Subject Description Form

Subject Code	CSE40408
Subject Title	Traffic Surveys and Transport Planning
Credit Value	3
Level	4
Pre-requisite/ Co-requisite/ Exclusion	Pre-requisites: CSE304 / CSE312 / CSE30312 and CSE30390/ CSE39300/ CSE30284/ CSE39284/ CSE38900 Exclusion: CSE408
Objectives	1. To expose students to the various techniques of traffic survey and transport modelling; 2. To develop an understanding of the nature and extent of urban transportation planning processes; and 3. To enable students to conduct traffic surveys and modelling traffic impacts for urban transportation planning purposes.
Intended Learning Outcomes	Upon completion of the subject, students will be: a. Able to design and conduct various traffic and transport surveys for urban transportation planning purposes; b. Able to systemically analyze and interpret data from traffic and transport surveys for strategic transport planning and travel demand forecasting; c. Able to calibrate and apply the four-steps modelling techniques for forecasting the future travel demand and analyzing the effects of demand and supply strategies; d. Able to discuss and analyze the problems of traffic congestion and the solutions; e. Able to understand the practical constraints (engineering, economic, social, environmental) in solving the specific transportation problems; f. Able to analyze the merits and limitations of current approaches in data collection and transport modelling for strategic planning purposes.
Subject Synopsis/ Indicative Syllabus	1. <u>Overview of Transportation Planning</u> (1 week) Hierarchy of Transport/ Land-use planning. Strategic Transport Planning and Transport System Management Planning. Transport Planning Process. Comprehensive Transport Study 2. <u>Traffic and Transport Surveys</u> (3 weeks) Data needs in Transport Planning and Traffic Impact Evaluation. Travel Characteristics Survey and Annual Traffic Census. Traffic Data Collection and Analysis: ; Origin and Destination Surveys 3. <u>Transportation System Modelling</u> (6 weeks)

	Zoning and Network Coding. Four-steps modelling approach: Trip generation and Attraction, Trip Distribution, Modal Split, Traffic Assignment. Model calibration and application. Case studies.
	4. <u>Transportation Problems and Solutions</u> (3 weeks) Overview of Transportation Problems, Traffic Congestions, Demand and Supply Strategies. Transport Economics,System Optimal and Marginal Cost Road Pricing. Practical Road Pricing Schemes.
	5. <u>Computer Laboratory</u> Origin-Destination Survey. Transportation System Modelling and Analysis.
Teaching/Learning Methodology	The underlying principles and techniques relating to traffic survey and transport planning will be introduced in lectures. However, it is important that the students be exposed to the interdependence between theories and practice in transport planning. Students will therefore be required to undertake survey design and data collection in laboratory sessions so as to understand the associated techniques in practice. Individual assignments will consist of numerical problems on transport modelling and analysis, while computer laboratory sessions will be held to demonstrate the applications of transport model and to provide opportunity for students to appreciate the difference between manual calculation and computer modelling.

Assessment Methods in Alignment with Intended Learning Outcomes

Specific assessment methods/tasks	% weighting	Intended subject learning outcomes to be assessed					
		a	b	c	d	e	f
1. Assignments and Lab Reports	20%	✓	✓	✓	✓		
2. Mid-term Test(s)	20%		✓	✓	✓		
3. Final Examination	60%		✓	✓	✓	✓	✓
Total	100 %						

Students must pass the final examination and achieve a passing overall score/ grade to pass the subject.

Explanation of the appropriateness of the assessment methods in assessing the intended learning outcomes:

The students will be assessed with three components, i.e., the laboratory session and assignment, at least one mid-term test and a final examination at the end of the semester. The students will be required to attend laboratory sessions and submit individual (or group) laboratory reports. These laboratory sessions will enable students to acquire basic laboratory techniques and report writing. The works in the laboratory sessions are closely related to practicing transportation engineering requirements. Students will have to exert engineering judgments to complete the laboratory sessions. The laboratory sessions to together with the report writing are best to achieve intended learning outcomes a, b, c and d. The

	mid-term test(s) will emphasize on assessing students' basic concept and current practices of traffic surveys and transport modelling. It is appropriate to achieve intended learning outcomes b, c and d. The final examination will consolidate students' learning in lectures and tutorials. It is most appropriate to achieve the intended learning outcomes b, c, d, e and f.	
Student Study Effort Expected	Class contact:	
	▪ Lectures	26 Hrs.
	▪ Tutorials	6 Hrs.
	▪ Laboratory Sessions	8 Hrs.
	Other student study effort:	
	▪ Reading and studying	39Hrs.
	▪ Completion of Assignments/Lab Reports	39Hrs.
	Total student study effort	118 Hrs.
Reading List and References	**Essential Textbooks** 1. Ortuzar, J.D and Willumsen, L.G. "Modelling Transport" 4th Edition, Wiley, 2011. 2. Taylor, M.A.P, Young, W. and Bonsall, P.W., "Understanding Traffic Systems: Data, Presentation and Analysis", Avebury Technical Books: Aldershot, 1996. 3. Norbert Oppenheim, "Urban Travel Demand Modelling", John Wiley & Sons. Inc., 1995. 4. Michael J. Burton, "Introduction to Transportation Planning", 3rd Edition, Hutchinson & Co. (Publishers) Ltd., 1985. **Reference Textbooks** 1. D.A. Hensher and K.J. Button, "Handbook of Transport Modelling", Elsevier Science, 2007. 2. P. Stopher and C. Stecher, "Travel survey methods: quality and future directions", Elsevier, 2006. 3. C.S. Papacosta and P.D. Prevedouros, "Transportation Engineering and Planning", Pearson Prentice Hall, 2005. 4. J.D. Fricker and R.K. Whitford, "Fundamentals of Transportation Engineering: A Multimodal Systems Approach", Pearson Prentice Hall, 2004. 5. E. Cascetta, "Transportation Systems Engineering: Theory and Methods", Springer, 2001. 6. C.A. O'Flaherty, "Transport Planning and Traffic Engineering" 4th Edition, Butterworth-Heinemann, 1996. 7. Yosef Sheffi, "Urban Transportation Networks", Prentice Hall, Inc., 1985. 8. http://www.td.gov.hk/en/publications_and_press_releases/publications/index.html 9. http://www.hk2030.gov.hk/	