
FACULTY OF ENGINEERING SCIENCE AND THE BUILT ENVIRONMENT

Unit title:	Railway Systems and Operation	
Unit number:	BCE/1/025	
Unit value:	1.0	
Unit co-ordinator:	P J Mellow	
Contact time:	Lectures	39 hours
	Tutorials	13 hours
Private study time:	98 hours	
Unit pre-requisites:	None	

SHORT DESCRIPTION

This unit introduces the railway culture to students, covering rules, laws and practice as well as trains and contro; systems. Safety and risk management is an underlying theme.

AIMS

To introduce railway engineering to students

LEARNING OUTCOMES

- * To understand the role of established rules and practice in the railway industry
- * To understand and be able to describe different types of railway equipment and their applicability
- * To carry out a simple railway planning exercise.

TRANSFERABLE SKILLS

- manage own roles and responsibilities;;
- receive and respond to a variety of information;
- communicate in writing;
- use information sources;
- deal with a combination of routine and non routine tasks;
- extending knowledge and understanding to ability to solve practical problems;
- apply a range of skills and techniques to develop a variety of ideas in the creation of new and modified products, services or situations

TEACHING AND LEARNING PATTERN

Lectures by experienced engineers with appropriate handouts and group seminars intended to encourage discussion and reflection on their own and other students' experiences. Students wi be expected to investigate around the subject outside normal teaching times.

INDICATIVE CONTENT

The following topics will be addressed by the Unit:

What is the railway for? Safe conveyance of as many passengers as possible within operational constraints?

Rules and the Law Rules and Her Majesties Railway Inspectorate; Law as it affects railway operations; Case Histories and Accidents; The railway safety case

Train Operations Appreciation of railway vehicles and their structure; Interaction of Capacity, Signalling and Train control; Signals - strings, relays, computerised moving block systems; Train control, protection systems, TPWS ATP; Power types and capacity, earthing, stray currents, track circuits and train detection.

Possessions and scheduling of maintenance work.

SCADA

Risk Assessment and Management

The Future Euro Standards, Customer Information, telematics, Faster trains.

ASSESSMENT METHOD

Continuous Assessment

A report on a recent railway accident and a method statement, system of working and preparation documents for a piece of railway work.

INDICATIVE SOURCES

CORE

Health and Safety Executive, Railway Safety Statistics Bulletin 1999/2000, HSE, 2001

HM Railway Inspectorate Web Site, <http://www.hse.gov.uk/railway/rihome.htm>

All change; British Railway Privatisation, Maidenhead: McGraw-Hill, Freeman R and Shaw J, eds 2000

OPTIONAL

Historic Railway Disasters, Cheam: IPC Magazine Ltd, Slater J 1993

Railway control systems, London; A & C Black, Leach M ed 1991

Railway safety principles and guidance, Part 1, Sudbury, HSE Books. HSE 1996

The Docklands Light Railway, London, ICE Fuchs N, 1990

Train Protection Systems and Mark 1 rolling stock, Railwat Safety Regulations 1999