POSTGRADUATE DEGREES
in
TRANSPORT AND TRAFFIC
by
OFF-CAMPUS LEARNING

offered through
Institute of Transport Studies
Department of Civil Engineering
Faculty of Engineering
Monash University

30 November 2009

Established under the
Australian Research Council’s Key Centre Program.

INSTITUTE OF
TRANSPORT STUDIES
The Australian Key Centre
in Transport Management

The University of Sydney
and Monash University
TABLE OF CONTENTS

1. Introduction .................................................. 1
2. Transport and Traffic Postgraduate Degree Framework .... 2
4. Elective Options ................................................ 6
5. Critical Dates ...................................................... 7
6. Contacts for Additional Assistance .......................... 7

APPENDIX 1: Course Details .................................. 8

Graduate Certificate of Transport and Traffic (Grad. Cert. T&T) ........................................ 9
Postgraduate Diploma of Transport and Traffic (Postgrad. Dip. T&T) ....................................... 10
Master of Traffic (M Traffic) ........................................ 11
Master of Transport (M Transport) ................................ 12
Master of Transport and Master of Traffic (M Traffic and M Transport) .................................. 13

APPENDIX 2: Detailed Core Unit Outlines .................. 14

CIV5301 : Traffic Engineering Fundamentals ............. 15
CIV5302 : Road Traffic: Engineering and Management .... 16
CIV5303 : Quantitative Methods .................................. 17
CIV5304 : Intelligent Transport Systems ...................... 18
CIV5305 : Transport Modelling ................................... 19
CIV5306 : Road Safety Engineering ............................. 20
CIV5307 : Parking Policy and Design ........................... 21
CIV5310 : Infrastructure Project and Policy Evaluation ... 22
CIV5314 : Transport Planning and Policy ................. 23
CIV5315 : Transport Economics ................................. 24

APPENDIX 3: Detailed Elective Unit Outlines ............ 25

CIV5308 : Case Studies in Transport ...................... 26
CIV5312 : Asset Management I .................................. 27
CIV5313 : Asset Management II ................................ 28
CIV5311 : Infrastructure Project Management ............. 29
CIV5316 : Fundamentals of Urban Public Transport ....... 30
1. Introduction

The Transport Group in the Civil Engineering Department at Monash University was established in 1969. Over its 35+ year history the group has been one of Australia’s leading centres in traffic and transport education and research and has a deserved international reputation in this field. In recognition of its excellence, the Federal Government provided funding to Monash University, together with the University of Sydney, for the establishment of a Commonwealth Key Centre of Teaching and Research in Transport Management. The Centre, which commenced on 1 July 1995, is known as the Institute of Transport Studies (ITS). ITS has one node at Monash University and the other at the University of Sydney. The transport and traffic postgraduate program described in this document is offered at Monash University, through the Department of Civil Engineering, by staff affiliated with ITS. The postgraduate program has been developed in consultation with the Industry Advisory Committee operated through ITS (Monash) in the Department of Civil Engineering. The advisory committee strongly supported the concept of coursework only postgraduate degrees.

The aim of the program outlined in this document is to meet the needs of individuals working in the transport and traffic industry for postgraduate education opportunities, which provide:

- comprehensive coursework options,
- increased flexibility for students to choose when and where they study, and
- enhanced articulation options.

The program makes use of a framework for postgraduate education approved by the Engineering Faculty at Monash University. Under that framework, coursework only postgraduate degrees are offered at three levels, namely:

- Graduate Certificate,
- Postgraduate Diploma, and
- Masters.

The move to off-campus learning, or distance education, for the postgraduate program has drawn on the expertise which ITS (Monash) has already developed in offering non-award courses in transport management via distance education. ITS (Monash) currently offers an Industry Program in Parking Management as well as a Transport Management Course in Bus and Coach Operations. Over 1300 students have been involved in those distance education programs.

This document begins by outlining the framework for the postgraduate programs (Section 2). A discussion of unit (subject) offerings then follows (Section 3). Critical dates for enrolment are identified in Section 4 while the final section provides contact details for ITS (Monash) staff who can help with question which are not answered by this information booklet.

Details about this program and an application form can also be accessed via our website:

civil.eng.monash.edu.au/its
2. Transport and Traffic Postgraduate Degree Framework

The overall postgraduate degree framework is shown in Figure 1. It is based on offerings at three levels:

- Graduate Certificate,
- Postgraduate Diploma, and
- Masters Degrees.

As can be seen from Figure 1, articulation paths are clearly defined between all levels.

<table>
<thead>
<tr>
<th>Graduate Certificate in Transport and Traffic</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Direct entry for students with a three year degree in engineering, science, applied science or another appropriate degree program</td>
</tr>
<tr>
<td>• Alternative entry path available for students who have not completed a Bachelors degree</td>
</tr>
<tr>
<td>• Requires completion of 24 credit points from the postgraduate program (6 months full time equivalent)</td>
</tr>
<tr>
<td>• Upon completion of the 24 credit points the student could graduate or, if they have achieved an average of at least 65 per cent, transfer to the Postgraduate Diploma.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Postgraduate Diploma in Transport and Traffic</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Entry only available to students who articulate from the Graduate Certificate program with an average of at least 65 per cent</td>
</tr>
<tr>
<td>• Based on completing 24 credit points from the postgraduate program (12 months full time equivalent)</td>
</tr>
<tr>
<td>• Upon completion of 24 credit points, students articulating from the Graduate Certificate could graduate or, if they have achieved an average of greater than 65%, articulate to the Master of Transport or Master of Traffic single degrees or ultimately the Master of Transport and Master of Traffic double degree</td>
</tr>
<tr>
<td>• Students who qualify for direct entry to the Masters Degree options may choose to exit after completing 24 core credit points and graduate with the Postgraduate Diploma.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Master of Traffic OR Master of Transport</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Direct entry for students with a four year engineering degree, a three year undergraduate science or applied science degree with an honours year or a three year degree with appropriate postgraduate studies. Students entering via this pathway will complete 48 credit points of study (12 months full time equivalent). Students may exit from the program after 24 credit points and still obtain a Postgraduate Diploma in Transport and Traffic provided all core units for this qualification have been completed.</td>
</tr>
<tr>
<td>• Articulation option available to students who have completed the Postgraduate Diploma in Transport and Traffic with an average of greater than 65%. Students entering via this pathway will complete 24 credit points of study (6 months full time equivalent).</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Master of Transport and Master of Traffic</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Students who have completed either the Master of Transport or Master of Traffic may undertake a further 24 credit points of study to obtain both the qualifications.</td>
</tr>
</tbody>
</table>

