

Module Descriptor: Faculty Postgraduate Training Package

Generic Module Title	Credit Value	Level
EF901 - Design Management	12	PG

Timetable

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Syllabus

<p>New product and process design, design process models, design organisation - team and management structures, concurrent engineering, the role of design in competitiveness, innovation, creativity, technology management. The design activity, some design process models, role of market, specification, conceptual and detail design; design complexities (e.g. relating to the people, processes, resources, product, key considerations, knowledge and information, decision making); aspects of product development (i.e. concurrent engineering, team engineering, product management, design management, distributed design, decision support); design co-ordination; a fundamental integrating framework.</p>

Learning Objectives

<p>To provide a structured introduction to the Design Management process, issues and tools. On completion of the module, students should be able to:</p> <ol style="list-style-type: none"> 1. Appreciate and understand the role of design within an organisation. 2. Understand the organisational structures required for effective design 3. Appreciate the role of design models, approaches and methods 4. Appreciate the importance of costs and good design 5. Know a variety of aspects and the complexities of design development 6. Appreciate the role of innovation in design management 7. Know how to measure design performance 8. Be able to articulate answers to questions and present their understanding of the subject to an audience

Assessment Method(s)

<p>Coursework – examined by presentation.</p> <p>To promote confidence building and given the need for students to be able to present themselves and their ideas within a competitive market, to respond appropriately during interviews or project critiques, and to deliver convincing arguments while under time and performance pressure, classes shall be inter-active in nature and question focussed. Thus, students are expected to participate in inter-active class question and answering, impromptu class presentations, and open but focussed dialogue. To ensure adequate knowledge and development resulting from the class failing adequate participation and demonstration of subject knowledge may result in formal examination.</p>
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Coursework, case studies, factory visits, visiting speakers

<p>Research, analysis and presentation (executive report and presentation) on a specific topic.</p>

Recommended Reading

<p>B Prasad: “Concurrent Engineering Fundamentals”, Vols. 1 and 2, Prentice Hall, 1997. A H B Duffy, M M Andreasen, K J MacCallum and L N Reijers: “Design Co-ordination for Concurrent Engineering”, Jnl of Engineering Design, v.4, n.4, 1993, pp251-265. S M Duffy, M M Andreasen and A H B Duffy: “Design Co-ordination and Design Complexities”, Esprit Basic Research Working Group 7401 - CIMDEV/CIMMOD Workshop, Bremen, Germany, 3-4th February 1995. A H B Duffy: “Ensuring Competitive Advantage with Design Co-ordination”, 2nd. Int. Conf. On Design to Manufacture in Modern Industry (DMMI’95), Bled, Slovenia, 29-30 May 1995, pp68-89.</p>
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Lecturers

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Prof. Alex Duffy	JW506C	3005	alex@cad.strath.ac.uk
Mr Bill Ion	JW504B	2323	w.j.ion@strath.ac.uk

Module Descriptor: Faculty Postgraduate Training Package

Generic Module Title	Credit Value	Level
EF912 Environmental Impact and Sustainability	12	PG

Timetable

Friday 11.00 –13.00h, Semester 1, Weeks 1-11, Room M4.13 James Weir Building.

General Aim

To provide students with an understanding of the concepts of environmental sustainability and sustainable development.
 To identify principles of environmental impact.
 To elaborate these principles to describe approaches to impact mitigation.

Syllabus

The Biosphere; Limits to Growth 1; Limits to Growth 2; Environmental Problems; Climate Change; Impacts on Land; Impacts on Air; Impacts on Water; Sustainable Development; Environmental Management

Learning Objectives

On completion of this module students should be able to:

- Demonstrate an understanding of environmental sustainability and sustainable development.
- Appreciate the environmental impact of engineering systems and products.

