Syllabus GEOSCI 494A CPE 9/3/08

Fall 2008 UMass Outreach Continuing and Professional Education

Department of Geosciences


Lecture and Lab: 3-Credits W 6:00 - 9:00 Morrill IV 271

Instructor: Sean M. Fitzgerald, sf@geo.umass.edu, 572-2906 (H)

Office hours: W 3:30-5:30pm or by appointment

Objectives:

The objective of this course is to introduce the concepts and principles of GIS. Both theoretical and applied themes of GIS are included in this course; with an emphasis on professional application. Through the completion of labs and a final project, the students will become proficient in using ESRI ArcGIS for mapping, basic spatial analysis and other GIS applications.

Prerequisites:

Basic knowledge of computers, including MS windows

Required textbook:

(Available in Textbook Annex or online.)

  ISBN-10: 0971764727

Reference books: (optional)


Session Overview:

Sessions include a lecture phase covering GIS concepts and theory, and a Lab phase doing topical or thematic exercises, and/or assignments.
Completed exercises and assignments may be submitted by email attachment in MS Word or PDF format. Use ‘GIS Lab #’ as your email subject.

Session 1: Introduction to ArcGIS I
- Lab-server protocol and Data Archives
- Establish course modules
- Project Topics

Session 2: Introduction to ArcGIS II
- Data models-Vector and raster
- Geodatabases-Arc Catalog
- ARC MAP
- ARC CATALOG Projections, Coordinate Systems Datums

Thematic Module: Earth Systems
Session 3: Descriptive Analysis Thematic Mapping I
- Attribute Data Tables-Queries
- GPS & Remote Sensing Data Sources

Session 4: Descriptive Analysis Thematic Mapping II
- Table Statistics
- Vector data analysis, and Boolean and Continuous surfaces

Thematic Module: Socio-Political demographic analysis
Session 5: Basic spatial analysis -selection and classification
- Buffer and Overlay operations

Session 6: Map overlay-SMCDA-Model Builder
- Focal, Zonal and Block operations

Thematic Module: Economic Analysis
Session 7: Spatial Join-Geo-coding
- Introduction to Descriptive Spatial Statistics
Thematic Module: Epidemiology and Health Analysis

Session 8:  Spatial Pattern Analysis
            Interpolation and (Inferential) Geo-statistical analysis

Thematic Module: Public Policy Analysis

Session 9:  Introduction to Path & Network Analysis-Logistics
            Multi-Objective Spatial Analysis

Session 10: 3D analysis-TIN DEM data models
            View-shed Terrain Analysis –Site suitability

Spatial Modeling Review

Session 11: Projects I

Session 12: Projects II

Session 13: Projects III

Session 14: Presentations