



CIVL6047 Traffic Management and Control

Course Outline

Course code:	CIVL6047
Course title:	Traffic Management and Control
Offered by (department):	Department of Civil Engineering
Level:	MSc
Credit units:	6 credits
Pre-requisite course code:	Nil
Co-requisite course code:	Nil
Study load (hours):	150
Contact hours:	30
Student quota:	100
Course type:	Discipline course for MSc(Eng) in Transportation Engineering
Offer in academic year:	See announcement by Department
Assessment (%):	Written examination (80%) Continuous assessment (20%)

This document contains information for the course CIVL6047 Traffic Management and Control.

Its intention is for students undertaking the course to be well informed in terms of its learning expectations and also to help make their learning journey an enjoyable one.

Information presented in this document was correct at the time of printing.

Course Description and Aims

Syllabus: Transportation networks; network equilibrium concepts; estimation of origin-destination matrix; traffic management measures; traffic control techniques.

This course provides modern and advanced techniques for traffic management and control. The topics covered include theories of transportation networks, network equilibrium concepts, estimation of origin-destination matrix, traffic management measures and traffic control techniques.

Teaching Staff

Contact details for the course co-ordinator and course teachers are shown below:

Course Co-ordinator	
Name (Department: Specialty)	Contact Details
Prof. S.C. Wong (Civil Engineering: Transportation Engineering)	E-mail: hhecwsc@hku.hk Phone: 2859 1964 Office: Room 6-26, Haking Wong Building
Course Teachers	
Name (Department: Specialty)	Contact Details
Ir J.C.C. Wong (Adjunct Associate Professor) (Executive Director of Ho Wang SPB Ltd)	E-mail: josephwong@howangspb.com Phone: 2865 0090 Office: Nil

Course Learning Outcomes (Alignment with Output Standards of Engineering Council)

By the end of this course students should be able to demonstrate a threshold level of mastery of the following learning outcomes. The appropriate specific learning outcomes of Engineering Council associated with each of the course learning outcomes are also presented.

Course Learning Outcomes (CLO)	Relevant Specific Learning Outcomes of Engineering Council for Masters Degree Graduates (Equivalent to Programme Learning Outcomes)
1. Explain key terminologies and principles of traffic management and control in transportation networks.	Underpinning science and mathematics, etc. (a)
2. Identify problematic areas in traffic networks and apply analytical techniques to solve traffic management and control problems.	Engineering analysis (b)
3. Examine the social, environmental and political considerations of traffic management strategies.	Economic, social and environmental context (a) General learning outcome (d)

Assessment Methodologies

CLO No.	Performance Criteria	Metric	Rubric	Standard
1	Demonstrate a thorough understanding of key terminologies and principles of traffic management and control in transportation networks.	Assessment will be based on examination.	A student will demonstrate successful completion of this outcome by achieving grade C or above in these parts.	Not less than 70% of the students achieving grade C or above in these parts.
2	Demonstrate an ability to identify problematic areas in traffic networks and apply analytical techniques to solve traffic management and control problems.	Assessment will be based on examination.	A student will demonstrate successful completion of this outcome by achieving grade C or above in these parts.	Not less than 70% of the students achieving grade C or above in these parts.

3	Demonstrate a thorough understanding of the constraints of traffic management techniques in practice.	Assessment will be based on an assignment.	A student will demonstrate successful completion of this outcome by achieving grade C or above in these parts.	Not less than 70% of the students achieving grade C or above in these parts.
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Course Teaching and Learning Activities and Alignment with Learning Outcomes

Teaching and learning activities in this course includes 30 lectures. All course learning outcomes will be introduced and explained through lectures.

The course contents and its alignment with the course learning outcomes and assessment tasks are described below.

Course Content	Responsible Lecturer	Contact Hours	Total Study Load (Hours)	Course Learning Outcomes
<i>Weeks 1-8: Traffic Network Flow Estimation</i>				
Theory of transportation networks	Prof. S.C. Wong	2.5	10	1
Network equilibrium models	Prof. S.C. Wong	5	25	1, 2
Estimation of origin-destination matrix	Prof. S.C. Wong	2.5	15	1, 2
Road pricing	Prof. S.C. Wong	2.5	20	1, 2, 3
Traffic signal	Prof. S.C. Wong	7.5	30	1, 2
<i>Weeks 9-12: Traffic Management Principles and Examples</i>				
Traffic management principle	Ir J.C.C. Wong	10	50	1, 2, 3

Guidelines on Grading and Standards of Assessment

HKU has adopted standards-based assessment. The general course grade descriptors aim to provide descriptions on the normal expectations of student achieving particular grades.

