GIS in Civil Engineering

**Course Objectives**

1. Understanding the basic concepts of GIS and RS and learning the data-base creation and data structure
2. Spatial analysis and image classification
3. Gaining experiences with GIS and RS software tools (ArcGIS, ArcView)
4. Explore real-world applications of GIS and RS across natural science disciplines.

Week 1: Introduction to GIS

Week 2: Spatial Data; types and Sources

Week 3: Coordinate Systems and Projections

Week 4: Spatial analysis and modeling (part 1)

Week 5: Introducing ArcGIS

Week 6: Spatial analysis and modeling (part 1)

Week 7: Data Management

Week 9: Remote Sensing Data Integration

Week 10: 3D data and terrain analysis

Week 11: Spatial interpolation

Week 12: GIS and RS applications in natural disasters management

Week 13: GIS and RS applications in water and hydro-climate

Week 14: GIS and RS in Urban Planning

Week 15: Final Exam

Week 13: GIS in Environmental Management

Applications of GIS in environmental management

Case studies and practical exercises in environmental analysis with ArcGIS

Spatial decision support systems (SDSS) in ArcGIS

Week 14: GIS in Urban Planning

**Topic:**

1. Introduction to GIS.

2. Spatial data.

3. Spatial data modelling.

4. Attribute data management.

5. Vector and spatial GIS.

6. Data input, editing and analysis.

7. Analytical modelling in GIS.

8. Data query.

9. Introducing GIS software (ArcView, ArcMap)

10. Civil engineering applications in GIS (examples from water, transportation, earthquake environmental engineering fields)

**Course Text Book:**

1. Geographic Information Systems and Computer Cartography, Christopher Jones,

Longman Publishers.

2. An introduction to Geographic Information Systems, Ian Heywood et al.,

Longman Publisher.

**Course Assessment**

Assignments & short reports.………………….. 30%

Mid term …………………………. 20%

Final exa Introducing the fundamentals concepts of GIS and learning the data-base

creation and data structure. Study shape and data-base files relationships.

Learning the vector and raster GIS and practice civil engineering GIS-based

oriented applications.m …………………………………….. 50%