Comprehensive details of each course are provided in Appendix 1.
Figure 1: Postgraduate Coursework Framework
3. Unit Details

The various postgraduate coursework programs draw on a common pool of units (subjects). These units are as follows:

**Offered in Semester 1:**
- CIV5301 Traffic Engineering Fundamentals
- CIV5303 Quantitative Methods
- CIV5307 Parking Policy and Design
- CIV5308 Case Studies in Transport
- CIV5310 Infrastructure Project and Policy Evaluation
- CIV5311 Infrastructure Project Management
- CIV5314 Transport Planning and Policy

**Offered in Semester 2:**
- CIV5302 Road Traffic Engineering and Management
- CIV5304 Intelligent Transport Systems
- CIV5305 Transport Modelling
- CIV5306 Road Safety Engineering
- CIV5308 Case Studies in Transport
- CIV5312 Asset Management I
- CIV5313 Asset Management II
- CIV5315 Transport Economics
- CIV5316 Fundamentals of Urban Public Transport

Detailed unit outlines are provided in Appendices 2 and 3. Each of these transport and traffic units is weighted as six credit points and each unit will usually be offered at least once every year.

Table 1 shows the links between particular units and individual postgraduate programs in transport and traffic.
Table 1: Summary of Unit Offerings for Postgraduate Courses in Transport and Traffic

<table>
<thead>
<tr>
<th>Core Units</th>
<th>Graduate Certificate in Transport &amp; Traffic</th>
<th>Postgraduate Diploma in Transport &amp; Traffic if articulating from the Graduate Certificate</th>
<th>Postgraduate Diploma in Transport &amp; Traffic if exiting from the Masters</th>
<th>Master of Traffic</th>
<th>Master of Transport</th>
<th>Master of Transport and Traffic</th>
</tr>
</thead>
<tbody>
<tr>
<td>CIV5301: Traffic Engineering Fundamentals</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>CIV 5302: Road Traffic: Engineering and Management</td>
<td></td>
<td>✓</td>
<td>✓</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>CIV 5303: Quantitative Methods</td>
<td></td>
<td></td>
<td>❌</td>
<td>✓</td>
<td></td>
<td>↑</td>
</tr>
<tr>
<td>CIV 5304: Intelligent Transport Systems</td>
<td></td>
<td></td>
<td>❌</td>
<td>✓</td>
<td></td>
<td>↑</td>
</tr>
<tr>
<td>CIV5305: Transport Modelling</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>↑</td>
</tr>
<tr>
<td>CIV5306: Road Safety Engineering</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>↑</td>
</tr>
<tr>
<td>CIV5307: Parking Policy and Design</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>↑</td>
</tr>
<tr>
<td>CIV5310: Infrastructure Project and Policy Evaluation</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>↑</td>
</tr>
<tr>
<td>CIV5314: Transport Planning and Policy</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>↑</td>
</tr>
<tr>
<td>CIV5315: Transport Economics</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>↑</td>
</tr>
<tr>
<td>Total Core Coursework Units</td>
<td>2</td>
<td>1</td>
<td>3</td>
<td>7</td>
<td>7</td>
<td>10</td>
</tr>
<tr>
<td>Elective Units</td>
<td>2</td>
<td>3</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>TOTAL UNITS REQUIRED</td>
<td>4</td>
<td>4</td>
<td>4</td>
<td>8</td>
<td>8</td>
<td>12</td>
</tr>
</tbody>
</table>

Key: ✓ = core unit  
Note: Each units is 6 credit points
4. Elective Options

An important component of the program is the explicit inclusion of elective units in each degree. Considerable flexibility exists for students to choose their elective units. The following electives are available for any of the postgraduate qualifications:

- All units listed above which are not specified as core for the desired qualification, plus
- CIV5308: Case Studies in Transport
- CIV5310: Infrastructure Project Management
- CIV5312: Asset Management I
- CIV5313: Asset Management II
- Other approved electives (from Monash or other universities) including MBA/business units

or other distance education postgraduate units from Monash University. These include units offered in the Master of Business Systems through the Gippsland Campus specifically:

- GC05803: Applied Operations Research
- GC05804: Forecasting Methods
- GC05806: Electronic Data Interchange
- GC05015: Evolutionary and Neural Computing

Details of these units are available in the Monash University Distance Education Handbook or at website:


Students are able to choose elective units from Monash University or other institutions so long as the unit(s):

- is of a postgraduate level
- has not formed part of the work presented for another degree
- includes a formal examination, which makes up at least 50 percent of the assessment in the unit.

Students will need to apply in writing to the Program Director (Associate Professor Geoff Rose) to obtain credit for units completed at other universities. Students will need to provide detailed copies of:

- the unit syllabus
- the course within which that unit fits (to determine the number of credit points to be allowed for the Monash degree)
- assessment mix, including the number, size and weighting of assignments, and the nature, duration and weighting of the examination
- transcript of results.

