MODULE DESCRIPTOR 2021/22

CL504: Financial Engineering

Registrar: Andrew Ward	**Taught To (Programme):** MSc Students (Sustainable Engineering) and 5th Year MEng students from across department in the Faculty; PhD students opting for the course as an elective	
Other Lecturers Involved: None	**Credit Weighting:** 10	**Semester:** 2
Assumed Pre-requisites: None	**optional/ elective class**	**Academic Level:** 5

Class Format and Delivery (hours):

Lecture	Tutorial	Laboratory	Coursework	Project	Private Study	**Total**
10	10		50		30	100

Class Aim(s)

This class explores the role finance plays in business solvency and sustainability. It will give participants an appreciation of the core issues surrounding finance in business and how to analyse financial data to support decision making. The module aims to:

1. Explain the need for and role of finance in business

2. Describes the financial tools that are used for making decisions

3. Explore different strategies for raising finance and investing

The material will be delivered through a series of online lectures and tutorials, supported by background reading available on myPlace.

Learning Outcomes

On completion of the course the student is expected to be able to:

LO1 Identify and analyse issues arising from the financial accounts and reports of companies

LO2 Identify sources and methods of raising project finance and implications of these for business and financial risk

LO3 Analyse the principles underlying operation of financial/capital markets

LO4 Be able to apply knowledge required to make investment decisions

Syllabus

The syllabus will consist of the following points:

Week 1: Money and the role of finance within an organisation
About the course – course structure – expectations
Overview of financial engineering – finance and reporting – wealth creation – understanding risk and return – corporate governance

Week 2: Structure of a business and corporate governance
Limited liability! – equity – assets – liabilities – accounting conventions and principals – standards and legal obligations

Week 3: Financial reporting tools: the three statements
Statement of financial position (balance sheet) – statement of income (P&L) – statement of cash flow

Week 4: Debt financing and the time value of money
Difference between equity and loans – Funding mechanisms: Bonds, stock and derivatives

Week 5: The stock market: how it works
Principles of the stock market – Stakeholders – Tracking stocks – Stock market games

Week 6: Depreciation and Amortisation
The need for depreciation – straight line method – declining balance – sinking fund – capital recovery

Week 7: Capital structure and asset valuation
The need for a systematic approach to investment – Investment appraisal techniques (e.g. DCF/NPV/IRR/ARR/PP)

Week 8: Investment decisions and portfolio theory
Making Investment Decision and the internal rate of return – Common models in portfolio management

Week 9: Project financing and private finance initiative
Financing large infrastructure project – Special purpose vehicles – the failure of private finance initiatives

Week 10: Corporate restructuring, mergers and acquisitions
The many forms of corporate restructuring – Winners and losers in mergers and acquisitions – evasive strategies in acquisitions

Assessment Criteria

For each of the Course Learning Outcomes the following criteria will be used to make judgements on student learning:

LO1 Identify and analyse issues arising from the financial accounts and reports of companies
C1 Use data from corporate accounts to assess financial performance and present reasons for success/failure of organisations
C2 Compare financial information across similar organisations using recognised financial tools and equations in order to assess performance

LO2 Identify sources and methods of raising project finance and implications of these for business and financial risk
C1 Show knowledge of the different sources of finance available to businesses
C2 Demonstrate knowledge of the advantages and disadvantages of different financing routes

LO3 Analyse the principles underlying operation of financial/capital markets
C1 Show knowledge of how financial and capital markets exist
C2 Describe the principles of the stock market

LO4 Be able to apply knowledge required to make investment decisions
C1 Apply asset valuation tools used to make investment decisions
C2 Demonstrate understanding of the relationship between risk and return

The standards set for each criterion per Learning Outcome to achieve a pass grade are indicated on the assessment sheet for all assessments.

Principles of Assessment and Feedback (*https://www.strath.ac.uk/staff/policies/academic/*)

Assessment will be 50% group coursework, with written feedback provided through assessment feedback sheets. The remaining 50% of assessment will be by multiple choice exam at the end of the module, where a summative mark will be provided.

Recommended Reading

Atrill, P., McLaney, E.J., (2019) Accounting and finance for non-specialists, Eleventh edition. ed. Pearson, Harlow, England; New York.

Duhon, T.L., (2012). How the trading floor really works. Wiley, Hoboken, N.J.

