

COURSE DETAILS

Units of Credit	6	
Contact hours	4 hours per week	
Class	Tuesday, 9:00-11:00	Colombo Theatre C
Labs	Weeks 2, 4, 7, 9 Tuesday, 11:00 - 13:00 or, 13:00 - 15:00	http://timetable.unsw.edu.au/2020/CVEN4404.html
Workshop	Weeks 1, 3, 5, 8, 10 Tuesday, 11:00 - 12:00 or, 12:00 - 13:00	http://timetable.unsw.edu.au/2020/CVEN4404.html
Course Coordinator and Lecturer	Dr. Divya J. Nair Email: divya.nair@unsw.edu.au Office: H20, Level 1, CE 103	
Lecturer	Prof. Vinayak V. Dixit Email: v.dixit@unsw.edu.au	
Lecturer	Dr. David Rey Email: d.rey@unsw.edu.au	

INFORMATION ABOUT THE COURSE

Traffic engineering professionals are tasked with the responsibility of ensuring the safe and efficient movement of people and goods through the provision and maintenance of transportation systems. The effectiveness of the transport system defines the economic development and quality of life for the entire community. This course offers students to understand the technical expectations required by both public and private sector employees in the discipline. The fundamentals of traffic flow theory and the tools necessary to assess capacity and level of service for road segments and intersections are discussed in detail during the first half of the course. The second half of the course covers the application of the theory and use of the tools to conduct traffic studies and manage and control traffic related issues.

HANDBOOK DESCRIPTION

See link to virtual handbook -

<https://www.handbook.unsw.edu.au/undergraduate/courses/2020/CVEN4404/>

OBJECTIVES

This course is designed to develop students' understanding, skills and knowledge in the field of traffic and transport engineering. While the focus of the course is clearly on the design, analysis and management of road transport facilities on both the supply and demand side, importance is also placed on the reporting and presentation of technical material that can be used by high level decision makers.

List of programme attributes:

- An in-depth knowledge of fundamentals of traffic engineering
- Capacity for analytical and critical thinking and for creative problem solving in traffic engineering
- Ability to engage independent and reflective learning
- Skills for collaborative and multi-disciplinary work
- Learn management methods related to traffic engineering.

TEACHING STRATEGIES

The teaching strategies that will be used and their rationale. Give some suggested approaches to learning in the course.

Private Study	<ul style="list-style-type: none">• Review lecture material and textbook• Do set problems and assignments• Join Moodle discussions of problems• Reflect on class problems and assignments• Download materials from Moodle• Keep up with notices and find out marks via Moodle
Lectures	<ul style="list-style-type: none">• Find out what you must learn• See methods that are not in the textbook• Follow worked examples• Hear announcements on course changes
Workshops	<ul style="list-style-type: none">• Be guided by Demonstrators• Practice solving set problems• Ask questions
Assessments	<ul style="list-style-type: none">• Demonstrate your knowledge and skills• Demonstrate higher understanding and problem solving
Laboratory Work	<ul style="list-style-type: none">• Hands-on work, to set studies in context

EXPECTED LEARNING OUTCOMES

This course is designed to address the learning outcomes below and the corresponding Engineers Australia Stage 1 Competency Standards for Professional Engineers as shown. The full list of Stage 1 Competency Standards may be found in Appendix A.

Learning Outcome		EA Stage 1 Competencies
1.	Understand relationships between fundamental traffic flow parameters	PE1.1, PE1.2, PE1.4
2.	Identify and understand current technologies being used in traffic management and control	PE1.1, PE1.4, PE1.5, PE2.2, PE 2.4
3.	Have a sound understanding of the practical application of basic concepts, methods and techniques in urban traffic management studies.	PE2.1, PE2.2, PE2.4
4.	Understand the value of traffic design softwares as a tool to evaluate various strategies	PE1.1, PE1.2, PE1.5
5.	Understand and analyse field survey methodologies and analyse traffic data	PE1.1, PE1.2, PE2.1, PE2.2, PE2.4
6	Recognise and remediate existing and potential traffic management problems	PE1.1, PE1.2, PE2.1, PE2.2, PE2.4
7	Develop appropriate management and control strategies to achieve these goals	PE2.1, PE2.2, PE2.4, PE3.1, PE3.2

