# EARTH SCIENCE LAB (GEOS1131)
Spring 2021

**Lab Time and Location: R** 9:30 – 11:30 AM
**Instructor**: Gaumani Gyanwali – Ph. D.: OSU-Stillwater; MS, BS: Tribhuvan University
**Office Location:** S 244
**Office Hours:** Posted on office door
**Contact Information:** Office: (479)-394-7622, Ext. 1339
Cell: (479)-234-8727 Email: gyanwali@uarichmountain.edu

**Prerequisite**: A grade of "C" or better in Elementary Algebra.

**Resources**: equired Materials:

1. Lab Safety Goggles
2. Earth Science Lab Manual: Gaumani Gyanwali 2017 (Revised: December 2019)

**Course Description**: This introductory course will explore on various aspects of Earth structure and properties mainly, focusing on the scientific explanation and understanding. The course will be covered in a way to help students in concept building and problem solving, but emphasis will be given to real-life experience and application of scientific process and progress. Topics covered will include plate tectonics, earthquake, volcanoes, rocks and minerals, weathering, oceans and coastlines, atmosphere, and weather and climate.

**Program Outcomes:** Students will increase their
-writing, reading, speaking, and listening skills,
-competency in mathematics, utilizing their analytical and occupational skills to solve real life problems,
-understanding of different cultures and societies across the globe and how both have changed over time,
-understanding of basic principles and their application in the field of physical sciences and biological sciences, and
-technological and research skills.

**Rationale:** Structure and properties of the Earth, as well as natural processes and events have always been very influential in determining the society's community and the economic, environmental, and social development. Understanding the basic science behind these processes not only helps remove misconceptions but also to take right decisions in right time. Creating interest in these processes and properties will help build better and safer communities to some extent.

**Course Objectives:** Upon successful completion of GEOS1131, the student should be able to do the following:
1. Understand the method of measuring mass and volume of rocks and to find the density using the measured mass and volume.
2. Measure the density of water and solution and to find the correlation between the density and salinity
3. Understand the basic difference between land and water heating rates

4. Demonstrate the relationship between viscosity and temperature
5. Identify given rock and mineral samples as the three basic types and understand the basic silica composition
6. Understand the basic concept of earth features such as albedo, humidity, Coriolis, Insolation and their effects

**Tentative Schedule for Lab: Earth Science**

| Date | Experiments | Expt. #/ Page # Lab Manual |
|---|---|---|
| 1/14 | Syllabus/Safety | Sign the safety agreement |
| 1/21 | Insolation Pattern - first data collection<br>Isostasy Experiment Practice | Expt. 11 Page 95<br>Expt. 4 Page 33 |
| 1/28 | 1. Density of Rocks and Water | Expt. 1 Page 5 |
| 2/4 | 2. Salinity and Density | Expt. 2 Page 15 |
| 2/11 | 3. Latent Heat and Differential Heating… | Expt. 3 Page 25 |
| 2/18 | 4. Magma Viscosity and Isostasy… | Expt. 4 Page 33 |
| 2/25 | 5. Minerals and Rocks Part I | Expt. 5 Page 43 |
| 3/4 | 6. Minerals and Rocks Part II | Expt. 6 Page 53 |
| 3/11 | Make-up lab (one lab from 1-6) | One missed lab |
| 3/18 | 7. Mineral Crystallization | Expt. 7 Page 61 |
| *3/25* | *Spring Break - no lab* | |
| 4/1 | 8. Albedo Effect | Expt. 8 Page 69 |
| 4/8 | 9. Psychrometer Experiment | Expt. 9 Page 75 |
| 4/15 | 10. Coriolis Effect | Expt. 10 Page 85 |
| 4/22 | 11. Insolation Pattern | Expt. 11 Page 95 |
| 4/29 | Make-up (one lab from 7-11) | One missed lab |

**Course Conduct:** The lab will be performed once a week and a laboratory manual is provided as a guide to perform designated experiments within the laboratory period. The data must be collected properly following the guided principles of chemistry and scientific experimentation techniques mentioned in the manual. There are three steps to properly performing an experiment and completing a laboratory report.

1. Study the Introduction section in the lab manual for that experiment. Complete the Pre-laboratory Questions before coming to the lab.
2. Perform the experiment or several experiments in that chapter and fill up the data page as well as answer all the given questions.
3. Prepare a formal laboratory report following the guideline given at the end of the lab manual and following the format mentioned. Submit the completed lab report the next lab period (usually 1 week later).

