EAPS 100: Planet Earth

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Course Time and Location: Online

Educational Objectives: This course is designed primarily for non-science majors and provides a brief introduction to Planet Earth including the following geoscience subjects: Earth science (geology), oceanography, atmospheric science (meteorology), and astronomy. The coursework, assignments, and examinations emphasize developing a basic understanding of geoscience processes and concepts rather than memorization of terms, definitions, and facts. Specific objectives of the course in three areas are:

1) Content Objectives:

- Develop an understanding and appreciation of the basic characteristics, history, and processes of Planet Earth; the realization that we interact with these aspects of the Earth system everyday; and the importance to the future of Earth science related issues such as energy, natural hazards, and the environment.
- Enhance understanding of the interconnection between various Earth processes and topics.
- Emphasize potential human effects on Earth processes and related environmental issues.
- Recognize the interactions of Earth science and society in our increasingly technological world.
- Consider the fundamental Earth science topics that are relevant to future teachers.

2) Skill Objectives:

- Gain experience in problem solving associated with complex science issues.
- Practice some analysis techniques that are useful in science, including graphing, map interpretation, visualizing three-dimensional features, and understanding the concepts associated with scale – particularly for very long time periods or large distances.

3) Attitudinal Objectives:

- Enhance appreciation of modern scientific study.
- Gain confidence in understanding and using scientific methods and information.
- Recognize the relevance of Earth science and the study of Planet Earth to you daily lives and your future.
- Increase your appreciation of the Earth.

Textbook: *Exploring Earth Science 2e* by Reynolds and Johnson. Feel free to buy used versions, the e-text, or the traditional book. There will be a reading assigned from this text each week. You can also purchase the online study materials offered by McGraw Hill, which will provide additional resources to enhance your learning. However, no graded assignments will utilize these materials.

Evaluation:

1) Homework (35%): Each week will include one or more modules in Brightspace. These modules will include reading assignments, video lectures, and questions. For reading assignments and lectures you will either check that you have completed the task or Brightspace will automatically track your progress. The questions will be multiple-choice and are representative of the type of questions that will be on the midterms and final exam. These questions are designed to help you prepare for those tests and to *help you learn*. So, you will have three attempts at each homework assignment. Your grade for the assignment will be an average of all of your attempts. This policy is designed to penalize random guessing while still

giving you a chance to correct your mistakes and achieve a higher overall score. Late homework will not be accepted unless arrangements have been made with your academic case manager or the office of the dean of undergraduate students.

2) Midterm Exams (25%): Two midterm exams will be administered. These tests are not designed to be overly difficult *if you have been engaged with the course*. Both midterms will be administered online through Brightspace and consist of multiple-choice questions. We will provide more details about the format of the exams as we approach the test dates.

3) Final Exam (40%): There will be a cumulative final exam at the end of the course. Similar to the midterms it is not designed to be difficult *if you have been engaged with the course materials for the duration of the semester.* The final exam will be administered online via Brightspace and consist of multiple-choice questions. We will provide more details about the format of the exams as we approach the test dates.

Grading: The course will be graded on an *adjustable curve*, whereas an adjustable curve as opposed to a straight scale (>89 = A, 80-89 = B, 70-79 = C, etc.), or a fixed curve (top 10% = A, next 20% B, next 40% C, etc.). Our goal is to design a course where everyone can succeed provided they put in the effort to learn the course material. After each exam, we will discuss the scores and the approximate corresponding grade ranges. Remember, your final grade will be dependent on a weighted average of your homework (35%), midterm exams (25%), and final exam (40%). At the end of the course, we will individually evaluate borderline cases. In cases where the student has shown improvement through the course or otherwise demonstrated a high level of engagement we will give them the benefit of the doubt. Please keep track of your grades on Brightspace. If there appears to be a discrepancy, notify one of the course TAs.

Suggestions: Our goal is for you to leave the course with a basic understanding of how the Earth works and how we are both affected by and affect it. In other words, we want you *learn*. In that regard, we encourage you to discuss the course content and work together on the homework assignments. However, students must submit their own individual assignment online. We recommend that you do not abuse collaborative work. These assignments are designed to prepare you for the exams, which ultimately will count for most of your grade.

Lecture Schedule

Week 1: Aug. 24 – Aug. 28
Module 1..... Course Introduction
Module 2..... Why Study Earth Science?

Week 2: Aug. 31 – Sept. 4
Module 3..... Minerals: The Building Blocks of the Solid Earth
Module 4..... Sediment: Transport and Deposition

Week 3: Sept. 7 – Sept. 11
Module 5..... Sedimentary Rocks: Interpreting the Geologic Past
Module 6..... Rock Clocks: Quantifying Geologic Time

Week 4: Sept. 14 – Sept. 18
Module 7..... Plate Tectonics I: Divergent Margins and Basaltic Magmatism
Module 8..... Plate Tectonics II: Convergent Margins and Silicic Magmatism

Week 5: Sept. 21 – Sept. 25
Module 9..... Plate Tectonics III: Transform Margins and Hotspots
Module 10..... Volcanic Hazards: Where to Go When the Mountain Blows

Week 6: Sept. 28 – Oct. 2
Module 11 ..... Earthquakes: Sudden Events, Tectonic Consequences
Module 12 ..... Earth Resources: Connecting the Solid Earth to You

Week 7: Oct. 5 – Oct. 9
Midterm I ..... Midterm Exam Focused on Modules 1-12

Week 8: Oct. 12 – Oct. 16
Module 13 ..... Tectonics and the Ocean: Ridges, Trenches, and Tsunamis
Module 14 ..... Shorelines: Erosion, Deposition, and Your Beach House

Week 9: Oct. 19 – Oct. 23
Module 15 ..... Atmospheric Structure: How is the Atmosphere Heated?
Module 16 ..... Atmospheric Motion: Why Does the Wind Blow?

