Subject Description Form

Subject Code	CSE562
Subject Title	Traffic Engineering and Control
Credit Value	3
Level	5
Pre-requisite/ Co-requisite/ Exclusion	Recommended background knowledge: It is expected that students will have a fundamental understanding of mathematics, statistics, and physics consistent with undergraduate level study in science/ engineering.
Objectives	To provide knowledge of fundamental traffic flow characteristics and associated analytical methods in the planning, design, and control of transport systems.
Intended Learning Outcomes	Upon completion of the subject, students will be able: a. to visualize the applications of theories and practical concepts on topics of the traffic engineering and control; b. to apply the theories and practical measures on solving the encountered traffic problems; c. to convey the ideas and proposed traffic control schemes to others with the support of logical concepts and survey data; and d. to work independently and collaborate with others with minimal supervision.
Subject Synopsis/ Indicative Syllabus	**Keyword Syllabus** a. Traffic Engineering Fundamentals Elements of traffic engineering; the road user, the vehicle, the road and geometric design; speed-flow-density relationship; traffic steam and capacity; level of service concept. b. Traffic Studies and Analysis Volume studies; speed studies; travel time and delay studies; capacity analysis; data collection technique. c. Analytical Methods Traffic stream characteristics; headway and gap distributions; traffic simulation; traffic flow theories: shock wave analysis, car following theory, queuing theory. d. Junction Design and Control Types of at-grade junction; design of priority junctions, roundabouts, and signal controlled junctions; coordination of traffic signal systems. e. Traffic safety and control devices Traffic control devices: pretimed, semi-actuated, actuated; accident studies and safety measures. f. Traffic management techniques

<table>
<tr><td></td><td>Urban transportation problems; Intelligent Transportation Systems (ITS): Transportation System Management (TSM), Travel Demand Management (TDM), emerging technologies.
g. <u>Laboratory</u>
<u>Two</u> Laboratories: calibration of traffic stream model, signal controlled junction.</td></tr>
<tr><td>Teaching/Learning Methodology</td><td>Lectures will cover the general traffic engineering models, traffic theories, traffic control methods and applications;
Assignments, such as traffic signal control, junction design or traffic modeling will be given to students. Students need to conduct the traffic survey, data analysis and model formulation.
Presentations and discussions in tutorials provide students a ground for polishing their presentation and communication skills.</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>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. Final 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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Explanation of the appropriateness of the assessment methods in assessing the intended learning outcomes:
Continuous assessment will be based on lab reports and written assignments
Students must attain at least Grade D in both coursework and final examination (whenever applicable) in order to attain a passing grade in the overall result.</td></tr>
<tr><td>Reading List and References</td><td>Dowling, R., Holland, J., and Huang, A. (2002) California Department of Transportation Guidelines for Applying Traffic Microsimulation Modeling Software.
May, A.D. (1990) Traffic Flow Fundamentals, Prentice-Hall, Englewood Cliff, New Jersey.
Roess, R.P., Prassas, E.S., McShane, W.R. (2011) Traffic Engineering (4th Edition), Prentice-Hall, Englewood Cliff, New Jersey.
Spiegelman, C.H., Park, E.S., Rilett, L.R. (2010) Transportation Statistics and Microsimulation. Chapman & Hall/CRC.
Transport Planning and Design Manual, Hong Kong Transport Department</td></tr>
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