SOSC 3240 APPLICATION OF GEOGRAPHICAL INFORMATION SYSTEMS

Fall, 2011-2012
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Office/Lab Hour: Tuesday 13:00~15:00

COURSE WEBSITE: http://lmes2.ust.hk/portal
CLASSROOM: Room 3006 by Lift 3 or Lift 4
LAB: Room 3001 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 9.0 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.
Evaluation: attendance (5%), lab assignments (40%), mid-term exam (25%), report (30%).

PREREQUISITE: basic computer skills.

Week 1 (9/1)
Course Introduction

Week 2 (9/8)
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

Week 3 (9/15)
Lecture: GIS basics
• GIS, computer systems, and information systems
• History and trends of GIS
Lab: Introduction to ArcView GIS
• Introduction to ArcGIS
• What is ArcView GIS
• Use of ArcView for Social Analysis

Week 4 (9/22)
Lecture: GIS data and data presentation
• Spatial information, spatial data, data models, and maps
• GIS coordinate and projection systems
• GIS data input and output
• Spatial data of socio-demographics
Lab: Basic functions of ArcView
• Data input, storage output in ArcView
• Navigating layers and tables in ArcView GIS
• Data selection and querying for social analysis

Week 5 (9/29)
Lecture: GIS Data Structures I
• Basic data structures and algorithms in GIS (raster data and vector data)
Lab: Data displaying and mapping in ArcView
• Symbolizing data
• Labeling features
• Mapping using ArcView GIS (layers and layouts)

Week 6 (10/6)
Lecture: TBD
Lab: Data operations in ArcView GIS
- Creating new data in ArcView
- Editing spatial data and social data using ArcView
- Joining and relating tables of socio-demographic attributes
- Geo-coding

Week 7 (10/13)
Lecture: TBD
Lab: Analyzing feature relationship using ArcView GIS
- Union and intersect
- Merge and dissolve
- Buffering data
- Spatial join

Week 8 (10/20)
Mid-term test

Week 9 (10/27)
Lecture: TBD
Lab: Analyzing Spatial Data using ArcView GIS I
- Spatial Analysis in social science and other fields

Week 10 (11/3)
Field trip to CUHK

Week 11 and 12 (11/10&11/17)
GIS Applications (Case studies)
- Resource planning and management.
  - Case 1: Conservation studies.
- Marketing and network planning.
  - Case 2: Precise marketing.
- Environmental studies.
  - Case 3: Hazard assessment.

Week 12 and 13 (11/24&12/1)
Power Point Presentation of Report

EXAM
The mid-term exam will be given on Oct. 20th. Exam will be in-class close-notes. The exam consists mostly of multiple selection and short essay questions.

ASSIGNMENTS AND LABS
Several assignments will be given for this semester. Each assignment is due in two weeks.

FINAL REPORT
To do a real world GIS application. Make some spatial analysis and a report of power point presentation (10-15 slides).

ESSENTIAL LEARNING MATERIALS
1. NCGIA. 1990 and 2000. *Introduction to GIS*. NCGIA.

REFERENCES