SPATIAL DECISION SUPPORT SYSTEMS
(GIS-877)

Contact Hours		Credit Hours	
Theory	= 72	Theory	= 3
Practical	= 0	Practical	= 0
Total	= 72	Total	= 3

Course Objectives

This course aims at decision analysis as a set of systematic procedures for analyzing complex spatial problems. It has its importance in solving many real-world spatial planning and management problems where it often becomes difficult to choose the most appropriate decision in the presence of several alternatives.

Course Outcomes

Students are expected to learn how to develop a spatial decision support system for a particular domain using multi criteria decision making techniques and software development paradigm.

Course outline

PART-I INTRODUCTION

a. Introduction to information and decision support systems
b. Decision and Decision Makers
c. Modeling decision process
d. The Systems Perspective of a DSS
e. Geographical data, information and decision making

PART-II MULTICRITERIA DECISION ANALYSIS

a. Introduction to multi criteria decision analysis
b. Spatial multi criteria decision analysis
c. Evaluation Criteria
    1. Hierarchical Structure of Evaluation Criteria
    2. Criterion Maps
    3. Scale of Measurement
    4. Deriving Commensurate Criterions Maps
    5. Linear Scale Transformation
    6. Value utility function
    7. Probabilities and Fuzzy sets
d. Decision alternative and constraints
e. Criterion Weighting
    1. Ranking Methods
    2. Rating Methods
    3. Pairwise Comparison Method

4. Trade-off Analysis Method

f. Decision Rules

1. Multi attribute Decision Rules
2. Simple Additive Weighting Methods
3. Analytical Hierarchy Process

g. Multi criteria decision support systems

1. Spatial Data Processing Systems
2. Spatial Decision Support Systems
3. Spatial Expert Systems
4. Spatial Expert Support Systems

PART-III ADVANCED TOPICS

a. Cellular Automata
b. Agent Based Modeling
c. Spatial Data Mining
d. Oracle Spatial
e. XML

Reference Books

a. GIS and Multicriteria Decision Analysis by Jacek Malczewski
b. George M. Marakas (2004) Decision Support Systems in the 21st century, Prentice Hall, India.
c. Class lectures and Lab exercises
d. Oracle Spatial 10g User Guide
e. Research papers and case studies provided during the semester