Course Grade	Description
A	Exceptionally good performance demonstrating a superior understanding of the subject matter, a foundation of extensive knowledge, a skillful use of concepts and/or materials, and ability to analyze and evaluate problems.
B	Good performance demonstrating capacity to use the appropriate concepts, a good understanding of the subject matter, and an ability to handle the problems and materials encountered in the course.
C	Adequate performance demonstrating an adequate understanding of the subject matter, an ability to handle relatively simple problems, and adequate preparation for moving on to more advanced work in the field.
D	Minimally acceptable performance demonstrating at least partial familiarity with the subject matter and some capacity to deal with relatively simple problems, but also demonstrating deficiencies serious enough to make it inadvisable to proceed further in the field without additional work.
F	Unacceptable performance demonstrating unfamiliarity with the subject matter, and lack of capacity to deal with relatively simple problems, and also demonstrating deficiencies serious enough to make it advisable to retake the course.

Course Assessment Tasks and Alignment with Learning Outcomes

Assessment tasks in this course are described below, which includes weighting, assessment type, and alignment with course learning outcomes.

Weighting of continuous assessment and written examination

Assessment Type	Percentage of Total Assessment (%)	Description	Course Learning Outcomes
Continuous Assessment	20%	1 written assignment	3
Written Examination	80%	A 2-hour closed book exam	1, 2, 3

Course and Assessment Policy

Late submission / Missed quiz

The Department of Civil Engineering's policy on the submission of late assignments will be enforced. Details can be found on the Department of Civil Engineering's website (<http://www.hku.hk/civil/> → Student Intranet → M. Sc.(Eng.) → Miscellaneous → A Note to MSc(Eng) Students).

Academic conduct

The University Regulations on academic misconduct will be strictly enforced. Students are strongly recommended to refer to <http://www.hku.hk/student/plagiarism/> for further details. In addition, students should familiarise themselves with <http://lib.hku.hk/turnitin/>.

Means / Processes for Student Feedback on Course

SETL

Students are asked to complete this evaluation (Student Evaluation of Teaching and Learning) of their learning experiences at the conclusion of the course. Questionnaire items relate to the overall evaluation of the course as well as an evaluation of teaching.

Other means of student feedback

In addition, individual teachers may seek other student feedback mechanism in the duration of their course such as through student forums or class discussion feedback.

Learning Resources

Required text / References

1. Allsop, R.E. (1992) Evolving application of mathematical optimisation in design and operation of individual signal-controlled road junctions, in J.D. Griffiths (Ed.) *Mathematics in Transport and Planning and Control*, 1-24, Clarendon Press, Oxford.
2. Ford, L.R. and D.R. Fulkerson (1962) *Flow in Networks*, Princeton University Press.
3. Institution of Highways and Transportation and Department of Transport (1987) *Roads and Traffic in Urban Areas*, HMSO, London.
4. Gazis, D.C. (1974) *Traffic Science*, Wiley, New York.
5. Potts R.B. and R.M. Oliver (1972) *Flows in Transportation Networks*, New York: Academic.
6. Sheffi, Y. (1985) *Urban Transportation Networks*, Prentice-Hall, Englewood Cliffs, N.J.
7. Transport Bureau (1979) Transport Policy White Paper "Keeping Hong Kong Moving", Hong Kong.
8. Transport Bureau (1990) Transport Policy White Paper "Moving into 21st Century", Hong Kong.
9. Transport Bureau (1999) A Transport Strategy for the Future "Hong Kong Moving Ahead", Hong Kong.
10. Transport Department (1976) First Comprehensive Transport Study Report, Hong Kong.
11. Transport Department (1986) Road traffic signals, Vol. 4, *Transport Planning and Design Manual*, Hong Kong.
12. Transport Department (1989) Second Comprehensive Transport Study Report, Hong Kong.
13. Transport Department (1992) Surveillance, Vol. 10, *Transport Planning and Design Manual*, Hong Kong.
14. Transport Department (1993) Second Comprehensive Transport Study Report Update Report, Hong Kong.
15. Transport Department (1999) Third Comprehensive Transport Study Report, Hong Kong.
16. Webster, F.V. (1958) Traffic signal settings, *Road Research Technical Paper*, No. 39, HMSO, London.

Course website

Course materials will be posted on Moodle in addition to announcements and important dates/deadlines: students are advised to regularly consult the Moodle site for this course.

Date: October 16, 2019

Completed by: Prof. S.C. Wong