

**BS Geography 4 Years Programme, University of the Punjab, Lahore**

- **Introduction to GIS:**
  - Definition
  - Components of GIS
- **Spatial Data:**
  - Introduction
  - Types
  - Sources
- **GIS Data Structures:**
  - Introduction
  - Digital file structures: Simple lists, Ordered Sequential Files, Indexed Files
  - Digital database structures for Managing Data: Hierarchical Data Structures, Network systems, Relational Database Management Systems

- GIS Data Models for Multiple Coverages: Raster Models, Compact storing of Raster Data, Vector Models, Compacting Vector Data Models, Hybrid and Integrated Systems
- **Spatial Data Modeling:**
  - Introduction
  - Spatial data models
  - Spatial data structures
  - Modeling surfaces
  - Modeling networks
  - Modeling third and fourth dimensions
- **Attribute Data Management:**
  - Introduction
  - Creating a database
  - Integrating database
  - Development in database
  - GIS database applications
- **Spatial Data Input and Editing**
  - Introduction
  - Methods of Data Input
  - Data Editing
  - The Importance of Editing GIS Database
  - Detecting and Editing Errors
  - Projection Changes
  - Edge Matching
  - Conflation and Rubber Sheeting
  - Integrated databases
- **Spatial Analysis: Techniques of spatial analysis**
- **GIS Output:**
  - Display of Analysis
  - Cartographic output
  - Map design controls
  - Nontraditional Cartographic output
  - Technology and GIS output
- **GIS Project Design and Management:**

- Introduction
- Problem identification
- Designing a data model
- Project management
- Implementation problems
- Project evaluation

**Books Recommended :**

1. Environmental Systems Research Institute (ESRI) 1993: Understanding GIS: The ARC/INFO method. John Wiley & Sons, New York.
2. Found, W. C. 1971: A theoretical approach to rural land-use patterns. Edward Arnold London.
3. Garnett, A. 1945: The interpretation of topographical maps, Ltd., George G. Harrap & Co. London.
4. Huxhold, W.E. 1991: An Introduction to Urban Geographic Information Systems, Oxford University Press. Oxford.
5. Johnson et al. 1992: Geographic Information System and Mapping, American Society for Testing and Materials.
6. Lillesand, T. M. & Kiefer, R. W. 1994: Remote Sensing and Image Interpretation, John Wiley & Sons, New York.
7. Lo, C. P. 1976: Geographical Applications of Aerial Photography, Crane Russak, New York
8. Lyon J. G. & McCarthy J. (edit) 1995: Wetland and Environmental Applications of GIS, CRC Press Inc, USA.
9. Masser, I. & Blackmore, M. 1991: Handling Geographic Information, Longman, London.
10. Mather, A. S. 1986: Land Use, Longman, London.
11. Mather, P.M. 1993: Geographical Information Handling - Research and Applications, John Wiley & Sons, New York.
12. Peuquet, D. J. & Marble, D. F. 1990: Introductory Readings in Geographic Information Systems Taylor & Francis London.
13. Rhind, D. W., Googchild, M. F. and Maguire, D. J. (edit) 1991: Geographical Information Systems: Principles and Applications, Longman Group UK.
14. Rhind, D. W., Googchild, M. F. and Maguire, D. J. (edit) 1991: Geographical Information Systems: Principles and Applications, Longman Group, UK.
15. Scholten, H.J. & Stillwell, C.H. 1990: Geographic Information Systems for Urban and Regional Planning, Kulwer Academic Publications.