The Australian Professional Engineers, Scientists and Managers Association (APESMA) MBA program (offered through LaTrobe University) offers distance education management units, which can provide credit for the Monash Postgraduate Program in Transport and Traffic. Examples of LaTrobe units that fit into this category include:

<table>
<thead>
<tr>
<th>Group A:</th>
<th>Group B:</th>
</tr>
</thead>
<tbody>
<tr>
<td>101 Financial Management</td>
<td>306 Strategic Management</td>
</tr>
<tr>
<td>102 Management Perspectives</td>
<td>401 Marketing</td>
</tr>
<tr>
<td>201 Economic Decision Making</td>
<td>402 Contemporary People Management</td>
</tr>
<tr>
<td>202 Legal Studies</td>
<td>403 Information Technology for Managers</td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td>Group C:</td>
<td>Group B:</td>
</tr>
<tr>
<td>404 Best Practice in Quality Management</td>
<td>410 Strategic Management in Services</td>
</tr>
<tr>
<td>405 Environment Management</td>
<td>423 e-business Strategy</td>
</tr>
<tr>
<td>407 International Business Strategy</td>
<td>424 e-Business Implementation</td>
</tr>
</tbody>
</table>
To enrol in any of these or other units in the APESMA MBA please contact:

APESMA
Tele: (03) 9695 8855 Fax: (03) 9696 9312
+61 (0) 3 9695 8855 +61 (0) 3 9696 9312
Email: mbainfo@apesma.asn.au

Units from the Centre for Pavement Engineering Education (CPEE) Masters of Technology can also be used as elective units for the Transport and Traffic programs. The units that provide credit are:

| SEC 600 | Introduction to Pavements | SEC 605 | Pavement Maintenance and Rehabilitation |
| SEC 601 | Pavement Design | SEC 606 | Industrial and Heavy Duty Pavements |
| SEC 602 | Pavement Construction | SEC 607 | Pavement Management |
| SEC 603 | Pavement Wearing Surfaces | SEC 608 | In situ Stabilisation |
| SEC 604 | Asphalt Mix Design |

To enrol in any of these CPEE units please contact:

Ken Mavin, Executive Officer, CPEE
Tele: (03) 9853 3626 Fax: (03) 9853 3656
+61 (0) 3 9853 3626 +61 (0) 3 9853 3656
Email: cpee@aapa.asn.au

5. Critical Dates

Listed below are details of the critical dates for the program. Exact details are available in the “Key Semester Dates” section of the website at the following address:

civil.eng.monash.edu.au/courseworkdegrees

Close of Enrolment: There are separate cut-offs for enrolment beginning in either Semester 1 or Semester 2. Check the above website for exact cut-off dates for each Semester.

Semester Dates:

| Semester 1 | Feb/March –June | (Examination period: early June – late June) |
| Semester 2 | July–October | (Examination period: late October – mid November) |

6. Contacts for Additional Assistance

Enrolment or administrative questions: Ms Brenda O’Keefe
Tele: +61 (0)3 9905 9627
Email: brenda.okeefe@eng.monash.edu.au

Academic and course content questions: Associate Professor Geoff Rose
Tele: +61 (0)3 9905 4959
Email: geoff.rose@eng.monash.edu.au

Details about this program and an application form can also be accessed via our website:

civil.eng.monash.edu.au/courseworkdegrees
APPENDIX 1:

Course Details
**Course Outline and Structure**

The Graduate Certificate course is a response to the growing need for professionals with broad awareness of the characteristics and significance of transport, including its technological, economic, environmental and social impact. The course requires students to complete 24 credit points, which equates to 4 units. Three units (18 credit points) are specified as core.

**Objectives**

At the completion of the course, graduates should be able to:

1. Demonstrate an understanding of the (analytic) techniques relevant to the planning, design, management and operation of transport and traffic facilities
2. Demonstrate an understanding of the policy context of transport including interactions between transport technology, the land use and urban activity system and institutional/economic dimensions
3. Practice critical appraisal of the literature and evidence when evaluating the appropriateness of particular transport technologies or solutions to transport problems

**Length of Course**

One year if studying part-time and enrolling in two units each semester.

**Admission Requirements**

Participants will have:
- a three year degree in Engineering, Science, Applied Science or another appropriate degree program or
- at least three years of high level experience and successful completion of two units from the program (one of which must be CIV5301: Traffic Engineering Fundamentals) on a not-for-degree basis with an average of at least 65 per cent or successful completion of both CIV5301: Traffic Engineering Fundamentals on a not-for-degree basis and an ‘Entry Exam’, based on the material covered in an Industry Program (a non-award program like the Transport Management Course in Bus and Coach Operations or the Education Program in Parking Management) offered through the Institute of Transport Studies, Department of Civil Engineering, with an average of at least 65%.

**Fee Structure**

Please visit the following website for all up-to-date information on costs per unit:

*www.monash.edu.au/study/coursefinder/browse/engineering/*

Select:

1. Study Area: Civil Engineering
2. Course Level: Postgraduate
3. Course Location: Off-Campus
Postgraduate Diploma of Transport and Traffic (Postgrad. Dip. T&T)

Course Outline and Structure

The Postgraduate Diploma course is a response to the growing need for professionals with broad awareness of the characteristics and significance of transport, including its technological, economic, environmental and social impact. The course requires students to complete 24 credit points, which equates to 4 units.

Objectives

At the completion of the course, graduates should be able to:

1. Demonstrate an understanding of the (analytic) techniques relevant to the planning, design, management and operation of transport and traffic facilities
2. Demonstrate an understanding of the policy context of transport including interactions between transport technology, the land use and urban activity system and institutional/economic dimensions
3. Practice critical appraisal of the literature and evidence when evaluating the appropriateness of particular transport technologies or solutions to transport problems.
4. Demonstrate knowledge and skills in a number of chosen areas of special interest as defined in the objectives and content of individual elective units of this course.

