Important note for Team Dynamic Earth and Global Change Fall 2023: *As we begin the semester I want to acknowledge that we continue to live in a challenging time. Each of us is coming to the semester from different backgrounds, experiences, and expectations for what life and learning will (or should) be like. The challenges of the recent pandemic may be exacerbated by other pressing local and global concerns – sustained and systemic racism in our society, economic disparity and financial insecurity, US politics and international strife (to name a few!). Many of you may be separated from friends and loved ones, and nervous about classes and expectations about workload, performance, and emotional health. GAH!*

I want you to know that I care about you as individuals and as students, and I am here to support you personally and academically. I LOVE teaching this course - I have high expectations of your abilities and engagement, but I'm also a very reasonable human and understand that there will be obstacles and other priorities for you this semester. I encourage you to prioritize taking care of yourselves and those in your community, including practicing self-care (whatever this looks like for you!) as well as empathy and kindness toward others. PLEASE let me know if you ever want to talk/email/zoom and tell me how you are doing, and how I can best support you and your success! I am so excited to get to know all of you as people and as scientists, and look forward to teaching (and learning from) you this semester!

Dynamic Earth and Global Change (GEOL/ENVI160)
Dr. Kelly MacGregor (Professor, Geology Department): macgregor@macalester.edu
Student drop-in hours (Olin-Rice 114): flexible! make an appointment if you can!
Classroom: Olin-Rice 100

Jeff Thole (lab instructor): thole@macalester.edu
Student drop-in hours (Olin-Rice 112): flexible!
Lab Room: Olin-Rice 187

Rennie DiCarlo (paraprof): Olin-Rice 189, rdicarlo@macalester.edu

Teaching Assistant (TA): Mikayla Giehler
Student drop-in hours (Olin-Rice 187): Sunday-Thursday 7-9pm

Course Overview: The planet Earth is an amazing place, with a dynamic interior and surface even after 4.6 billion years under its belt. At its most basic, this class is an introduction to the materials and structure of the Earth, and to the processes acting on and in the Earth to produce change. We will begin to learn the language of geology through a study of plate tectonics, planetary structure, and rocks of all sorts. I am particularly interested in the physical forces that shape the surface of the Earth, and I am excited to

teach you about a multitude of surface processes that shape our planet (rivers and glaciers and landslides, oh my!) and tell you about my research on glaciers and in lakes and rivers. The planet has begun to show signs of our expanding population and the increasing need for natural resources, and we will consider the feedbacks between humans and the Earth.

Broadly, the goals of the course are three-fold: first, to introduce the materials and processes that govern the evolution of the Earth; second, to examine global environmental changes in the context of natural processes; and third, to inspire you to develop a lifelong curiosity about the planet on which you reside. The course begins with an overview of the origin of the solar system and other planets. Next, you will learn about Earth materials and how to interpret the significance of minerals and rocks in the context of our dynamic planet. We will examine the composition, structure, and evolution of the interior of our planet, as well as the well-accepted (but not complete) model of plate tectonics. We will also spend time examining the forces that shape our continental surfaces, including surface and groundwater movement, hillslope processes, coastlines, wind and deserts, and glacial processes. Throughout the course, I will strive to link the academic study of our planet to 'real-life' situations and events, and demonstrate the importance of understanding earth processes to being an educated global citizen. **Note:** There are no prerequisites for DEGC, and it is appropriate for students interested in either a science major OR a degree outside of the science division. It is a Q2 course (supports Macalester's Quantitative Reasoning requirement), and fulfills a Science Division general education requirement.

Required texts: https://opengeology.org/textbook/ (An Introduction to Geology, by Johnson, Affolter, Inkenbrandt & Mosher). I'm trying an online, open-source (free!) textbook this semester – I hope you like it! I use textbooks as a *supplement* to the course, and it is a great place to find additional detail about key concepts and case studies.

