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Reflections on Teaching Role and Practice

As a teacher, I view my role as a learning facilitator, providing the conditions in which students can learn, guiding and inspiring them to achieve their best

I place strong emphasis on developing flexible delivery and on-line resources, and on creating a pleasant and safe learning environment that is conducive to student self-learning and interaction. I also encourage teamwork, communications, presentation and technical writing skills and designs tutorials and projects that help students improve their critical thinking in the assessment of engineering and design alternatives. I also believe students learn best by 'doing' work and equally well by being shown examples of successful professionals, attitudes, real-world projects and case studies. A number of distinguished guest lecturers from the industry and government are invited to contribute to my courses, which also ensures that teaching remains relevant to current practice. In my supervision role, I place strong emphasis on stimulating student interests and developing their critical analysis skills. Students are also encouraged to write papers; enter competitions; and attend conferences to present their work. Seven of my students (6 undergraduate and 1 postgraduate) have won local/national awards for presentations/publications related to their theses.

Undergraduate and Postgraduate Courses

Traffic Flow Theory and Analysis (Undergraduate, Core, Year 2)	**Course Description:** *Traffic flow theory, theories of interrupted & area-wide traffic flow; traffic surveys & data collection/analysis methods; performance/design of intersections & roundabouts; traffic signal operation/design; transport & the environment; planning & design for public transport systems; Intelligent Transport Systems* This course introduces students to the field of traffic and transportation engineering. It deals primarily with road transport systems and the traffic analysis process. The course emphasises basic traffic flow theories; data collection methodologies and techniques; optimisation; performance evaluation of transport facilities and their associated impacts; and the role of advanced technologies in addressing today's urban congestion challenges. The course also emphasises the need for good planning, design and operation of transport facilities in order to improve their safety, efficiency, cost effectiveness and minimise their adverse impacts. Students are introduced to the basic traffic flow theories used to describe the operation of both signalised and un-signalised intersections. Other major topics include optimisation techniques and economic evaluation traffic engineering projects. The role of Intelligent Transport Systems (ITS) and the impact of advanced technologies on the transport system are also discussed
Transportation Systems Engineering (Undergraduate, Core, Year 3)	**Course Description:** *Principles of road design; road safety; traffic calming & local area traffic management; travel demand management techniques; transportation planning & travel demand forecasting; transport operations research & decision making tools; airport operations; railway planning; Intelligent Transport Systems* This course introduces students to a number of topics in transportation engineering, road design, planning, operations and management of transportation systems. The course emphasises the need for good planning, design and operation of transportation facilities in order to improve their safety, efficiency and cost effectiveness. Students are introduced to the basic road design variables and the important aspects of driver behaviour which are vital to the successful design and operation of the road system. The principles of vertical and horizontal road alignment are also covered. The fundamentals of project planning and evaluation, including multiple criteria economic analysis, are also presented. Students are also introduced to the process of urban transport planning and travel demand forecasting methods and techniques for assessing the air quality, noise and energy impacts of transportation projects. Analysis of road capacity and level of service of operational road facilities is also covered. Finally, this course includes a number of special topics in transportation engineering which are delivered as independent study and cover road safety and Intelligent Transport Systems

Traffic Systems Operations and Management (Undergraduate, Elective, Year 4) An advanced version including a term project was also offered as a Postgraduate Elective	***Course Description:*** *Strategic transport planning; modelling of land-use-transport-environment interaction; planning & design for on-road public transportation; advanced travel demand forecasting methods & computer modelling techniques; transport operations research; advanced computing techniques & applications in intelligent transportation systems* This course comprises a number of modules and case studies on Traffic Systems Operations and Management with particular emphasis on Intelligent Transport Systems applications. A number of modules developed by the Consortium for ITS Training and Education (CITE) are provided. This course is offered in Australia through the University of Queensland, one of the partner and participating universities in CITE. The course is intended to cover a broad set of topics in transport systems operations, management and Intelligent Transport Systems. The course covers modules on transportation management, advanced signal systems, corridor management, ITS applications in transit management, advanced communications technology and evaluation of ITS projects
Intelligent Transport Systems (Undergraduate, Elective, Year 4) An advanced version including a term project was also offered as a Postgraduate Elective	***Course Description:*** *Introduction to Intelligent Transportation Systems & the application of advanced technologies to improve network efficiency & performance. Topics include advanced traffic & traveller information systems; advanced public transportation systems; commercial vehicle operations; emergency management systems; rural applications; & applied systems engineering tools* This course provides an introduction to intelligent transportation systems (ITS), which involves the application of advanced information processing or computing, communications, sensor and control technologies and management strategies, primarily in real-time, in an integrated manner to improve the operation of the surface transport system. The theme of this course is that intelligent transportation systems should be used to provide cost-effective solutions to real world problems, not just as a use of technology. The course has been designed with three components: (1) Overview and Framework: providing an overview of ITS and a framework for planning and evaluating ITS applications. (2) Solutions to Transport Challenges: ITS User Services. How ITS technologies and services can be applied to address transport challenges such as ensuring safety, mitigating congestion, efficiently moving people and goods, managing travel demand, considering the environment and providing better customer service. (3). Enabling Systems and Technologies: to plan, design, implement and operate ITS.

