Subject Description Form

Subject Code	LSGI3213
Subject Title	**Intelligent Transportation Systems**
Credit Value	3
Level	3
Pre-requisite/ Co-requisite/ Exclusion	Nil
Objectives	The aims of this subject are: 1. To provide an understanding of the fundamental principles of Logistics and Transportation. 2. To enable students to use Geo-IT to provide solutions to Logistics and transportation problems. 3. To understand the value and technology behind an Intelligent Transportation System
Intended Learning Outcomes	Upon completion of the subject, students will be able to: 1. Explain the concepts of logistics and transportation (L3) 2. Explain spatially-related issues in logistics and transportation (L3) 3. Construct a transport network and perform related analysis (L4) 4. Apply GIS, information sensors, and communication systems to build an intelligent transportation system for solving transport-related planning and everyday life problems (L4)
Subject Synopsis/ Indicative Syllabus	**A. Introduction to Logistics and Transportation** Concepts of Logistics and transportation, spatial related issues in logistics and transportation, and emerging technologies and services (e.g., vehicle electrification, automation and sharing) in logistics and transportation. **B. Information and Sensors for logistics and transportation applications** Positioning and navigation systems, Roadside sensors, CCTV cameras, RFID etc. Information for logistics operation and management Information for transportation planning and traffic management **C. GIS for Logistics and Transportation** GIS data model for transportation, spatial analysis and modelling for transportation, Resource allocation, network flow and facility location, shortest paths and routing algorithms **D. Applications with Intelligent Transportation Systems**

<table>
<tr><td></td><td>Fleet Management Systems, Emergency, Daily Commuting etc.</td></tr>
<tr><td>Teaching/Learning Methodology</td><td>Teaching and learning materials will be provided on-line for students to download easily. Contact hours will be used for formal lectures, in-class discussions and presentations, and practical work. On-line forum discussions will be scheduled for topics on selected planning problems, for students to identify their level of understanding, and these will be used as an additional form of course assessment.</td></tr>
<tr><td>Assessment Methods in Alignment with Intended Learning Outcomes</td><td>
<table>
<tr><td rowspan="2">Specific assessment methods/tasks</td><td rowspan="2">% weighting</td><td colspan="4">Intended subject learning outcomes to be assessed (Please tick as appropriate)</td></tr>
<tr><td>1</td><td>2</td><td>3</td><td>4</td></tr>
<tr><td>1. Project</td><td>50</td><td></td><td></td><td>✓</td><td>✓</td></tr>
<tr><td>2. Quiz</td><td>10</td><td>✓</td><td>✓</td><td></td><td></td></tr>
<tr><td>3. Examination</td><td>40</td><td>✓</td><td>✓</td><td>✓</td><td>✓</td></tr>
<tr><td>Total</td><td>100</td><td colspan="4"></td></tr>
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Explanation of the appropriateness of the assessment methods in assessing the intended learning outcomes:

Practical work / project will be used to assess students’ ability to build a transport network and explore transport issues. Both the Quiz and Examination will be given to assess students’ independent understanding of basic concepts of logistics and transportation, and applications with intelligent transportation system.</td></tr>
<tr><td>Student Study Effort Expected</td><td>
<table>
<tr><td>Class contact:</td><td></td></tr>
<tr><td>▪ Lecture</td><td>26 Hrs.</td></tr>
<tr><td>▪ Practical</td><td>26 Hrs.</td></tr>
<tr><td>Other student study effort:</td><td></td></tr>
<tr><td>▪ Project preparation work</td><td>23 Hrs.</td></tr>
<tr><td>▪ Self study</td><td>30 Hrs.</td></tr>
<tr><td>Total student study effort</td><td>105 Hrs.</td></tr>
</table>
</td></tr>
<tr><td>Reading List and References</td><td>1. Zhu L, Yu F R, Wang Y, et al. Big data analytics in intelligent transportation systems: A survey. IEEE Transactions on Intelligent Transportation Systems, 2018, 20(1): 383-398.</td></tr>
</table>

2. Sumalee A, Ho H W. Smarter and more connected: Future intelligent transportation system. Iatss Research, 2018, 42(2): 67-71.

3. Kaffash S, Nguyen A T, Zhu J. Big data algorithms and applications in intelligent transportation system: A review and bibliometric analysis. International Journal of Production Economics, 2021, 231: 107868.

4. Guerrero-Ibáñez J, Zeadally S, Contreras-Castillo J. Sensor technologies for intelligent transportation systems. Sensors, 2018, 18(4): 1212.

5. Chowdhury, Mashrur, Amy Apon, and Kakan Dey, eds. Data analytics for intelligent transportation systems. Elsevier, 2017.

6. Miller H J, Shaw S L. Geographic information systems for transportation: principles and applications. Oxford University Press on Demand, 2001.

7. Sładkowski, Aleksander, and Wiesław Pamuła, eds. Intelligent transportation systems-problems and perspectives. Vol. 303. Cham: Springer International Publishing, 2016.