



SCHOOL OF CIVIL ENGINEERING

Unit Outline Prepared by: Dr. Martin H. Murray

Date.: 08Apr02

UNIT TITLE: Railway Business & Engineering

UNIT CODE.: CEP011

DISCIPLINE CODE: 030909

SEMESTER/YEAR.: Sem 1, 2003

CREDIT POINTS 12

PREREQUISITES. Nil

Coordinator: Dr Martin Murray, QUT, ph 07 38642513, fax 07 38641515, email: m.murray@qut.edu.au.

1. Rationale

Railways around the world are being privatised and are investing heavily in very advanced technology. These changes are set to revolutionise the industry in a short period of time. The environment in which railway personnel are currently functioning is changing in terms of the complexity of the rail transport system, the extent and sophistication of resources, progress in technology and increased competition in the transport market. This unit is offered with support from and full collaboration with the Australian Railway Research Institute.

2. Aims

The aims of this unit are to enable railway personnel to obtain a thorough knowledge and insight of five major facets of the rail transport system, to broaden their awareness of rail system operation beyond their own discipline and to enable them to see how management of the transport service occurs.

3. Objectives

The **technical** objectives of this unit are that upon completion of the study requirements, you should be able to:

1. Demonstrate a more thorough knowledge of the total rail transport system.
2. Develop interactions between the various railway disciplines.
3. Demonstrate an improved understanding in decision- making.
4. Organise effective resource utilisation.
5. Construct procedures to improve the dissemination of information.
6. Appraise an efficient business operation.
7. Contribute positively to management of and innovation in railway operations.

By the completion of this unit, you should also have become aware of your current abilities in the following **generic** capabilities, and will have progressed in the development of them:

- a) *Communication* –written communication
- b) *Work practices* - innovation, planning and decision making, interacting with other professions
- c) *Problem solving* - problem identification, formulation and solution; reflective learning
- d) *Discipline knowledge* – competent in the skills and practice of at least one body of knowledge.

4. Content

The five modules in the Study Guide are described below. Each module follows a similar format:

Introduction, Objectives, Textbook/s, References, and requires 3 weeks of study and work to complete.

- Module 1: *Railway business*. Railway types and attributes, characteristics of railway clients and their needs, revenue sources, owner requirements, legislations affecting railways, competition

policy, railway strength and weaknesses, railway organisational structures, business planning and supply of labour, material and technology for the operation of the railway.

- Module 2: *Railway access*. The role of the infrastructure owner and the management of the asset, the business of owning an asset and earning revenue from use of the asset by operators, selling access under mutually acceptable conditions, maintenance and upgrading the asset to permit efficient use.
- Module 3: *Project management*. General project management principles, fundamentals of assessing and understanding tasks, developing and evaluating options, breaking large tasks down to sub-tasks, estimation of time, resources and costs, project planning charts, managing project interfaces, monitoring and controlling, reporting and post-completion audits will all be covered. A case study relevant to the railway industry will be developed as the module progresses and used to illustrate the topics introduced.
- Module 4: *Infrastructure*. Task and layout of railway infrastructure, wheel / rail interface, maintenance and renewal, incidental infrastructure, bridges, contribution of infrastructure to railway business, management of track and related fixed infrastructure.
- Module 5: *Rollingstock*. Rollingstock types and differing design parameters, vehicle configuration and structural layout, suspension design and the wheel / rail interface, locomotive design, rail vehicle sub-systems, and rail vehicle maintenance.

WEEK of STUDY	Component	Relevant Objectives & Capabilities
1-3	Module 1: railway business. Submit assignment #1	1-4, 6, 7, (a) - (d)
4-6	Module 2: railway access. Submit assignment #2	1, 3, 4, 7 (a) - (d)
7-9	Module 3: project management. Submit assignment #3	1, 3-7, (a) - (d)
10-12	Module 4: infrastructure. Submit assignment #4	1, 3, 4, (a), (c), (d)
13-15	Module 5: rollingstock. Submit assignment #5	1, 3, 4, (a), (c), (d)
16	UNIT COMPLETED	

5. Teaching & Learning Approaches

You will undertake this unit entirely in an external or distance education mode; therefore, the teaching approaches in this unit were developed through QUT's Open Learning Unit and are based on principles of adult learning, theory and practice. The study notes and part of the resource material you will need are contained within the folder you will receive from QUT. The authors of the modules that comprise the study materials in this unit are also those who will be interacting with you during your study of the unit, and will be assessing the assignments you submit. The authors are all highly experienced and senior personnel in the railway industry. They, and the academic staff at QUT together with support personnel at ARRI, are keen to provide you with assistance wherever possible, but communication will all be via remote means such as telephone, email, fax and mail.

Although the supplied study materials direct you to certain texts and standards for you to read, the external nature of the unit also requires you to draw on your own skills and other human and written resources at your disposal, for information to complete some assignments.

The study materials you will be supplied contain two major components.

- The *Unit Profile* introduces you to the unit, explains the administrative detail, includes a study plan to help you manage your time, provides contact details for student support and sets the expectations for the unit.
- The *Study Guide* contains five modules (1-5) to be studied sequentially. Each module is designed to help you structure your study in this unit. The presentation of the content for each module provides a written guide related to module topics. This design is intended to facilitate your learning by: identifying important concepts; presenting illustrations, case studies and worked examples; providing a commentary on the subject matter; and providing activities for reflection and problems for you to resolve. The activities presented within each module are not compulsory, but we highly recommend that you do attempt these as a self-development activity to assist your learning and to prepare you for

the compulsory assignment at the end of each module You will be provided with a grade for each assignment you submit and with written comment on your work.

6. Assessment

Component	Form- ative	Summ- ative	%	Generic Capabilities	Objectives	Date given	Date due
Activity 1	X			All	1-4, 6, 7	Week 1	
Assignment 1		X	20	All	1-4, 6, 7	“	Week 4
Activity 2	X			All	1, 3, 4, 7	“	
Assignment 2		X	20	All	1, 3, 4, 7	“	Week 7
Activity 3	X			All	1, 3-7	“	
Assignment 3		X	20	All	1, 3-7	“	Week 10
Activity 4	X			(a), (c), (d)	1, 3, 4	“	
Assignment 4		X	20	(a), (c), (d)	1, 3, 4	“	Week 13
Activity 5	X			(a), (c), (d)	1, 3, 4	“	
Assignment 5		X	20	(a), (c), (d)	1, 3, 4	“	Week 16

To pass this unit, students need to gain a passing grade in **each** of the five assignments. There is no final exam in the unit. Full details of these assessment tasks will be provided in the study guide which you will receive in the first week of lectures and which is available electronically from the unit's OLT site.

7. Resource Materials

Required: Aside from the study materials supplied by QUT there is no set textbook for this unit. However, Module 3 requires that you have access to a 'Project management' textbook (see Module 3 for recommended titles).

There are extensive lists of references in each of the modules; many are available through QUT's library, others will be available through railway businesses' libraries and state libraries.

The following text may assist with the extensive writing required in the five assignments.

- Lewis, D. Ed. (1999) The Written Assignment: A guide to the writing and presentation of assignments. Brisbane: Queensland University of Technology. Available in QUT bookshop

Unit website address: <https://olt.qut.edu.au/bee/cep011>

8. Risk assessment

There are no particular risks associated with the operation of this unit.