Length of Course

Depends on entry path. The four unit requirement could be met in one year if studying part-time and enrolling in two units each semester.

Admission Requirements

Participants will obtain admission to the course by articulating from the Graduate Certificate program with an average of at least 65 per cent.

Fee Structure

Please visit the following website for all up-to-date information on costs per unit:

www.monash.edu.au/study/coursefinder/browse/engineering/

Select:

1. Study Area: Civil Engineering
2. Course Level: Postgraduate
3. Course Location: Off-Campus
Master of Traffic (M Traffic)

Course Outline and Structure

The Masters course is a response to the growing need for professionals with broad awareness of the characteristics and significance of traffic, including its technological, economic, environmental and social impact. The course consists of 48 credit points of study (seven core units and one elective unit) or completion of the Postgraduate Diploma plus an additional 24 credit points or completion of the Master of Transport and a further 24 credit points, including any incomplete core units in the Master of Traffic.

Objectives

Knowledge
Graduates will:
1. understand the need to plan, develop and maintain the traffic system at a high level
2. demonstrate an understanding of the policy context of traffic engineering and management including interactions between transport technology, the land use and urban activity system and institutional/economic dimensions.

Skills
Graduates will be able to:
3. apply the (analytic) techniques relevant to traffic engineering and management
4. assess traffic related projects and policies in a rigorous manner
5. practise critical appraisal of the literature and evidence when evaluating the appropriateness of particular technologies or solutions to traffic problems
6. communicate their arguments effectively to teams and clients
7. critically evaluate their own and others’ work.

Attitudes
Graduates will be able to:
8. recognise the importance of balancing a range of broad considerations in achieving the best operation of the traffic system.

Length of Course

Will depend on entry path. The 8 unit requirement could be met in two years if studying part-time and enrolling in two units each semester.

Admission Requirements

Normal admission to the Master of Traffic will require a four-year degree course in an Engineering discipline, a four-year (Hons) Science/Applied Science degree, or a three-year degree and an appropriate postgraduate qualification equivalent to full-time studies at Level 4. Entry can also be obtained by articulation through the Graduate Certificate and Postgraduate Diploma in Transport and Traffic with an average of at least 65%. Entry is also open to students who have completed the Master of Transport degree.

Fee Structure

Please visit the following website for all up-to-date information on costs per unit:

www.monash.edu.au/study/coursefinder/browse/engineering/

Select:
1. Study Area: Civil Engineering
2. Course Level: Postgraduate
3. Course Location: Off-Campus
Master of Transport (M Transport)

Course Outline and Structure

The Masters course is a response to the growing need for professionals with broad awareness of the characteristics and significance of transport, including its technological, economic, environmental and social impact. The course consists of 48 credit points of study (seven core units and one elective unit) or completion of the Postgraduate Diploma plus an additional 24 credit points or completion of the Master of Traffic and a further 24 credit points, including any incomplete core units in the Master of Transport.

Objectives

Knowledge
Graduates will:
1. understand the need to plan, develop and maintain the transport system at a high level
2. demonstrate an understanding of the policy context of transport planning including interactions between transport technology, the land use and urban activity system and institutional/economic dimensions.

Skills
Graduates will be able to:
3. apply the (analytic) techniques relevant to transport planning
4. assess transport projects and policies in a rigorous manner
5. practise critical appraisal of the literature and evidence when evaluating the appropriateness of particular transport technologies or solutions to transport problems
6. communicate their arguments effectively to teams and clients
7. critically evaluate their own and others' work.

Attitudes
Graduates will be able to:
8. recognise the importance of balancing a range of broad considerations in achieving the best operation of the transport system.

Length of Course

Will depend on entry path. The 8 unit requirement could be met in two years if studying part-time and enrolling in two units each semester.

Admission Requirements

Normal admission to the Master of Transport will require a four-year degree course in an Engineering discipline, a four-year (Hons) Science/Applied Science degree, or a three-year degree and an appropriate postgraduate qualification equivalent to full-time studies at Level 4. Entry can also be obtained by articulation through the Graduate Certificate and Postgraduate Diploma in Transport and Traffic with an average of at least 65%. Entry is also open to students who have completed the Master of Traffic degree.

Fee Structure

Please visit the following website for all up-to-date information on costs per unit:

www.monash.edu.au/study/coursefinder/browse/engineering/

Select:
1. Study Area: Civil Engineering
2. Course Level: Postgraduate
3. Course Location: Off-Campus
Master of Transport and Master of Traffic
(M Traffic and M Transport)

Course Outline and Structure

The Masters level courses are a response to the growing need for professionals with broad awareness of the characteristics and significance of transport and traffic, including their technological, economic, environmental and social impacts. Students who wish to cover both fields of transport and traffic may continue on after the completion of either Masters degree and obtain the double masters qualification by undertaking a further 24 credit points of study. Students must complete all core subjects for both Masters degrees in order to obtain the double degree.

Length of Course

Will depend on entry path. The 4 unit requirement in addition to either the Master of Traffic or Master of Transport could be met in one year if studying part-time and enrolling in two units each semester.

Admission Requirements

Entry is open to students who have completed either the Master of Traffic or Master of Transport degree.

Fee Structure

Please visit the following website for all up-to-date information on costs per unit:

www.monash.edu.au/study/coursefinder/browse/engineering/

Select:

1. Study Area: Civil Engineering
2. Course Level: Postgraduate
3. Course Location: Off-Campus
APPENDIX 2:
Detailed Core Unit Outlines
CIV5301 : Traffic Engineering Fundamentals

Unit Co-ordinator: Associate Professor Geoff Rose

Course Details:

Credit Points: 6
When Offered: Every year
Campus: Clayton

Hours Work Required: 150
Mode: Distance Education

Unit Objectives:

Knowledge/Understanding:
To develop: 1. familiarity with the basic parameters and theories of traffic flow

Skills:
To develop: 1. ability to design, undertake and analyse traffic surveys
2. ability to apply basic traffic flow theory to the analysis of unsignalised intersection capacity
3. ability to design timing plans for isolated traffic signals

Attitudes:
To develop: 4. awareness of the importance of traffic engineering and its relationship broader transport issues

Unit Summary:

This unit develops students’ understanding of traffic flow theory, analysis of signalised and unsignalised intersections. The course is designed to provide a rigorous and practical coverage of the collection of traffic data. The traffic surveys component of the course will cover traditional techniques for counting, classification and origin-destination surveys and we will also consider the capabilities of new traffic data collection equipment.

