Course Title	:	GIS and Managing Smart City
Course Code	:	PMS4101
Recommended Study Year	:	2
No. of Credits/Term		3
Mode of Tuition	:	3-hour Lecture
Class Contact Hours	:	3 hours per week
Category in Major Prog.	:	Required
Discipline	:	Interdisciplinary
Prerequisite(s)	:	N/A
Co-requisite(s)	:	N/A
Exclusion(s)	:	N/A
Exemption Requirement(s)	:	N/A

Brief Course Description

This course provides a fundamental understanding of the concept of Geographical Information System (GIS) and Smart Cities. GIS has been integrated into many different disciplines (e.g., environmental science, criminology, social science, business, public health, etc.) and offers a supportive role in Smart City planning and decision-making. The course will discuss the importance of GIS to building and managing Smart Cities. Case studies and examples of GIS application will be elaborated. The ethical, legal, and societal issues in the field will also be reviewed and addressed. This course combines lecture (1-hour) and hands-on session (2-hour). Lecture will cover the Smart City Blueprint for Hong Kong 2.0, and the role of GIS in enabling Smart Cities. Hands-on tutorial will explore industry leading web-based mapping applications and learn GIS analytical skills by practice.

Aims

The aim of this course is to provide a solid foundation of understanding what is GIS and the importance of how GIS is being used and integrated in Smart City development. The course will also cover the operation skills needed to use GIS software and conduct GIS applications.

Learning Outcomes (LOs)

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

1. Recognise key concepts and principles of Smart Cities and GIS
2. Understand and embrace the importance of GIS in Smart City Development
3. Discuss and evaluate the case studies of GIS applications being integrated in Smart Cities and the ethical/societal issues that may arise
4. Acquire operational skills in the use of GIS software
5. Design and conduct an independent GIS project or application

Indicative Content

1. Introduction to Smart City and its components
2. Geospatial open data and common spatial data infrastructure
3. Spatial mapping and analysis
4. Location-based analysis and applications
5. Real-time GIS and Information and Communications Technology (ICT)
6. Smart City data collection and public engagement
7. Managing accuracy and uncertainty in GIS

8. GIS project management and implementation
9. Discuss and review the ethical, legal and societal issues
10. Future trend and impact

Teaching Methods

The course will be delivered through weekly lectures and tutorials. Lessons will make use of lectures, readings, videos, in-class discussions, software demonstrations, hands-on sessions and projects to engage students in analysing and reflecting on the topics introduced.

Course Assessment

1. 10% **In-class participation and discussion**
2. 25% **Assignment**
3. 25% **Mid-term test**: A one-hour mid-term test will be conducted in the middle of the course
4. 40% **Final group project and presentation**: Students in a group will be required to design and conduct a GIS-related project.

Measurement of Learning Outcomes

Learning Outcome	**In-class participation and discussion (10%)**	**Assignment (25%)**	**Mid-term test (25%)**	**Final group project and presentation (40%)**
1. Recognise key concepts and principles of Smart Cities and GIS	✓	✓	✓	✓
2. Understand and embrace the importance of GIS in Smart City Development	✓	✓	✓	✓
3. Discuss and evaluate the case studies of GIS applications being integrated in Smart Cities and the ethical/societal issues that may arise	✓	✓	✓	✓
4. Acquire operational skills in the use of GIS software		✓		✓
5. Design and conduct an independent GIS project or application	✓	✓		✓

Required/Essential Readings

What is a Smart City? https://www.gemalto.com/iot/inspired/smart-cities

Hong Kong Smart City Blueprint 2.0. (2020), HKSAR Government, The Smart City for Hong Kong, *https://www.smartcity.gov.hk/*

Fu, Pinde. Getting to Know Web GIS. 3rd ed., Esri Press, 2018

Recommended/Supplementary Readings

1. Eiselt, H A, Marianov, Vladimir (2015) Applications of Location Analysis. Springer International Publishing
2. Fritz, S., See, L., Carlson, T. et al. Citizen science and the United Nations Sustainable Development Goals. Nat Sustain 2, 922–930 (2019)
3. Hassan, Abdishakur, Vijayaraghavan, Jayakrishnan (2019) Geospatial Data Science Quick Start Guide : Effective techniques for performing smarter geospatial analysis using location intelligence, Packt Publishing Limited
4. Longley, Goodchild, Maguire, and Rhind. (2001) Geographic Information Systems and Science. Hoboken, NJ: John Wiley & Sons
5. Pimpler, E. (2017). Spatial Analytics with ArcGIS. Packt
6. Worboys, Michael F. (1995) GIS: A Computing Perspective. London, UK: Taylor & Francis

**Additional readings will also be given weekly on a topic by topic basis.*

Important Notes:

1. Students are expected to spend a total of 9 hours (i.e. 3 hours of class contact and 6 hours of personal study) per week to achieve the course learning outcomes.
2. Students shall be aware of the University regulations about dishonest practice in coursework, tests and examinations, and the possible consequences as stipulated in the Regulations Governing University Examinations and Course Work. In particular, plagiarism, being a kind of dishonest practice, is "the presentation of another person's work without proper acknowledgement of the source, including exact phrases, or summarised ideas, or even footnotes/citations, whether protected by copyright or not, as the student's own work". Students are required to strictly follow university regulations governing academic integrity and honesty.
3. Students are required to submit writing assignment(s) using Turnitin.
4. To enhance students' understanding of plagiarism, a mini-course "Online Tutorial on Plagiarism Awareness" is available on https://pla.ln.edu.hk/.