THE EDUCATION UNIVERSITY OF HONG KONG

Course Outline

Part I

Programme Title	**:**	Bachelor of Social Sciences (Honours) in Sociology and Community Studies and Bachelor of Education (Honours) (Geography); all undergraduate programmes
Programme QF Level	**:**	5
Course Title	**:**	**Spatial Data Analysis and GIS**
Course Code	**:**	GGP2020
Department	**:**	Social Sciences and Policy Studies
Credit Points	**:**	3
Contact Hours	**:**	39
Pre-requisite(s)	**:**	Nil
Medium of Instruction	**:**	English
Course Level	**:**	2

Part II

The University's Graduate Attributes and seven Generic Intended Learning Outcomes (GILOs) represent the attributes of ideal EdUHK graduates and their expected qualities respectively. Learning outcomes work coherently at the University (GILOs), programme (Programme Intended Learning Outcomes) and course (Course Intended Learning Outcomes) levels to achieve the goal of nurturing students with important graduate attributes.

In gist, the Graduate Attributes for Sub-degree, Undergraduate, Taught Postgraduate, Professional Doctorate and Research Postgraduate students consist of the following three domains (i.e. in short "PEER & I"):

- **P**rofessional **E**xcellence;
- **E**thical **R**esponsibility; **&**
- **I**nnovation.

The descriptors under these three domains are different for the three groups of students in order to reflect the respective level of Graduate Attributes.

The seven GILOs are:

1. Problem Solving Skills
2. Critical Thinking Skills
3. Creative Thinking Skills

4a. Oral Communication Skills

4b. Written Communication Skills

5. Social Interaction Skills
6. Ethical Decision Making
7. Global Perspectives

1. **Course Synopsis**
This course provides students with the knowledge of spatial data analysis and skills in using GIS software to conduct geographical data analysis. This is an independent course which can be taken by students from various disciplines and is also beneficial to students with a general interest in the spatial analysis of geographical or environmental data.

2. **Course Intended Learning Outcomes** ($CILO_s$)
Upon completion of this course, students will be able to:

$CILO_1$: analyze spatial data and provide cartography visualization;

$CILO_2$: identify the use of geographic information system (GIS) in different areas such as presentation of detailed data, environmental issues, road networks, utilities, property records, and community facilities;

$CILO_3$: apply different kinds of data collection methods including digitizing maps, scanning, photo interpretation, and remote sensing to capture measurement data;

$CILO_4$: evaluate the data quality and to organize appropriate storage and indexing;

$CILO_5$: recognize the role played by GIS and spatial data analysis in geography teaching.

3. **Content, CILOs and Teaching & Learning Activities**

Course Content	CILOs	Suggested Teaching & Learning Activities
(a) Introduction to Spatial Analysis • Classification and reclassification • Spatial measurement, aggregation, overlays • Spatial filtering spatial interpolation • Digital terrain model • Network analysis	*$CILO_1$*	• Lectures • Classroom discussions • Tutorials or workshops
(b) Map reading, design and interpretation • Principle of map making • Design consideration • Reading and interpretation skills • Word processing, IT and graphics	*$CILO_{2,3}$*	• Lectures • Classroom discussions • Tutorials or workshops
(c) Introduction to GIS • Definition and components of GIS • Georeferencing system • GIS functions and limitations	*$CILO_2$*	• Lectures • Classroom discussions • Tutorials or workshops
(d) GIS data and collection method • Vector and raster data • Spatial data modeling	*$CILO_{2,3}$*	• Lectures • Classroom discussions

Course Content	CILOs	Suggested Teaching & Learning Activities
• Remote sensing • Field survey • Data quality and transforming • Cartographic instrument		• Tutorials or workshops
(e) GIS Project and Database Management • GIS database design • Data entities • GIS project design and implementation	$CILO_{2,4}$	• Lectures • Classroom discussions • Tutorials or workshops
(f) Application of statistical data processing in GIS • Attribute operations • Statistics package	$CILO_{3,4}$	• Lectures • Classroom discussions • Tutorials or workshops
(g) Application of GIS on geography teaching	$CILO_{5}$	• Lectures • Classroom discussions • Tutorials or workshops