Evaluation of Teaching

Course	Year	Number of Respondents	Overall Rating
Traffic Flow Theory and Analysis	2004	53	83%
Transportation Systems Engineering	2002	86	82%
Transportation Systems Engineering	2001	60	86%

During the 10-year tenure at the University of Queensland, I received **16 *'Best Teacher'*** nominations from recipients of the Dean's Commendation for High Achievement. This was based on my teaching in the undergraduate core transportation engineering courses.

Development of Teaching
- Strong emphasis on developing electronic and web-based instructional material to maximise the potential for flexible delivery
- Course outlines, lecture notes and other resources are available for students to download from especially designed course web pages
- Introduced a number of new online postgraduate courses in collaboration with the Consortium for ITS Training and Education (CITE). The courses are offered fully on-line with few formal contact sessions during the semester
- Implemented different techniques in teaching and ran elective courses as Seminars or in flexible delivery mode, which promoted and encouraged self-learning (courses were very well received by the students)
- Introduced a number of Internet-related newsgroups and mailing lists to encourage student feedback and interaction

Professional Development Courses

Intelligent Transport Systems *Short Course held a number of times in Brisbane, Australia between 2000-2008*	***Course Description:*** Increasing levels of traffic congestion have prompted authorities around the world to place more emphasis on improving the efficiency and capacity of existing transport infrastructure through information technologies. Space and budgetary constraints have limited the solution of increased traffic congestion by upgrading and constructing new transport facilities. New technologies have recently created more opportunities to address transport problems through the application of communications, electronics and computer software and hardware to all modes of transport. Collectively known as Intelligent Transport Systems (ITS), these technologies aim to reduce traffic congestion, improve safety, economic productivity and environmental quality by emphasising the efficient and safe use of existing transport infrastructure. The importance of ITS lies in its potential to produce a paradigm shift in transport operations, away from reliance on building more road capacity and towards the development of an integrated, multimodal "intelligent" transport system This Short Course has been developed to cater for practicing transport professionals. It is aimed at expanding the breadth and depth of knowledge, abilities and core competencies needed for implementing successful ITS applications. Participants from State road and transport authorities, local government, research organisations, consultants and commercial vehicle operators will find this course useful and relevant. This course meets the continuing professional development requirements of the Institution of Engineers, Australia. Certificates of attendance will be issued to all full-time participants
Workshop on Traffic Simulation-Bridging Theory and Practice *5-6 August, 2004, Brisbane, Australia*	***Workshop Description:*** This meeting will bring together developers, researchers and users of commercial and non-commercial microscopic traffic simulation packages to explore their use in modelling traffic systems and emerging applications in Intelligent Transport Systems (ITS). Topics to be considered will include: • Calibration and validation of simulation models; • Arterial and freeway operations and management; • Optimal utilisation of transport infrastructure; • Planning and operations of multi-modal transport facilities; • Modelling of traveller information systems and their impacts; • Comparative evaluation of simulation algorithms; • Modelling of high occupancy vehicle facilities; • Performance evaluation of transport networks; and • Modelling of traffic incident management systems and their impacts. The meeting is intended to provide a forum for users from different backgrounds (government, industry and research organisations) to exchange experiences in development and evaluation of simulation models. The meeting will provide a unique opportunity to contribute to shaping the direction of future research and development in this emerging field. Participants from road and transport authorities, local government, research organisations, consultants and the private sector will find this course useful and relevant. This forum will be appealing to both the professional and scientific communities and will provide a unique opportunity to meet, exchange ideas and discuss future trends
Microscopic Traffic Simulation *AIMSUN NG and VISSIM Introductory Training Courses* *Courses held a number of times between 2005-2008 in Brisbane, Australia*	***Course Description:*** Microscopic traffic simulation tools are increasingly being applied by traffic engineers and transport professionals to deal with dynamic and operational traffic problems and to evaluate a range of transportation, traffic engineering and Intelligent Transport Systems (ITS) applications. There are many problems such as adaptive traffic management, traveler information and incident management which are difficult to evaluate using traditional analytical tools due to the complex nature of the underlying system dynamics in these applications. Microscopic traffic simulation provides an environment where different scenarios can be introduced and evaluated in a controlled setting without disrupting traffic conditions on the road The course aims to provide participants with background on traffic simulation methodology, model development and evaluation using the traffic simulators AIMSUN NG and VISSIM. The course will also provide participants with an understanding of the tasks required to collect data, develop the model and evaluate its performance and accuracy in replicating field traffic conditions. Participants from road and transport authorities, local government, research organisations, consultants and the private sector will find this course useful and relevant. This course will be appealing to practising professionals, consultants and researchers