isolate for the recommended time. Alternative assignments will be provided.
- All surfaces, microscopes, and samples will be cleaned and disinfected by Custodial Services and/or the TAs prior to each lab section.

During lab:

- Students will enter through a designated door and go straight to their assigned lab seat
- Students will stay at their microscope the whole time except to get wipes or gloves, or to go the restroom
- Masks are required and everyone must maintain a distance of at least 6 feet from all others in the lab.
- Gloves are required when handling rock samples and microscopes
- TAs will answer questions using their microscope with a camera hooked up to a projector
- Students will exit through a designated door

**Accessibility and accommodations:**

If you have concerns about accessibility or need special accommodations for exams or lectures, first contact the UC Davis Student Disability Center, and if they determine that special accommodations are warranted, I will work with you to find a solution. Accommodations must be put in place *before* the lab sections or exams, and it is your responsibility to start the process early enough to allow enough time for this to happen.

**Code of Conduct**

Academic misconduct such as cheating or plagiarism will be dealt with in accord with the Code of Academic Conduct. You must review this document before the course and confirm that you have reviewed it online (you will be prompted to do so by email and on MyUCDavis). An updated version can be found at <http://sja.ucdavis.edu/files/cac.pdf> You must also confirm your participation in this course by following this link:

[participate.ucdavis.edu](http://participate.ucdavis.edu). Academic Senate policy requires instructors to report any suspected cases of cheating or plagiarism to Student Judicial Affairs.

## Student wellness

You deserve respect, and are encouraged to practice self-care so that you can remain focused and engaged; that might mean getting a drink of water, leaving to use the restroom, taking a moment to stretch, or doing something else you need to do to take care of yourself. Please be respectful of others by minimizing distractions when practicing self-care – especially in lab, and during virtual sessions.

College life can be overwhelming at times, but know that you are not alone if you're feeling stressed. For many of us, systems of oppression such as racism, sexism, heterosexism or cissexism may cause additional stress. Please remember to practice self-care and reach out for support if and when you need it.

You can visit [Virtual UC Davis](#) to find resources related to health and well-being, academics, basic needs (food and housing) and more.

Additional information on general academic, health and wellness, career/internship, and community resources for students can be found here: [Student Resources FAQ page](#).

## Course Schedule

### Lectures:

I will try to adhere to the attached schedule in terms of topics, but this may be updated during the quarter based on how the class evolves. The schedule also shows due dates and exam dates. The exams must be taken during the exam dates; **there are no make-up exams**. It is your responsibility to keep up with the reading assignments.

GEL 105: Course Schedule - Spring 2021							
Lectures							
		Lecture	Reading	Problem sets	Due date	Mini-Exams	Due date
Week 1	March 29	Intro, Earths interior	Chapters 1-5				
	March 31	Magma generation/ascent	Chapters 1-5				
Week 2	April 5	Thermodynamics 1	Chapter 5				
	April 7	Thermodynamics 2	Chapter 5	Problem set 1	April 16	Exam 1	April 9
Week 3	April 12	Thermodynamics 3	Chapter 5				
	April 14	Phase diagrams 1	Chapters 6				
Week 4	April 19	Phase diagrams 2	Chapters 6, 7, 8, 10				

	April 21	Phase diagrams 3	Chapters 6, 7, 8	Problem set 2	April 30	Exam 2	April 23
Week 5	April 26	Phase diagrams 4	Chapters 6, 7, 8				
	April 28	Phase diagrams 5	Chapters 6, 7, 8, 18				
Week 6	May 3	Magma diversity	Chapter 11				
	May 5	Magma diversity	Chapter 11	Problem set 3	May 14	Exam 3	May 7
Week 7	May 10	Chemical Petrology	Chapters 8,9				
	May 12	Chemical Petrology	Chapters 8,9				
Week 8	May 17	Chemical Petrology	Chapter 13-15				
	May 19	Chemical Petrology	Chapter 13-15	Problem set 4	May 28	Exam 4	May 21
Week 9	May 24	Chemical Petrology	Chapter 16-17				
	May 26	Applications	Chapter 16-17				
Week 10	May 31	no lecture	no lecture				
	June 2	Applications	Chapter 16-17			Exam 5	June 4
Week 11	June 7-10	no lecture	no lecture				

Labs:

Date	Lab #	Format	Topic
3/29 - 3/30	Lab 1	in-person	Igneous Minerals
3/31 - 4/1	Lab 1	in-person	Igneous Minerals

4/5 - 4/6	Lab 2	in-person	Igneous Textures
4/7-4/8	Lab 2	in-person	Igneous Textures

4/12 - 4/13	Lab 3	virtual	Magma Differentiation
4/14 - 4/15	Lab 3	virtual	Magma Differentiation

4/19 - 4/20	Lab 4	in-person	Basalts
4/21 - 4/22	Lab 4	virtual	Basalts

4/26 - 4/27	Lab 5	in-person	Plutons
4/28 - 4/29	Lab 5	in-person	Plutons

5/3 - 5/4	Lab 6	virtual	Trace elements
5/5 - 5/6	Lab 6	virtual	Trace elements

5/10 - 5/11	Lab 7	in-person	Arc volcanism
5/12 - 5/13	Lab 7	virtual	Arc volcanism

5/17 - 5/18	Term project	in-person	Term project
5/19 - 5/20	Term project	in-person	Term project

5/24 - 5/25	Term project	in-person/virtual	Term project
5/26 - 5/27	Term project	in-person/virtual	Term project

5/31 - 6/1	No Lab	No Lab	Memorial Day
6/2-6/3	Term project	virtual	Term project

June 7 to 10	TBD	TBD	TBD
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