Other readings: I will be posting additional readings at least a week before they need to be read. I reserve the right to change/add reading assignments as the semester progresses (and will almost certainly do this!). Keep checking the Moodle page for this course to keep current with the readings. Most additional readings will be fairly short.

Field Trip: This course is designed to allow us to get our hands dirty – sometimes literally! - in the field – like real geologists! We have one field trip planned for MONDAY/TUESDAY OCTOBER 2-3 (optional but strongly encouraged!). We will leave Macalester at ~9 am Monday, drive up along the north shore of Lake Superior, and spend the night camping near Ely, MN. On Tuesday morning we will take a surface tour of the Soudan iron mine (no longer operating as an iron mine, and houses a former neutrino physics lab!) and return at about 5pm. We will learn a ton, and have a GREAT time! Please speak with your other professors about missing classes on those dates as soon as possible (and I can help if

needed). And we know that many of you have never been camping – we have all the gear you will need, and will help guide and support you through this experience!!!

Assignments: In addition to weekly lab assignments, you will have occasional class activities/assignments. I expect all of the assignments/labs to be turned in within 1 week of being assigned. There will be an additional 1 week 'grace period' where I will accept work for full credit; note that assignments submitted more than a week after the deadline (but prior to the hard deadline(s)) will be given credit but will not include any comments/feedback. There will be hard deadlines 1) prior to Fall Break (for any work assigned before this) and 2) the last day of class (for any work assigned after Fall Break). PLEASE let me know if you are struggling to get your work completed in a timely manner (this happens! I get it!!!) and we can work together to make a plan for your success!

Labs:

- Lab activities are fantastic opportunities to 'learn like a geologist' – touch rocks, make observations, interpret maps, and tell lame jokes (or at least be forced to listen to Jeff's puns). Some of the concepts you will cover in labs will be introduced in lecture, but you will also gain an in-depth understanding of new topics during labs. Please come to lab prepared to be engaged: short lectures, lots of work in small groups, and hands-on learning! Jeff, Rennie, and the TA's are wonderful resources for your learning – take advantage of them!
- Collaboration/group work on labs and problem sets is STRONGLY encouraged; we also expect each person to turn in their own work, but we appreciate it if you let us know with whom you worked! This helps us guide you moving forward AND get to know the class dynamics. Note that you will almost certainly be working with classmates OUTSIDE of class time!
- We encourage/advise you to consult with us once you have already attempted to figure something out; i.e., do not lean too heavily on others to get you through the labs, or you will find yourself having a tough time on the quizzes. *We write the lab assignments in such a way that we expect you will need our assistance* – we believe you will ultimately learn more and become a better critical thinker if you have to reason through the details (with our help)! That said, do not wait until the last minute to start the lab assignments – you will find it a painful and unsatisfying academic experience.
- We expect you to turn in neat work. We will deduct points if it is too difficult to find your work or answers. If you need to type or re-copy handwritten work, please do so.

Rock project: We will have one research project during the semester, focused on the history of a 'rock of your choice'. This will include analytic work in the lab, an examination of published scientific literature, and a poster presentation to the class. Details on the project and key dates will be discussed in class and can also be found on the moodle page.

Quizzes: In this course you will have 3 one hour-long quizzes. The quizzes will be primarily short answer questions, with some computational questions. I try to write quizzes that will allow you to show me your understanding of the presented concepts and not simply your ability to memorize an answer.

Artificial Intelligence (AI) Use Policy: AI can both interfere with and enhance our capacity to learn. We must be mindful of when it might hinder us and when it might provide us with new understanding and/or assistance. In specific situations and contexts within this course you may be encouraged to use AI tools (like ChatGPT & GoogleBard) to explore how they can be used, what their limits are, and how to use them ethically and critically. You may not submit any work generated by an AI program as your own. If you include material—including both *ideas* and *language*—generated by an AI program, it must be cited like any other reference material, both in this course and at Macalester College in general (click here for a good AI resource). This policy covers all types of AI: text, code, images, video, audio, and translation. AI is absolutely not allowed on quizzes. If you have any questions, please feel free to contact me!