COURSE PROGRAM

Term 1 2020

Date	Topic (Lecturer)	Lecture Content	Demonstration Content
18/02/2020 (Week 1)	Traffic flow theory (Divya Nair)	Fundamentals of traffic flow theory	Fundamentals of traffic flow theory: practice problems
25/02/2020 (Week 2)	Traffic flow theory (Divya Nair)	Introduction to traffic studies, traffic flow elements and data collection	Lab: Introduction to SIDRA: guidelines, data Inputs, setting up a base model, calibrating and validating
03/03/2020 (Week 3)	Traffic flow theory (Vinayak Dixit)	Microscopic approaches to describe traffic flow theory, shock waves	Shockwaves: practice problems
10/03/2020 (Week 4)	Signalised Intersection (David Rey)	Concepts and design	Lab: Design and optimize intersection: traffic signal model
17/03/2020 (Week 5)	Signalised intersection (David Rey)	Optimisation, coordination and adaptive signal control	Signal design: practice problems
24/03/2020 (Week 6)		Non-teaching week for all courses	
31/03/2020 (Week 7)	Mid-Session Exam (Divya Nair)		Lab: Evaluation of signalised intersection
07/04/2020 (Week 8)	Capacity and Level of Service (Divya Nair)	Road segments: uninterrupted flow facilities	Capacity and level of service: practice problems
14/04/2020 (Week 9)	Capacity and level of Service (Divya Nair)	HCM approach: uninterrupted flow facilities	Lab: Traffic flow parameter sensitivity analysis: calibration and optimisation
21/04/2020 (Week 10)	Interrupted traffic flow (Divya Nair)	Interrupted traffic flow facilities, capacity and level of service	Capacity and level of service: practice problems

ASSESSMENT

Overall rationale for assessment components and their association with course objectives.

The final grade for this course will be based on the sum of the scores from the assignment, mid-session exam and the final examination.

The pass mark is 50% overall; however, students must score at least 40% in the final examination in order to qualify for a Pass in this course. If below a 40% is scored in the Final Exam, the final exam mark will replace your course mark.

Students who perform poorly in the group project and mid-session exam are recommended to discuss the progress with the lecturer during the term. The lecturer reserves the right to adjust the final scores by scaling if agreed by the Head of School.

ASSESSMENT OVERVIEW

Item	Length	Weighting	Learning outcomes assessed	Due date and submission requirements	Deadline for absolute fail	Marks returned
Moodle Quiz	2 hours	5%	1, 2, 3	Tuesday, 3 rd March, 3PM	Tuesday, 3 rd March, 3PM	Tuesday, 10 th March
Mid-session Exam	1.5 hours	25%	1, 2, 3, 5	Tuesday, 31 st March	Tuesday, 31 st March	Friday, 17 th April
Practical Project	8 Weeks	20%	1, 2, 3, 4, 5, 6, 7	Tuesday, 28 th April, 9AM	Friday, 1 st May, 11:59PM	Friday, 8 th May
Final Exam	2 hours	50%	1, 2, 3, 4, 5, 6, 7	TBD (Refer to myUNSW)	N/A	N/A

Details of each assessment component, the marks assigned to it, the criteria by which marks will be assigned, and the dates of submission are set out below.

Assessment	Assessment Criteria
Moodle Quiz	<p>The Moodle Quiz focuses on students "Understanding Theory" that has been presented during the first 3 weeks of the semester. The quiz will involve solving a series of problems, extending from the problems discussed during the lectures. The quiz will assess the expected learning outcomes and will be assessed based on technical accuracy, clarity in reporting and presentation.</p> <p>Date of Quiz: 3rd of March 1PM-3PM Grades Returned: 10th March</p> <p>Failure to attend the Moodle quiz will result in a mark of zero. Students who miss the assessment as a result of illness or unforeseen circumstances must apply for special considerations through the School of Civil and Environmental Engineering and contact the course-coordinator.</p> <p>The performance in the assignment will contribute to 5% of the final grade.</p>

Assessment	Assessment Criteria
Mid-session Exam	<p>A mid-session exam will be administered during the first 90 minutes of the Week 7 Lecture (31st of March). The exam will cover all the material until and including Week 6 of the course and is intended to assess students' knowledge of the expected learning outcomes, prepare students for the final exam, and discourage last minute cramming. The exam will be assessed on technical accuracy.</p> <p>Date of Exam: 31st of March 9AM-11AM Grades Returned: 17th of April</p> <p>Failure to attend the mid-session exam will result in a mark of zero. Students who miss the assessment as a result of illness or unforeseen circumstances must apply for special considerations through the School of Civil and Environmental Engineering and contact the course-coordinator.</p> <p>The performance in the mid-session exam will contribute to 25% of the final grade.</p>
Assignment: Practical Project (Group)	<p>Assignment 2 (group project) will be released on 25th of February (Week 2) and will be due on 28th of April (Week 11). This assignment allows students to display their understanding of how to conduct a traffic study and propose traffic management schemes for realistic scenarios. The assignment will involve investigating a case study and using the knowledge gained within the lectures to develop solutions for the specific case. The assignment will assess the expected learning outcomes and will be assessed based on technical accuracy, clarity in reporting and presentation.</p> <p>Deadline: 28th of April 9AM Penalties: A late penalty of 10% per day will apply for failure to submit the assignment by the stated due date. Any reports submitted 5 or more days after the deadline will receive a mark of zero.</p> <p>Absolute Deadline: 1st of May 11:59PM Grades Returned: 8th of May</p> <p>The performance in the assignment will contribute to 20% of the final grade.</p>
Final Exam	<p>A 2-hour open-book final exam will be administered at the end of the semester. The exam will be cumulative and intended to assess the students' knowledge of the material covered throughout the entire course. The exam will be assessed on technical accuracy.</p> <p>The performance in the final exam will contribute to 50% of the final grade. In order to pass the course, a student MUST achieve a mark greater than 40% in the final exam to demonstrate a holistic understanding of the course material.</p> <p>The formal exam scripts will not be returned but you are permitted to view the marked script.</p>

