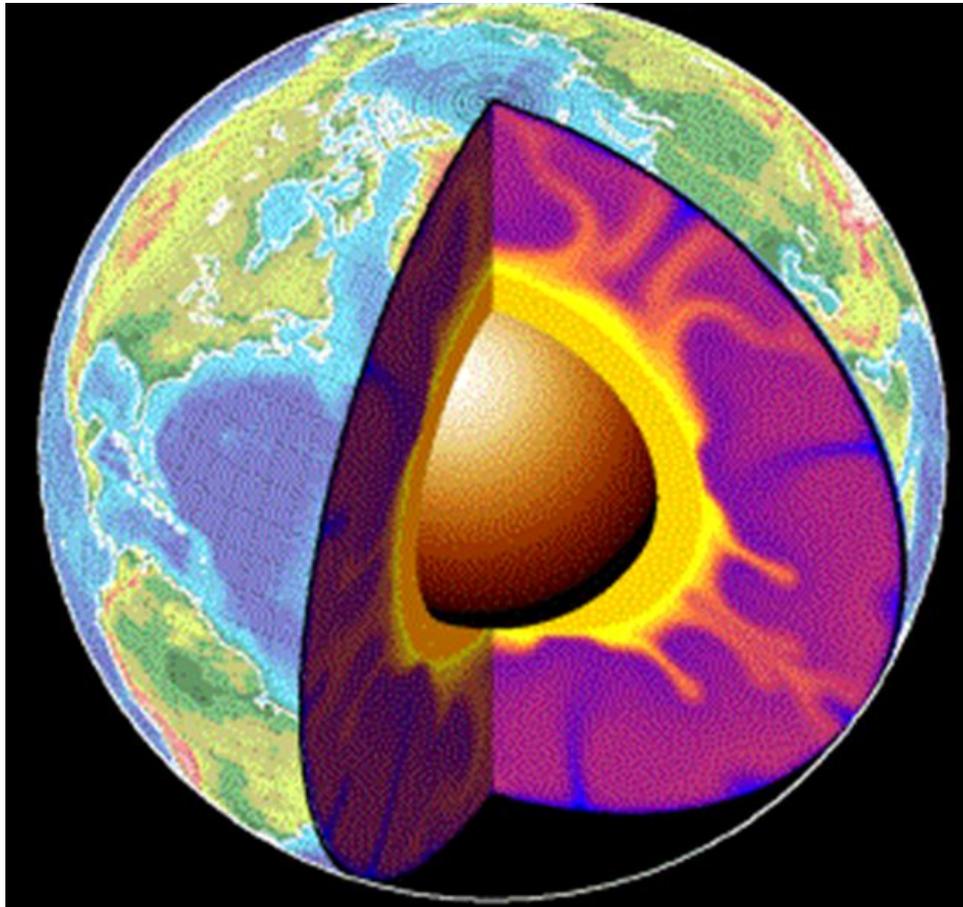


Department of Earth Sciences, Spring 2021

ERTH304: Physics of the Earth and Planets



Instructor: Robert Dunn 808 POST, dunnr@hawaii.edu

Office hours: after class, by appointment

Lecture: TTH 10:30-11:45

Lab: M 1:30-4:20

The Earth's shape, orbit, interior structure, and geological evolution are all the result of the interaction between Earth's materials and the physical laws of gravity, electromagnetism, heat flow, and deformation. In this class we will explore these interactions to understand the basic physics of the Earth and other planets. We will achieve this by examining and utilizing observations of gravity, electromagnetism, heat flow, and seismic wave propagation.

Preliminary Schedule:

Week 01	Introduction to Geophysics + Planets & Orbits
Week 01	Material Properties of the Earth and Planets
Week 02	Gravity Fields and Earth's Gravity , Geoid, Tides
Week 03	Gravity Field Data Processing and Interpretation
Week 04	Magnetic Fields and Geomagnetic Surveying
Week 05	Magnetic Field Data Processing and Interpretation
Week 06	Heat Flow and Planetary Rheology
Week 07	Elasticity, Earthquakes, and Seismology + Mid-Term
Week 08	Seismic <i>Refraction</i> Theory and Methods
Week 09	Seismic <i>Refraction</i> Data and Earth's Structure
Week 10	Spring Break 03/15 - 03/19
Week 11	Seismic <i>Reflection</i> Theory and Methods
Week 12	Seismic <i>Reflection</i> Data and Earth's Structure + Mid-Term
Week 13	Electric Fields and Geoelectrical Surveys
Week 14	Geoelectrical Data Processing and Interpretation
Week 15	GPR
Week 16	Geodetic Techniques / Acoustic Mapping Techniques
Week 17	Term Review
Week 18	Final Exam

Course Structure: Two lectures and one lab per week. Lecture: includes class participation; small group activities; problem solving; Lab: Lab and outdoor activities with required report.

Grading: We will have homework, a lab/project report, two in-class midterms, and one final exam. The relative weightings of homework, lab assignments, exams, and class participation are: Exams 25%; Homework Assignments 25%; Project Report 25%; Class/Project Participation 25%.

Questions: Questions are welcome and help everyone. Please ask questions freely!

Learning Objectives: The **Department of Earth Sciences** has established the following undergraduate student learning objectives. All of these objectives are relevant targets for the curriculum of EARTH304.

1. Students can explain the relevance of geology and geophysics to human needs, including those appropriate to Hawaii, and be able to discuss issues related to geology and its impact on society and planet Earth.
2. Students can apply technical knowledge of relevant computer applications, laboratory methods, and field methods to solve real-world problems in geology and geophysics.
3. Students use the scientific method to define, critically analyze, and solve a problem in earth science.

4. Students can reconstruct, clearly and ethically, geological knowledge in both oral presentations and written reports.
5. Students can evaluate, interpret, and summarize the basic principles of geology and geophysics, including the fundamental tenets of the sub-disciplines, and their context in relationship to other core sciences, to explain complex phenomena in geology and geophysics.

Disability Access: If you have a disability and related access needs the Department will make every effort to assist and support you. For confidential services students are encouraged to contact the Office for Students with Disabilities (known as “Kokua”) located on the ground floor (Room 013) of the Queen Lili’uokalani Center for Student Services: KOKUA Program; 2600 Campus Road; Honolulu, Hawaii 96822. Voice: 956-7511; Email: kokua@hawaii.edu; URL: www.hawaii.edu/kokua

The University of Hawai’i is committed to providing a learning, working and living environment that promotes personal integrity, civility, and mutual respect and is free of all forms of sex discrimination and gender-based violence, including sexual assault, sexual harassment, gender-based harassment, domestic violence, dating violence, and stalking. If you or someone you know is experiencing any of these, the University has staff and resources on your campus to support and assist you. Staff can also direct you to resources that are in the community. Here are some of your options:

As members of the University faculty, your instructors are required to immediately report any incident of potential sex discrimination or gender-based violence to the campus Title IX Coordinator. Although the Title IX Coordinator and your instructors cannot guarantee confidentiality, you will still have options about how your case will be handled. Our goal is to make sure you are aware of the range of options available to you and have access to the resources and support you need.

If you wish to remain ANONYMOUS, speak with someone CONFIDENTIALLY, or would like to receive information and support in a CONFIDENTIAL setting, use the **confidential resources available here:** <http://www.manoa.hawaii.edu/titleix/resources.html#confidential>

If you wish to directly REPORT an incident of sex discrimination or gender-based violence including sexual assault, sexual harassment, gender-based harassment, domestic violence, dating violence or stalking as well as receive information and support, contact: Dee Uwono Title IX Coordinator (808) 956-2299 t9uhm@hawaii.edu.