

Semester	AUG 2022
Open to semester	21
Course code	EC6512
Course title	Fundamentals of Geophysics
Credits	/2
Course Coordinator & participating faculty (if any)	Arjun Datta*, Argha Banerjee, Rahul Dehiya
Nature of Course	Lectures
Pre-requisites	None
Objectives (goals, type of students for whom useful, outcome etc)	The objective of this course is to introduce graduate students in ECS, to the rudiments of solid Earth geophysics.
Course contents (details of topics /sections with no. of lectures for each)	<p>L1- Whole Earth structure: chemical and mechanical subdivisions of Earth, role of global seismology, seismic structure, pressure and density variations with depth, phase changes in the mantle</p> <p>L2 – Plate tectonics 1 (qualitative): seafloor spreading, subduction of oceanic lithosphere and associated phenomena (e.g. sea-floor elevations, sea-level changes, seismicity including Wadati-Benioff zones, volcanism)</p> <p>L3 – Plate tectonics 2 (quantitative): relative plate motions, triple junctions, tectonics on a sphere</p> <p>L4- Geomagnetism 1: the geomagnetic field, diurnal and secular variations, rock magnetism</p> <p>L5- Geomagnetism 2: palaeomagnetism, apparent polar wander and relationship with tectonics</p> <p>L6- Rock rheology: elastic, plastic and ductile regimes, stress and strain, solid-state viscous flow</p> <p>L7- Earth's gravity: gravitational potential, figure of the Earth, rotation and ellipticity, geoid</p> <p>L8- Earth's heat and thermal structure: geotherms, surface heat flux, depth and age of seafloor</p> <p>L9- Seismology 1: theoretical foundations – continuum mechanics, seismic wave equation, body and surface waves</p> <p>L10- Seismology 2: applications – earthquake location, estimation of Earth structure including seismic tomography</p>

Evaluation /assessment	End-Sem Examination-30% Mid-Sem Examination-40% Others-30 (quizzes)%
Suggested readings (with full list of authors, publisher, year, edn etc.)	<ol style="list-style-type: none"> 1. Lowrie, W. and Fichtner, A. 2020. Fundamentals of Geophysics (3rd ed.). Cambridge University Press. 2. Fowler, C.M.R. (2004). The Solid Earth: An Introduction to Global Geophysics (2nd ed.). Cambridge University Press.