

Subject Description Form

Subject Code	CSE580
Subject Title	Smart Transport
Credit Value	3
Level	5
Pre-requisite/ Co-requisite/ Exclusion	Students should have fundamental knowledge about mathematics and computation methods consistent with undergraduate level study in science/engineering.
Objectives	This course aims to provide students an overview of transport models along with emerging technologies to effectively develop and manage modern urban transport systems in the era of big data analytics and urban informatics. Transport models are fundamental for transport planning and traffic management. Emphasis will be given to smart mobility and intelligent transport innovations.
Intended Learning Outcomes	Upon completion of the subject, students will be able to: a. obtain a broad knowledge in smart city/mobility initiatives in Hong Kong and around the world b. appreciate the need for a systematic approach for modeling transport systems with emerging technologies; c. provide a bridge between mathematical models and real-world transport systems d. demonstrate the capability to apply the skills learned in this course to model and solve real-world transport problems
Subject Synopsis/ Indicative Syllabus	This subject covers the following contents: 1. <u>Smart Transport/Mobility Concepts</u> Overview of smart city/mobility initiatives using emerging technologies in the era of big data analytics and urban informatics 2. <u>Fundamentals</u> Basic principles in systems analysis applied to transportation; Basic theory of optimization and statistical methods 3. <u>Transportation Planning</u> Basic concepts of transportation planning and modeling; travel demand models; public transport planning; multi-modal transport systems

	4. <u>Intelligent Transportation Systems (ITS)</u> Basic concepts of travel demand management and modeling; advanced traffic management systems (ATMS); advanced traveler information systems (ATIS); ITS in Hong Kong 5. <u>Emerging Technology Applications and Policy/Regulations</u> Mobility as a service (MaaS) or ridesharing; electric vehicles; autonomous (driverless or self-driving) vehicles; connected and automated vehicles (CAVs); automated electric transportation (AET)																																														
Teaching/Learning Methodology	The subject is delivered mainly using lectures to explain theories and methodology of transport models for planning and management of transport systems with emerging technologies. The lectures need to be supplemented by substantial self-study after class by students of reference materials and other up-to-date technical reports/journal papers recommended by the lecturer(s). The students need to complete a set of assignments and a final examination.																																														
Assessment Methods in Alignment with Intended Learning Outcomes	<table><tr><th rowspan="2">Specific assessment methods/tasks</th><th rowspan="2">% weighting</th><th colspan="4">Intended subject learning outcomes to be assessed</th></tr><tr><th>a</th><th>b</th><th>c</th><th>d</th></tr><tr><td>1. Continuous Assessment</td><td>40%</td><td>✓</td><td>✓</td><td>✓</td><td>✓</td></tr><tr><td>1.1. Quizzes</td><td>10%</td><td>✓</td><td>✓</td><td>✓</td><td></td></tr><tr><td>1.2. Homework assignments</td><td>15%</td><td>✓</td><td></td><td>✓</td><td>✓</td></tr><tr><td>1.3. Laboratory reports</td><td>15%</td><td></td><td>✓</td><td>✓</td><td>✓</td></tr><tr><td>2. Written Examination</td><td>60%</td><td>✓</td><td>✓</td><td>✓</td><td>✓</td></tr><tr><td>Total</td><td>100%</td><td colspan="4"></td></tr></table> The students will be assessed with two components, i.e. 1. Continuous Assessment, 2. Written Examination. The continuous assessment will be based on a set of assignments. Each assignment is designed to cover a particular aspect of transport models for planning and management of transport systems. Written examination is evaluated by the final examination. Students must pass the final examination and achieve a passing overall score / grade to pass the subject.	Specific assessment methods/tasks	% weighting	Intended subject learning outcomes to be assessed				a	b	c	d	1. Continuous Assessment	40%	✓	✓	✓	✓	1.1. Quizzes	10%	✓	✓	✓		1.2. Homework assignments	15%	✓		✓	✓	1.3. Laboratory reports	15%		✓	✓	✓	2. Written Examination	60%	✓	✓	✓	✓	Total	100%				
Specific assessment methods/tasks	% weighting			Intended subject learning outcomes to be assessed																																											
		a	b	c	d																																										
1. Continuous Assessment	40%	✓	✓	✓	✓																																										
1.1. Quizzes	10%	✓	✓	✓																																											
1.2. Homework assignments	15%	✓		✓	✓																																										
1.3. Laboratory reports	15%		✓	✓	✓																																										
2. Written Examination	60%	✓	✓	✓	✓																																										
Total	100%																																														

Student Study Effort Expected	Class contact:	
	▪ Lectures	33 Hrs.
	▪ Labs	6 Hrs.
	Other student study effort:	
	▪ Assignments	40 Hrs.
	▪ Self-study / Preparation	47 Hrs.
	Total student study effort	126 Hrs.
Reading List and References	(1) Ortúzar, J.de D. and Willumsen, L.G., 2011. Modelling Transport. 4th Edition, Wiley. (2) Spiegelman, C.H., Park, E.S., Rilett, L.R., 2010. Transportation Statistics and Microsimulation. Chapman & Hall/CRC. (3) Sheffi, Y., 1985. Urban Transportation Networks: Equilibrium Analysis with Mathematical Programming Methods, Prentice Hall. (4) Hong Kong Smart City Blueprint: https://www.smartcity.gov.hk/ (5) Transport Department: https://www.td.gov.hk/en/home/index.html (6) Mobility as a Service: https://en.wikipedia.org/wiki/Mobility_as_a_service (7) DiDi Mobility as a Service: https://www.didiglobal.com/	