

SARDAR PATEL UNIVERSITY
Programme & Subject: M.Sc (Earth Science)
Semester: III
Syllabus with Effect from: June - 2014

Paper Code: PT03EESC01	Total Credit: 4
Title Of Paper: Remote Sensing, GPS, Earth Resources and Future Energy Options	

Unit	Description in Detail	Weightage (%)
I	Principles of Remote Sensing, Electromagnetic Radiation, Interaction of EMR with the Atmosphere, Image resolution – spatial, radiometric, spectral resolution, Spectral Signatures, Vegetation, Satellite data formats and standards, Platforms and sensors- Satellite orbital characteristics, Geostationary Satellite, Sun-synchronous Satellite, Image characteristics, LANDSAT Series, Indian Remote Sensing Satellite (IRS) series- IRS and Others, Sensors- Sensor parameters, Microwave Remote Sensing, Thermal Remote Sensing, thermal properties of materials, MODIS: Moderate Resolution imaging spectro-radiometer and applications.	25%
II	Global Position System – NAVSTAR, GPS basics, GPS signals, Satellite Ranging- Absolute and Differential positioning, Errors in GPS data- Noise, international errors, other sources of errors, GLONASS, GALILEO, COMPASS, WAEE, GNSS, GPS in India, GPS Traversing, GPS applications. Geographic Information System- Definitions of GIS, CAD verses GIS, GIS applications in India. Components of GIS, Software of GIS- Data standards and metadata.	25%
III	Earth Resources: Land – Its use and Management- Land a resource, Spheres of land management, Land Capability and mapping, Human settlements and land use, Soil- Nature of Soil, Origin of soils, Classification of Soils, Soil types of India, Microclimate modifications, Soil conservation, Water - Water resources of India, Nature of Ground water, Favourable geological conditions, Recharge of ground water, Springs in the hills, Quality of water, Water management	25%
IV	Renewable Sources of Energy – The energy crisis, Energy option, Energy from solar Radiation, Harnessing the wind, Energy from tides and waves, Thermal and salinity gradients in sea water, Tapping geothermal energy, Energy from biomass, alternative Fuel, Nuclear energy option.	25%

Basic Text & Reference Books:-

- Concepts and Techniques of Geo-informatics, Masood A. Siddiqui, Sharada Pustak Bhavan.
- Remote Sensing and Image Interpretation, Lillesand, Kiefer, Chipman, Wiley India Publication, 6th Edition.
- Remote Sensing, GIS and Wetland Management, Millea cooke, Random Publications, New Delhi.
- Environmental Geology Ecology, Resource and Hazard management, K. S. Valadiya, McGraw Hill Education (India) private Ltd, 2nd Edition,
- Geosciences, Environment and Man, H. Chamley, Elsevier Science.
- Earthquake and Natural Disasters, Manik Kar, EBH Publishers.

