

Radio Astronomy Techniques (RP 4.1.16)

General Astronomy Fundamentals: Solar system, Milky Way Galaxy, Extra-galactic systems and the Universe, Coordinate Systems, Measurement of time, distance and motion, Visual, photographic and radio magnitudes (3)

Radio Astronomy Fundamentals: Introduction, Power, spectral power and brightness, Brightness distribution, Discrete sources, Radiance, Minimum detectable temperature and flux density (5)

Radio Telescope Receivers: General principles, Receiver types, System noise, Total Power Receiver and its Sensitivity related issues, Dicke Receiver, Interferometer Receiver, Correlation Receiver, Noise Temperature and Noise Figure of a linear two-port, Noise temperature of linear two-ports in series connection (7)

Major Radio Astronomy Facilities: GMRT – basic advantages offered by India, scientific objectives, system configuration, signal flow, LOFAR, SKA – key drivers, prime characteristics, configuration (5)

Wave polarization: Polarization Response of an antenna to a radio wave of arbitrary polarization, Ellipse and Poincare sphere, Stokes' parameters (5)

Propagation effects affecting radio astronomy observations: Angular refraction, Faraday Rotation, Scintillations (5)