Examinations			Courseworks		Projects	
Number	Duration	<i>Max Marks</i>	Number	<i>Max Marks</i>	Number	<i>Max Marks</i>
				100		

Recommended Reading

“Climate Change” - Intergovernmental Panel on Climate Change: Cambridge University Press, Cambridge, 1999
 “Beyond the Limits: confronting global collapse or envisioning a sustainable future” - D H Meadows et al: (Earthscan, London, 1992)
 “World Development Indicators 2003” - The World Bank: The World Bank, Washington, DC, 2003
 “Our Common Future” - World Commission on Environment and Development (WCED); (Oxford University Press, Oxford, 1987)
 “World Resources: A Guide to the Global Environment” - World Resources Institute (WRI); (Oxford University Press, Oxford, 1996)

Lecturers

Name	Tel. Ext.	E-mail
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Module Descriptor: Faculty Postgraduate Training Package

Generic Module Title	Credit Value	Level
EF909 Finance	12	PG2

Timetable

Friday 11.00 – 13.00h, Semester 2, Weeks 1-12, Room M4.03 James Weir Building.

Syllabus

This module explores financial strategies and instruments for ensuring the solvency and sustainability of corporate business ventures. It examines the methods of raising capital and the issues in portfolio management in the light of the risks and rewards associated with investment initiatives. Project financing options, including private finance and joint venture initiatives, are explored in terms of the costs and benefits arising from risk transfer arrangements, and with reference to UK- and overseas-based experiences of clients, financiers, designers and contractors. Financial accounting and reporting methods are also introduced as a basis for sustainable financial management decisions.

Learning Objectives

Upon successful completion of this module, the student will be able to:

- Identify and analyse issues arising from the financial accounts and reports of companies
- Evaluate investment decisions
- Identify and evaluate sources and methods of raising finance
- Analyse the principles underlying operation of financial/capital markets
- Identify and evaluate financial strategies and instruments for corporate risk management
- Identify the various risks involved in the construction business and evaluate the implications for financial strategies
- Evaluate the financial viability of risk transfer options available to PFI projects in terms of cost-benefit analysis

Assessment Method(s)

100% Coursework

Recommended Reading

“Risk Management and Analysis” – C Alexander (1998): New York: John Wiley.
“Fundamentals of Corporate Finance” – R A Brealey, S C Myers and A J Marcus, (1999): New York: McGraw Hill.
“Mergers and Acquisitions..in Engineering Construction and Architectural Management” – P M Carrillo, P.M. (1998), Vol. 7, No. 3, pp. 322-328.
“Financial Engineering: Derivatives and Risk Management” – K Cathbertson, K. (2001): New York: John Wiley.
“Project Financing: Asset-Based Financial Engineering” – J D Finnerty, (1996): New York: John Wiley.
“Investment Appraisal and Financing Decisions” – S Lumby (1999): London: International Thomson Press.
“Financial Engineering” – J F Marshall, and V K Bansal, (1993): Miami, Florida: Kolb Publishing Co.
“Corporate Finance and Investment Decisions and Strategies” – R Pike and B Neal, (1999), London: MacMillan.
“Why Companies Fail: Strategies for Detecting, Avoiding and Profiting from Bankruptcy” – H D Platt, (1985): Lexington, Mass: Lexington Books.
“Capital Structure, International Project Analysis and Financing” – B Pollio, G. (1999): London: MacMillan.
“International Project Accounting” - A D F Price, (1995): Geneva: International Labour Office.
“Derivatives: The Theory and Practice of Financial Engineering” – P Wilmott (1998):New York: John Wiley.

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Module Descriptor: Faculty Postgraduate Training Package

Generic Module Title	Credit Value	Level
EF908 - Information Management	12	PG

Timetable

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Syllabus

Introduction; information systems; reasons for centralised information, information input and retrieval; information modelling process and techniques, databases as an information resource; information normalisation; Knowledge Information and Data (KID) acquisition techniques, knowledge data discovery process, data mining, data visualisation; Software Engineering process.

Learning Objectives

- To familiarise students with information technology, how to model and use information and in introduction into a way of representing information on a computer based system.
- To introduce students to some widely used computer software packages relevant to industry.
- To acquire a good basic understanding of information storage and retrieval, acquisition and use.
- To provide an appreciation and basic skills in the process of developing information systems.

Assessment Method(s)

Course exercise.

Students are expected to participate in inter-active class question and answering, impromptu class presentations, and open but focussed dialogue. Failing adequate participation and demonstration of subject knowledge may result in formal examination.

