

## COURSE CONTENT

<b>Academic Year</b>	2020-2021	<b>Semester</b>	1
<b>Course Coordinator</b>	Dr Lum Kit Meng		
<b>Course Code</b>	CV4112		
<b>Course Title</b>	Traffic Engineering		
<b>Pre-requisites</b>	CV3014 Transportation Engineering		
<b>No of AUs</b>	3		
<b>Contact Hours</b>	Total: 39 Hours (Lecture: 26 hours; Tutorial: 13 hours)		
<b>Proposal Date</b>	05 Feb 2020		

### Course Aims

This course is offered to final year students taking it as a Prescribed Elective. By the end of the course, you shall be equipped with essential knowledge on the capacity of highway, unsignalised and signalised intersections, and traffic flow theory and management. This knowledge can be applied in the planning and design of land transport infrastructure facilities.

### Course Learning Outcomes (Course LO)

By the end of this course, you should be able to:

1. Perform basic statistical analysis of traffic data;
2. Analyse capacity of different kinds of roads;
3. Analyse capacity of unsignalised intersections;
4. Perform signal timing design and capacity analysis of signalised intersections;
5. Design signal progression system;
6. Determine speed-flow relationships and conduct shockwave analysis;
7. Recommend suitable traffic management and demand management measures;
8. Apply traffic safety practices.

### Course Content

S/N	Topic	Lecture Hrs	Tutorial Hrs
1	Statistical Analysis of Traffic Data	4	2
2	Highway Capacity	4	2
3	Unsignalised Intersection Capacity	3	1
4	Signalised Intersection Capacity	4	2
5	Signal Progression	1	1
6	Traffic Flow Analysis	4	2
7	Traffic Management and Demand Management	4	2
8	Traffic Safety	2	1
	Total	26	13

<b>Components</b>	<b>Course</b>	<b>Related</b>	<b>weighting</b>	<b>Team/</b>	<b>Assess</b>
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	LO tested	programme SLO or graduate attributes		Individual	ment rubrics
1. Final Examination	All	EAB SLOs (a), (b), (c)	60%	Individual	
2. Continuous Assessment 1 : Quiz 1	1, 2, 3, 4, 5	EAB SLOs (a), (b), (c)	20%	Individual	
3. Continuous Assessment 2 : Quiz 2	6, 7, 8	EAB SLOs (a), (b), (c)	20%	Individual	
Total			100%		

\*CEE SLOs = Student Learning Outcome For Civil Engineering Programme (Per BEng Civil Engineering Accreditation)

#### Related Programme LO or Graduate Attributes

- a. **Engineering knowledge:** Apply the knowledge of mathematics, natural science, engineering fundamentals, and an engineering specialisation to the solution of complex engineering problems;
- b. **Problem Analysis:** Identify, formulate, research literature, and analyse complex engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences;
- c. **Design/development of Solutions:** Design solutions for complex engineering problems and design system components or processes that meet the specified needs with appropriate consideration for public health and safety, cultural, societal, and environmental considerations.
- d. **Investigation:** Conduct investigations of complex problems using research-based knowledge and research methods including design of experiments, analysis and interpretation of data, and synthesis of the information to provide valid conclusions
- e. **Modern Tool Usage:** Create, select, and apply appropriate techniques, resources, and modern engineering and IT tools including prediction and modelling to complex engineering activities with an understanding of the limitations.
- f. **The engineer and Society:** Apply reasoning informed by the contextual knowledge to assess societal, health, safety, legal, and cultural issues and the consequent responsibilities relevant to the professional engineering practice.
- g. **Environment and Sustainability:** Understand the impact of the professional engineering solutions in societal and environmental contexts, and demonstrate the knowledge of, and

need for the sustainable development.

- h. **Ethics:** Apply ethical principles and commit to professional ethics and responsibilities and norms of the engineering practice.
- i. **Individual and Team Work:** Function effectively as an individual, and as a member or leader in diverse teams and in multidisciplinary settings.
- j. **Communication:** Communicate effectively on complex engineering activities with the engineering community and with society at large, such as, being able to comprehend and write effective reports and design documentation, make effective presentations, and give and receive clear instructions.
- k. **Project Management and Finance:** Demonstrate knowledge and understanding of the engineering and management principles and economic decision-making, and apply these to one's own work, as a member and leader in a team, to manage projects and in multidisciplinary environments.
- l. **Life-long Learning:** Recognise the need for, and have the preparation and ability to engage in independent and life-long learning in the broadest context of technological change

#### **Formative feedback**

1. Feedback will be through the dissemination of the student's performance in quizzes as well as review of the quiz questions in class.
2. We encourage you to initiate an Individual consultation sessions on your particular learning needs.

#### **Learning and Teaching approach**

<b>Approach</b>	<b>How does this approach support students in achieving the learning outcomes?</b>
Lectures	Weekly lectures to provide you with the specific knowledge and techniques to achieve the learning outcome stated above.
Tutorials	Weekly tutorials to enable you to apply the knowledge to solve structured problems. We encourage you to explore alternative approaches and techniques.

#### **Textbooks/References:**

1. Roger P. Roess, Elena S. Prassas, William R. McShane, Traffic Engineering, 4th ed., Pearson/Prentice Hall (HE355.M175 2012)
2. Transportation Research Board (2000). Highway Capacity Manual (HCM 2000). National Research Council, Washington, DC.

3. Khisty, C.J. and Lall B.K. (1998). Transportation Engineering. 2nd ed., Prentice-Hall. New Jersey.

### Course Policies and Student Responsibilities

The standing university policy governing student responsibilities shall apply.  
No special policy for this course.

### Academic Integrity

Good academic work depends on honesty and ethical behaviour. The quality of your work as a student relies on adhering to the principles of academic integrity and to the NTU Honour Code, a set of values shared by the whole university community. Truth, Trust and Justice are at the core of NTU's shared values.

As a student, it is important that you recognize your responsibilities in understanding and applying the principles of academic integrity in all the work you do at NTU. Not knowing what is involved in maintaining academic integrity does not excuse academic dishonesty. You need to actively equip yourself with strategies to avoid all forms of academic dishonesty, including plagiarism, academic fraud, collusion, and cheating. If you are uncertain of the definitions of any of these terms, you should go to the [academic integrity website](#) for more information. Consult your instructor(s) if you need any clarification about the requirements of academic integrity in the course.

### Course Instructors AY2017/18

Instructor	Office Location	Phone	Email
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### Planned Weekly Schedule

Week	Topics	Course LO	Activities
1	Statistical Analysis of Traffic Data	1	Lectures & Tutorial
2	Statistical Analysis of Traffic Data	1	Lectures & Tutorial
3	Highway Capacity of Basic Freeway Segment	2	Lectures & Tutorial
4	Highway Capacity of 2-lane Highway	2	Lectures & Tutorial
5	Capacity of Unsignalised Intersection	3	Lectures & Tutorial
6	Capacity of Unsignalised Intersection	3	Lectures & Tutorial
6	Signal Timing Design of Signalised Intersection	4	Lectures & Tutorial
7	Signal Timing Design of Signalised Intersection	4	Lectures & Tutorial
8	Capacity Analysis of Signalised Intersection	4	Lectures & Tutorial
8	Signal Progression	5	Lectures & Tutorial
9	Traffic Flow Analysis	6	Lectures & Tutorial
10	Traffic Flow Analysis	6	Lectures & Tutorial
11	Traffic Management	7	Lectures & Tutorial
12	Demand Management	7	Lectures & Tutorial
13	Traffic Safety	8	Lectures & Tutorial

