GEOG3430 Geospatial Data for Environmental Change

TIMETABLE ARRANGEMENT: Annual; 2nd Semester

CREDITS: 6

COURSE TEACHER: Professor Peng ZHU

ASSESSMENT:

EXAMINATION 50 %	COURSEWORK 50 %
• a two-hour exam	• Lab exercises • Report on a group project (Essay)

OBJECTIVES:
This course is designed to introduce basic concepts of geospatial data and environmental change issues. It aims to equip students with the knowledge and skills to apply geospatial datasets in addressing environmental change issues.

COURSE SYNOPSIS:
This course introduces the application of geospatial data in environmental change monitoring and modeling. It will first introduce basic concepts of geospatial data and environment issues. The course will then delve into the practical application of geospatial data in environmental change studies, including climate change, land cover, vegetation, hydrology, ecosystem production, and agricultural systems.

LECTURE TOPICS:
• Geospatial data overview
• Satellite remote sensing basics
• Environmental change issues
• Data analysis of climate systems
• Land cover classification and dynamics
• Vegetation monitoring and production models
• Terrestrial carbon cycling
• Hydrological monitoring and modeling
• Spatial data applications in cropping system
• Integration of satellite observations and models

RECOMMENDED READING LIST:
• GIS: Research Methods, 2020, Bearman, N. Bloomsbury Publishing.
• Ecological Climatology : Concepts and Applications, 2015, Gordon Bonan, Cambridge University Press
• Climate Change and Terrestrial Ecosystem Modeling, 2019, Gordon Bonan, Cambridge University Press
• Advanced Remote Sensing: Terrestrial Information Extraction and Applications, edited by Shunlin Liang and Jindi Wang, 2019, Academic Press. (U. of I. online resources: http://www.sciencedirect.com/science/book/9780123859549)

	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	Gain a scientific understanding of the environmental change issues influenced by physical and societal factors.	✔	✔					Essay & exam
2	Understand the strengths and weaknesses of different geospatial datasets and modeling strategies for various environmental change issues.	✔			✔			Lab exercises & exam
3	Develop critical thinking skills to solve a real-world environmental problem with various applications of geospatial data.			✔	✔	✔		Lab exercises & exam
4	Acquire sufficient hands-on skills to utilize and analyze one or more types of geospatial data for environmental research.			✔	✔	✔	✔	Essay, Lab exercises
5	Obtain the skills of "story-telling"-based communication for science, through paper discussions and project paper writing.				✔	✔	✔	Essay

*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.