**UA Rich Mountain Credit Hour Calculator:** For every course credit hour, you should expect to spend at least five clock hours per week of concentrated attention on course-related work, including but not limited to time studying the Introduction, completing the Pre-lab work, finishing the experiment and recording the data, preparing the lab report.

**Course Requirements / Evaluation (Grading):**

Your grade for this lab course comes from the following:

11 Lab reports @ 20 each = 200 (lowest one dropped after submitting all)

**Total points possible = 200**

The final grade for the course will be determined by dividing the student's total number of points earned by the number of possible points. Grades are assigned using the following percentage scale, after rounding the calculated percentage to the nearest whole number:

| | |
|---|---|
| 90 or higher | **A** |
| 80 - 89 | **B** |
| 70 - 79 | **C** |
| 60 - 69 | **D** |
| Less than 60 | **F** |

**Class Procedures/Student Requirements**:

On-Campus Resources: A general guideline will be provided to how to perform experiments and how to prepare a laboratory report based on the experiments. You should follow the instructions clearly and completely to get the optimum benefit of not only understanding the objective of the experiments but also to get good grades.

Attendance Policy: You must attend the lab and must complete the experiment yourself. Cannot copy other's data to prepare the lab report.

Assignment Due Dates: Lab reports will be due the next week of the lab period.

Make-up Work Policy**:** Make up work should be competed promptly after the absence when available. You must make up to be able to fill the data pages, use the Pre-lab for grades, and to prepare the lab report

Grading:

1. Pre-laboratory questions and the data pages including the questions: 10 points.
2. Laboratory Report: 10 points.

**Academic Dishonesty**: It is expected that each student shall do his/her own work on class works, quizzes, exams, and lab reports. Cheating, copying other's answers, writing other's statement without citing their reference are all considered plagiarism and are penalized from allowing no point in that particular unit up to dismissal from the whole course, depending on the severity of the offense.

**Disability Policy:** It is the policy of UA Rich Mountain to accommodate students with disabilities, pursuant to state and federal law. Any student with a disability who needs accommodations should contact the Vice-Chancellor for Student Affairs Office, 394-7622, ext. 1400.

**Arkansas Clean Air Act**: In compliance with the Arkansas Clean Air Act, UA Rich Mountain is a smoke and tobacco free facility. Students and guests are to refrain from the use of all tobacco products while on campus.

**Student Misconduct**: Students committing misconduct are subject to disciplinary sanction(s) and/or restrictions. Misconduct or prohibited behavior includes, but is not limited to endangerment, harassment, disruption, sexual misconduct, illegal drugs and/or alcohol, fire

or safety issues, gambling, property violations, computer violations or other violations as listed in the UA Rich Mountain catalog.

**UA Rich Mountain Mission:** UA Rich Mountain provides transformative education to all learners.

| Credit Hour Requirement Calculator | | | | |
|---|---|---|---|---|
| | | | | |
| **Course Information** | | | | |
| Department, Course Number | GEOS1131 and GEOS 1133 | | | |
| Course Title | Earth Science Laboratory and Lecture | | | |
| Credit Hours | 4 | | | |
| Mode of Delivery | Traditional | | | |
| Weeks in Part of Term | 15 | | | |
| Level of Reading Material | Advanced/Scientific/Technical (2) | | | 2 |
| Reading Level of Students | Average Student (2) | | | 2 |
| Average Pages per Hour | 10 | | | |
| | | | | |
| | | *Enter either week or term, not both* | | |
| **Contact Hours** | | **Hours/Week** | **Hours/Term** | **Total Hours** |
| Lecture/Recitation | | | 45 | 45 |
| Lab Contact Hours | | | 24 | 24 |
| | **Pages Asg'd** | **Hours/Week** | **Hours/Term** | |
| **Syllabus Items** | | | | |
| Reading | 360 | | | 36 |
| Assignment | | 1 | | 15 |
| Online Quiz | | 1 | | 15 |
| Researching Lab questions | | 2 | | 30 |
| Reviewing for exams | | | 10 | 10 |
| | | | | 0 |
| | | | | 0 |
| | | | | 0 |
| | | | | 0 |
| | | | | 0 |
| | | | | |
| **Total Hours** | | | | 175 |
| **Required Hours** | | | | 150 |
| **Difference** | | | | Ok + 25 |