Course Type	Course Code	Name of Course	L	T	P	Credit
E/SO1	**GPE201**	**Earth and Planetary System**	3	0	0	9

Course Objective

The primary objective of the course is to introduce fundamental aspects of Earth and Planetary system and its related changes with time. This course will emphasize the knowledge on the branches of geophysics, solar system, planets, climates, ocean, carbon cycle, and transitions of Earth's structure through different geological ages. The underlying physics of the various Earth and planets related changes and its creation are presented through theory classes.

Learning Outcomes

Knowledge on the history of Earth's development, the solar system; climate and its changes; Earth's interior; plate tectonics; the physical property of ocean water; changes of ocean climates; global carbon cycle; depositional events and environments with geological ages and glaciations are the goal of the.

Unit No.	Topics to be Covered	Lecture Hours	Learning Outcome
1.	Introduction to Geophysics, different branches of Geophysics and relationship with other sciences	4	Presentation of geophysics and its branches
2.	Solar System formation, meteorites, planet formation, Asteroid belt, Nebula Hypothesis, Kepler's Law, Bode's law	4	Knowledge of the solar system
3.	Isotopes and Minerals	2	Fundamentals of minerals
4.	Geomorphology and Geophysical Signature observed by various missions	3	Study of comparative planetology
5.	Plate tectonics, physical geology systems explaining the interior of the Earth	6	Study on Earth's tectonic system
6.	Blackbody radiation, energy balance, greenhouse effect, climate forcings, climate sensitivity, the role of	4	Overview and fundamental concept on

	sun/volcanoes/greenhouse gasses/aerosols, climate feedbacks		Earth's climates system
7.	Structure and circulation of the atmosphere, Coriolis effect, Geostrophic balance, Wind-driven circulation, Thermo-Haline circulation, Upwelling, El Nino-Southern Oscillation, Monsoons	5	Knowledge of ocean-atmospheric circulation
8.	Carbon reservoir and fluxes, long-term carbon cycle and plate tectonics, Volcanic outgassing and silicate weathering, glacial-interglacial CO_2 cycles, and role of the Ocean, the anthropogenic perturbation, Keeling curve, Carbon uptake by Ocean and the terrestrial biosphere	4	Fundamental study on the global carbon cycle
9.	Major climate events and trends during the Cenozoic last 65 Million	4	Knowledge of climate changes during Cenozoic
10.	Late Paleocene Thermal Maximum, Eocene climate optimum, Antarctic glaciation, Northern Hemisphere glaciation, Plio-Pleistocene Cooling	3	Glaciation and physical property changes of Earth during different geological age
	Total Class	**39**	

Text Book

1. Fowler, C.M.R., Solid Earth: An Introduction to Global Geophysics
2. Howell, B.F., An Introduction to Geophysics, Mc-Graw Hill
3. Lowrie, W., Fundamentals of Geophysics, Cambridge University Press

Reference Book

1. Jacobs, J.A., A Text Book of Geonomy, Adam-Hilger
2. Tucker, R.H., Cook, A.H., Iyer, H.M. and Stacey, F.D., Global Geophysics, English Univ. Press
3. Donald, L., Turcotte& Gerald Schubert : Geodynamics (Second Edition)