

The Solid and Fluid Earth

Course Number: [ESYS 102](#)

Quarter: Winter, 2022

Number of units: 4

Lecture: Tuesday, Thursday 2:00 PM - 3:20 PM, starting Jan. 4, in Zoom room link available on Canvas website until January 17th, 2022.

COVID considerations: Due to the fluid and constantly changing situation of in-person vs. remote teaching, it's important for us all to be flexible in terms of our class format. This syllabus and the plans within it are subject to change, including lecture meeting locations, discussion meeting locations, and exam formats (take home/online vs. in person). It is important to stay up to date on these changes as they develop over the quarter through the Canvas website.

Sections: All sections are held in lecture Zoom room until January 17th, then will be held in person.

Section 1 (Rachel Chen) – Thursday, 1:00-1:50 PM (in person location Vaughan Hall 100; SIO campus)

Section 2 (Rachel Chen)– Tuesday 3:30-4:20 PM (in person location Eckart 236, SIO campus)

Section 3 (Cody Spiegel) – Wednesday 2:00-2:50 PM (in person location, Humanities & Social Sciences 1315)

Section 4 (Cody Spiegel) – Wednesday 4:00-4:50 PM (in person location, Humanities & Social Sciences 1315)

Course Website*: <https://canvas.ucsd.edu/>

*I will often use this website for communication purposes. While it is your option to turn off notification of announcements, it is still your responsibility to be aware of the information contained within these messages.

Instructor: Dr. Sarah Aarons, Assistant Professor in the Geosciences Research Division at [Scripps Institution of Oceanography](#), UCSD

Instructor Email*: smaarons@ucsd.edu (and also saarons@ucsd.edu, they go to the same place)

*Please add ESYS 102 to the subject line of your email. This will facilitate a quicker response, as will cc'ing your TA. Any inquiries regarding homework and sections should be sent to your TA.

Office Location: Virtual through Zoom ☺

Teaching Assistants: Rachel Chen; rsc011@ucsd.edu and Cody Spiegel; cjspiegel@ucsd.edu

Office Hours: Available times are below or by appointment. Virtual office hours are also available via [Zoom](#).

Instructor	Office Hour Time	Office Hour Location
Rachel Chen	Wednesday 11:30 AM-12:30 PM	ESYS 102 Zoom Room
Sarah Aarons	Wednesday 12:30-1:30 PM	ESYS 102 Zoom Room
Cody Spiegel	Thursday – 10-11 AM	ESYS 102 Zoom Room

Course Catalog Description: Earth's dynamic physical systems interact in complex ways with profound impact on our environment. Processes such as volcanism and physical and chemical weathering enable

geochemical exchange between solid and fluid (ocean and atmosphere) systems. Sea level and climate changes interface with tectonic processes. **Prerequisites:** Math 10A or Math 20A, Chem 6A, Physics 1A or 2A, or consent of instructor. (W)

Course Texts

The Earth System (required), Kump, Kasting and Crane, Pearson, 3rd edition, 2010. Chapter numbers in the course schedule reflect chapter numbers in this book. There is 1 copy of the required text on reserve at the Science and Engineering Library.

Assignments may require additional readings, provided by the instructor through the course website.

Learning Outcomes

Upon completion of this course, you will be able to:

1. Understand the feedbacks between the various subsystems within the Earth system.
2. Analyze how Earth cycles and processes vary at different time scales.
3. Apply conceptual and mathematical models of the Earth system.
4. Evaluate the scientific components of climate change and other environmental challenges.

Schedule

I will do my best to adhere to the schedule below, but reserve the right to alter the timeline as necessary to meet the course learning outcomes. Any modifications will be reflected in the assignments/exams.

Week	Monday	Tuesday	Wednesday	Thursday	Friday
1 (1/3)		<i>Lecture 1</i> Introduction/Earth System Science Ch1-2 HW 1 Distributed No Sections		<i>Lecture 2</i> Earth System Science Ch1-2 cont. Global Energy Balance Ch 3 HW 2 Distributed	
2 (1/10)		<i>Lecture 3</i> Global Energy Balance Ch 3		<i>Lecture 4</i> Atmospheric Circulation Ch 4 HW 1 Due	
3 (1/17)	Martin Luther King Day	<i>Lecture 5</i> Ocean Circulation Ch 5		<i>Lecture 6</i> Ocean Circulation Ch 5	
4 (1/24)		<i>Lecture 7</i> The Cryosphere Ch 6 HW 2 Due Review Session 5:00-6:50 PM	Midterm #1 (Ch 1 – 5, HW 1&2)	<i>Lecture 8</i> The Cryosphere Ch 6 HW 3 Distributed	