Assessment:
3 hour Examination (50%) and Assignments (50%)

CIV5302 : Road Traffic: Engineering and Management

Unit Co-ordinator:  
Professor William Young

Course Details:

Credit Points:  6  
Hours Work Required:  150  
When Offered:  Every year  
Mode:  Distance Education  
Campus:  Clayton

Unit Objectives:

Knowledge:
To develop:  1. an understanding of the principles of traffic engineering and management  
2. appreciation of the strengths and weaknesses of various methods of practice and management

Skills:
To develop:  3. skills in eliciting the components in a traffic problem, analysing the components and suggesting one or more solutions

Attitudes:
To develop:  4. awareness of the role of the traffic engineer in determining impacts, explanations and solutions to road traffic problems

Unit Summary:

This unit develops students' understanding of the principles and practice of traffic management. The emphasis is on the role of the traffic manager in providing the road and traffic network for road based vehicles. The fundamentals of human factors and road network design are considered. The principles of signalised and non-signalised intersections are covered as are the planning and design considerations for different road users. Emphasis is placed on the need to forecast traffic impacts at sites and on the road network.

The unit exposes the student to the fundamentals of the three components to the traffic system: the vehicle, the driver and the road environment. The emphasis is on the application of theory to practice in solving traffic related problems. The unit covers the road traffic system, traffic networks, traffic design elements, intersection design and control and analytic techniques.

Assessment:  3 hour Examination (50%) and Assignments (50%)

CIV5303 : Quantitative Methods

Unit Co-ordinator: Dr Majid Sarvi

Course Details:

Credit Points: 6  
Hours Work Required: 150  
When Offered: Every year  
Mode: Distance Education  
Campus: Clayton

Unit Objectives:

To provide understanding and skills in data analysis and statistical methods relevant to traffic and transport, survey design, modelling and forecasting.

Knowledge:
To develop understanding of:
1. the need for a systematic approach to data collection interpretation and analysis
2. graphical and tabular methods of presenting data
3. probability theory and statistical distributions used in transport studies
4. descriptive statistics, their uses and the limitations of classical statistics
5. the concept of Analysis of Variance
6. the steps in model development
7. least squares regression and time series analysis

Skills:
To be able to:
8. use methods to present data and identify its faults and strengths
9. calculate and interpret descriptive statistics
10. test for differences in means and variances
11. calculate minimum sample sizes
12. apply the Analysis of Variance and nonparametric statistical technique
13. test the fit of observed data to specific distributions
14. apply least squares regression

Attitudes:
To develop awareness of the:
15. power and variety of visual methods available for presenting and investigating the character of data
16. implications of data errors and the approximate nature of statistical analyses
17. limitations of data analyses.

Unit Summary:

Quantitative methods is a course in data analysis and statistical methods relevant to traffic and transport, survey design, modelling and forecasting. The student is expected to develop an understanding of basic statistical procedures, an approach for integrating data analysis and graphical methods, the model development procedure, least squares regression, the interpretation of behavioural modelling techniques and time series analysis.

Assessment:

3 hour Examination (50%) and Assignments (50%)

CIV5304 : Intelligent Transport Systems

Unit Co-ordinator:  
Associate Professor Geoff Rose

Course Details:

<table>
<thead>
<tr>
<th>Credit Points:</th>
<th>6</th>
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<tbody>
<tr>
<td>When Offered:</td>
<td>Every year</td>
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<tr>
<td>Campus:</td>
<td>Clayton</td>
</tr>
<tr>
<td>Hours Work Required:</td>
<td>150</td>
</tr>
<tr>
<td>Mode:</td>
<td>Distance Education</td>
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Unit Objectives:

Knowledge/Understanding:
To develop:
1. understanding of the role that technology plays in addressing transport problems,
2. understanding of the role of advanced technology, or intelligent transport systems (ITS), in improving the performance and reducing the impacts of urban transport (passenger and freight) modes,
3. understanding of technology building blocks which underlie ITS,
4. appreciation of the functional areas of ITS and the characteristics of the technology in different application areas,
5. understanding of how ITS applications are built from component technologies and how those systems can be evaluated.

Skills:
To develop:
6. skills in obtaining information from the world wide web
7. communications skills

Attitudes:
To develop:
8. awareness of the broader societal issues associated with the application of ITS
9. appreciation of contemporary issues in the application of advanced technology in transport including the roles of the public and private sectors.

Unit Summary:

This unit develops students' understanding of application of advanced technology in transport. The emphasis is on the surface transport system in general and urban transport systems in particular. The term ‘Intelligent Transport Systems (ITS)’ is now commonly used to cover the application of advanced technology to the surface transport system. This unit introduces students to the field of ITS, examines component technologies and explores how those component technologies are brought together in applications or products. Contemporary issues in the application of advanced technology in transport are considered including societal impacts and the roles of the public and private sectors.