4. Assessment

Assessment Tasks	Weighting (%)	CILO
(a) Exercises Exercises assessing students' understanding of technical skills about GIS applications.	40%	$CILO_{1,2}$
(b) Group project report Written report evaluating students' practical skills such as designing GIS analysis model, collecting GIS data sets, carrying out the planned analysis and providing cartography visualization.	30%	$CILO_{1,2,3,4,5}$
(c) Examination A two-hour written examination comprising of various format of questions aiming to assess different levels of knowledge such as analytical skills of cases, basic concepts and data models.	30%	$CILO_{1,2,3,4}$

5. Use of Generative AI in Course Assessments

Please select one option only that applies to this course:

☐ ***Not Permitted***: In this course, the use of generative AI tools is not allowed for any assessment tasks.

☑ ***Permitted***: In this course, generative AI tools may be used in some or all assessment tasks. Instructors will provide specific instructions, including any restrictions or additional requirements (e.g., proper acknowledgment, reflective reports), during the first lesson and in relevant assessment briefs.

6. Required Text(s)

Heywood, I., Cornelius, S. & Carver, S. (2011). *An Introduction to Geographical Information Systems*, 4th edition. Harlow, England; Hong Kong: Prentice Hall.

7. Recommended Readings

Batton-Hubert, M., Desjardin, E., & Pinet, F. (2019). *Geographic data imperfection. 1, From theory to applications* (M. Batton-Hubert, E. Desjardin, & F. Pinet, Eds.). ISTE, Limited; Wiley. https://doi.org/10.1002/9781119507284

Birkin, M., Clarke, G., Corcoran, J., & Stimson, R. (2021). *Big data applications in geography and planning : an essential companion* (M. Birkin, G. Clarke, J. Corcoran, & R. Stimson, Eds.). Edward Elgar Publishing.

Chang, K.-T. (2016). *Introduction to geographic information systems* (8th edition.). McGraw-Hill Education.

Chun, Y. W., Griffith, D. A. (2013). *Spatial Statistics & Geostatistics: Theory and applications for geographic information science & technology*. Sage.

Fischer, M. M.; Wang, J. F. (2011). Spatial Data Analysis: Models, methods and techniques. Springer Briefs in Regional Science. New York and Heidelberg: Springer.

Kennedy, M. (2013). *Introducing geographic information systems with ArcGIS a workbook approach to learning GIS* (3rd ed.). Wiley.

Lloyd, C. (2010). *Spatial Data Analysis: An introduction for GIS user*s. Oxford University Press.

Price, M. H. (2016). *Mastering ArcGIS* (7th edition.). McGraw-Hill Education.

Solari, O. M., Demirci, A., & Schee, J. A. van der. (2015). *Geospatial technologies and geography education in a changing world : geospatial practices and lessons learned* (O. M. Solari, A. Demirci, & J. A. van der Schee, Eds.). Springer. https://doi.org/10.1007/978-4-431-55519-3

Stimson, R. J., Haynes, K. E. (2012). *Studies in Applied Geography and Spatial Analysis: Addressing real world issues*. Edward Elgar.

8. Related Web Resources

Geospatial Analysis - A comprehensive guide
http://www.spatialanalysisonline.com

9. Related Journals

International Journal of Geographical Information Science
International Journal of Remote Sensing
Cartography and Geographic Information Science
Journal of Geographical Systems
Mapping Sciences and Remote Sensing
Remote Sensing of Environment
Computers and Geosciences
Transactions in GIS
GeoInformatica
Journal of Geographical Systems
Geofocus International Review of GI Science and Technology
Geographical Analysis

10. Academic Honesty

The University upholds the principles of honesty in all areas of academic work. We expect our students to carry out all academic activities honestly and in good faith. Please refer to the *Policy on Academic Honesty, Responsibility and Integrity* (https://www.eduhk.hk/re/uploads/docs/00000000001633679892454 8BbN5). Students should familiarize themselves with the Policy.

11. Others

Newspaper articles and other media reports, including contemporaneous reporting, related to the course; recent related reports from scientific organisations and nongovernmental organisations; new video media and websites.

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