

SARDAR PATEL UNIVERSITY
Programme: MSC (Applied Science)
Semester: I
Syllabus with effect from: June 2013

Paper Code: PT01EASC01	Total Credits: 4
Title Of Paper: Earth, Earth Materials and Solar System	

Unit	Description in detail	Weightage (%)
1	<p>Earth Materials, surface features and Processes: Gross composition and physical properties of important minerals and rocks; properties and processes responsible for mineral concentrations; nature and distribution of rocks and minerals in different units of the earth and different parts of India.</p> <p>Surface features and Processes: Physiography of the Earth; weathering, erosion, transportation and Deposition of Earth's material; formation of Soil, sediments and sedimentary Rocks; energy balance of the Earth's surface processes; physiographic features and river basins in India.</p> <p>Interior of the Earth, Deformation and Tectonics: Basic concepts of seismology and internal structure of the Earth. Physio-chemical and seismic properties of Earth's interior. Concepts of stress and strain. Behaviour of rocks under stress; Folds, joints and faults. Earthquakes - their causes and measurement. Interplate and intraplate seismicity. Paleomagnetism, sea floor spreading and plate tectonics.</p>	25 %
2	<p>The Earth and the Solar System: Milky Way and the Solar System. Modern theories on the origin of the Earth and other planetary bodies. Earth's orbital parameters, Kepler's laws of planetary motion, Geological Time Scale; Space and time scales of processes in the solid Earth, atmosphere and oceans. Age of the Earth. Radioactive isotopes and their applications in earth sciences. Basic principles of stratigraphy. Theories about the origin of life and the nature of fossil record. Earth's gravity and magnetic fields and its thermal structure: Concepts of Geoid and, spheroid; Isostasy.</p>	25 %
3 & 4	<p>Ocean and Atmosphere: Hypsography of the continents and ocean floor-continental shelf, slope, rise and abyssal plains. Physical and chemical properties of sea water and their spatial variations. Residence times of elements in sea water. Ocean currents, waves and tides, important current systems, thermohaline circulation and the oceanic conveyor belt. Major water masses of the world's oceans. Biological productivity in the oceans. Motion of fluids, waves in atmospheric and oceanic systems. Atmospheric turbulence and boundary layer. Structure and chemical composition of the atmosphere, lapse rate and stability, scale height, geopotential, greenhouse gases and global warming. Cloud formation and precipitation processes, air-sea interactions on different space and time scales. Insolation and heat budget, radiation balance, general circulation of the atmosphere and ocean. Climatic and sea level changes on different time scales. Coupled ocean- atmosphere system. El Nino Southern Oscillation (ENSO). General weather systems of India, - Monsoon system, cyclone and jet stream, Western disturbances and severe local convective systems, distribution of precipitation over India. Marine and atmospheric pollution, ozone depletion.</p>	50 %

Basic Text & Reference Books: -----

