

Subject Code	LSGI3212
Subject Title	Mobile GIS and Location Based Services
Credit Value	3
Level	3
Pre-requisite	LSGI2223 Geographic Information Science
Objectives	The aim of this subject is to provide students an opportunity to explore different up-to-date communication and positioning systems relevant to spatial data collection, and their integration with GIS for different applications. It allows students to get a clear understanding of the issues to consider when working on mobile-based GIS applications.
Intended Learning Outcomes	Upon completion of the subject, students will be able to: A. Explain the concepts of LBS and mobile GIS (L2) B. Apply the latest mobile computing technologies and wireless positioning to a mobile system (L2) C. Confidently design and develop LBS applications and mobile GIS applications (L2, L3)
Subject Synopsis/ Indicative Syllabus	A. Mobile computing concepts [20%] 1) Mobile communication systems 2) Multi-tier client/server computing model B. Positioning technologies in mobile- and location-based services [35%] 1) Ground-based radio navigation systems 2) Satellite-based positioning systems 3) Wireless and multi-sensor systems 4) Indoor location determination C. Data management and services in the mobile environment [20%] 1) Interoperability through standards 2) Open-source projects 3) Security and privacy D. Integration of communication, positioning, and geospatial data management technologies to the mobile geospatial system [20%] E. LBS: case studies [5%]
Teaching/Learning Methodology	Background knowledge will first be addressed in formal lectures. Existing systems and research prototypes will be used to demonstrate concepts and principles of communication and positioning techniques. After students have acquired the necessary background knowledge, students will be facilitated discussions on strengths and weaknesses of different communications and positioning methods, ways for improving the performance and applications.

Assessment Methods in Alignment with Intended Learning Outcomes	Specific assessment methods/tasks	% weighting	Intended subject learning outcomes to be assessed (Please tick as appropriate)					
			A	B	C			
	1. Assignments	35%	✓					
	2. Quizzes	30%	✓	✓	✓			
	3. Group project	35%	✓	✓	✓			
Total	100 %							
<p>Explanation of the appropriateness of the assessment methods in assessing the intended learning outcomes:</p> <p>Quizzes will test the student’s understanding of concepts and principles of mobile systems, communication, positioning, and mobile geospatial data management will be assessed during the quiz and phase test.</p> <p>The group project will assess all components as students will have to develop a mobile application. The project will be done as a group to train the students to work in a team on project development and to enhance their communication and organization skills.</p>								
Student Study Effort Expected	Class contact:							
	▪ Lectures							26 Hrs.
	▪ Practical sessions							13 Hrs.
	Other student study efforts:							
	▪ Lecture and lab preparations							26 Hrs.
	▪ Assignments and project							42 Hrs.
	Total student study effort							107 Hrs.
Reading List and References	<p>Syed A. Ahson and Mohammad Ilyas (eds.), 2011. Location-based services handbook: applications, technologies, and security, CRC Press.</p> <p>Jochen Schiller and Agnes Voisard, 2004. Location-Based Services, Morgan Kaufmann.</p> <p>Peng, Z., 2003. Internet GIS: distributed geographic information services for the Internet and wireless networks, Wiley.</p> <p>Allan Brimicombe and Chao Li, 2009. Location-based services and geo-information engineering, Wiley-Blackwell.</p>							

Axel Kupper, 2005. Location-based services: fundamentals and operation, Wiley.

Chen, Ruizhi, 2012. Ubiquitous Positioning and Mobile Location-Based Services in Smart Phones, IGI Global.

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