SOSC 3240 APPLICATION OF GEOGRAPHICAL INFORMATION SYSTEMS

Fall, 2019
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COURSE WEBSITE:  http://canvas.ust.hk

LECTURE:   Friday: 12:00-13:20  Room 1409  by Lift 25-26
LAB:     Friday: 13:30-14:50   Room 4402  by Lift 17-18
Office Hour:    TBA     Room 3005   by Lift 4

COURSE DESCRIPTION

Geographic Information Systems (GIS) is a set of computer-based systems integrated for collecting, checking, storing, integrating, analyzing, and presenting spatial information.

Objectives:
1. the fundamental understanding and comprehensive knowledge of GIS basic concepts
2. a working knowledge of GIS technical issues
3. a practical training of using ArcGIS 10.6 from ESRI and associated hardware
4. GIS applications to various fields such as marketing, planning, social and environmental studies.

Main Form:  a lecture section + a lab tutorial section (every week in first two months)
Evaluation:   attendance & 5 quizzes (10%), lab exercises & assignments (20%), exam (30%),
group project (40%) = presentation (20%) + discussion (5%) + report in PPT file (15%)

* PREREQUISITE: Required to take a pretest in terms of database, computer and computing skills.

* QUIZZES:   Regular in-class PRS exercises with MCQs
EXAM:   The test will be close-notes with multiple choices and essay question

ASSIGNMENTS & LABS: Lab tutorials and two assignments (each assignment due in two weeks).

GROUP PROJECT: Independently perform a spatial analysis of a real world problem with a presentation (20 minutes).

TENTATIVE COURSE SCHEDULE

Week 1   (Sep 6)
Course Introduction & pretest
Lab: Tutorial Introduction
Introduction to ArcCatalog/ArcMap: creating your first map
Examples of past students’ GIS projects

Week 2   (Sep 13)
Lecture: Introduction to GIS and Social Analysis
What is GIS? Why use a GIS? Who uses a GIS?
Applications of GIS to Social Science and other fields
Lab: Introduction to ArcView GIS
Introduction to ArcTools
Create your map using GoogleEarth map

Week 3   (Sep 20)
Lecture: GIS basics
GIS, computer systems, and information systems
Lab: Basic functions of ArcView
Data input, storage output in ArcView GIS
Navigating layers and tables in ArcView GIS
Data selection and querying for social analysis

Week 4   (Sep 27)
Lecture: GIS data and data presentation
Spatial information, spatial data, data models, and maps
GIS coordinate and projection systems
GIS Data input and output
Lab: Data displaying
- Symbolizing data
- Labeling features
- Mapping using ArcGIS (layers and layouts)

Week 5 (Oct 4)
Lecture: GIS Project Introduction
- Project grouping
- Related topics introduction
Lab: Georeferencing
- Georeferencing with XY data
- Georeferencing with Geocoding
  i. Project Grouping

Week 6 (Oct 11)
Lecture: GIS Data Structures I
- Basic data structures and algorithms in GIS (raster data and vector data)
Lab: Data operations in ArcMap
- Creating new data in ArcMap
- Editing spatial data and social data using ArcMap
- Joining and relating tables of socio-demographic attributes
  ii. Project Proposal Submission

Week 7 (Oct 18)
Lecture: Feature relationship and topology
Lab: Analyzing feature relationship using ArcMap
- Union and intersect
- Merge and dissolve
- Buffering data
- Spatial join
  iii. Project Topic Discussion

Week 8 (Oct 25)
GIS Applications (Case studies)
- Resource planning and management- Case 1: Conservation studies.
- Marketing and network planning- Case 2: Precise marketing.
- Social Science.- Case 3: Clinton-Gore election
Lab: Analyzing Spatial Data using ArcGIS 10.6
- Spatial Analysis in social science and other fields
  iv. Project Topic Finalizing and Processing

Week 9-11 (Nov 1, 8, 15)
Project Progress discussion with instructors
Lab: Project data collection, input, and analysis

Week 12-13 (Nov 22, 29)
PowerPoint Presentation of Project Report (to be announced)

ESSENTIAL LEARNING MATERIALS
We will not use a required textbook for this course, but instead use material we created or available on Canvas:
1. Lecture notes and Lab tutorials
2. ESRI. 2012. What is GIS. ESRI.
4. ESRI. Getting to Know ArcGIS. Getting Started with ArcGIS, Chapter 1.

USEFUL Spatial Data WEBSITES: