UNIVERSITY of HAWAI'I®
WINDWARD
COMMUNITY COLLEGE

ERTH 103, GEOLOGY OF THE HAWAIIAN ISLANDS

3 Credits, CRN 62454 - EC at Kamakau High, In-person

INSTRUCTOR: Dr. Arjun Aryal

OFFICE: Hale Imiloa 119 or Imiloa 113 (Lab)

OFFICE HOURS: W 12:00 PM to 2:00 PM, or by arrangement

TELEPHONE: 8082369257 **EMAIL**: aryal@hawaii.edu

EFFECTIVE DATE: Spring 2024

WINDWARD COMMUNITY COLLEGE MISSION STATEMENT

Windward Community College offers innovative programs in the arts and sciences and opportunities to gain knowledge and understanding of Hawai'i and its unique heritage. With a special commitment to support the access and educational needs of Native Hawaiians, we provide the Ko'olau region of O'ahu and beyond with liberal arts, career and lifelong learning in a supportive and challenging environment — inspiring students to excellence.

CATALOG DESCRIPTION

Hawaiian geology and geological processes: origin of Hawaiian Islands, volcanism, rocks and minerals, landforms, stream and coastal processes, landslides, earthquakes and tsunamis, groundwater, geological and environmental hazards. Field trips arranged. (3 hrs. lect.) WCC: DP

STUDENT LEARNING OUTCOMES

As a result of taking this course, students can expect to attain the following outcomes:

1. 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. Apply technical knowledge of relevant computer applications, laboratory methods, and field methods to solve real-world problems in geology and geophysics.
3. Use the scientific method to define, critically analyze, and solve a problem in earth science.
4. Reconstruct, clearly and ethically, geological knowledge in both oral presentations and written reports.
5. 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.

COURSE TASKS

Weekly study guide or 'roadmap': Will be explained in the class.

Weekly Lectures: Weekly lectures will be on W 8:15-11:15 AM.

Class discussions/Lab visits: Class participation is required. WCC Geology lab visit will be arranged (if possible).

Homework and Quiz: A weekly quiz or homework will be provided. It will be available in Laulima on Mondays and due on Saturdays (midnight).

Midterm and Final: There will be one midterm and the final exam. Most of the questions will be in multiple-choice format.

Project: Writing an article related to the geology of Hawai'i is required. Suggested topics will be given, but students are encouraged to find their topic of interest for this term project. It is highly recommended that your writing compare the geologic process/event/feature to the Hawaiian explanation (or myth or legend) when possible. Specific instructions about your project work will be provided later. I highly encourage you to write a newspaper or magazine-type article and submit it for publishing (school magazine). Presentation in the class on a topic is also acceptable.

Grading: Grading will be based on the following points of distribution

Quiz	20%
Homework	20%
Midterm exam	20%
Project (one)	20%
Final exam	20%
Class Participation and weekly engagement in Laulima	5% (extra credit)

Letter Grade Breakdown: A = 90%+; B = 80 – 89%; C = 70 – 79%; D = 60 – 69%; F = < 60%
Please check your grade book in Laulima regularly.

Make-Up Exams/Early Exams: Midterm and Finals will be available on the exam date. There will be no Make-up exams unless there is a very legitimate reason, such as illness or family emergency. Please get in touch with me as soon as possible if such a situation arises. Note: make-up and/or early exams might be in essay format and may be substantially more time-consuming.

COURSE CONTENT

Concepts or Topics and Schedule (Tentative):

Week #, Week of [day]	**Topic(s)**
1, Jan 8 [10]	Setting the stage, Introduction to Geology, Earth Layers

2, Jan 15 [17]	Plate Tectonics, Minerals, Rocks and Rock Cycle, Formation of Hawaiian Islands or the island chain (Hm1)
3, Jan 22 [24]	Life Stages of Hawaiian Volcanoes, Calderas and Rift Zones
4, Jan 29 [31]	Lōʻihi, Kīlauea and recent eruptions in Big Island (Hm2)
5, Feb 5 [8]	Earthquakes
6, Feb 12 [14]	Earthquakes in Hawaii, Tsunami (Hm3)
7, Feb 19 [21]	Hawaiian Eruption Styles, ʻAʻā and Pāhoehoe lava, Lava flows, Vents and pyroclasts,
8, Feb 26 [28]	Mauna Kea, Glaciers, Hualālai (H4)
9, Mar 4 [6]	Kohala, Soil Formation, Streams, Water Erosion, ET Volcanoes
10, Mar 11 [13]	**Midterm** and Project Overview
Mar 18	SPRING RECESS
11 Mar 25 [27]	East Maui, Haleakalā, West Maui, and Rejuvenation
12, Apr 1 [3]	Lānaʻi and Kahoʻolawe, East and West Molokaʻi, Aeolian Processes
13, Apr 8 [10]	Oʻahu (Koʻolau and Waiʻanae), Giant Avalanches and Submarine Geology
14, Apr 15 [17]	Kauaʻi, Niʻihau, Papahānaumokuākea
15, Apr 22 [24]	Groundwater Hydrology, Shorelines, and Sea Level
16, Apr 29 [M1]	Climate Change Adaptation, Project submission (Due Dec 3)
17, May 6 [8]	**Final Exam**

LEARNING RESOURCES

Course Website: https://laulima.hawaii.edu/portal

Textbook: There is no particular textbook for this course, and all the required study materials will be provided in Laulima.

