ELECTIVE COURSES

53. Geographic Information System (GIS) and Spatial Analysis (PH046IU)

Module designation	*This course will focus on the concepts and techniques of GIS. Students will be familiar with data models and structures, database management and spatial analysis and modeling.*
Semester(s) in which the module is taught	1, 2
Person responsible for the module	Dr. Phan Hiền Vũ
Language	English
Relation to curriculum	Elective
Teaching methods	Lecture, lesson, homework.
Workload (incl. contact hours, self-study hours)	(Estimated) Total workload: 140 Contact hours (please specify whether lecture, exercise, laboratory session, etc.): lecture: 25, practice: 25 Private study including examination preparation, specified in hours: 90
Credit points/ECTS	3 (2 theory + 1 practice) credits/5.08 ECTS
Required and recommended prerequisites for joining the module	None

Module objectives/intended learning outcomes	Upon the successful completion of this course students will be able to:	
	Competency level	**Course learning outcome (CLO)**
	Knowledge	CLO1. Design geospatial data structure for management information systems.
	Skill	CLO2. Analyze geospatial data using QGIS tools
	Attitude	CLO3. Show an understanding of the role and responsibility of an engineer in fields related to geospatial data. CLO4. Show abilities of further self-learning and long-life learning.

Content	*The description of the contents should clearly indicate the weighting of the content and the level.* Weight: lecture session (3 hours Teaching levels: I (Introduce); T (Teach); U (Utilize)		
	Topic	**Weight**	**Level**
	Chapter 1: Introduction to Geograp Information Systems (GIS)	1	T
	Chapter 2: Maps and Geospatial Data	1	T
	Chapter 3: Digital Representation and Organization of Geospatial Data	1	T
	Chapter 4: Geospatial Data Quality and Standards	1	T
	Chapter 5: Raster Geo-processing	1	T, U
	Chapter 6: Vector Geo-processing	1	T, U
	Chapter 7: Geo-visualization and Geospatial Information Products	2	T, U
	Chapter 8: Digital Terrain Modeling, Management of Imagery and Elevation Data	1	T, U
	Chapter 9: Spatial Data Analysis, Modeling and Mining	3	T, U
	Chapter 10: Remote Sensing and GI Integration	1	T, U
	Chapter 11: GIS Implementation and Project Management	1	T
	Chapter 12: GIS Issues and Prospects	1	T
Examination forms	Exam, project, report.		

Study and examination requirements	Attendance: A minimum attendance of 80 percent is compulsory for the class sessions. Students will be assessed on the basis of their class participation. Questions and comments are strongly encouraged. Assignments/Examination: Students must have more than 50/100 points overall to pass this course.
Reading list	**Textbooks:** [1] Paul A. Longley, Michael F. Goodchild, David J. Maguire, David W. Rhind. *Geographic Information Science and Systems,* 4th Edition, Wiley, 2015. **References:** [2] Keith C. Clarke, *Getting Started with Geographic Information Systems*, Prentice Hall, 1999. [3] Yue-Hong Chou, *Exploring Spatial analysis in Geographic Information Systems*, On WordPress, 1997. [4] Aronoff, S., *Geographic Information Systems: A Management Perspective*, WDL Publications, Ottawa, 1991. [5] Bernhardsen, T., *Geographic Information Systems: An Introduction*, John Wiley and Sons, New York, 2002. [6] Bolstad, P., *GIS Fundamentals, A First Text on Geographic Information Systems*, Eider Press, White Bear Lake, Minnesota, 2005. [7] Chang, K., *Introduction to Geographic Information Systems,* McGraw Hill Higher Education, 2008. **Software:** QGIS