

Introduction to Applied Geophysics

Earth Sciences 207

Section: D100

Term: 2008 Fall

Instructor: Dr. A.J. Calvert

Discussion Topics: Course Outline: REQUIREMENT DESIGNATION: Q

Use of physical measurements in determining the subsurface properties of the Earth. Principles underlying analysis of geophysical data. Basic rock physics. Gravity surveying: basic theory, instrumentation, data reduction, and anomaly interpretation. Magnetic surveying: rock magnetism, Earth's magnetic field, instrumentation, data reduction, anomaly interpretation. Electrical surveying: (i) resistivity of rocks, electrode arrays and current flow in the ground, resistivity sounding and profiling; (ii) induced polarisation, IP measurement and applications; (iii) self potential methods. Seismic surveying: stress and strain, seismic waves, reflection and refraction of seismic waves, critical refraction, rays and waves. Seismic refraction surveying: seismic sources and detectors, geometry of refracted raypaths for horizontal, dipping and undulating layers, data interpretation.

Course Topics:

Introduction to geophysical data: physical properties of rocks , sampling, time vs. frequency

Gravity surveying

Magnetic surveying

Electrical methods: resistivity, induced polarisation and self potential

Seismic refraction methods

Grading: 1. Midterm examination 15%

2. Laboratory/Assignments 35%

3. Final examination 50%

Required Texts: An Introduction to Applied and Environmental Geophysics, by J.M. Reynolds (Wiley) ISBN 0-471-95555-8.

Introduction to Applied Geophysics

Recommended Texts: None.

Materials/Supplies: None.

Prerequisite/Corequisite: EASC 101, MATH 152, PHYS 121, PHYS 131, All with grade C- or higher, or EASC 101, MATH 152 with a grade of C- or higher and PHYS 102, PHYS 130 both with a grade of B or higher. FAN X99

No student will be admitted to this course unless all phy

Notes: None.

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