

# THE EDUCATION UNIVERSITY OF HONG KONG

## Course Outline

### Part I

<b>Programme Title</b>	: Bachelor of Education (Honours) (Geography) (Five-year Full-time)
<b>Programme QF Level</b>	: 5
<b>Course Title</b>	: Spatial Data Analysis and GIS
<b>Course Code</b>	: GGP1003
<b>Department</b>	: Social Sciences
<b>Credit Points</b>	: 3
<b>Contact Hours</b>	: 39
<b>Pre-requisite(s)</b>	: Nil
<b>Medium of Instruction</b>	: English
<b>Course Level</b>	: 1

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### Part II

The University's 4Cs Learning Framework 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 attributes embodied in the 4Cs.

The 4Cs are:

- Character and moral responsibility
- Competence and professional excellence
- Cultivation of wisdom and intellectual engagement
- Civic-mindedness & social responsibility

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. Synopsis

This course provides students with the fundamental 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 (CILOs)

Upon completion of this course, students will be able to:

CILO<sub>1</sub>: analyze spatial data and provide cartography visualization.

CILO<sub>2</sub>: 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<sub>3</sub>: apply different kinds of data collection methods including digitizing maps, scanning, photo interpretation, and remote sensing to capture measurement data.

CILO<sub>4</sub>: evaluate the data quality and to organize appropriate storage and indexing.

CILO<sub>5</sub>: 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
<b>1. Introduction to Spatial Analysis</b> a) Classification and reclassification b) Spatial measurement, aggregation, overlays c) Spatial filtering spatial interpolation d) Digital terrain model e) Network analysis	CILO <sub>1</sub>	<ul style="list-style-type: none"> <li>• Lectures</li> <li>• Classroom discussions</li> <li>• Tutorials or workshops</li> </ul>
<b>2. Map reading, design and interpretation</b> a) Principle of map making b) Design consideration c) Reading and interpretation skills d) Word processing, IT and graphics	CILO <sub>2,3</sub>	<ul style="list-style-type: none"> <li>• Lectures</li> <li>• Classroom discussions</li> <li>• Tutorials or workshops</li> </ul>
<b>3. Introduction to GIS</b> a) Definition and components of GIS b) Georeferencing system c) GIS functions and limitations	CILO <sub>2</sub>	<ul style="list-style-type: none"> <li>• Lectures</li> <li>• Classroom discussions</li> <li>• Tutorials or workshops</li> </ul>
<b>4. GIS data and collection method</b> a) Vector and raster data b) Spatial data modeling c) Remote sensing d) Field survey e) Data quality and transforming	CILO <sub>2,3</sub>	<ul style="list-style-type: none"> <li>• Lectures</li> <li>• Classroom discussions</li> <li>• Tutorials or workshops</li> </ul>

Course Content	CILOs	Suggested Teaching & Learning Activities
f) Cartographic instrument		
<b>5. GIS Project and Database Management</b> a) GIS database design b) Data entities c) GIS project design and implementation	<i>CILO<sub>2,4</sub></i>	<ul style="list-style-type: none"> <li>Lectures</li> <li>Classroom discussions</li> <li>Tutorials or workshops</li> </ul>
<b>6. Application of statistical data processing in GIS</b> a) Attribute operations b) Statistics package	<i>CILO<sub>3,4</sub></i>	<ul style="list-style-type: none"> <li>Lectures</li> <li>Classroom discussions</li> <li>Tutorials or workshops</li> </ul>
<b>7. Application of GIS on geography teaching</b>	<i>CILO<sub>5</sub></i>	<ul style="list-style-type: none"> <li>Lectures</li> <li>Classroom discussions</li> <li>Tutorials or workshops</li> </ul>

#### 4. Assessment

Assessment Tasks	Weighting (%)	CILO <sub>s</sub>
(a) <b>Exercises</b> Exercises assessing students' understanding of technical skills about GIS applications.	40%	<i>CILO<sub>1, 2</sub></i>
(b) <b>Group project report</b> 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%	<i>CILO<sub>1,2,3,4,5</sub></i>
(c) <b>Examination</b> 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%	<i>CILO<sub>1,2,3,4</sub></i>

#### 5. Required Text(s)

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

#### 6. Recommended Readings

- Lloyd, C. (2010). *Spatial Data Analysis: An introduction for GIS users*. Oxford University Press.
- DeMers, M. N. (2009). *Fundamentals of Geographic Information Systems*. Hoboken, NJ: Wiley.
- Lloyd, C. (2007). *Local Models for Spatial Analysis*. Boca Raton: CRC/Taylor & Francis.
- Wang, F. H. (2006). *Quantitative Methods and Applications in GIS*. Boca Raton, FL: CRC/Taylor & Francis.
- Chun, Y. W., Griffith, D. A. (2013). *Spatial Statistics & Geostatistics: Theory and applications for geographic information science & technology*. London: Sage.
- Stimson, R. J., Haynes, K. E. (2012). *Studies in Applied Geography and Spatial Analysis: Addressing real world issues*. Cheltenham: Edward Elgar.
- Fischer, M. M.; Wang, J. F. (2011). *Spatial Data Analysis: Models, methods and techniques*. Springer Briefs in Regional Science. New York and Heidelberg: Springer.

## 7. Related Web Resources

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

## 8. 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*

## 9. Academic Honesty

The University adopts a zero tolerance policy to plagiarism. For the University's policy on plagiarism, please refer to the *Policy on Academic Honesty, Responsibility and Integrity with Specific Reference to the Avoidance of Plagiarism by Students* (<https://www.eduhk.hk/re/modules/downloads/visit.php?cid=9&lid=89>). Students should familiarize themselves with the Policy.

## 10. Others

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

*Updated 31 July 2017*