

Syllabus for Entrance Test for Ph.D. Geoinformatics

The syllabus for the entrance test for Ph.d. in Geoinformatics is based on the syllabus for the Masters in Geoinformatics course conducted by Bharati Vidyapeeth University. The Entrance exam will be based on the following topics.

1. Biosciences and Natural Resources

Basic ecological concepts and ecosystems: types, functions and structure; Biodiversity-levels, values, threats, conservation measures; Natural resources and associated problems; Planning conservation areas-criteria for conservation, approaches for conservation, tools for conservation and design criteria; Integrated watershed management-watershed management strategy, ecological assessment

2. Urban Planning

Introduction; Urbanisation and its impacts; Urban climatology; Disasters and urbanization; Housing; Slums; Urban traffic; Urban utility planning; Open space provisions; Planning laws and environment; Planning Agencies

3. Fundamentals of Remote Sensing

Introduction- Components, platforms, applications; Remote sensing of the environment- the remote sensing process; Principles of electro-magnetic radiations-atmospheric windows, energy matter interactions; Fundamentals of aerial photography- classification of aerial photography, scale, resolution, geometric characteristics of aerial photographs, photo recognition elements; Elements of visual interpretation; Sensors; Remote Sensing Data Products; Multi-spectral remote sensing; Thermal infrared remote sensing; Applications of passive, microwave and lidar remote sensing

4. Fundamentals of Geographic Information Systems

Introduction to GIS; Geographic data and data measurement map basics, basic geographic concepts; data models, data structures and data input; Global Positioning Systems; Database management; Data Analysis; GIS Project Design and Management

5. Photogrammetry and Digital image processing

Photogrammetric sensing systems; Introduction to digital image processing-data formats, errors; Image rectification and restoration; Image enhancement techniques; Image classification; Data merging and GIS integration; Hyperspectral Image analysis; Digital change detection

6. Geodatabase management

Overview of database; Database models and modeling; Spatial data and database systems; Introduction to oracle; Simple queries; PostgreSQL and PostGIS

7. Applications of remote sensing and GIS-I

Remote sensing and GIS applications in ecosystem studies and conservation, agricultural applications, urban applications, water resources and related applications, health studies, Remote sensing and GIS applications in forest studies, marine sciences, urban mapping, disaster management.

8. Spatial Statistics

Data in ecology and environmental sciences; Statistical techniques; Basic elements and tools of statistical analysis; Concepts of probability ; Distribution; Contingency tables and χ^2 ; χ^2 - test of goodness – of – fit and homogeneity ; Correlation of measurement; Regression analysis; Introductory Multivariate Statistics and Partial correlation Geostatistics

9. Spatial analysis

Introduction to Spatial analysis; Vector and raster based spatial analysis; Network analysis; Point pattern analysis; Surface analysis; Spatial modeling

10. Trends in Geoinformatics

Web GIS; 3D GIS and visualization; Object oriented GIS; Mobile GIS; Spatial data warehousing and mining; Open GIS consortium; Customization and automation in GIS