

Module Outline

Module Code : RE3903
Module Title : GIS for Real Estate
Semester : Semester 2, Academic Year 2022/2023
Faculty : Assistant Professor Wang Xize
Department : Real Estate
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Overview

Whether you are going to become a real estate investor, urban planner, city administrator, or policy analyst, the spatial aspects of cities will be a large part of your job. If you pursue a career related to disaster management, business consulting, shared mobility, public health, or a host of other goals, you will need to analyze the spatial data for the social or natural environment on a daily basis. We have developed tools, called Geographic Information Systems (or GIS) to assist us in analyzing spatial data and addressing spatial issues. Specifically, GIS is a computer system that captures, stores, visualizes, queries and analyzes geospatial data. As a field, GIS is fast-growing in the private sector, the public sector, and academia. In other words, GIS skills are valuable assets in today's competitive job market.

This module aims to serve as a first course on GIS with no prerequisites. It covers the basic concepts and applications of GIS, including basic cartography, data models, map projections, data creation, spatial databases, vector analysis, raster analysis and internet GIS. It especially focuses on building up the students' capacity of spatial information processing and spatial analysis in the context of real estate, urban policy and business.

Learning Outcomes

By the end of this module, the students will be able to:

- Acquire technical skills in the use of GIS software and database management tools
- Solve a diverse array of real-estate, urban policy or business problems using QGIS
- Learn qualitative methods in gathering & documenting data, analyzing information and effectively presenting results
- Investigate the potential of GIS technologies in a typical real estate, urban policy, and/or business setting
- Understand basic principles underlying the growth of web mapping, geospatial services and location-aware computing

Module Prerequisite(s)

Nil

Module Preclusion(s)

GE2215 Introduction to GIS & Remote Sensing;
GE3238 GIS Design and Practices

Format

RE3903 is a one-semester module and follows a lecture-and-lab format. The class usually meets once per week for three hours per session. Normally, each class meeting consists of a lecture session (first half) and a lab

session (second half). The lecture sessions cover the key concepts and theories related to GIS, with occasional demo sessions on selected GIS functions; the lab sessions provide hands-on learning experiences in using the GIS software for the students to work towards bi-weekly assignments.

GIS Software

The primary GIS software used in this module is QGIS. QGIS is an open-source software that can be downloaded and used free-of-charge. You are expected to bring a laptop and run QGIS on that laptop. QGIS is compatible with Windows, MacOS and Linux systems, so it does not matter which operation system your laptop is running on.

We will use the long-term release (or LTR) version of the QGIS software. As of the day of writing, the LTR version of QGIS is 3.22 “Bialowieza.” To more information of QGIS, see: <https://www.qgis.org/en/site/>. To download QGIS, see: <https://www.qgis.org/en/site/forusers/download.html>.

Reading

- Introduction to Geographic Information Systems, 9th edition. (2019). Kang-Tsung Chang. McGraw-Hill (Hard copies for the 8th and 6th editions are available at Central Library RBR)
- QGIS online training materials: https://docs.qgis.org/3.22/en/docs/training_manual/index.html

Tentative Schedule & Outline

Week	Date	Lecture	Lab
1	Jan. 9	Introduction to Module and GIS	
2	Jan. 16	Cartography and GIS Data Models	Lab 1: GIS Basics
3	Jan. 23	CNY Holiday, no class	
4	Jan. 30	Coordinate Systems and Projections	
5	Feb. 6	GIS Data Management and Relational Databases	Lab 2: Database Operations in GIS
6	Feb. 13	GIS Data Creation	
Recess Week 18 Feb to 26 Feb 2023			
7	Feb. 27	Spatial Analysis (Vector)	Lab 3: Vector Analysis
8	Mar. 6	Spatial Analysis (Raster)	
9	Mar. 13	Advanced Spatial Analysis	Lab 4: Raster Analysis
10	Mar. 20	Introduction to Internet GIS	
11	Mar. 27	Group Project Q&A and Troubleshooting	Group Project Lab Work
12	Apr. 3	Group Project "Meeting Each Group" Consultations	

13	Apr. 10	Group Project Presentation, Wrap-Up and Review	
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Assessment

Assessment Components	Weightage (%)
Individual Lab Assignments (4 Labs)	20
Group Project (presentation + slides)	20
Participation	10
Final Exam (Open book)	50
Total	100

Academic Honesty & Plagiarism

Academic integrity and honesty is essential for the pursuit and acquisition of knowledge. The University and School expect every student to uphold academic integrity & honesty at all times. Academic dishonesty is any misrepresentation with the intent to deceive, or failure to acknowledge the source, or falsification of information, or inaccuracy of statements, or cheating at examinations/tests, or inappropriate use of resources.

Plagiarism is “the practice of taking someone else’s work or ideas and passing them off as one’ own” (The New Oxford Dictionary of English). The University and School will not condone plagiarism. Students should adopt this rule - You have the obligation to make clear to the assessor which is your own work, and which is the work of others. Otherwise, your assessor is entitled to assume that everything being presented for assessment is being presented as entirely your own work. This is a minimum standard. In case of any doubt, you should consult your instructor.

Additional guidance is available at:

- <http://www.nus.edu.sg/registrar/administrative-policies-procedures/acceptance-record#NUSCodeofStudentConduct>
- <http://nus.edu.sg/osa/resources/code-of-student-conduct>

About me

Dr. WANG Xize is an assistant professor at the Department of Real Estate of National University of Singapore (NUS). He is also a faculty affiliate of NUS Institute of Real Estate and Urban Studies (IREUS) and NUS Centre for Family and Population Research (CFPR).

He works interdisciplinary in the fields of public policy, urban planning, public health and transportation. His current work focuses on (1) the impact of urban built environment on people’s mental health and well-being, as well as (2) how individuals and policy makers could best mitigate the negative health impacts of the incoming global challenges (e.g., climate change, and aging).

Prior to NUS, he has been a postdoctoral scholar at University of California, Berkeley. He received a Ph.D. in Urban Planning and Development at University of Southern California, a Master in Urban and Regional Planning at University of Minnesota, and a B.E. in Urban Planning and a B.A. in Economics in 2010 at Peking University, where he was also a recipient of China’s National Scholarship.