		Zoom Room			
5 (1/31)		<i>Lecture 9</i> Plate Tectonics Ch 7		<i>Lecture 10</i> Plate Tectonics Ch 7/ Carbon and Nutrient Cycles Ch 8	
6 (2/7)		<i>Lecture 11</i> Ecosystems & Biodiversity Ch 9 HW 3 Due		<i>Lecture 12</i> Origin of Earth and Life Ch 10 HW 4 Distributed	
7 (2/14)		<i>Lecture 13</i> Effect of life on atmosphere Ch 11		<i>Lecture 14</i> Effect of life on atmosphere Ch 11	
8 (2/21)	President's Day	<i>Lecture 15</i> Long-Term Climate Regulation Ch 12 HW 4 Due Potential Review Session	Midterm #2 (Ch 6 – 11, HW 3-5)	<i>Lecture 16</i> Long-Term Climate Regulation Ch 12 HW 5 Distributed	
9 (2/28)		<i>Lecture 17</i> Pleistocene Glaciations Ch 14		<i>Lecture 18</i> Pleistocene Glaciations Ch 14 Global Warming Part 1 Ch 15	
10 (3/7)		<i>Lecture 19</i> Global Warming Part 2 Ch 16 HW 5 Due		<i>Lecture 20</i> Ozone Depletion Ch 17	Review
Finals Week	Final TBD				

Attendance Policy

- I cannot require attendance in section because of asynchronous learning, but I strongly encourage participation in both section and in office hours.
- You should attend or listen to every lecture as well, as this class has a fast pace and covers a lot of material.
- Lecture slides will be posted on the course website, and the lecture will be recorded and posted on Canvas for asynchronous learning.

Zoom Policy

Lecture and section will be online through Zoom, please use the “raise hand” function to ask a question during and after the lecture. Because it is a large class, please keep yourself muted during the lecture to minimize external noise but feel free to keep your video on if you feel comfortable.

Homework Policy

- Homework is turned in through Canvas. The website will lock submissions on the due date at the specified time (usually Tuesdays by 2:00 PM).
- Homework is due on the specified due date and time listed on Canvas, unless otherwise arranged with your TA. *Please communicate any foreseen problems with turning in assignments at the beginning of the quarter.*
 - Late homework *will generally not be accepted* in order to allow your TAs the opportunity to go over solutions during section. Do not wait until the last minute to do your assignment, as emergencies do arise. Turn in what you have done on time, even if it is not complete, to receive at least partial credit.
 - Certain circumstances may permit acceptance of a late assignment but this is up to the discretion of the TA/instructor and may require formal documentation. Moreover, there may be a late penalty assigned.
- All homework must be typed with the exception of figures/schematics and mathematical answers. If your hand-written answers are illegible, you will not receive credit.
- I encourage you to work together and discuss course content to gain deeper understanding of the material. However, each assignment must be completed individually with your own words.
- Answers extracted verbatim from the text book will not be given credit. You must use your own words.

Exam Policy

- Make-up exams will only be given with prior approval with the exception of extraordinary unforeseen circumstances. The exam will either be in person or it will be a take home format with a limit of 24 hours. Any known conflicts must be communicated with the instructor *at the beginning of the quarter* to facilitate a reasonable solution. Formal documentation may be required to justify this arrangement.
- Anyone found in violation of UCSD’s academic integrity policy will be reported (see Academic Integrity section below).

Grading

Component	Weight
Homework assignments (5 x 9% each)	45%

Midterm 1	15%
Midterm 2	15%
Final exam	25%
Total	100%

Grading Scale*:

90-100%	A	Pass
80-89%	B	Pass
70-79%	C	Pass
60-69%	D	No Pass
< 60%	F	No Pass

*Percentages may be subject to a curve at the end of the course if I deem it necessary based on raw scores.

Course Expectations

What I expect of you	What you can expect of me and your TAs
Be informed. Read this syllabus carefully and completely so you understand the course structure and expectations.	Enthusiasm. To be prepared for each class and to bring my enthusiasm for teaching to each in-class and office hour meeting.
Be attuned. Keep up with reading assignments in order to be able to contribute to the in-class discussions.	Responsiveness. To respond to emails within 48 hours. Emails received on weekends or while I'm traveling may take longer. Please see note on e-mail communication.
Professionalism. Arrive on time and be ready to critically consider these questions: <ol style="list-style-type: none"> 1. How do I know when I know something? What is the evidence and how reliable is it? 2. How are things, events, theories, models or people connected? What is the cause and effect? 3. What is new and what is old - have I run across this idea before? When, where, what did it mean to me then, and how I can expand and further connect the concept now? 4. So what? Why does it matter? What does it all mean? 	Professionalism. To start and end class meetings on time and to help you answer the questions to the left for yourself.
Be Ethical. A good attitude and maintenance of honest and ethical principles towards me, your classmates, and the execution of the course. Please read UC San Diego's Principles of Community and Conduct Code .	Timely feedback. To make every effort to return graded assignments in a timely manner and provide homework answers in advance of the exams.

Integrity. An honest, fair, responsible, respectful, trustworthy, and courageous effort on all academic work and collaboration. Please read UC San Diego's Policy on [Integrity of Scholarship](#). Then, take the [integrity pledge](#)!

Integrity. To uphold integrity standards and create an atmosphere that fosters active learning, creativity, critical thinking, and honest collaboration.

