

DEPARTMENT OF GEOINFORMATICS

Entrance Test Syllabus for 1-year M.Sc. Geoinformatics Course Academic Session 2026 based on NEP-2020 UG syllabus

The detailed syllabus for the Entrance Test admission to the 1-year M.Sc. Geoinformatics course at the University of Kashmir is outlined under the following 16 units based on the NEP-2020 UG syllabus.

80 MCQ questions shall be set from the entire syllabus for the Entrance Examination

Unit 1 - Computer Science

Concepts of hardware and software. Storage devices. User Interface. Database concepts. Number systems: Binary, Decimal. Common Application Software. Compilers and interpreters. Computer networks. Processors.

Unit 2 – Geology

Origin, evolution, and structure of the Earth. Geological time scale. Earth's tectonics and plate movement. Causes and distribution of earthquakes. Rocks and rock types. Palaeoclimate proxies. Mass movements. Glacial landforms.

Unit 3 - Remote Sensing

History of remote sensing. Types of remote sensing. Typical remote sensing system. Important satellite systems: Landsat and IRS. Resolution and its types. Elements of image interpretation.

Unit 4 – Hydrology

Hydrologic cycle. Various hydrological processes. Hydrographs. Hydrological extremes - Floods, GLOFs, hailstorms, erratic snowfall. Hydropower estimation. Instrumentation for hydrometeorological monitoring.

Unit 5 - Geographic Information Systems

Historical perspective of GIS. Components and types of GIS. Geospatial data models. Data sources. National Geospatial Policy.

Unit 6 - Digital Cartography

Cartography - digital and analogue. Maps: introduction, types, and uses. Elements of maps. Concept of scale and projection. Survey of India topographic maps.

Unit 7 - Land Use Planning

Land use and land cover classification. Land capability classification, Weathering, erosion and types of erosion, soil classification, soil formation, and soil conservation.

Unit 8 Physical Geography of Jammu and Kashmir

Major rivers. Mountain ranges. Important glaciers and glacial catchments. Lakes and wetlands, including alpine lakes. Climate of Jammu and Kashmir.

Unit 9 - Physics of Earth

Sources of electromagnetic radiation. Electromagnetic spectrum. Radiation Laws. Interaction of electromagnetic radiation with the Earth: reflection, absorption, and emittance. Gravitational law. Laws of thermodynamics.

Unit 10 – Climatology

Origin, composition, and structure of the atmosphere. Global atmospheric circulation patterns. Regional influences – Western Disturbances, Indian Summer Monsoon. Climate change – causes and impacts. IPCC climate change scenarios.

Unit 11 – Statistics

Measures of central tendency and dispersion. Skewness and kurtosis. Linear and multivariate regression analysis. Sampling methods. Time series analysis.

Unit 12 – Mathematics

Arithmetic, geometric, and harmonic progressions. Logarithms. Permutations and combinations. Quadric and polynomial equations. Matrices and determinants. Set theory. Boolean Algebra.

Unit 13 – Advanced Remote Sensing

Interaction of EMR with earth: vegetation, water, soil. Image classification: supervised and unsupervised. Image enhancement techniques: histogram equalization and contrast enhancement. Image indices for vegetation, water, and snow.

Unit 14 – Microwave Remote Sensing

Concept of wavelength and frequency in microwave remote sensing. Space-borne and air-borne radar systems: AIRSAR, ASAR, RADARSAT, Sentinel 1. NASA-ISRO SAR mission. Backscattering coefficient and sigma naught. InSAR: Concept and applications.

Unit 15 – Geospatial Databases

Global and regional topographic datasets. MODIS snow cover and land surface temperature products. USGS Earth Explorer. Bhuvan: Thematic services pertaining to LULC, Land degradation, and geomorphology. Bhukosh data portal.

Unit 16 – Geospatial Statistics

Basic concepts of time series data analysis. Trend analysis of time series geospatial data. Significance of trends. Univariate and multivariate statistics for multidimensional satellite data. Spatial interpolation: Inverse Distance weighting, Krigging, and Natural Neighbour.