Assessment:  
3 hour Examination (50%) and Assignments (50%)

Prescribed Texts:  
None
CIV5305 : Transport Modelling

Unit Co-ordinator: Dr Majid Sarvi

Course Details:

Credit Points: 6
When Offered: Every year
Campus: Clayton

Hours Work Required: 150
Mode: Distance Education

Unit Objectives:

Knowledge/Understanding:
To develop: 1. an understanding of the different types of models used by transportation analysts to analyse policy decisions
2. an appreciation of the strengths and weaknesses of the various modelling approaches

Skills:
To develop: 3. skills in the calibration and application of micro- and macro-transportation models

Attitudes:
To develop: 4. awareness of the purpose of analytic modelling in transport planning

Unit Summary:

This subject develops students' understanding of the models and methods used to predict the impacts of policy changes on travel behaviour. The full-range of modelling options are covered including land-use models, macro-level urban transportation models (traditional four-step and activity-based), and micro-level operational models. The capabilities of commercial modelling packages are also reviewed.

Assessment: 3 hour Examination (50%) and Assignments (50%)

Prescribed Texts: None

CIV5306 : Road Safety Engineering

Unit Co-ordinator:  
Mr Peter Daly

Course Details:

Credit Points: 6  
Hours Work Required: 150  
When Offered: Every year  
Mode: Distance Education  
Campus: Clayton

Unit Objectives:

Knowledge/Understanding:
To develop:  
1. understanding of the fundamentals and role of road safety engineering  
2. recognition of the organisations involved in the road safety industry  
3. understanding of the fundamentals of road and traffic engineering theory and practice  
4. understanding of how the hazardous road location process is applied  
5. knowledge of where to find road crash data and how to analyse a mass accident database to determine the nature and extent of road crash problems at any given site  
6. knowledge of the range of road crash countermeasures (especially those related to road or traffic design and operation) which may be applied to improve road safety  
7. understanding of the effectiveness of countermeasure evaluation

Skills:
To develop skills in:  
8. design of road and traffic engineering elements  
9. translating road crash data into meaningful information through preparation of crash diagrams and accident factor matrices  
10. determining countermeasure options from thorough analysis of information  
11. prioritising and evaluating countermeasure implementation

Attitudes:
To develop:  
12. appreciation of the design of traffic elements on the road network  
13. a rigorous detective approach to investigating road crash data  
14. awareness of the ‘big-picture’ and the need for best allocation of scarce resources

Unit Summary:

The unit introduces participants to the fundamentals and role of road safety engineering theory and practice. An appreciation of the design of traffic elements on the road network and a rigorous detective approach to investigating road crash data will be developed. Participants will learn applied skills to find road crash data and analyse it to determine the nature and extent of road crash problems. An ability to translate road crash data into meaningful information through preparation of crash diagrams and accident factor matrices, determine countermeasure options and prioritise and evaluate countermeasure implementation programs will be cultivated.

Assessment:  
3 hour Examination (50%) and Assignments (50%)

Prescribed Texts:  

Recommended Reading:  
CIV5307 : Parking Policy and Design

Unit Co-ordinator:  
Professor William Young

Course Details:

Credit Points: 6  
Hours Work Required: 150  
When Offered: Every year  
Mode: Distance Education  
Campus: Clayton

Unit Objectives:

To develop the understanding and skills required for the development of parking policy and the design of parking systems.

Knowledge/Understanding:
To develop: 1. an understanding of the process for development of parking policy and the issues which influence parking policy development  
2. understanding of the fundamentals of parking systems design

Skills:
To develop: 3. policy determination  
4. policy application  
5. on-street design  
6. off-street design

Attitudes:
To develop: 7. awareness of the role of parking policy  
8. awareness of the need for efficient parking design

Unit Summary:

This unit concentrates on the parking policy and design. Parking policy determines the overall direction parking is to take in an urban or rural area. It is closely associated with transport and urban issues. Parking design focuses on the functioning of on- and off-street parking. More specifically, the parking policy section introduces the types of policies, and their implementation and effectiveness. Parking policy should be seen within the context of urban policy and this unit brings urban transport and parking policy together. The parking design section develops a series of design principles and applies these to on- and off-street design. Mechanical parking systems are discussed.

Assessment: 3 hour Examination (50%) and Assignments (50%)

Prescribed Texts: None

CIV5310 : Infrastructure Project and Policy Evaluation

Unit Co-ordinator: Ms Rita Seethaler

Course Details:

Credit Points: 6
Hours Work Required: 150
When Offered: Every year
Mode: Distance Education
Campus: Clayton

Unit Objectives:

Knowledge/Understanding:
To develop:
1. Familiarity with the principles of sustainability
2. Understanding of the application of an interdisciplinary approach, incorporating natural, social and engineering sciences
3. Appreciation of the theory and application of well approved “classical” approaches that have to be adapted to new situations.

Skills:
To develop:
4. Ability to apply the principles of sustainability as a framework for the conduct of a practical evaluation (of projects and/or policies) in their own professional area
5. Ability to obtain the specific forms of information and communication required in an interdisciplinary context
6. Skills extension beyond classical approaches to evaluation
7. Availability to change along with the moving targets of the context within which they work
8. Ability to cope with complex, often conflicting situations, in which sustainability based evaluation procedures must be combined with the necessary forms of participation, in order to be accepted and supported by the community

Attitudes:
To develop:
9. A practical approach to sustainability
10. An interdisciplinary approach and corresponding communication skills
11. Awareness of the need to be flexible and innovative in the application of evaluation methodologies
12. Confidence to be able to deal with complexity, conflicts and participation

Unit Summary:
This unit is an introduction to the principles and methods of triple-bottom-line evaluation of projects and policies. The triple-bottom-line stands for economic, environmental and social requirements of sustainable development. The principles of sustainability and their assessment are explained, based on a number of international guidelines and conventions. Economic evaluation is discussed in detail, including the different methodological approaches, the components and the process of cost benefit analysis. The consideration of the environmental domain of sustainability covers general evaluation procedures and concepts, such as the establishment of dose-response relationships for impact quantification and valuation of environmental impacts in monetary units. The evaluation of different types of impacts, such as air pollution, noise, climate change etc. is then explored in detail. Social aspects, such as distributional effects and equity implications of projects and policies are addressed explicitly. The unit ends with a general outline of information management and its integration into the decision process. Throughout the unit, the theoretical foundations are complemented with experience from practical case studies from Australia and overseas.

