

GEOG 440 Business Applications of Geographic Information Systems

Instructor:

Prof. Mei-Po Kwan

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Lecture: Monday 10am to 10:50am

Teaching Assistant:

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Lab Time: Monday & Tuesday 3pm to 4:50pm (Location: 338 Davenport Hall)

Course objective

Geographic information systems (GIS) are increasingly used by business firms in a wide variety of business and strategic planning applications. These include areas like industrial site selection, service area analysis, understanding market demographics, spatial decision support, and planning logistics and distribution systems. This course focuses on the design and implementation of GIS for business and strategic planning applications, which includes application domains like marketing, real estate, financial services, insurance, transportation and logistics, healthcare service planning. The goals of the course include: (1) to provide students with an understanding of Geographic Information Systems; (2) to provide students with an understanding of how GIS can be applied in various business applications; (3) to familiarize students with GIS and modeling techniques; (4) to provide students with opportunities to work with various data sources through lab exercises.

Format of the course

This course will rely heavily on both lecture and discussion of the literature relevant to business applications of GIS. Students will gain experience in GIS by working on lab exercises and a class project related to their own area of interest. Students will have flexibility in defining the application area for their application. Graduate students who are taking 4 credit hours are expected to do a more extensive project in terms of scope (more literature review and/or longer write-up). There will be five lab exercises in this course. The lab is due by 11:59pm on the due date (See the schedule below). A penalty for the late submission will be given up to 2 days after the due date, and no points will be given to any assignment that is over 2 days late. Send your lab assignment to ypark96@illinois.edu.

Course readings

Required readings for this class include a variety of relevant chapters from the following books. It is compiled as a course packet. You can buy the course packet at the Illini Union Bookstore, and the price is \$16.

1. Church, R. L., & Murray, A. T. (2009). Business site selection, location analysis, and GIS. John Wiley & Sons.
2. Pogodzinski, J. M., & Kos, Richard M. (2013). Economic Development & GIS. Esri Press.
3. Pick, J. B. (Ed.). (2005). Geographic information systems in business. Igi Global.
4. Thomas, C., & Ospina, M. (2004). Measuring Up: the business case for GIS. Environmental Systems Research.
5. Wang, F. (2006). Quantitative Methods and Applications in GIS. London: CRC Press.
6. Thrall, G.T. (2002). Business Geography and New Real Estate Market Analysis. Oxford University Press.

Course requirements and Prerequisites

There is no prerequisite for the class. The distribution of the grade is as follows:

For Undergraduate students who take 3 credit hours:

- Two examinations (50%)
- Class discussion and participation (5%)
- Lab exercises (30%)
- Class project (15%)

For Graduate students who take 4 credit hours:

- Two examinations (50%)
- Class discussion and participation (5%)
- Lab exercises (30%)
- Critical Review of literature and class project (15%)

Examination and Class project

There will be two examinations (50%). Part of the evaluation will be based on the class project.

Students are required to formulate a project through defining an application or research problem and examining issues for using GIS techniques to address the problem. You can work on an individual project. You are also welcome to work in teams (2-3 students in one project usually). If you work in a team then the workload should be proportional to the number of the team members. Graduate students are required to do a project equivalent to the workload of a 4 credit hour course. All students will give a presentation of the project to the class at the end of the course. The presentation will count as part of the grade for the project. Every student needs to detail in a write-up of their contribution to the project, and all students will participate in the presentation in order to count towards their grade.

For graduate students who are taking a 4 credit hour course, you will be required to submit TWO reviews on the literature (from major journals). The length should be about 5 pages each.

Topics of lectures, Assigned readings and Schedule:

Week One (Jan 18)

M.L. King Day - no class

Week Two (Jan 25)

Introduction of GIS

Chapter 2 in "Business site selection, location analysis, and GIS"

Week Three (Feb 1)

Data models, representation, visualization in GIS

Chapter 1 in "Economic Development and GIS"

Lab 1 due (For students in the Tue lab session, due by Feb 2)

Week Four (Feb 8)

Techniques and Methods of GIS for business

Chapter 3 in "Geographic information systems in business"

Project Proposal due (1 page detailing the name of the team members and topic)

Week Five (Feb 15)

Save Money, Time and Generate Revenue by GIS

Chapter 1, 2, 3 and 7 in "Measuring Up: the business case for GIS"

Lab 2 due (For students in the Tue lab session, due by Feb 16)

Week Six (Feb 22)

In-class Examination

Week Seven (Feb 29)

Guest Lecture from Business Practitioner

Critical Review One Due for Graduate Students

Week Eight (Mar 7)

Spatial Decision Support Systems and Location Allocation in Business

Chapter 7 in "Geographic information systems in business"

Lab 3 due (For students in the Tue lab session, due by Mar 8)

Week Nine (Mar 14)

Trade and Service Area Analysis Using GIS

Chapter 4 in "Quantitative Methods and Applications in GIS"

GIS Analysis of Market: Customer Targeting

Chapter 4 in "Business Geography and New Real Estate Market Analysis"

Week Ten (Mar 21)

Spring Vacation - no class

Week Eleven (Mar 28)

Annual Meeting of Association of American Geographers -

Week Twelve (Apr 4)

GIS Analysis of Market: Geodemographics Approach

Chapter 7 in "Business Geography and New Real Estate Market Analysis"

Critical Review Two Due for Graduate Students

Lab 4 due (For students in the Tue lab session, due by Apr 5)

Week Thirteen (Apr 11)

In-class Examination

Week Fourteen (Apr 18)

Class Presentation

Week Fifteen (Apr 25)

Class Presentation

Lab 5 due (For students in the Tue lab session, due by Apr 26)

Week Sixteen (May 2)

Class Presentation

Written Project Due