

# **Employability Audit**

The University of Manchester 2012

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## **Chapter 1 - Introduction**

Over a period of three months, twelve undergraduate students from the University of Manchester have produced a series of documents that assess and evaluate the current employability skills that are taught, practised and assessed by different course units that comprise the mathematics undergraduate degrees. The students are from all years of study, and are from both single honours and joint honours degrees.

This report is comprised of an assessment of the current degree programme, followed by an evaluation and discussion of which areas in particular we believe have room for improvement. Finally, we propose four improvements to the current degree, that we think would improve undergraduates employability skills.

Throughout the course of the audit, the participating students were invited to share their ideas using a blog (<http://mathsaudit.wordpress.com/>).

## Chapter 2 - Employer Input

The 12 key skills that we decided to evaluate were communication, numeracy, team working, problem solving, project management, research skills, self-management, commercial awareness, creative thinking, positive attitude to work, IT skills and career management skills. To make the audit as relevant as possible, we contacted various companies including PwC, IBM, Deloitte, Teach First and CSC, to ask them to comment on the skills that we had chosen to audit. Overall, the response from companies led us to believe that the key skills listed above covered most of the skills that a good candidate would be expected to have.

We did find that companies were looking for students to be able to demonstrate skills apart from their academic capability. Andrew Bargery, student recruitment campus engagement leader at PriceWaterhouseCoopers suggested

”We do look for our applicants to be able to demonstrate and use varied examples which should include non-academic examples too, so I think it’s also key to ensure students have thought about what else they do outside of their academic studies and apply the same principles to these activities too.”

With this in mind, we decided that we would also audit some of the extra curricular activities that currently run within the School of Mathematics, such as the STEM ambassador scheme and the mock interview scheme (See section 3).

Having comments from employers was particularly useful when we came to the evaluation section of the audit. Recruitment officers from three different companies suggested that although they agreed that all of the key skills were important, in particular they were looking for candidates who could demonstrate exceptional team working, communication and numeracy skills. This helped us to decide which skills to prioritize.

Finally, recruitment officers from GrantThornton, the Co-operative Group and IBM suggested that they look for the ability to influence others, and confidence in a candidate. We decided that these factors, rather than being key skills, are qualities that can be developed through improving their skills in the twelve areas listed above.

# Chapter 3 - Assessment of graduate skills

## 3.1 Course Units Offered

### Level 1

#### Semester 1

MATH10001	Mathematical Workshop
MATH10101	Sets, Numbers and Functions A
MATH10111	Sets, Numbers and Functions B
MATH10121	Calculus and Vectors A
MATH10131	Calculus and Vectors B
MATH10141	Probability I
MATH10951	Finance for Actuarial Science 1

### Level 2

#### Semester 1

MATH20101	Real and Complex Analysis Real
MATH20111	Analysis
MATH20201	Algebraic Structures 1 PDE's
MATH20401	and Vector Calculus A
MATH20411	PDE's and Vector Calculus B
MATH20701	Probability 2 Finance for
MATH20951	Actuarial Science 2

### Level 1

#### Semester 2

MATH10282	Introduction to Statistics
MATH10202	Linear Algebra A
MATH10212	Linear Algebra B
MATH10222	Calculus and Applications A
MATH11222	Calculus and Applications A
MATH10232	Calculus and Applications B
MATH10242	Sequences and Series

### Level 2

#### Semester 2

MATH20122	Metric Spaces
MATH20132	Calculus of Several Variables
MATH20142	Complex Analysis
MATH20212	Algebraic Structures 2
MATH20222	Introduction to Geometry
MATH20302	Propositional Logic
MATH20502	Fluid Mechanics
MATH20512	Classical Mechanics
MATH20602	Numerical Analysis
MATH20712	Random Models
MATH20722	Foundations of Modern Probability
MATH20802	Statistical Methods
MATH20812	Practical Statistics 1
MATH20962	Contingences 1
MATH20972	Actuarial Insurance
MATH20902	Discrete Mathematics
MATH20912	Intro to Financial Mathematics
HSTM20482	History of Mathematics

### Level 3

#### Semester 1

MATH31011 Fourier Analysis and Lebesgue Integration  
MATH31051 Introduction to Topology  
MATH32001 Group Theory  
MATH32031 Coding Theory  
MATH32051 Hyperbolic Geometry  
MATH33001 Predicate Logic  
MATH34001 Applied Complex Analysis  
MATH34011 Asymptotic Expansions and Perturbation  
MATH35001 Viscous Fluid Flow  
MATH35021 Elasticity  
MATH35051 Singularities, Bifurcations and Catastrophes  
MATH36001 Matrix Analysis MATH36041 Essential Partial Differential Equations  
MATH37001 Martingales with Applications to Finance  
MATH38001 Statistical Inference  
MATH38011 Linear Models  
MATH38061 Multivariate Statistics  
MATH38071 Medical Statistics  
MATH38091 Statistical Computing  
MATH39001 Combinatorics and Graph Theory  
MATH39511 Actuarial Models  
MATH39991 Career Management Skills