Assessment:
3 hour Examination (50%) and Assignments (50%)

Prescribed Texts: None

Recommended Reading: None
CIV5314 : Transport Planning and Policy

Unit Co-ordinator:  
Associate Professor Geoff Rose

Course Details:

Credit Points: 6  
Hours Work Required: 150  
When Offered: Every year  
Mode: Distance Education  
Campus: Clayton

Unit Objectives:

Knowledge/Understanding:
To develop: 1. understanding of the framework within which transport planning is conducted and the foundations for formulation of transport policy  
2. appreciation of the range, and potential impact, of supply and demand oriented solutions which can be used to address transport and associated environmental problems within a sustainability context  
3. knowledge of the performance, impacts and costs of various transport modes (covering both passenger and freight) and the factors influencing the level, pattern and trends in travel demand  
4. appreciation of the issues relevant to selecting a mode for a particular transport task  
5. understanding of the factors to be considered in conducting transport surveys including sample design, questionnaire design and survey administration.

Skills:
To develop: 6. the ability to plan, undertake and report results from a travel survey  
7. the ability to analyse contemporary transport issues through consideration of different policy options  
8. communication skills

Attitudes:
To develop: 9. the confidence to be able to discuss contemporary issues in transport planning and policy

Unit Summary:

This unit introduces students to contemporary issues in transport planning. The concept of sustainable transport is introduced along with the steps in the transport planning process. Supply and demand oriented approaches to addressing transport challenges are reviewed and travel demand management is placed into context. The characteristics of transport modes and travel demand patterns are used to provide a framework for considering the suitability of a particular transport mode for a particular context. Travel survey methods are considered with an emphasis on the role of survey design and administration in the collection of useful travel survey data.

Assessment:  
3 hour Examination (50%) and Assignments (50%)

Prescribed Texts:  
To be advised

Recommended Reading:  
To be advised
CIV5315 : Transport Economics

Unit Co-ordinator: Mr John Clements

Course Details:

Credit Points: 6  
Hours Work Required: 150  
When Offered: Every year  
Mode: Distance Education  
Campus: Clayton

Unit Objectives:

Knowledge/Understanding:
To develop:
1. understanding of the foundations of demand and supply analysis and of the structure, conduct and performance of transport markets
2. understanding of cost concepts and their measurement, with relevance to decision-making for transport operations and investment
3. understanding key concepts and measurement approaches in the application of cost benefit analysis
4. knowledge of the key role which governments play in influencing the institutional environment within which transport operations take place
5. knowledge of the forms and impacts of different types of government intervention and deregulation on transport markets and operations

Skills:
To develop:
6. the ability to calculate consumer surplus as a measure of transport benefits
7. the ability to undertake breakeven analysis for transport operations
8. the ability to calculate and apply arc elasticities to determine the impacts of changes in prices or service levels on demand
9. the ability to apply cost benefit analysis to transport investment economic evaluation
10. communication skills

Attitudes:
To develop:
11. confidence to be able to discuss the application of transport economics principles to contemporary issues in transport

Unit Summary:

This unit provides an introduction to contemporary analytical methods and issues in transport economics, with particular relevance to transport operations, infrastructure investment and policy decision-making. Fundamental concepts and methods relevant to demand, cost, pricing and investment analysis and decision-making are covered. The important role of regulations in the operations of markets and transport operations is considered as are the forms and impacts of different types of government intervention, deregulation and privatisation in transport markets and operations. The unit emphasizes the application of transport economics principles to contemporary policy issues in transport.

Assessment:
3 hour Examination (50%) and Assignments (50%)

Prescribed Texts:

Recommended Reading:
APPENDIX 3:
Detailed Elective Unit Outlines
CIV5308 : Case Studies in Transport

Unit Co-ordinator: Associate Professor Geoff Rose

Course Details:
Credit Points: 6
When Offered: Every year
Campus: Clayton

Hours Work Required: 150
Mode: Distance Education

Unit Objectives:
Knowledge/Understanding:
To develop: 1. an understanding of the area/topic selected by the student

Skills:
To develop: 1. the ability to plan, undertake and report on an independent program of investigation/research
2. the ability to communicate information about a topic to readers who may have a limited background in that area

Attitudes:
To develop: 1. awareness of the importance of critical analysis of published material

Unit Summary:
This unit develops students’ understanding of a particular topic/area in the transport field through completion of a one semester long project which will develop their ability to plan, undertake and report on an independent program of investigation/research. Students will be provided with a selection of topics, or they will be able to propose their own reflecting their professional interests. On the basis of their selected topic, the student will undertake a one semester long program of independent investigation/research and document the findings in a professional report.

Assessment: Written project plan, progress and final reports (100%)

Prescribed Texts: None

Recommended Reading: None
CIV5312 : Asset Management I

Unit Co-ordinator:  
Mr Tim Provis

Course Details:

Credit Points: 6  
Hours Work Required: 150  
When Offered: Every year  
Mode: Distance Education  
Campus: Clayton

Unit Objectives:

Knowledge/Understanding:
To develop:  
1. Familiarisation of the students with the concept of ‘whole of life’ asset management  
2. Understand processes for developing and implementing effective infrastructure policy  
3. To develop an understanding of the external risks and issues to be managed  
4. Understand the process of establishing asset performance (service) levels and measures  
5. Understanding of the steps in developing and evaluating asset management strategies.

Skills:
To develop:  
6. Recognise and cope with complex and competing situations in the achievement of agreed infrastructure performance outcomes  
7. Develop a systemic approach to managing infrastructure systems  
8. Identify and consult appropriately with stakeholders  
9. Develop and manage infrastructure policy  
10. Measure the performance of the system.

