AGP 320–Independent Geophysical Field Work

COURSE PARTICULARS

Course Code: AGP 320  
Course Title: Independent Geophysical Field Work  
No. of Units: 3  
Course Duration: Independent Field Work Lasting for 6 weeks  
Status: Compulsory  
Course Email Address: Nil  
Course Webpage: Nil  
Prerequisite: AGP 202

COURSE INSTRUCTORS

All Staff and Dr. M. A., Ayuk  
Applied Geophysics Department  

Dr. Ayuk, M. A.  
CERAD building  
Dept. of Applied Geophysics  
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COURSE DESCRIPTION

This is an independent geophysical fieldwork lasting 4-6 weeks during long vacation at the end of the third year. 300 level undergraduates students are trained to acquire, process and interpret geophysical data based on each of the geophysical methods they have been taught in the school. A written report on this exercise shall be submitted at the beginning of the second semester of the fourth year.

COURSE OBJECTIVES

The objectives of this course are:  

I. GEOLOGICAL:  
   - Location of outcrops and description  
   - Strike and dip measurement of outcrops  
   - Plotting strike and dip on the field map  
   - Assigning a tentative field name to outcrops studied  

II. GEOPHYSICAL:
• Establishment of geophysical traverses
• Study of subsurface geology and structure
• Improvement of existing geologic boundaries of rock types
• Study of the groundwater and mineral potentials of the study location

**COURSE LEARNING OUTCOMES / COMPETENCIES**

Upon successful completion of this course, the student will be able to:

*Knowledge based*

- The student will understand the relationship between geophysical traverses and existing geology
- Instrumentation trouble shooting to detect malfunctioning
- Position location on the field using compass-chinometer, global positioning system (GPS) and topographic map

*Skills*

- Students can carry out geophysical survey independently with little supervision
- The students can also process and interpret the acquired data.
- Understanding of the fundamental of geophysical report writing

**GRADING SYSTEM FOR THE COURSE**

This course will be graded as follows:

- Geological report: 30%
- Geophysical report: 70%
- TOTAL 100%

**GENERAL INSTRUCTIONS**

*Attendance:* It is expected that every student must be on the field and participate effectively in all the exercises. Attendance records are kept each day to determine each person participation in the field work. In case of illness or other unavoidable cause of absence, the student must communicate as soon as possible with any of the instructors, indicating the reason for the absence. A maximum attendance and participation of 60% is expected from a student to be eligible for grading on the field.

*Academic Integrity:* Violations of academic integrity, including dishonesty in assignments, stealing, fighting or other unethical behaviours are prohibited. You are not allowed to make
copies of another person’s work and submit it as your own, that is plagiarism. All the cases of academic dishonesty will be reported to the university management for appropriate sanctions in accordance with the guidelines for handling student misconduct as spelt out in the student handbook.

**Assignments and Group Work:** students are expected to submit assignments as scheduled. Failure to submit an assignment as at when due will earn you zero for that assignment only under extenuating circumstances, for which a student has notified any of the instructors in advance with late submission of assignment be permitted.

**Code of Conduct during Field Work**

*(In the Hostel/Hotel)*

Students should turn off their cell phones during lectures. Students are prohibited from engaging in other activities (such as texting, watching videos etc. during lectures. A register is marked at 10pm each night to ensure that every student is around. Going out at late hours is forbidden or prohibited except on emergency cases where a student took ill and had to be rushed to the nearest hospital. This is normally done with the consent of any of the instructors. All the rules and regulations for a successful field work as outlined by the field co-ordinator must be strictly adhered by both students and staff members.

*(On the Field)*

Late coming to the field by the students is not allowed. Playing on the field while others are working will attract severe sanctions and in extreme cases, the students may be asked to return to school, this means automatic carry-over of the course to another year.

**READING LIST**

4. Keller, G.V. and Frischnecht F.C 1966 Electrical methods in Geophysical Prospecting
Pergamon, London
5. Ocan, O.O 2000 Fundamentals of geological mapping: a field manual. Department of
geology Obafemi Awolowo university ile-ife
state of the art in 1985. Geophysics vol.50, pp. 2558-2594
Cambridge University press, Cambridge
Cambridge university press.
geophysics vol.11 pp. 13-196

**COURSE OUTLINE**

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<tr>
<th>Week</th>
<th>Topic</th>
<th>Remarks</th>
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| 1    | Review of Geology of Nigeria and its economic importance  
  - Sedimentary basins  
  - Basement complex rocks  
  - Mineral and Ground water potentials of sedimentary and basement complex rocks  
  Discussion of equipment used for Geological Field Mapping  
  Pacing and determination of pace-length by each student  
  Production of field base maps  
  Position location on the field  
  Geological field mapping | Student expectations are documented during this first week of teaching and Training |
| 2    | - Geological field mapping  
  - Lectures on processing and interpretation of geologic field data  
  - Processing and interpretation of field data by students  
  - Preliminary report writing and submission | Students become more familiar with methodology of geologic mapping and field observations made on outcrops |
<table>
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<th></th>
<th>Overview of geophysical methods and their applications</th>
<th>Training of students in instrumentation and geophysical data acquisition</th>
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| 3 | Geophysical instrumentation and uses. They include:  
   - Proton precession magnetometer  
   - ABEM-WADI VLF-EM  
   - Ohmega-Resistivity  
   - Mark 6 Terraloc refraction seismograph (not functioning) | 
|   | Auxiliary tools used in geophysical survey  
   Position location and establishment of transverses  
   Data acquisition using electrical resistivity method  
   - Electrical resistivity profiling  
   - Dipole-dipole resistivity profiling  
   - Vertical electrical resistivity depth sounding  
   Data acquisition using VLF-EM method  
   - Horizontal profiling  
   Data acquisition using magnetic method  
   - Horizontal profiling  
   - Magnetic gradient technique | 
| 4 | Dividing students into groups and assigning plots measuring 450m by 300m  
   - Generation of base maps of the locations  
   - Establishment of transverses and pegging them | Students are allowed to work independently with little supervision by staff lectures and technologists |
| 5 | Data acquisition using electrical resistivity method  
   Data acquisition using VLF-EM method  
   Data acquisition using magnetic method | Students continue to work on their own |
| 6 | Data acquisition using magnetic method  
   Lectures on data processing and interpretation  
   Data processing and interpretation by the students to produce subsurface maps | Students continue to work on their own |
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<tr>
<th>Lectures on report writing</th>
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<td>Preliminary report writing and submission</td>
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<td>Cleaning of the hostel/hotel and departure</td>
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