Inclusion Statement

I support the values of UC San Diego to “create a diverse, equitable, and inclusive campus in which students, faculty, and staff can thrive”. I strive to uphold the values articulated by the Office of the Vice Chancellor for Diversity, Equity, and Inclusion: “We believe that true excellence is achieved through productive relationships among people of diverse perspectives. When the collective talents of our students, faculty, and staff at UC San Diego are united in an environment that is open and inclusive, creativity and innovation prosper.” I commit to exerting my best efforts to ensuring these values are reflected in this course.

Throughout the quarter we will be conducting classroom discussions and group work regularly. I hope to create an environment in which we can all learn, ask questions, and contribute opinions and perspectives while being respected and valued. Honesty, listening for understanding, a willingness to share your ideas, and respect for self and others are basic guidelines that can help create a positive learning environment. Your participation and feedback are important to the success of the course.

ADA statement

I am happy to provide accommodations for this course for students with documented disabilities. Students must provide a *current* Authorization for Accommodation (AFA) letter issued by the Office for Students with Disabilities (OSD) which is located in University Center 202 behind Center Hall. Students are required to present their AFA letters, by paper or electronically, to me and to Sid Eads, the OSD Liaison in the CCS program (sleads@ucsd.edu) *in advance* so that accommodations may be arranged.

Basic Needs

Any student who has difficulty accessing sufficient food to eat every day, or who lacks a safe and stable place to live, and believes this may affect their performance in this course, is encouraged to contact: foodpantry@ucsd.edu | basicneeds@ucsd.edu | (858) 246-2632

Reporting Harassment and Discrimination

The Office for the Prevention of Harassment and Discrimination (OPHD) is the Title IX Office for UC San Diego and investigates reports of sexual harassment, sexual violence, dating and domestic violence and stalking. You may file a report online with the UC San Diego OPHD at <http://ophd.ucsd.edu/reportbiasform.asp> or you may call OPHD at 858-534-8298. For further information about OPHD, please visit <http://ophd.ucsd.edu/>.

Please note that University employees (including all faculty, teaching and research assistants, and staff), who are not confidential resources, are designated Responsible Employees. Responsible Employees are required to report any incidents of sexual violence or sexual harassment to Jennifer Broomfield, OPHD Director / Title IX Officer. If you are not ready to file a report, but wish to receive confidential support and advocacy, please contact CARE at the Sexual Assault Resource Center ([CARE at SARC](#)). CARE at SARC provides violence prevention education for the entire UCSD campus and offers free and

confidential services for students, staff and faculty impacted by sexual assault, relationship violence and stalking. Accessing resources at CARE at SARC will not constitute a report to the University.

Academic Integrity

Academic Integrity is expected of everyone at UC San Diego. This means that you must be honest, fair, responsible, respectful, and trustworthy in all of your actions. Lying, cheating or any other forms of dishonesty will not be tolerated because they undermine learning and the University’s ability to certify students’ knowledge and abilities. Thus, any attempt to get, or help another get, a grade by cheating, lying or dishonesty will be reported to the Academic Integrity Office and will result sanctions. Sanctions can include an F in this class and suspension or dismissal from the University. So, think carefully before you act by asking yourself: a) is what I’m about to do or submit for credit an honest, fair, respectful, responsible & trustworthy representation of my knowledge and abilities at this time and, b) would my instructor approve of my action? You are ultimately the only person responsible for your behavior. So, if you are unsure, don’t ask a friend—ask your instructor, instructional assistant, or the Academic Integrity Office. You can learn more about academic integrity at academicintegrity.ucsd.edu. (Source: Academic Integrity Office, 2018)

Academic Support

Geisel Library	Research tools and eReserves
Content Tutoring with the Teaching + Learning Commons	Drop-in and online tutoring through the Academic Achievement Hub
Supplemental Instruction with the Teaching + Learning Commons	Peer-assisted study sessions through the Academic Achievement Hub to improve success in historically challenging courses
Writing Hub Services in the Teaching + Learning Commons	Improve writing skills and connect with a peer writing mentor
Learning Strategies Tutoring	Address learning challenges with a metacognitive approach
OASIS	Intellectual and personal development support
Student Success Coaching Program	Peer mentor program that provides students with information, resources, and support in meeting their goals
Academic Integrity	Policy on Academic Integrity of Scholarship and strategies to excel with integrity
Technical Support	Assistance with accounts, network, and technical issues

Campus Resources

Basic Needs	Provides access to food, housing, and financial resources
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Counseling and Psychological Services (CAPS)	Provides services like confidential counseling and consultations for psychiatric services and mental health programming
Community Centers	As part of the Office of Equity, Diversity, and Inclusion the campus community centers provide programs and resources for students and contribute toward the evolution of a socially just campus
Counseling and Psychological Services	Individual, group, couples, and family psychotherapy services for registered undergraduate and graduate students
Office for Students with Disabilities	Documents students' disabilities, provides accessibility resources, and reasonable accommodations
Triton Concern Line	Report students of concern at (858) 246-1111