Supplementary Examinations for Term 1 2020 will be held on Monday 25th May – Friday 29th May (inclusive) should you be required to sit one. You are required to be available during these dates. Please do not to make any personal or travel arrangements during this period.

PENALTIES

A late penalty of 10% per day will apply for failure to submit the assignment by the stated due date. Any reports submitted 5 or more days after the deadline will receive a mark of zero.

RELEVANT RESOURCES

- Roess, Roger P., Elene S. Prassas, William R. McShane. **Traffic Engineering**. Fourth Edition, Upper Saddle River: Pearson Prentice Hall, 2011 (ISBN 0-13-913573-0)
- Daganzo, C. Fundamentals of Transportation and Traffic Operations, Pergamon-Elsevier ,Oxford, U.K. (1997)
- Mannering, F. and Washburn, S. (2013). "Principles of Highway Engineering and Traffic Analysis". Chapter 5: Fundamentals of Traffic Flow and Queueing Theory.
- **Highway Capacity Manual** (2010) (HCM2010), Transportation Research Board
- Austroads (2008-2015). **Guide to Traffic Management Set** (13 Part Series)
 - Part 2. Traffic Theory
 - Part 3. Traffic Studies Analysis
 - Part 6. Intersections, Interchanges and Crossings
 - Part 8. Local Area Traffic Management
 - Part 7. Traffic Signals

DATES TO NOTE

Refer to MyUNSW for Important Dates available at:

<https://student.unsw.edu.au/dates>

PLAGIARISM

Beware! An assignment that includes plagiarised material will receive a 0% Fail, and students who plagiarise may fail the course. Students who plagiarise are also liable to disciplinary action, including exclusion from enrolment.

Plagiarism is the use of another person's work or ideas as if they were your own. When it is necessary or desirable to use other people's material you should adequately acknowledge whose words or ideas they are and where you found them (giving the complete reference details, including page number(s)). The Learning Centre provides further information on what constitutes Plagiarism at:

<https://student.unsw.edu.au/plagiarism>

ACADEMIC ADVICE

(Formerly known as Common School Information)

For information about:

- Notes on assessments and plagiarism,
- School policy on Supplementary exams,
- Special Considerations: student.unsw.edu.au/special-consideration
- Solutions to Problems,
- Year Managers and Grievance Officer of Teaching and Learning Committee, and
- CEVSOC.

Refer to Academic Advice on the School website available at:

<https://www.engineering.unsw.edu.au/civil-engineering/student-resources/policies-procedures-and-forms/academic-advice>

Appendix A: Engineers Australia (EA) Competencies

Stage 1 Competencies for Professional Engineers

	Program Intended Learning Outcomes
PE1: Knowledge and Skill Base	PE1.1 Comprehensive, theory-based understanding of underpinning fundamentals
	PE1.2 Conceptual understanding of underpinning maths, analysis, statistics, computing
	PE1.3 In-depth understanding of specialist bodies of knowledge
	PE1.4 Discernment of knowledge development and research directions
	PE1.5 Knowledge of engineering design practice
	PE1.6 Understanding of scope, principles, norms, accountabilities of sustainable engineering practice
PE2: Engineering Application Ability	PE2.1 Application of established engineering methods to complex problem solving
	PE2.2 Fluent application of engineering techniques, tools and resources
	PE2.3 Application of systematic engineering synthesis and design processes
	PE2.4 Application of systematic approaches to the conduct and management of engineering projects
PE3: Professional and Personal Attributes	PE3.1 Ethical conduct and professional accountability
	PE3.2 Effective oral and written communication (professional and lay domains)
	PE3.3 Creative, innovative and pro-active demeanour
	PE3.4 Professional use and management of information
	PE3.5 Orderly management of self, and professional conduct
	PE3.6 Effective team membership and team leadership

