Course Title: Geophysics	Course code: 24MJPH4S
Total Contact Hours: 30	Course Credits: 02
Internal Assessment Marks: 10 marks	Duration of SEE: 1.5 hours
Semester End Examination Marks: 40 marks	

Course Outcomes:

By the end of this course, students will be able to:

1. Understand fundamental geophysical concepts and Earth's physical properties.
2. Explain principles of seismic, gravitational, and electrical geophysical methods.
3. Apply geophysical techniques in earthquake studies, resource exploration, and environmental monitoring.

Geophysics (24MJPH4S)

Unit	Description	Hours
Unit 1	**Introduction to Geophysics & Earth's Interior** Introduction to Geophysics: Definition, branches, and applications, Earth's Internal Structure: Crust, mantle, and core (composition and properties), Seismology & Earthquakes: Types of seismic waves (P, S, Surface waves), Earthquake magnitude and intensity (Richter & Mercalli scales), Seismographs and earthquake monitoring, Plate Tectonics & Geodynamics: Continental drift, seafloor spreading, and tectonic activity (6 h) Hands on Session: Use of 1) Magnetometer, 2) GPS, and 3) soil testing parameters Modelling: Earth's Internal Structure. Survey of earthquake events (10 h)	**16**
Unit 2	**Gravity, Properties of Earth and** Environmental geophysics Gravity & Earth's Shape: Gravity anomalies and their significance, Isostasy and buoyancy, Geomagnetism & Paleomagnetism: Earth's magnetic field, Magnetic reversals and their geological significance, Electrical Properties of Earth: Conductivity, resistivity, and electromagnetic properties, Ground Penetrating Radar (GPR) and its environmental applications. Environmental geophysics (landfill detection, groundwater contamination), Engineering Geophysics: Geophysical techniques in civil engineering, tunnel & dam site investigations (6 h) Hands on Session: 1) Measurement of g, 2) measurement of B_H 3) water testing parameters Modelling: 1) Tunnel & 2) Dam (8 h)	**14**

Reference Books:

1. Telford, W. M., Geldart, L. P., & Sheriff, R. E. (1990). *Applied Geophysics*. Cambridge University Press.
2. Fowler, C. M. R. (2005). *The Solid Earth: An Introduction to Global Geophysics*. Cambridge University Press.
3. Dobrin, M.B. (1988). *Introduction to Geophysical Prospecting*. McGraw Hill.