Beder, T.S., Marshall, C.M. (Eds.), (2011). Financial engineering: the evolution of a profession, The Robert W. Kolb series in finance. Wiley, Hoboken, NJ.

John D. Finnerty, (2007). Project financing: asset-based financial engineering, 2nd ed.. ed, Wiley finance series. John Wiley & Sons, Hoboken, N.J.

Solomon, J. (2007), Corporate Governance and Accountability. West Sussex: John Wiley & Sons Ltd.

PLEASE NOTE:
Students need to gain a summative mark of 50% to pass the module. Students who fail the module at the first attempt will be re-examined during the August diet. This re-examination will consist entirely of exam.

Resit Arrangements

Resit assessment will be 100% by exam in the August exam diet.

Approved

Programme Director Signature:
Date of Last Modifications:

Assessment and Feedback Schedule

Class Code	CL504	Class Title	Financial Engineering

Brief Description of Assessment

Assessment will be partly by coursework and partly by exam. Students will be expected to do one coursework in groups on an assigned topic. The group coursework (2000 word report) will be assessed at 50% and the exam which will be assessed at 50%. For the group coursework will be carried out in allocated groups of four or five. The coursework (submitted through Myplace) is expected to be well-researched, well-structured, well-written, well-referenced and Turnitin-checked for originality.

Indicate in the tables below the Hand-Out (H), Submission (S) and Feedback (F) dates for each lab report/coursework/project and the timing of each Exam/Class Test (E), (T). Include duration of exam in brackets (e.g. E (2)).

Semester 2

Assessment type (& title)	LOs	Weight (%)	Individual / Group	WK1	WK2	WK3	WK4	WK5	WK6	WK7	WK8	WK9	WK10	WK11	Exam Period
Group Coursework	LO1-4	50%	Group	H					S			F			
Exam	LO1-4	50%	Individual												E

.Mapping Module Learning Outcomes to AHEP

Module Learning Outcome	Engineering Council AHEP competencies: Knowledge, Understanding and Ability
LO1 Identify and analyse issues arising from the financial accounts and reports of companies	**Science and mathematics** • Understanding of concepts from a range of areas, including some outside engineering, and the ability to evaluate them critically and to apply them effectively in engineering projects. **Engineering analysis** • Ability to extract and evaluate pertinent data and to apply engineering analysis techniques in the solution of unfamiliar problems. **Additional General Skills** • Apply their skills in problem solving, communication, working with others, information retrieval and the effective use of general IT facilities • Exercise initiative and personal responsibility, which may be as a team member or leader
LO2 Identify sources and methods of raising project finance and implications of these for business and financial risk	**Economic, legal, social, ethical and environmental context** • Knowledge and understanding of risk issues, including health & safety, environmental and commercial risk, risk assessment and risk management techniques and an ability to evaluate commercial risk **Additional General Skills** • Apply their skills in problem solving, communication, working with others, information retrieval and the effective use of general IT facilities • Exercise initiative and personal responsibility, which may be as a team member or leader
LO3 Analyse the principles underlying operation of financial/capital markets	**Economic, legal, social, ethical and environmental context** • Knowledge and understanding of risk issues, including health & safety, environmental and commercial risk, risk assessment and risk management techniques and an ability to evaluate commercial risk • Understanding of the key drivers for business success, including innovation, calculated commercial risks and customer satisfaction.

	Additional General Skills • Apply their skills in problem solving, communication, working with others, information retrieval and the effective use of general IT facilities • Exercise initiative and personal responsibility, which may be as a team member or leader
LO4 Be able to apply knowledge required to make investment decisions	**Design** • Understand and evaluate business, customer and user needs, including considerations such as the wider engineering context, public perception and aesthetics. **Additional General Skills** • Apply their skills in problem solving, communication, working with others, information retrieval and the effective use of general IT facilities • Exercise initiative and personal responsibility, which may be as a team member or leader

JBM Programme Threads

Thread	Primary	Secondary	Contributory
Design	**LO4**		
Health, Safety & Risk Assessment			**LO2**
Sustainability		**LO4**	
Maths for Engineers	**LO1**		**LO2**
Industrial Engagement	**LO2, LO3**		
Digital Technologies			**LO1, LO2, LO3, LO4**