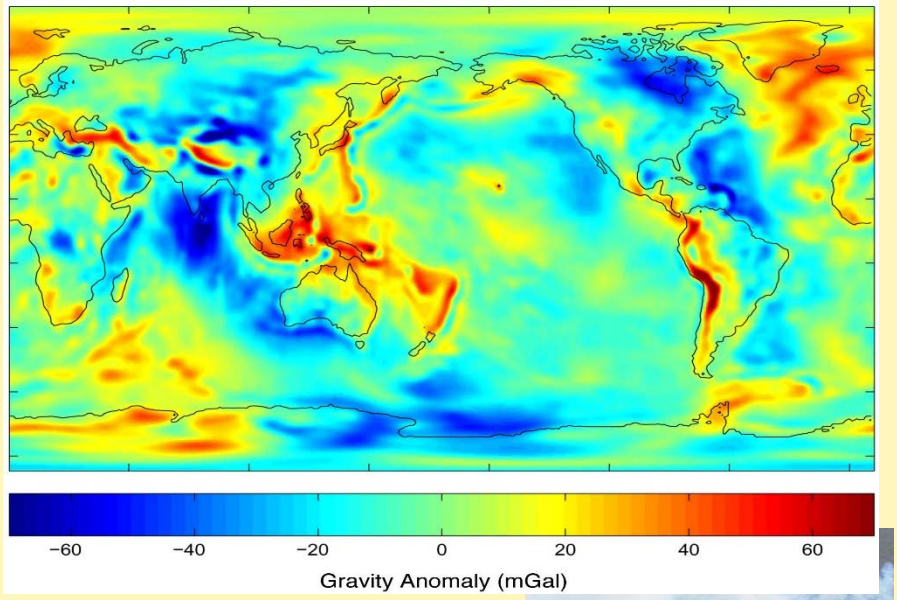
GG632: Geophysics-Gravity, Magnetics, and Heat Flow

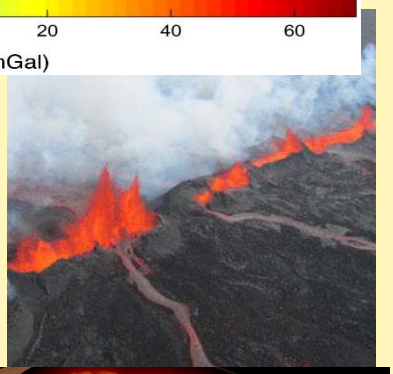
Instructed by Garrett Apuzen-Ito



Learning Objectives: students who take GG 632 will gain...

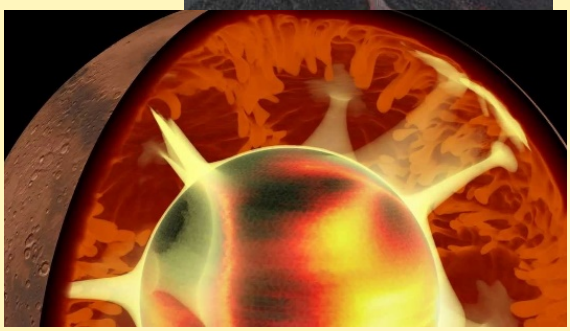
- Practice in using integral theorems, vector calculus, calculus, and ordinary differential equations
- Knowledge of the fundamental theory, familiarity with common analytical tools, and applications in studies of gravity, magnetics, heatflow, and lithospheric flexure in geophysics
- Enhanced skills in independent learning, quantitative reasoning, and scientific discourse
- Practice in scientific programming using MATLAB, Python, R…

Class Format: Class meetings will emphasize interactive learning and peer discussion based on weekly reading assignments. Weekly problem sets will provide avenues for building skills, practicing techniques, and assessing knowledge. A final class project of the student's choice will allow students to apply various methods to real data in an area of their own interest.



Required Text:

•*Potential Theory in Gravity and Magnetic Applications*, Richard J. Blakely
•*Geodynamics*, Turcotte and Schubert



Additional References

•*Fundamentals of Geophysics*, W. Lowrie
•*Introduction to Geophysical Prospecting*, M. B. Dobrin and C. H. Savit
•*Physics of the Earth*, F. D. Stacy
•*Advanced Engineering Mathematics*, Michael D. Greenberg

Week	Topic
1	Introduction, Potential Theory
2	Green's Identities, Helmholtz Theorem, Greens Functions
3	Gravitational Potential
4	Magnetic Potential
5	Magnetization
6	Earth's Gravity Field and Gravity Anomalies
7	Isostasy and Plate Flexure
8	Geomagnetic field
9	Fourier Domain Modeling
10	Fourier's Law of Conduction, Heat Equation
11	Oceanic heat flow, seafloor subsidence and mantle thermal structure
12	Heat flow: Earth's heat budget and evolution
13	Student projects
14	Student projects
15	Student projects

GG 632 directly supports the following student learning objectives for the MGeo, M.S., and Ph.D. degrees

1. Technical knowledge Graduates are proficient in applying technical knowledge of theory, laboratory methods, field methods, computer applications, and the supporting disciplines (math, physics, chemistry, biology) in solving societally relevant problems in the geosciences.

2. Scientific method (effective and ethical practice) Graduates are able to (a) construct scientific hypotheses, (b) define and carry out research to evaluate them in a timely manner, (c) analyze and synthesize the results of their research, and (d) derive conclusions that help advance the fields of geology and geophysics. The highest standards of ethical practice are emphasized.

3. Communicate geological knowledge Graduate are able to effectively communicate about the findings of their research in writing at a level comparable to that of a scientific journal publication, and defend it orally to the satisfaction of a scientific audience. They are also able to communicate orally about Geology though seminar or conference presentations.

Title IX:

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 UwonoTitle IX Coordinator (808) 956-2299 t9uhm@hawaii.edu.