2023 Spring

Geospatial Information Technology and Analysis 空間資訊技術與應用分析

Class hour: Tuesday 14:00-17:00

Classroom：B204, BRC Building, Academia Sinica

Lecturer & course organizer：Dr. Chung-Te Chang (張仲德)

Office: LS135 at Department of Life Science, Tunghai University

Phone：04-23590121#LS135 分機32403

chungtechang@thu.edu.tw

Office Hours (討論時間及地點)：

Tuesday 14:00 -15:00 at LS135
Friday 10:00 – 11:00 at LS135

Course objectives (教學目的)：

Geographical Information System is designed to work with complicated environmental and geospatial data and provides functions for data entry, management, thematic mapping, data analysis and map layout. With increasing concerns of environmental and ecological issues, the requirements of applying geospatial information and various data types across scales become more and more important. To deal with environmental issues such as pollution, natural hazards, natural resources management, habitat suitability analysis and tourism/recreational planning, we usually require datasets from various spatiotemporal scales to better delineate their features. In this course, we will practice ArcGIS software and the diverse toolboxes with different data types and data conversions, and design, create and layout thematic maps.

Course schedule (主要內容與教學大綱)：

Week 01 [Feb. 21]: Introduction to GIS
Week 02 [Feb. 28 Peace Memory Day]:
Week 03 [Mar. 7]: GIS Data: vector model and raster model
Week 04 [Mar. 14]: GIS Data: vector model and raster model
Week 05 [Mar. 21]: Managing GIS data
Week 06 [Mar. 28]: Coordinate Systems
Week 07 [Apr. 4 Children's Day & Tomb Sweeping Day]:
Week 08 [Apr. 11]: **Mid-term Exam (or Basic editing)**
Week 09 [Apr. 18]: Presenting GIS Data
Week 10 [Apr. 25]: Attribute Data
Week 11 [May 2]: Queries
Week 12 [May 9]: Spatial Joins
Week 13 [May 16]: Mapping Overlay and Geoprocessing 1
Week 14 [May 23]: Mapping Overlay and Geoprocessing 2

Week 15 [May 30]: Raster Analysis
Week 16 [Jun. 6]: **Final-term Reports (Application of open data and design Story Map)**

Major Textbooks:
Prince MH (2019) Mastering ArcGIS. 7th edition, McGrawHill Education.

Hardware requirements for ArcGIS Installation
Platform: **Windows**
Memory/RAM: minimum 4 GB (8 GB or higher will be recommended)
Disk space: minimum 4 GB (6 GB or higher will be recommended)
Video/Graphics adapter: 64 MB RAM minimum (256 MB RAM or higher recommended). NVIDIA, AMD, and Intel chipsets supported

Presentation of final-term major assignment and report
Each student will lead a 15-minute presentation and discussion of his/her story maps, including the data sources, object of the thematic maps and the major outcomes from the GIS analysis and mapping (3-5 maps at least). (Week 16)
Following the major assignment, each student needs to write his/her report (no more than 10 pages) using the format of journal *Ecosystems*.
The report structure should include Introduction, Materials and Methods, Results and Discussion, Conclusions and References.

Finally, each student should hand the final term report (paperwork) to me by the end of week 16 (before Sunday), at the following email (chungtechang@thu.edu.tw).

Grading policy (成績考核)
Class participation (15%)
Assignment (50%)
Final-term assignment and report (35%)
*penalty of 5% loss of paper grade will be applied for each day past due

Bonus: will depend on students who raise questions, discuss and the performance of assignment in the class.