Success in this course:
Please attend class and lab!!! Readings are meant as a supplement, not a substitute, for the class and lab material. I will focus your attention on the parts of the reading assignments that I think are important. If you can't be in class, please let me know in advance, if possible (remember, you can request to Zoom and listen in!). In all cases of an absence, YOU will be responsible for getting notes/assignments from your colleagues. If you have additional questions that your peers cannot answer, I am happy to discuss with you the material you missed.

Do not get behind in your work. You will learn much more if you can ask questions along the way, and your stress level will likely be lower!

Studying and working in groups is incredibly useful – talk with your peers (and me!) about the material you are learning! In addition, you can help each other – one person's weakness is anothers' strength. Group work also allows you to find out what you don't know. Importantly, how effectively a student works with others is one of the key aspects of letters of recommendation that faculty write for students when they apply for internships, jobs, and study away programs!

Utilize me as your learning partner! As paraphrased from Adam Heidebrink-Bruno's article in *Hybrid Pedagogy*: You all enter my classroom with different sets of skills. In virtue of this fact, I open my office to you as an extension of the classroom, including scheduled meetings and individualized tutoring in the vast areas of scientific writing, quantitative skills, and

critical thinking approaches. There is no shame or embarrassment in asking for help, although it is common to feel anxious when approaching one's teacher. ***To ask for help is an act of bravery.*** To enter and chat about nothing in particular often leads to new insight. Both are valuable. Both show that you trust me. I promise to respect you and earn that trust through compassionate listening and understanding.

Grades:
Labs: 30%
Quiz #1: 10%
Quiz #2: 15%
Quiz #3: 15%
Rock project: 20%
Homework, class exercises, reading reflections, participation: 10%

I will assign a final grade by taking the following percentages into account:
90-100% = A's
80-89% = B's
70-79% = C's
60-69% = D's
<60% = no credit
The top 2% of each category will typically receive a "+" (i.e., a score of 88-89% will receive a B+), and the lower 3% of each category will receive a "–" (92% is an A-).

Other important details:
Please talk with me about questions/concerns/goals/challenges! I am reachable via email, text, phone call, and office/coffee/hallway/outdoor meetings!!! My goal is not only to teach you the principles of my discipline, but also to stir your fascination in the way the earth works! Please do not hesitate to talk to me about how I can improve your learning environment.

Cheating: Forgery, cheating, and plagiarism are obviously not allowed. As per the Academic Integrity statement (also found in the Student Handbook), a first offense will likely cause you to get a failing grade on the assignment, and a second offense means you will be suspended from the College. If in doubt about what constitutes cheating or plagiarism, or if stress is causing you to consider this route, please come to my office to talk with me. We are all human and still in the process of learning, and I am here to support you!

Students with disabilities: I am committed to ensuring access to course content for all students, including those with disabilities of any kind. If you have a disability, please meet with me early in the semester to discuss your accommodation plan. If you have not yet obtained a plan or are unsure if you have a disability that requires accommodation, please

contact Disability Services: disabilityservices@macalester.edu, or call 651-696-6275. I look forward to partnering with you!!!

Health and Well-Being: Here at Macalester, you are encouraged to make your well-being a priority throughout this semester and your career here. Investing time into taking care of yourself will help you engage more fully in your academic experience. Remember that beyond being a student, you are a human being carrying your own experiences, thoughts, emotions, and identities with you. It is important to acknowledge any stressors you may be facing, which can be mental, emotional, physical, financial, etc., and how they can have an academic impact. I encourage you to remember that you have a body with needs. In the classroom, I encourage you to eat when you are hungry, drink water, make tea or coffee, use the restroom, and step out if you are upset and/or need a break. Please do what is necessary so long as it does not impede your or others' ability to be mentally and emotionally present in the course. Outside of the classroom, sleep, moving your body, and connecting with others can be strategies to help you be resilient at Macalester. If you are having difficulties maintaining your well-being, please **don't hesitate** to contact me and/or find support from other campus resources. I can provide a list of these resources to you, and they are also posted on my office door.

