

**COURSE TEACHER:** Dr. He Jia

**ASSESSMENT:**

**COURSEWORK 100 %**

- Lab exercises
- Comprehensive quiz
- Course project

**OBJECTIVES:**

This course is designed to build upon the fundamental concepts of GIS and provide students with a deeper understanding of GIS models and spatial analysis so as to address more complex geographical issues.

**COURSE SYNOPSIS:**

This course broadens the major research and application issues in GIS on the basis of understanding fundamental GIS concepts. The course will cover a range of topics, including spatial analysis and modeling, geospatial data management using Geodata, 3D analysis, and advanced GIS applications such as transportation planning. The course will emphasize the practical application of GIS, and students will have the opportunity to work on a project that applies GIS tools to a real-world problem or scenario. In addition, lab sessions and class discussions will provide opportunities for students to gain hands-on experience with GIS software and to engage with their peers in exploring the potential of GIS as a powerful tool for solving complex geographical and transportation issues. By the end of the course, students will have gained a deeper understanding of GIS concepts and techniques, as well as an appreciation for the ways in which GIS can be used to address a wide range of spatially-related challenges.

**LECTURE TOPICS:**

- Introduction to advanced GIS
- Geospatial data management
- Network analysis and accessibility
- Multi-criteria routing
- Spatial interpolation and prediction
- 3D analysis
- Applications including transportation planning

**RECOMMENDED READING LIST:**

- Chang, K. (2018) *Introduction to Geographic Information Systems*, 9th Edition, Boston: McGraw-Hill Higher Education.
- Longley, P.A., Goodchild, M.F., Maguire, D.J. and Rhind, D.W. (2015). *Geographic Information Science and Systems* (4th Edition), Wiley.

| Course Learning Outcomes (CLOs)<br>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 GIS theory and methodology, including data models, GIS architectures, and spatial analysis.                | ✓  | ✓ |   |   |   |   | Lab exercises, Comprehensive quiz, & Course project |
| 2   | Develop proficiency in utilizing advanced spatial analytical functionalities, including spatial interpolation, route planning, and location-allocation. |  |   | ✓ | ✓ |   |   | Lab exercises & Course project                      |
| 3   | Analyze and evaluate the applications of GIS in transportation planning and other geographical contexts.  | ✓  | ✓ |   |   | ✓ | ✓ | Comprehensive quiz & Course project                 |
| 4   | Apply GIS tools and techniques to solve real-world transportation and geographical issues.  | ✓  | ✓ | ✓ | ✓ | ✓ | ✓ | Comprehensive quiz & Course project                 |

### **\*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.