

課程綱要 Course Syllabus

開課系所 Class/Department：城市治理英語碩士學位學程

課程中文名稱 Title of course in Chinese：地理資訊系統的原理與應用

課程英文名稱 Title of course in English：Principles and Applications of Geographic Information Systems (GIS)

授課教師 Instructor：Liao, Hsin-Chung 廖興中

應修系級 Major：Graduate Students

選修類別 Type of Credit： 必修 Required 選修 Elective

全半學年 Whole or Half Academic Year： 全學年 Whole 半學年 Half

學分 Credit(s)：2 時數 Hour(s)：2

教師網址 Instructor's Website：

<http://ppm.wp.shu.edu.tw/%e5%bb%96%e8%88%88%e4%b8%ad/>

先修科目 Prerequisites：

教學目標 Course Objectives：

This course is designed for students who don't have any prior knowledge of Geographic Information Systems (GIS). It focuses on the principles of GIS as a way of analyzing and understanding the world, focusing on urban and metropolitan places. GIS is a tool to provide geospatial information analysis and display results. Industry standard GIS software will be used in this course. Students learn the concepts of spatial analysis with GIS; use techniques in importing and creating spatial and attribute data; recognize critical components of cartography to design maps; and build attribute and spatial queries for problem solving based on spatially relationships. Laboratory exercises incorporate the use of GIS software (ArcGIS or GeoDa) in the analysis of urban issues.

內容綱要 Course Outline：

The class time is dedicated to everything GIS. A typical class consists of announcements/news, review of readings, discussion of a topic, introduction of new material, and expectations for next class. Some classes may have field work, activities, group work, independent work, videos, web-based activities, or demonstrations. Generally, the course follows this outline:

- Review of GIS Foundations topics & tools
- ESRI ArcGIS and GeoDa Intensive Labs
- Exploration of other spatial analysis tools and topics
- Final Project

學生核心能力權重 Student's Core Competence Index:

*校定核心能力：八項加總為 100%，不需每項均填寫，惟至少需填一項

項 目 Item	創意思考與問題解決 Creative thinking and Problem-solving	綜合統整 Comprehensive integration	溝通協調 Communication and Coordination	團隊合作 Teamwork
權 重 Weight	40 %	10 %	10 %	20%
項 目 Item	誠信正直 Honesty and Integrity	尊重自省 Self-Esteem and Self-reflection	多元關懷 Caring for Diversity	跨界宏觀 Interdisciplinary Vision
權 重 Weight	%	%	10%	10%

*系定核心能力及權重：(請依照系所訂定之核心能力及課程權重簡述如下)

教學進度 Teaching Schedule :

週別 Weekly Schedule	教學預定進度 Tentative teaching schedule	教學方法與教學活動 (可複選) Teaching Methods and activities
Week 1	Introduction to GIS-terminology and definitions	Lecture
Week 2	Introduction to GIS and Map	Lab Exercise
Week 3	Map Anatomy	Lecture Lab Exercise
Week 4	Good Map Design and Layouts	Lecture Lab Exercise
Week 5	Data, Information, and Where to Find Them, Data Input	Lecture Lab Exercise
Week 6	Geospatial data management	Lecture Lab Exercise
Week 7	Thematic Maps	Lecture Lab Exercise
Week 8	Geocoding, Attributes Queries, and Spatial Queries	Lecture Lab Exercise
Week 9	Final Project Discussion	Discussion *The project must include the following functions: <ul style="list-style-type: none"> ■ Spatial & attribute data download from a minimum of 3 websites. ■ Open and/or import spatial & attribute data and open spatial data in to ArcGIS.

		<ul style="list-style-type: none"> ■ Create a graph in Excel using a portion of downloaded data ■ Geocode an attribute database table or create points using x,y coordinates to create a shapefile. ■ Create a minimum of 2 attribute SQLs. One SQL must be a relational join. ■ Create a new field. Use update column or calculate values for an attribute field. ■ Create 2 (minimum) thematic maps. ■ Overlay 2 data layers to show at least 1 of following geoprocessing tools: clip, merge, intersect, dissolve, or union with apportioned data associated. ■ Create presentation quality mapslayouts, save all map documents. ■ Export map from ArcGIS to create jpg or emf files.
Week 10	Spatial Analysis: Mapping Where Things Are	Lecture Lab Exercise
Week 11	Spatial Analysis: Mapping the Most and Least	Lecture Lab Exercise
Week 12	Spatial Analysis: Mapping Density	Lecture Lab Exercise
Week 13	Spatial Analysis: Analyzing Patterns	Lecture Lab Exercise
Week 14	Introduction of Spatial Regression	Lecture Lab Exercise
Week 15	Exploring Spatial Data <i>with GeoDa I</i>	Lecture Lab Exercise
Week 16	Exploring Spatial Data <i>with GeoDa II</i>	Lecture Lab Exercise

Week 17	Final Project Lab Work Time	
Week 18	International Golden Map Award	Activities

評量方式 Evaluation Methods : (各項成績請填百分比; 合計 100%)

平時成績 Regular grades 40 %	期中成績 Mid-term grades 0 %	期末成績 Final grades 60%
<input checked="" type="checkbox"/> 出席率 Participation <input type="checkbox"/> 數位學苑作業與討論 Digital classroom assignment and discussion <input checked="" type="checkbox"/> 課堂討論 Class discussion <input checked="" type="checkbox"/> 平時作業 Regular assignment <input type="checkbox"/> 平時考試 Regular test <input type="checkbox"/> 其他 Others : _____	<input type="checkbox"/> 期中考 Mid-term <input type="checkbox"/> 書面報告 Written report <input type="checkbox"/> 口頭報告 Oral report <input type="checkbox"/> 其他 Others : _____	<input checked="" type="checkbox"/> 期末考 Final <input type="checkbox"/> 書面報告 Written report <input type="checkbox"/> 口頭報告 Oral report <input type="checkbox"/> 其他 Others : _____

指定用書 Required Texts :

- Kurland, K. S., & Gorr, W. L. (2012). GIS tutorial for health. ESRI, Inc..
- Clemmer, G. (2010). The GIS 20: essential skills. Esri Press.
- Corr, W. L., & Kurland, K. S. (2010). GIS-Tutorial. Workbook for ArcView 10. Redlands: ESRI Press, 2010.-354 p.

參考書目 Reference Books :

其他參考資料 Other References :

※備註：開課單位新增課程時，如無授課教師得暫以文字敘述教學進度與評量方式。