Coursework, case studies, factory visits, visiting speakers

Design, development and presentation of a modern information system. Demonstration of a modern information system integrated through advanced IT such as web-based database.

Recommended Reading

Lab view Manual
Roger S. Pressman: "Software Engineering: A Practitioner's Approach" , Fourth Edition, McGraw-Hill Companies, October 1996
R Elmasri and S B Navathe: "Fundamentals of Database Systems", 3rd Ed., The Benjamin/Cummings Publishing Co. Inc.,

Lecturers

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Module Descriptor: Faculty Postgraduate Training Package

Generic Module Title	Credit Value	Level
EF911 Project Management	12	PG

Timetable

Friday 14.00-17.00h, Semester 1, Weeks 1-11, Room M405 James Weir Building.

General Aim

To provide students with knowledge of the techniques of project management and the responsibilities that engineers face in meeting project objectives.

Learning Objectives

By the end of the course students should:

have knowledge and understanding of:

- the inter-dependency between project estimating and project control
- different methods of project control.

have gained intellectual skills so that they are able to:

- demonstrate understanding of project network methods
- demonstrate familiarity with industry standard project planning software
- compare varying types and formats of standard estimating forms.

have gained practical skills so that they are able to:

- outline the basic aspects of projects
- analyse the critical path of a project.

have knowledge and understanding of:

- how project objectives can be controlled
- the influence of how teams are used in managing contracts.

Syllabus

Introduction to Project Networks: project estimating and project control; emphasising their interdependency. Also introduces basic aspects of project teams; project scope of work; network related management techniques; project features; project constraints and resources; quality assurance and document control.

Project Networks: "Activity on arrow" networks; definition of events; activities and nodes; precedence networks and "activity on node" method; analysis of critical path utilising dependency rules and dummy activities. Graphical presentation techniques are used as well as an industry standard planning package.

Project Estimating: Task identification; task classification; nodal estimating levels explained, importance of lead time discussed.

Project Control: project control techniques; system integration into the control cycle; control of resources (human, mechanised, cash).

Introduction to Contract Law : formation of contract; validity; terms of the contract; breach of contract; agency; company contracts; choice of law; overview of other aspects of law relevant to project management.

Types and Forms of contract and their choice for Projects ; conditions of contract; Tender Preparation and Bid Review; Basis of Contractual Claims and claim processes; Business and Financial Risk Aspects of contract administration within projects.

Assessment Method(s) Including Percentage Breakdown and Duration of Exams

Examinations			Courseworks		Projects	
Number	Duration	Max Marks	Number	Max Marks	Number	Max Marks
			1	50	1	50

Recommended Reading

Course notes provided via access to WebCT

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Module Descriptor: Faculty Postgraduate Training Package

Generic Module Title	Credit Value	Level
EF910 Risk Management	12	PG

Timetable

Semester 2, Weeks 1-12, Friday 1-3, M412

General Aim

Under Health and Safety legislation, and under the wider European Post-Seveso Directives, it is mandatory for many industries to carry out risk assessments with the aim of showing that risk is “As Low As Reasonably Practicable”. This course covers the basic techniques used in assessing risk.

Syllabus

<i>Week</i>	<i>Topic</i>
1	Introduction to technical and societal risk
2	Probability modelling
3	Fault and event tree modelling
4	Reliability workbench
5	Common cause failures
6	Bayesian belief nets
7	Genie
8	Historical data analysis
9	Expert judgement
10	Uncertainty analysis
11	ALARP decision making
12	Class review

Learning Objectives

- Apply probability and statistical methods in support of a risk analysis
- Build fault and event tree models, appreciating the modelling issues involved
- Build and quantify models representing uncertainty, and simulate using appropriate tools
- Understand and apply decision theory concepts, and apply these to risk metrics in the development of an ALARP case

Assessment Method(s)

Exam 50%
Coursework 50%

Coursework, case studies

Space Shuttle Risk Assessment Case Study
Fault and Event Tree Computer Lab
Analysis of ALARP decision
A CD ROM of learning materials will be available

Recommended Reading

“Probabilistic Risk Analysis: Foundations and Methods” - T. Bedford and R. Cooke: Cambridge University Press
Computer-based learning materials and software tools are made available throughout the course.

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