SARDAR PATEL UNIVERSITY
Programme: B.Sc (Physics)
Semester: V
Syllabus with effect from: June-2013

Paper Code: US05CPHY06	Total Credit: 3
Title Of Paper: Astronomy and Astrophysics	

Unit	Description in detail	Weighting (%)
I	**Astronomical Instruments and Astronomical Measurements** **Astronomical Instruments:** Light and its properties, The Earth's atmosphere and EM radiation, Optical telescopes, Radio telescopes, Hubble Telescope, Astronomical spectrograph, Photographic photometry, Photoelectric photometry, Spectrophotometry, Detectors and Image processing **Astronomical measurements:** Stellar magnitude sequence, Absolute magnitude and distance modulus, The bolometric magnitude, Different magnitude standards (UBV and six color), Radiometric magnitude, The color index of a star, Stellar parallax and units of stellar distances, Stellar positions, Stellar motions, The solar motion and the peculiar velocities of stars, Velocity dispersion, Statistical parallax, Moving cluster parallax	
II	**The Sun** Sun – a typical star, Photosphere limb darkening, Solar Granulation, Faculae, The Chromosphere, Solar corona, Prominences, The 11 year solar cycle, Solar magnetic fields, Theory of sunspots, Solar flares, Radio emissions from Sun, Solar wind, Solar neutrino puzzle	
III	**Spectral Classification of Stars, Binary and Multiple Stars** **Spectral Classification of Stars**: Introduction, Boltzmann's formula, Saha's equation of thermal ionization, Harvard classification – HD catalogue, Luminosity effect on stellar spectra, Importance if ionization theory in Astrophysics, Spectroscopic parallax, The H-R diagram **Binary and multiple stars**: Introduction, Visual binaries, Spectroscopic binaries, Eclipsing binaries, Multiple stars, Origin of binary stars, Stelar masses and mass luminosity relation, Mass transfer in close binary system	
IV	**Our Galaxy** Introduction, Rotation of the galaxy, Determination of rotational parameters in solar neighborhood, Radio observation of galaxy at 21 cm wave length, Rotation curve of the galaxy, Density distribution of gas and spiral structure, Radio and optical data, The general structure of our galaxy, The mass of our galaxy, Magnetic field in our galaxy, Cosmic rays, Continuous radio emission in our galaxy	

Basic Text & Reference Books :-

- An Introduction to Astrophysics
  Baidyanath Basu, Tanuka Chattopadhyay and Sudhindranath Biswas
  Prentice Hall India
- Astronomy and Astrophysics
  A.B.Bhattacharya, Overseas Publication
- Astrophysics of the Solar system
  Orient, Orient Longman