

MODULE DESCRIPTOR

TITLE:	Professional Engineering Management Techniques
CODE:	EAT340
CREDITS:	20
LEVEL:	6
FACULTY:	Applied Science
MODULE BOARD:	Undergraduate Engineering Board
PRE-REQUISITES:	None
CO-REQUISITES:	None
LEARNING HOURS:	200

LEARNING OUTCOMES

Upon successful completion of this module, students will have demonstrated

Knowledge

1. Critical understanding of Engineering management and related business practices
2. Critical understanding of tools and systems used to control and manage finance within an operations environment

Skills

3. Ability to apply theoretical concepts to practical managerial situations.
4. Ability to apply a range of financial tools that can be used to control cost and manage a business

CONTENT SYNOPSIS

Amplified Content

The module introduces business practices and topics related to engineering management. It covers relevant aspects of Human Resource management, Operations, Marketing, Finance, Personal development and Project Management.

In the first semester, the main focus is on project management. Here, the student is systematically taken through the full project life cycle including project planning, feasibility, evaluation and control. As part of this delivery, all of the relevant Project Management techniques are covered including but not exhaustively: WBS activity sequencing, cost benefit analysis (discounted cash flow, payback, return on investment ROI etc.) earned value and project risk. During the first semester oral and written communication is covered.

The second semester begins with an introduction to self-awareness and 'systems thinking'. This is followed by a brief overview of some of the key business functions that Engineers and Manufacturing Managers have to regularly interface with. Included in this are the constraints placed on Engineering professionals by UK Environmental and Health and Safety legislation. Appropriate systems and procedures are considered and developed for the workplace. More specifically, the mitigation of risk through risk

assessment and hazard spotting is reviewed as well as safety management systems and strategies based on the 'Bird' Study. Additionally, environmental management and the ISO 14001 standard are reviewed. At this point, the module focusses on the benefits of the standard and how it affects professional engineers in practice.

Moving on from this, additional managerial topics are introduced which embrace team-working, appraisal systems and ethical behavior. Concepts such as 'Belbin' team roles and team-problem solving techniques are presented, at the same time clarifying the use of enabling methods such as are reviewed and the use of qualitative versus quantitative approaches debated. In this section, students are encouraged to reflect on ethics in engineering and the ethical principles outlined in the codes and practices stipulated by professional bodies. Case studies underpin the concepts and cause the participants to question beliefs and behaviors.

More generally, the module examines the roles of other key functions providing wider business awareness. These functions include Quality, Marketing and Finance. Commencing with quality, the Total Quality Management (TQM) process and the concepts of 'quality' and 'zero defects' are discussed. Furthermore, the ideas espoused by 'Quality Gurus' such as Deming, Crosby, Tagucci and Peters are broached as well as quality circles and quality assurance techniques e.g. Statistical Process Control (SPC). Following on from this, a brief overview of the role of the Marketing function is provided along with the various strategies that may be adopted to promote and sell products e.g. 4 Ps, SWOT, PERT and competitive analysis. Completing this section, Operational Finance topics are covered. These include product costing: direct, marginal, standard, Profit and loss accounts (P&L), Cash flow, break-even analysis, Managing and controlling Budgets.

TRANSFERRABLE SKILLS:

- Understanding of, and ability to, apply a systems approach to engineering problems
- Identify and manage cost drivers
- Awareness of the framework of relevant legal requirements governing engineering activities, including personnel, health, safety, and risk (including environmental risk) issues
- Understanding of the need for a high level of professional and ethical conduct in engineering.
- General transferable skills of value in a wide range of situations, including problem solving, communication, and working with others.

TEACHING AND LEARNING METHODS:

Scheduled activities		Independent study		Placement		Total hours
Hours	Detail	Hours	Detail	Hours	Detail	
50	Lectorials	80	Private Study Private study (library and on line), directed reading, revision, preparation of formative work and summative assessment	0		130

NEW DESCRIPTOR

			mid-module assignment.			
30	Practical work					30
25	Summative Assessment	15	Private study (library and on line), revision for summative assessment exam			40
Total						200

ASSESSMENT METHODS

(Please ensure that the sequence numbering of the assessments is in the correct chronological order for the module, as this may affect funding.)

Seq.	Element	% of module assessment weighting	Summary	Pass Mark	LO	Required For KIS return to HESA							
						Written exam – central timetable (% of the element)		Written exam – local timetable (% of the element)		Coursework (% of the element)		Practical (% of the element)	
						%	Type	%	Type	%	Type	%	Type
001	Assignment	30	Group Assignment	30	1,4	0	–	0	–	100	Assignment	0	–
002	Exam	70	Written Exam	30	2,3	100	Exam	0	–	0	–	0	–

*** only populate if there is an approved programme specific regulation OR if the assessment is pass/fail**

(If the Pass Mark differs from the university regulations there must be a related programme specific regulation approved.)

Assessment 001 Group activity contributing 30% to the overall module mark. The assessment will be a group report with a named contribution from each student. It will be in the form of a business report of 1500 words indicative length. As part of the overall assessment Each group will also make a presentation lasting 15 minutes which includes time for questions.

Assessment 002 Examination of 3 hours length contributing 70% to the overall module mark.

Programme specific regulations

For IET Accredited programmes - (Mechanical, Automotive and Electronic and Electrical Engineering). students must achieve 30% or more in both elements of the module.

Students taking the BEng (Hons) Manufacturing Engineering must achieve 40% overall in the module to pass it in line with the Section 4.2 of the Undergraduate Regulations.

MyModuleResources List link (for existing modules).

https://moduleresources.sunderland.ac.uk/list.php?list_id=10715

PROGRAMMES USING THIS MODULE AS CORE/OPTION:

- a) B.Eng.(Hons) Automotive Engineering (core)
- b) B.Eng.(Hons) Electronic and Electrical Engineering (core)
- c) B.Eng.(Hons) Mechanical Engineering (core)
- d) B.Eng (Hons) Manufacturing Engineering (core)

Is the programme delivered On Campus or Off campus

On campus and Off campus

College(s):

University of Sunderland

SEGi University College Kota Damansara, Malaysia

SEGi College Subang Jaya, Malaysia

TEG International College Singapore

Hong Kong College of Technology – Homantin, Hong Kong

International College of Business and Technology Sri Lanka

Penang Skills Development Centre (PSDC) Malaysia

Work based learning: Yes/No

Professional Accreditation: Yes/ No

(If yes, by whom and what conditions if any are specific to the module?)

MODULE LEADER

Dr Ken Robson

LEAD DELIVERER

Dr Ken Robson

Mrs Helen Scott

JACS Code: H790

VERSION HISTORY V2