GEOG3432 GIS Workshop

 # Fulfill requirements of method-related courses

TIMETABLE ARRANGEMENT: Annual; 2nd Semester **CREDITS:** 6

COURSE TEACHER: Dr. Jia HE

ASSESSMENT:

COURSEWORK 100 %
• Programming tasks • Class discussion • Course projects

OBJECTIVES:
To equip students with the skills necessary to design and implement a GIS system that is capable of addressing a specific set of application issues.

COURSE SYNOPSIS:
The GIS Workshop is a hands-on course that provides students with practical experience in designing and implementing GIS projects. Students will learn the basic principles of GIS project design and work independently on a project that is relevant to their field of interest. Topics covered in the course include GIS system design, database design, Python programming, and workflow diagram design. Students will gain extensive experience in using and customizing GIS software, and will learn how to design and implement a GIS system that meets the specific needs of their project through Python programming. Additionally, students will also learn how to design workflow diagrams, which are an essential tool for organizing and visualizing complex GIS projects. Throughout the course, students will apply the GIS techniques they have learned in a substantive and meaningful way by working on a self-designed project. Students will be expected to demonstrate competence in using and developing GIS techniques, and to produce a final project that showcases their skills and knowledge.

LECTURE TOPICS:
- Introduction to advanced GIS
- Overview of GIS and GIS application system design
- Database design
- Python basics
- Python code editing and debugging
- Constructing workflows using ModelBuilder
- Working with layers, tables, geometries and rasters
- Manipulating spatial data with Python code

RECOMMENDED READING LIST:
- Paul A. Zandbergen, 2020. *Python Scripting for ArcGIS Pro*, ESRI Press.
- Python in ArcGIS Pro: https://pro.arcgis.com/en/pro-app/latest/arcpy/get-started/installing-python-for-arcgis-pro.htm

	Course Learning Outcomes (CLOs) After completing this course, students would be able to:	**Alignment with Programme** Learning Outcomes (PLOs)*						**Course Assessment Methods**
		1	2	3	4	5	6	
1	Demonstrate a comprehensive understanding of the principles of GIS system design and implementation.	✔	✔					Class discussion & Course projects
2	Develop proficiency in using Python programming language to write scripts and automate GIS tasks.		✔	✔	✔			Programming tasks & Course projects
3	Design and implement workflows using a range of GIS tools and techniques.		✔	✔	✔			Programming tasks, Class discussion, & Course projects
4	Customize and extend ArcGIS tools and workflows using Python to meet specific project requirements.		✔	✔	✔	✔	✔	Programming tasks, Class discussion, & Course projects
5	Demonstrate competence in using and developing GIS techniques, and be able to apply them in a substantive and meaningful way to solve real-world problems.	✔	✔	✔	✔	✔	✔	Class discussion, & Course projects

*Geography Major Programme Learning Outcomes (PLOs)

In order to meet the demands and challenges in this dynamic and ever-changing world, the Department has designed a series of well-structured and contemporary courses to cater to the different interests of students. Its courses are designed to align with the University's educational aims which hope to nurture future generations not only with a critical and intellectual mindset, but also with a passion to contribute to society in general.

After completing the programme, Geography Major students should be able to:

PLO1 **critically analyse the geographical aspects of the relationship between people and the natural environment;**

PLO2 **demonstrate and develop an understanding of how these relationships have changed with space and over time;**

PLO3 **identify, collect and utilize primary and secondary data to investigate and analyse the issues and problems facing people, places and society;**

PLO4 **integrate, evaluate and communicate information from a variety of geographical and other sources;**

PLO5 **participate in promoting social, economic and environmental sustainability at the local, regional and global scales; and**

PLO6 **effectively apply a range of transferable skills in academic, professional and social settings.**