Subject Description Form

Subject Code	LSGI532
Subject Title	Spatial Data Visualization and Modeling
Credit Value	3
Level	5
Pre-requisite/ Co-requisite/ Exclusion	The knowledge introduced in the subject of Principles and Concepts of GIS
Objectives	Visualization and representation are two important processes in spatial data handling. This subject is to provide students with theories and techniques for visualization of spatial data; theories and methodology for multi-scale representation of spatial data; as well as practical considerations of visualization and multi-scale representation in GIS environment for health research.
Intended Learning Outcomes	Upon completion of the subject, students will be able to: a. understand the concepts in spatial representation and visualization; b. master a range of modelling and representation techniques; c. evaluate the effect of perception and classification on representation of spatial data, and the effect of scale on modelling and representation; d. make decision on the appropriate use of modelling and visualization technique for a given set of health data; e. appreciate the effectiveness and limitation of the spatial representation and visualization techniques in health research.
Subject Synopsis/ Indicative Syllabus	• Variables for visualization: Visual variables, dynamic variables, exploration variables, screen variables and web-based variables; effectiveness of different types of variables for representation of spatial data. Visual limits and perceptions. • Different types of representation techniques (Topographic maps, thematic maps, pictorial maps), in different types of media; effectiveness of symbols and maps. • Map-like representation of spatial data: Cartograms, non-spatial graphics, animation, 3-D animation, morphing, schematic maps. • Multi-scale modelling: Scale-dependency of spatial data, effect of scale on modelling, and effect of scale on representation. Application to public health domains • Generalisation: Model generalisation and cartographic generalisation, generalisation approaches (rule-based vs. constraint-based)
Teaching/Learning Methodology	Lab sessions are to reinforce the theories and methodology introduced during the lectures and to enable students to gain practical problem solving skills, and reports and presentations to enhance students' all round development

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.	d.	e.
	Assignments	60%		✓	✓	✓	
	Examination	40%	✓	✓	✓	✓	✓
	Total	100%					

Explanation of the appropriateness of the assessment methods in assessing the intended learning outcomes:

Assignments are designed to make students work and evaluate techniques. After this students are able to make proper decision on appropriate techniques to use.

Examination provides an integrated assessment of these outcomes!

Generative AI can only serve as a tool for assisting initial idea development and proofreading for project presentation and report, and any involvement of generative AI tools must be clearly acknowledged and referenced. Students are required to make close link between the subject contents and the proposed case-specific scenario to encourage critical thinking.

Student Study Effort Expected	Class contact:	
	▪ Lecture	39 Hrs.
	Other student study effort:	
	▪ Self-learning	50 Hrs.
	▪ Group working	55 Hrs.
	Total student study effort:	105 Hrs.

Reading List and References

Journals

Cartographica

Cartography and Geographic Information Science

The Cartographic Journal

Books

Li, Z (2007), *Algorithmic foundation of multi-scale spatial representation*. CRC Press.

Mackaness, Ruas and Sarjakoski (2007) *Generalisation of Geographic Information: Cartographic Modelling and Applications, Elsevier Science, Amsterdam.*

	Quattrochi, D. and Goodchild, M., (1997), *Scale in Remote Sensing and GIS*. CRC Press, Boca Raton, New York, London and Tokyo.
	Slocum, T., 2008. *Thematic Cartography and Visualization (3rd edition)* Prentice Hall.