

Astronomy
B.Sc. Semester I
(Applicable from July 2018)

Paper I Spherical Astronomy

Unit 1: Geometry of the sphere: Definitions and properties of Great circle, Small circle, and the Spherical triangle. Derivations of the Cosine formula, Sine formula, The Analogue formula, and Cotangent formula.

Unit 2: The Celestial sphere, The coordinate systems: Azimuth & altitude, Right ascension & declination, Longitude & latitude; Hour angle; Earth's diurnal motion and annual motion, Atmospheric refraction, Rising and setting of celestial bodies.

Unit 3: Twilight, Sidereal time, Mean Sun, Mean time, Equation of time, and The Universal time.

Unit 4: Kepler's laws, Planetary Phenomena.

Books recommended:

- Textbook on Spherical Astronomy by W. M. Smart
- Textbook on Spherical Astronomy by Gorakh Prasad

Paper II General Astronomy I

Unit 1: The Earth: The shape, size, rotation, and revolution of the earth, Its atmosphere; Airglow and Aurora; Origin, location and observations; Geomagnetic field, Van Allen radiation belts, trapped radiation.

Unit 2: The Moon: Its Motion, surface features, phases, and tides.

Unit 3: The Sun: Determination of surface temperature, surface features, chromosphere, corona, solar activity cycle and rotation.

Unit 4: The solar system: Bode's law, planets, asteroids, satellites, meteors, zodiacal light and Gagenchein, structure and physics of comets, Properties and origin of solar system.

Books recommended:

- Introduction of Astronomy by Fredrick and Baker
- Introduction to Astronomy by C. Payne Gaposhkin

Astronomy
B.Sc. Semester II
(Applicable from January 2019)
Paper III General Astronomy II

Unit 1:Elementary ideas about formation of stars, Magnitudes and colors of stars, Apparent, absolute and bolometric magnitudes of stars, Luminosity of stars.

Unit 2:Distances of stars: Trigonometrical parallax, Moving cluster method, Spectroscopic parallax; Determination of stellar mass and temperature; Elementary ideas about stellar systems: clusters of stars; Galaxies: shapes and sizes.

Unit 3:Astronomical Instruments: Telescopes, Its kinds, Types of foci, Mountings, Light gathering power, Magnifying power and resolving power of telescope, Defects of telescope images: Chromatic, spherical, and astigmatism.

Unit 4:Photoelectric photometers, astronomical filters; Spectrograph, its resolving power, dispersion, spectral resolution, speed of spectrograph; Dispersion and resolving power of prism and grating spectrograph.

Books recommended:

- Introduction of Astronomy by Fredrick and Baker
- Introduction to Astronomy by C. Payne Gaposhkin

Practical B.Sc. Semester II

1. Drawing of celestial spheres for (i) a place in northern latitude, (ii) a place in southern latitude, (iii) a place on the equator. Showing therein the Sun, the Moon, a planet, and a star.
2. Calculation of shortest distance between two places on the surface of the earth.
3. Calculation of the times of rising and setting of the sun and duration of twilight.
4. Calculation of lunar phases and brightness.
5. Problems on conversion of times.
6. Problems on converting from one coordinate system to another.
7. Determination of the semidiameter of the Sun by Sextant.

8. Determination of time from the altitude of the Sun by Sextant.
9. Determination of the latitude of the place from observations of the meridian transit of the Sun by Sextant

Books recommended:

- Practical Astronomy by W. Schroeder
- Practical Astronomy by J. J. Nassau
- Practical Astronomy by G. L. Hosmer and J. M. Rubbins
- Practical Astronomy With Your Calculator by Peter Duffett-Smith