Veer Narmad South Gujarat University, Surat

Proposed Syllabus for T. Y. B. Sc. (Physics) Sem V

Elective Paper II

Astrophysics-I

Unit 1	**Astronomical Instruments(An Introduction to Astrophysics by Baidyanath Basu, Tanuka Chattopadhyay and Sudhindra Nath Biswas PHI Learning Private Ltd, 2nd ed.)**
	Optical Telescopes (1.3), Radio Telescopes (1.4), The Hubble Space Telescope (HST) (1.5), Astronomical Spectrograph (1.6), Spectrophotometry (1.9)
Unit 2	**Star (An Introduction to Astrophysics by Baidyanath Basu, Tanuka Chattopadhyay and Sudhindra Nath Biswas PHI Learning Private Ltd, 2nd ed.)**
	Magnitudes, Motions, and Distances of Stars Stellar Magnitude Sequence (3.1), Absolute Magnitude and the Distance Module (3.2), Radiometric Magnitudes (3.5), The colour index of a star (3.6), Luminosities of Star (3.7) **Spectral Classification of Stars** Introduction (4.1), Boltsmann's Formula (4.2), Saha's Equation of thermal Ionization (4.3), Importance of Ionization Theory in Astrophysics (4.6)
Unit 3	**The Sun (An Introduction to Astrophysics by Baidyanath Basu, Tanuka Chattopadhyay and Sudhindra Nath Biswas PHI Learning Private Ltd, 2nd ed.)**
	Sun- A Typical Star (5.1), The Photosphere: Limb- darkening (5.2), Solar Granulation (5.3), The Chromosphere (5.5), Solar Corona (5.6), Prominences (5.7), The 11 Year Solar Cycle and Sunspots (5.8), The Solar Magnetic Fields (5.9), Theory of Sunspots (5.10), Solar Flares (5.11), Radio Emissionfrom the Sun (5.12), Solar Wind (5.13), The Solar Neutrino Puzzle (5.14)
Unit 4	**Binary and Multiple Stars(An Introduction to Astrophysics by Baidyanath Basu, Tanuka Chattopadhyay and Sudhindra Nath Biswas PHI Learning Private Ltd, 2nd ed.)**
	Introduction (7.1), Visual Binary (7.2), Spectroscopic Binary (7.3), Eclipsing Binary (7.4), Multiple Stars (7.5), Origin of Binary Stars (7.6), Steller Masses and Mass Luminosity Relation (7.7), Mass Transfer in close Binary Systems (7.8)

Suggested books:

1. Astrophysics: Stars and Galaxies by K D Abhyankar, Unievrsity Press, 2001
2. Introduction to Cosmology by Jayant Narlikar, Cambridge University Press, 2002.

Veer Narmad South Gujarat University, Surat

Proposed Syllabus for T. Y. B. Sc. (Physics) Sem V

Elective Paper III

Measurements and Instrumentation-I

Unit 1	**Optoelectronic measurement (Electrical and Electronic Measurements and Instrumentation By A.K. Sawhney, Dhanpat Rai & Co 19th ed.)**
	Introduction (19.1), Monochromatic light (19.2), Polarized wave shape(19.3), Refraction and refractive index (19.4), Reflection, Absorption and transmission(19.5), Radiometry and photometry(19.6), Terms relating to photometry(19.7), Laws of illumination(19.11), Terms relating to radiometry(19.12), Photometry/radiometry measurement systems(19.13), Optical sources(19.14), Optical detectors(19.15).
Unit 2	**Electronic Instruments(Electrical and Electronic Measurements and Instrumentation By A.K. Sawhney, Dhanpat Rai & Co 19th ed.)**
	Introduction (20.1), Electronic voltmeter and their advantages(20.2), Vacuum tube voltmeter(20.3), Differential amplifier(20.4), Difference amplifier type of electronic voltmeter(20.5), Source follower types of electronic voltmeter(20.6), DC voltmeter with direct-coupled amplifier(20.7), Chopper stabilized amplifier(20.8), Electronic voltmeter using rectifier(20.9)
Unit 3	**Cathode Ray Oscilloscope(Electrical and Electronic Measurements and Instrumentation By A.K. Sawhney, Dhanpat Rai & Co 19th ed.)**
	Introduction (21.1), Cathode ray tube(21.2), Electron gun(21.3), Electrostatic focusing(21.4), Electrostatic deflection(21.5), Post deflection acceleration of electron beam(21.6), Effect of beam transit time and frequency limitations(21.7), Deflection plates(21.8), Graticule(21.10), Time base generator(21.13), Oscilloscope amplifiers(21.14), Vertical input and sweep generator signal synchronization(21.15), Attenuators(21.16), Basic CRO circuits(21.17), Observation of waveform on CRO(21.18), Measurements of voltage and currents(21.19), measurements of phase and frequency(21.20)
Unit 4	**Transducers(Electrical and Electronic Measurements and Instrumentation By A.K. Sawhney, Dhanpat Rai & Co 19th ed.)**
	Transducers (25.6), Electric-transducers (25.7), Classification Transducers (25.8), Characteristics and choice of transducers (25.9), Summary of factors influencing the choice of transducers (25.10), Resistive transducers (25.11), Potentiometers (25.12), Materials used for potentiometer (25.14), Advantages and disadvantages of resistance potentiometer (25.15)

Suggested books:

1. Electrical and electronic measurements and instrumentation By R.K.Rajput, S.Chand Publication
2. Electronic instrumentation by H.S.Kalsi, Mc Graw Hill (third Edition), 2017
3. Electrical and electronic measurements and instrumentation by Syed Imam and Vibhav Kumar Published by Wiley, 2020