

Introduction to Geophysics

Earth Sciences 207

Section: D100

Term: 2003 Fall

Instructor: Dr. Nathan Hayward

Discussion Topics: 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 40%

3. Final examination 45%

Required Texts: An Introduction to Applied and Environmental Geophysics, by J.M. Reynolds (Wiley).

Recommended Texts:

Materials/Supplies:

Prerequisite/Corequisite: EASC 101, PHYS 121, PHYS 131.

Students who have taken PHYS 101 instead of PHYS 120 and PHYS 102 instead of PHYS 121 will be admitted to the course if they have achieved a grade of B or higher.

No student will be admitted to this course u

Notes:

This outline is derived from a course outline repository database that was maintained by SFU

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Student Services and the University's IT Services Department. The database was retired in 2014 and the data migrated to SFU Archives in 2015.