



Sule Lamido University, Kaffin Hausa
Faculty of Natural and Applied Sciences
Department of Physics
2019/2020 Second Semester

Course Title: Physics of the solid Earth **Course Code:** PHY 238 **Credit Unit:** 3

Course Staff:

Lecturer: Prof. Chifu E. Ndikilar

Room Number: A5

Laboratory Instructor: Mal.

Course Prerequisites: NIL

Lecture Period: Wednesday, 02:00 pm – 04:00 pm & Friday, 10:00 am – 12:00 pm

Lecture Venue: Wednesday@ Lecture Room 3 & Friday@ Lecture Room 4

Reference Texts:

1. **The Solid Earth:** An introduction to global Geophysics, 2nd ed, 2004, Royal Holloway, University of London, ISBN: 9780521893077, by C.M.R. Fowler.
2. **Physics of the Earth,** 4th ed, Cambridge University Press, ISBN-13: 978-0521873622, by Frank D. Stacey and Paul M. Davis
3. **Introduction to the Physics of the Earth's Interior,** 2nd ed, ISBN: 9780521663922, by Jean-Paul Poirier.
4. **Fundamental of geophysics,** 2nd ed, 2007, ISBN: 9780521675963, by William Lowrie.
5. **Geodynamics,** 3rd ed, 2014, Cambridge University Press, ISBN-13: 978-0521186230, by Donald Turcotte and Gerald Schubert.

Lecture Notes: Lecture guides will be given to the class representative at least a day before each lecture.

Course Objectives:

The objectives of the course are as follows:

1. To apply the principles of geodynamics in understanding the origin, shape, structure and major divisions of earth.
2. To determine the earth's main magnetic field and its distribution.
3. To explain the basic concept of electrical theory of the earth's core and origin of the magnetic field.
4. To briefly explain the basic concept of the seafloor spreading, continental drift and plate tectonics.

5. To define and discuss Structure of the earth, conductivity, heat flow, elasticity, dynamo theory, magnetic field.

Measurement of Course Outcome:

At the end of the course lectures, a student will be able to:

1. Explain the origin of the earth and state the major divisions of the earth, and hence draw and level the structure and shape of the earth
2. Define and explain the variation of geomagnetic fields' strengths within the earth surface in different geographic locations.
3. Briefly describe the composition and electrical properties of the earth core, and briefly discuss the the origin of the earth magnetic field.
4. Define and explain the basic concept of seafloor spreading, continental drift and plate tectonics theory.

Course Grading:

1. Assignment / Project: **10%**
2. Continuous Assessment Tests: **30%**
3. Final Examination: **60%**

General Information:

1. Students must attend a minimum of 70% of the total lecture hours in order to be eligible to write the final exam. Students should notify the course staff of any intended absence from a lecture or laboratory at least a day prior to such lecture or laboratory. In a situation where the student is ill, an official documentation should be obtained from the university clinic.
2. The continuous assessment tests will be conducted in the weeks five and ten of the semester; thereafter, lecture commence for the week.
3. The final examination timetable will be as scheduled by the Faculty. Students are expected to liaise with the Sub-dean of the faculty to make sure that there are no clashes on their examination schedule.
4. Students are encouraged to meet with course staff to sort out any administrative and academic issues they may have relating to the course.
5. Students will be expected to fill out an online course assessment form, midway through the semester to get a feedback of what their lecture and laboratory experiences have been.
6. Students are encouraged to collaborate on assignments but every student must do the assignment on their own. It is important for student to note that cheating or any kind of academic dishonesty will not be tolerated and will be met with harsh punishment by the university administration if discovered (Please refer to student handbook).

Lecture Schedule

Lect. No.	Date	Topic
1	Week 1	Course Administration and general review of the course
2	Week 2	Origin, shape, structure and major divisions of earth
3	Week 3	The earth's main magnetic field and its distribution
4	Week 4	Electrical theory of the earth's core and origin of the magnetic field
5	Week 5	(Test 1) seafloor spreading.
6	Week 6	Continental drift and plate tectonic theory.
7	Week 7	Conductivity, heat flow and Curie temperature.
8	Week 8	Elasticity and dynamo theory of the earth.
9	Week 9	Gravity and magnetic fields.
10	Week 10	(Test 2)
11	Week 11	Field work: demonstration of Magnetic and gravity field effects.
12	Week 12	Laboratory demonstration of Gravity and magnetic fields.
13	Week 13	General Course Revision