The Hong Kong Polytechnic University

Subject Description Form

Please read the notes at the end of the table carefully before completing the 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 *(Note 1)*	Upon completion of the subject, students will be able: (a) to obtain a broad knowledge in smart city/mobility initiatives in Hong Kong and around the world (b) to appreciate the need for a systematic approach for modeling transport systems with emerging technologies; (c) to provide a bridge between mathematical models and real-world transport systems (d) to demonstrate the capability to apply the skills learned in this course to model and solve real-world transport problems
Subject Synopsis/ Indicative Syllabus *(Note 2)*	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)

<table>
<tr><td>Teaching/Learning Methodology
(Note 3)</td><td>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.</td></tr>
<tr><td>Assessment Methods in Alignment with Intended Learning Outcomes
(Note 4)</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>a</td><td>b</td><td>c</td><td>d</td></tr>
<tr><td>1. Continuous Assessment</td><td>40%</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>
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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 attain at least Grade D in both coursework and final examination in order to obtain a passing grade in the overall result.</td></tr>
<tr><td>Student Study Effort Expected</td><td>
<table>
<tr><td>Class contact:</td><td></td></tr>
<tr><td>▪ Lecture/Tutorial</td><td>39 Hrs.</td></tr>
<tr><td>▪ Examination</td><td>3 Hrs.</td></tr>
<tr><td>Other student study effort:</td><td></td></tr>
<tr><td>▪ Reading and studying</td><td>40 Hrs.</td></tr>
<tr><td>▪ Assignments</td><td>40 Hrs.</td></tr>
<tr><td>Total student study effort</td><td>122 Hrs.</td></tr>
</table>
</td></tr>
<tr><td>Reading List and References</td><td>(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</td></tr>
</table>

	(6) Mobility as a Service: https://en.wikipedia.org/wiki/Mobility_as_a_service (7) DiDi Mobility as a Service: https://www.didiglobal.com/

Note 1: Intended Learning Outcomes
Intended learning outcomes should state what students should be able to do or attain upon completion of the subject. Subject outcomes are expected to contribute to the attainment of the overall programme outcomes.

Note 2: Subject Synopsis/ Indicative Syllabus
The syllabus should adequately address the intended learning outcomes. At the same time over-crowding of the syllabus should be avoided.

Note 3: Teaching/Learning Methodology
This section should include a brief description of the teaching and learning methods to be employed to facilitate learning, and a justification of how the methods are aligned with the intended learning outcomes of the subject.

Note 4: Assessment Method
This section should include the assessment method(s) to be used and its relative weighting, and indicate which of the subject intended learning outcomes that each method purports to assess. It should also provide a brief explanation of the appropriateness of the assessment methods in assessing the intended learning outcomes.