Reference book: Only for your reference.

Roadside Geology of Hawaiʻi (Hazlett & Hyndman, 2022, Mountain Press Publishing Company, ISBN-978-0-87842-711-6).

WCC library has some copies of the book

ADDITIONAL INFORMATION

General Description of the Course:

"*Civilization exists by geological consent, subject to change without notice*." [Will Durant, American historian]

Have you ever wondered about what caused the formation of Hawaii's 'Smiley Face' Volcano? How did the lava lake at the Halemaumau crater change to a hot water lake after the 2018 eruption, and now, it is back to the lava lake? Or, would you like to know how the mountains, valleys, craters, beaches, reefs, etc., formed in Hawaii? What processes shaped Koolau Mountain as it is today? What processes provide for and threaten our resources and safety, and how did Hawaiians in the olden days manage to use these resources without modern materials? ERTH103 is a start to your understanding of these things.

ERTH103 introduces Hawai'i Nei geologically. It surveys Hawaiian geology and geologic processes. This includes the origin of the Hawaiian Islands, volcanism, rocks and minerals, landforms, stream and coastal processes, landslides, earthquakes and tsunamis, groundwater, and geologic and environmental hazards.

This course will interleave geologic processes and places, starting from Lō'ihi (the youngest Hawaiian volcano) and moving NW along the chain to finish at Meiji Seamount (the oldest Hawaiian volcano). We will cover processes along the way as we need them. For example, Kilauea is an active volcano, so we'll have to cover how magma is produced there. However, erosion only becomes a major geological process once a volcano starts to die off, so we won't cover it until we get to Mauna Kea, Kohala, and so on. The goal is that by the end of the semester, you will be able to look at the entire Hawaiian-Emperor volcanic chain and understand how it got there, why it is not the same all along the chain, and what the geologic future may hold.

The most important thing in ERTH 103 is not what I teach but what you learn. Learning is an active process – you have to do something to learn. In this class, class participation, reviewing course materials, doing homework/quizzes, and reading are very important.

DISABILITIES ACCOMMODATIONS

If you have a physical, sensory, health, cognitive, or mental health disability that could limit your ability to fully participate in this class, you are encouraged to contact the Accessibility Counselor to discuss reasonable accommodations that will help you succeed in this class. Roy Inouye can be reached at (808) 235-7448, royinouy@hawaii.edu, or you may stop by Hale Kākoʻo 106 for more information.

ADDITIONAL INFORMATION

- The Success Coach – Kumu Nancy
- Early College Coordinator at WCC - Kaʻimi Gample
- Classroom policy – follow the school classroom policy. Class participation is highly encouraged, and students earn extra credit by doing this.)
- MySuccess: Students may be referred for extra help or advising through MySuccess. Students can also explore resources at MySuccess.Hawaii.edu and windward.hawaii.edu/MySuccess

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SEX DISCRIMINATION AND GENDER-BASED VIOLENCE RESOURCES (TITLE IX)

Windward Community College 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, WCC has staff and resources to support and assist you. To report an incident of sex discrimination or gender-based violence, as well as receive information and support, please contact one of the following:

Leslie Cabingabang, Confidential Advocate
Phone/Text: ((808) 348-0432 or (808) 341-4952
Email: advocate@hawaii.edu
Office: Hale Kākoʻo 107

Desrae Kahale, Mental Health Counselor & Confidential Resource
Phone: (808) 235-7393
Email: dkahale3@hawaii.edu
Office: Hale Kākoʻo 101

Karen Cho, Deputy Title IX Coordinator
Phone: (808) 235-7404
Email: kcho@hawaii.edu
Office: Hale ʻAlakaʼi 120

As a member of the University faculty, I am required to immediately report any incident of sex discrimination or gender-based violence to the campus Title IX Coordinator. Although the Title IX Coordinator and I cannot guarantee confidentiality, you will still have options about how your case will be handled. My 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.

For more information regarding sex discrimination and gender-based violence, the University's Title IX resources and the University's Policy, Interim EP 1.204, go to manoa.hawaii.edu/titleix/

ACADEMIC INTEGRITY

Work submitted by a student must be the student's own work. The work of others should be explicitly marked, such as through use of quotes or summarizing with reference to the original author.

In this class, students who commit academic dishonesty, cheating or plagiarism will have the following consequence(s):

Students will receive a failing grade for plagiarized assignments.

All cases of academic dishonesty are referred to the Vice Chancellor for Student Affairs.

ALTERNATE CONTACT INFORMATION

If you are unable to contact the instructor, have questions that your instructor cannot answer, or for any other issues, please contact the Academic Affairs Office:

- Location: Alakaʻi 121
- Phone: (808) 235-7422