In the event of online class sessions - recording policy: If we hold any classes on Zoom this semester, I will record our synchronous class sessions in a manner consistent with Macalester's classroom recording policy. I will share these recordings in a password-protected (and not public) place. If you download any class recordings, you must store them in a password-protected file or on a password-protected site. Please note that the recording policy clearly states that ***you may not share, replicate, or publish any class recording, in whole or in part, or use any of the recordings for any purpose besides knowing what happened during the class period, without my written approval.*** If I use any recorded content from any of our classes for purposes beyond our class, I will – in accordance with the policy – obtain your written permission to do so.

Religious observance: Students may wish to take part in religious observances that occur during the semester. If you have a religious observance/practice that conflicts with your participation in the course, please contact me to discuss appropriate accommodations.

Title IX: Macalester is committed to providing a safe and open learning and living environment for all students, staff, and faculty. If you (or someone you know) has experienced any form of sexual misconduct, including sexual assault, dating or domestic violence, or stalking, please know that you are not alone, and that help and support are available. Here is a list of campus and local resources.

Please be aware that as a faculty member, I am a *non-confidential resource*, although I will keep anything you disclose to me *private*. This means that if I become aware of incidents or allegations of sexual misconduct, I am required to share the matter with the Title IX Coordinator or Deputy Title IX Coordinators. This College policy is intended to ensure that you receive the resources and support you need - it does NOT mean you are required to do anything you do not want to do.

Even as you might be away from campus, or your needs change, resources are available for you if you need support related to sexual and/or relationship abuse. If you would like to contact the Title IX office, Macalester's Title IX Coordinator is available and can assist you with supportive measures and referrals:

- Phone: 651-696-6258 Email: titleixcordinator@macalester.edu
- Incident Report Form: Macalester Incident Report

If you would like to talk to someone who would not have to share what you tell them with the Title IX office, *confidential* support resources through Macalester are also available to you, including:

- **Free, Urgent, Phone Counseling (Press 2) is available to Macalester students anywhere in the world, 24/7/365.** Speak to a licensed mental health counselor 24 hours a day by calling Hamre Center at 651-696-6275, then press or say option 2 when prompted.
- To contact support through the Center for Religious and Spiritual Life, call 651-696-6298 or email religiouslife@macalester.edu

Local and national resources are also available:

- Ramsey County SOS Sexual Violence Services offers confidential phone support at 651-266-1000 or you can use the SOS Contact Form
- RAINN is a national resource with both confidential phone support and live chat: Find out more about RAINN
- Futures Without Violence offers a COVID-19 specific page with a robust range of resources, including identity-specific options such as Trans Lifeline and the DeafHotline. FWV also offers resources on safety plans, check out FWV's COVID-19 page.
- National Domestic Violence Hotline 800-799-7233 or text LOVEIS to 22522

Bias Response Team: Macalester strives to foster an inclusive and welcoming community where any student, staff, or faculty member, regardless of background, can live, learn, and thrive. To that end, the Bias Response Team (BRT), a group of professional staff members, focuses on addressing incidents that undermine the values of inclusivity and human dignity

that our campus holds. Although we continue to pursue the goal of an inclusive community, we recognize that no campus is immune to larger systemic issues that include but are not limited to racism, anti-semitism, islamophobia, heterosexism, sexism, transphobia, ableism, classism, and ageism. These systemic issues may be manifested in the forms of bias incidents. Anyone who feels they have been affected by an incident of bias is encouraged to make a report to the Bias Response Team, so the college can offer assistance.

Safe & equitable learning environment: As a professor, one of my responsibilities is to help create a safe and equitable learning environment. That includes ensuring that all students are aware of and have access to the resources they need if and when they find themselves in crisis.