Week 10: Oct. 26 – Oct. 30
Module 17 ..... Weather: How Atmospheric Motion Can Make or Break Your Day
Module 18 ..... Ocean Currents: Connecting the Ocean-Atmosphere System

Week 11: Nov. 2 – Nov. 6
Module 19 ..... Climate I: Explaining the Earth's Modern Climate
Module 20 ..... Climate II: How Does the Climate Change Through Time?

Week 12: Nov. 9 – Nov. 13
Module 21 ..... Climate III: Are Humans Influencing Earth's Climate?
Module 22 ..... Evolutionary Catastrophes: Lessons From Earth's Past

Week 13: Nov. 16 – Nov. 20
Midterm II ..... Midterm Exam Focused on Modules 13-22

Week 14: Nov. 23 – Nov. 27
Module 25 ..... Star and Planet Formation: Contextualizing Our Solar System
Nov. 21, Th ..... Thanksgiving

Week 15: Nov. 30 – Dec. 4
Module 26 ..... Life on Mars: What Makes a Habitable Planet?
Module 27 ..... Exoplanets: What's Out There?

Week 16: Dec. 7 – Dec. 11
Final Exam ..... Cumulative Exam For the Course

Covid-19 Related Statements

Guidance if You are Quarantined/Isolated: If you become quarantined or isolated at any point in time during the semester, in addition to support from the Protect Purdue Health Center, you will also have access to an Academic Case Manager who can provide you academic support during this time. Your Academic Case Manager can be reached at acmq@purdue.edu and will provide you with general guidelines/resources around communicating with your instructors, be available for academic support, and offer suggestions for how to be successful when learning remotely. Importantly, if you find yourself too sick to progress in the course, notify your academic case manager and notify me via email or Brightspace. We will make arrangements based on your

particular situation. The Office of the Dean of Students (odos@purdue.edu) is also available to support you should this situation occur.

General Statements

Academic Integrity: Academic integrity is one of the highest values that Purdue University holds. Individuals are encouraged to alert university officials to potential breaches of this value by either emailing integrity@purdue.edu or by calling 765-494-8778. While information may be submitted anonymously, the more information that is submitted provides the greatest opportunity for the university to investigate the concern. Remember the mission of the Honor Pledge ("As a boilermaker pursuing academic excellence, I pledge to be honest and true in all that I do. Accountable together - we are Purdue.").

Nondiscrimination Policy: Purdue University is committed to maintaining a community which recognizes and values the inherent worth and dignity of every person; fosters tolerance, sensitivity, understanding, and mutual respect among its members; and encourages each individual to strive to reach his or her own potential. In pursuit of its goal of academic excellence, the University seeks to develop and nurture diversity. The University believes that diversity among its many members strengthens the institution, stimulates creativity, promotes the exchange of ideas, and enriches campus life. Purdue's nondiscrimination policy can be found at http://www.purdue.edu/purdue/ea_eou_statement.html.

Students with Disabilities: Purdue University strives to make learning experiences as accessible as possible. If you anticipate or experience physical or academic barriers based on disability, you are welcome to let me know so that we can discuss options. You are also encouraged to contact the Disability Resource Center at: drc@purdue.edu or by phone: 765-494-1247.

Mental Health Information: If you're struggling and need mental health services: Purdue University is committed to advancing the mental health and well being of its students. If you or someone you know is feeling overwhelmed, depressed, and/or in need of mental health support, services are available. For help, such individuals should contact Counseling and Psychological Services (CAPS) at (765) 494-6995 and http://www.purdue.edu/caps/ during and after hours, on weekends and holidays, or by going to the CAPS office of the second floor of the Purdue University Student Health Center (PUSH) during business hours.

Emergency Disclaimer: Major Campus Emergency - In the event of a major campus emergency, course requirements, deadlines, and grading are subject to change that may be necessitated by a revised calendar or other circumstances beyond the instructor's control. Relevant changes to this course will be posted on Brightspace and I will send an email.

Emergency Preparedness: Emergency preparedness is your personal responsibility. Purdue University is actively preparing for natural disasters or human-caused incidents with the ultimate goal of maintaining a safe and secure campus.

For any emergency text or call 911.

There are more than 300 Emergency Telephones (aka blue lights) throughout campus that connect directly to the Purdue Police Department (PUPD). If you feel threatened or need help, push the button and you will be connected right away.

Do not use the elevator during an evacuation.