Attitudes:
To develop:  
11. Apply a practical approach to the use of the concepts as a framework for the management of infrastructure in their own professional area  
12. Apply project management concepts and procedures within an asset management framework

Unit Summary:

This unit will describe the concepts, theory and methods of infrastructure management. It will cover asset management principles (whole of life cycle analysis, infrastructure policy, risk management and strategic development), concepts and identification of asset performance requirements (community and stakeholder benefits and consultation, system performance and measures, level of service).

Assessment:  
3 hour Examination (50%) and Assignments (50%)  

Prescribed Texts:  
None

Recommended Reading:  
None
CIV5313 : Asset Management II

Unit Co-ordinator: Mr Ashay Prabhu

Course Details:

Credit Points: 6  
Hours Work Required: 150  
When Offered: Every year  
Mode: Distance Education  
Campus: Clayton

Unit Objectives:

Knowledge/Understanding:
To develop:  
1. Familiarisation of students with information planning, data gathering and use related to the management of infrastructure networks.  
2. To develop student’s understanding of asset maintenance management  
3. To develop student’s understanding of the techniques used to ensure infrastructure is maintained appropriately

Skills:
To develop:  
4. Develop a data collection and measurement method  
5. Collect and analyse data on infrastructure performance  
6. Determine appropriate physical treatment options  
7. Use software programs to prepare long, medium & short-term asset management plans  
8. Develop deterioration (risk of failure) models based on whole of life analysis  
9. Identify and report on best result for least cost scenarios (Level of Service analysis)  
10. Prepare an annual asset maintenance program

Attitudes:
To develop:  
11. Apply a practical approach to the use of asset management tools for the management of infrastructure in their own professional area  
12. Apply project management concepts within an asset management framework

Unit Summary:

This unit will focus on identifying and managing relevant asset management data. Participants will be exposed to manipulating technical detail within asset management software enabling deterioration modelling and treatment tradeoffs. It will cover information management (maintaining inventories, condition rating methodologies, information planning decision making and long term impacts, asset usage data) and asset maintenance management (treatment options, management of asset use, maintenance management and strategy evaluation).

Assessment:

3 hour Examination (50%) and Assignments (50%)

Prescribed Texts: None

Recommended Reading: None
CIV5311 : Infrastructure Project Management

Unit Co-ordinator: Professor Tony Richardson

Course Details:

Credit Points: 6
When Offered: Every year
Campus: Clayton

Hours Work Required: 150
Mode: Distance Education

Unit Objectives:

Knowledge/Understanding:
To develop:
1. Familiarity with the concepts of project management
2. Knowledge of the application of an interdisciplinary approach, incorporating economic and engineering sciences
3. Appreciation for the specific forms of information and communication required in an interdisciplinary context
4. Knowledge of the theory and application of well approved “classical” approaches to project management

Skills:
To develop:
5. Ability to apply a framework for the management of projects in their own professional area
6. Ability to adapt project management methods to new situations
7. Ability to apply an interdisciplinary approach to project management and corresponding communication skills

Attitudes:
To develop:
8. Appreciation of the need for practical, flexible and innovative approaches to project management
9. Confidence to cope with complex, often conflicting, situations in which the different economic, engineering and social objectives of stakeholders need to be balanced to arrive at a mutually satisfying outcome

Unit Summary:

This unit is an introduction to the principles and methods of project management as applied in various engineering and infrastructure projects. It is designed to be immediately applicable to physical and non-physical projects at a small and medium scale, and to provide a framework on which project management skills for large-scale projects can be developed. Project scoping is covered by describing the roles of a Statement of Work and a Work Breakdown Structure. A key element of the subject is the treatment of time and cost planning for projects, particularly under conditions of risk and uncertainty.

The unit concludes with an overview of contracts used in project management, and a review of the increasingly important topic of quality management principles as applied to project management.

Assessment:
3 hour Examination (50%) and Assignments (50%)

Prescribed Texts: None

Recommended Reading: None
CIV5316 : Fundamentals of Urban Public Transport

Unit Co-ordinator: Professor Graham Currie

Course Details:

Credit Points: 6
Hours Work Required: 150
When Offered: Every year
Mode: Distance Education
Campus: Clayton

Unit Objectives:

Knowledge/Understanding:
To develop:
1. An understanding of the framework within which public transport planning and management is conducted and the foundations of public transport policy
2. An appreciation of the nature and trends of public transport markets, and the sensitivity of these markets to both external influences and public transport service changes
3. Knowledge of the performance, impacts and costs of various public transport systems, services and modes and the factors influencing improvements to these systems
4. An appreciation of the issues relevant to selecting a particular public transport mode for a particular transport task
5. An understanding of the factors to be considered in conducting demand and operational analysis in public transport

Skills:
To develop:
6. An ability to analyse the performance of public transport systems, modes and services including changes to these services
7. An ability to analyse contemporary public transport issues through consideration of different policy perspectives
8. Communication skills

Attitudes:
To develop:
9. The confidence to be able to discuss contemporary issues in public transport planning and policy

Unit Summary:

This unit is designed to lay important foundations of public transport planning and management knowledge. It covers public transport planning from a range of perspectives including policy, demand/markets and supply/operations and infrastructure. Policy analysis is designed to provide an understanding of the strategic, institutional and political context within which public transport services are provided. This is to illustrate the diverse and often conflicting objectives which drive the development and planning of services. Demand/market analysis aims to introduce students to the range of markets and market drivers which influence the use of public transport services. Supply/operations and infrastructure analysis provides an overview of the types of services which are provided and the operational, engineering and technology issues which govern their effective deployment.

Assessment:
3 hour Examination (50%) and Assignments (50%)

Prescribed Texts: None

Recommended Reading: None