

Subject Description Form

Subject Code	EE2029 / EE2029B
Subject Title	Transportation Engineering Fundamentals
Credit Value	3
Level	2
Pre-requisite/ Co-requisite/ Exclusion	Nil
Objectives	<ol style="list-style-type: none"> 1. To introduce the fundamental concepts of transportation engineering and transport economics. 2. To explain the operations of real-life transportation systems; and the related engineering, economics and environmental issues. 3. To describe the basic techniques on system analysis and economic evaluation. 4. To prepare students for tackling practical engineering problems, with a combination of strong theoretical background and sound engineering sense.
Intended Learning Outcomes	<p>Upon completion of the subject, students will be able to:</p> <ol style="list-style-type: none"> a. Identify the key issues in transportation systems. b. Appreciate the problems and suggest original solutions to real-life transport problems. c. Conduct simple engineering design, basic system analysis and economic evaluation. d. Be ready to study transportation-related subjects on higher level.
Subject Synopsis/ Indicative Syllabus	<ol style="list-style-type: none"> 1. Transportation systems: Introduction to transportation engineering, transportation systems engineering, transport problems and solutions in Hong Kong, sustainability of transportation systems, transportation in social, economic, environmental and political roles. 2. The technology of transportation: Transport modes and operational characteristics, transport technology and development, technology applications in transport industry. 3. Traffic engineering fundamentals: Elements of traffic engineering, time-space diagram, speed-flow-density relationships, traffic flow theory, queueing theory, traffic measurement, level of service. 4. Public transportation systems: designs, management, and operations of public transportation systems, transit network structures, service reliability, adaptive bus control. 5. Transport economics: Principles of transport economics; demand and supply for transport, from economics to transport policy, effects of transport pricing policies. 6. Transportation system analysis: Systems approach planning and engineering; travel choice behaviours and demand modelling; transportation network analysis; decision analysis and economic evaluation of transportation projects.
Teaching/ Learning Methodology	<p>The key concepts and techniques covered in this subject are discussed in lectures. Tutorials on specific topics, especially those on theories and numerical exercises, will be given to strengthen students' understanding. Furthermore, individual assignments and projects consisting of numerical problems let students demonstrate their level of understanding and create evidence of learning.</p>

	<table border="1"> <tr> <th rowspan="2">Learning/Learning Methodology</th> <th colspan="4">Outcomes</th> </tr> <tr> <th>a</th> <th>b</th> <th>c</th> <th>d</th> </tr> <tr> <td>Lectures</td> <td>✓</td> <td>✓</td> <td>✓</td> <td>✓</td> </tr> <tr> <td>Tutorials</td> <td>✓</td> <td>✓</td> <td>✓</td> <td>✓</td> </tr> </table>	Learning/Learning Methodology	Outcomes				a	b	c	d	Lectures	✓	✓	✓	✓	Tutorials	✓	✓	✓	✓									
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Assessment Methods in Alignment with Intended Learning Outcomes	<table border="1"> <thead> <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> </thead> <tbody> <tr> <td>1. Assignments</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></td> <td></td> <td></td> <td></td> </tr> </tbody> </table> <p>Explanation of the appropriateness of the assessment methods in assessing the intended learning outcomes:</p> <p>The students will be assessed with two components: 3-4 written assignments and a final exam. The written assignments will consist of numerical, descriptive, and real-system design problems to address different aspects of skills required in achieving intended learning outcomes (a), (b), (c), and (d). The final exam is conducted at the end of the semester to consolidate students' knowledge in lectures, tutorials, and class activities. It is appropriate in assessing intended learning outcomes (a), (c), and (d).</p>	Specific assessment methods/tasks	% weighting	Intended subject learning outcomes to be assessed				a	b	c	d	1. Assignments	40%	✓	✓	✓	✓	2. Final Examination	60%	✓		✓	✓	Total	100%				
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Reading List and References	<ol style="list-style-type: none"> 1. C.F. Daganzo, Fundamentals of Transportation and Traffic Operations, Pergamon, 2008. 2. C.F. Daganzo and Yanfeng Ouyang, Public Transportation Systems: Basic Principles of System Design, Operations Planning and Real-Time Control. 2019 3. J. Sussman, Introduction to Transportation Systems, Boston: Artech House, 2000 4. P. H. Wright, N. J. Ashford and R. J. Stammer, Jr., Transportation Engineering: Planning and Design, 1998 5. Jon D. Fricker and R.K. Whitford, Fundamentals of Transportation Engineering – A Multimodal Systems Approach. Prentice Hall, 2004 6. E. Quinet and R. Vickerman, Principles of Transport Economics, Edward Elgar Publishing Limited, 2004 7. J.H. Banks, Introduction to Transportation Engineering, McGraw-Hill, 2002 																												