#### Semester 2

MATH31002 Linear Analysis  
MATH31022 Analytic Number Theory  
MATH31062 Differentiable Manifolds  
MATH31072 Algebraic Topology  
MATH32012 Commutative Algebra  
MATH32062 Introduction to Algebraic Geometry  
MATH32112 Lie Algebras  
MATH34032 Green's Functions, Integral Equations and the Calculus of Variations  
MATH34042 Discrete Time Dynamical Systems  
MATH35012 Wave Motion  
MATH35032 Mathematical Biology  
MATH35132 Hydrodynamic Stability Theory  
MATH36022 Numerical Analysis 2  
MATH36032 Problem Solving by Computer  
MATH37012 Markov Processes  
MATH38032 Time Series Analysis  
MATH38052 Generalized Linear Models  
MATH38082 Design and Analysis of Experiments  
MATH38152 Social Statistics  
MATH39012 Mathematical Programming  
MATH39032 Mathematical Modelling in Finance  
MATH39522 Contingencies 2  
MATH39542 Risk Theory  
MATH30011 Undergraduate Project

## 3.2 Extra Curricular Activities

### STEM Ambassador Scheme

STEM Ambassadors are people from Science, Technology, Engineering and Mathematics backgrounds who volunteer as inspiring role models for young people. They can contribute both to regular lessons or participate in extra-curricular activities such as STEM Clubs, Careers Days and visits. STEM Ambassadors open the door to a whole new world for young people, helping them to see STEM subjects and careers with a fresh perspective and engage their interest and imagination in new ways.

### Mock Interview Scheme

The mock interview scheme run by the School of Mathematics at the University of Manchester is aimed at first year students who are thinking of applying for internships and want to practise their interview skills. All first year mathematics students are invited to apply for one of a number of mock intern posts. These applications are then appraised and short-listed by second and third year students, who will have recently undergone a series of interviewer training sessions. A number of applicants are then invited to attend a mock interview, and one winning candidate is chosen for each post, winning £100 in Amazon vouchers. More information on the mock interview scheme can be found at <http://www.maths.manchester.ac.uk/undergraduate/interviewerprog.php>.

### Peer Assisted Study Scheme (PASS)

The School of Mathematics runs a Peer Assisted Study Scheme (PASS). The PASS scheme consists of weekly sessions, which give First Year students a chance to share ideas with Second and Third Year students in the School. Each First Year academic advisor group is assigned two Second (or sometimes Third) Year students as mentors and these mentors will arrange to meet each week with the group. The Second and Third Year students have invaluable experience of course units and life as a student in Manchester, and they can help First Year students to learn how to study. Although material on examples sheets may be discussed at these sessions, this is not the primary purpose of the scheme and the PASS sessions are not considered to be alternatives to the feedback supervisions and feedback tutorials. The aims of the PASS scheme are:

- To enhance the quality, quantity and diversity of student learning within the School.
- To provide you with a supportive environment to work through issues relating to your academic course.
- To involve students as partners in the learning experience.

The School of Mathematics also has a PASS scheme for Second Year students, who will be assigned Third and Fourth Year students as mentors.

### 3.3 Numeric results of course unit analysis

Please note that due to the large number of course units at level 3 and level 4, a small number of units have not been audited and given numeric scores.

		10131	10232	10951	10212	10242	10111	10282	10001	10141	10222
Communication	Taught	1	1	0	1	1	1	1	1	0	0
	Practiced	1	2	0	2	1	1	0	2	0	1
	Assessed	1	2	0	0	0	1	1	2	1	0
	Overall	1	1	0	1	0	1	0	2	1	1
Numeracy	Taught	3	3	3	3	3	3	3	1	1	1
	Practiced	3	3	3	3	3	3	3	1	1	1
	Assessed	3	3	3	3	3	3	3	1	1	1
	Overall	3	3	3	3	3	3	3	1	1	1
Team Working	Taught	0	0	0	0	0	0	0	0	0	0
	Practiced	1	1	0	1	1	0	1	2	0	1
	Assessed	0	0	0	0	0	0	0	2	0	0
	Overall	1	0	0	0	0	0	0	3	0	1
Problem Solving	Taught	3	3	3	3	3	3	3	1	2	2
	Practiced	3	3	3	3	3	3	3	1	2	2
	Assessed	3	3	3	3	3	3	3	1	2	2
	Overall	3	3	3	3	3	3	3	1	2	2
Project Management	Taught	0	0	0	0	0	0	0	0	0	0
	Practiced	0	1	0	0	0	0	0	2	0	0
	Assessed	0	1	0	0	0	0	0	2	0	0
	Overall	0	1	0	0	0	0	0	2	0	0
Research Skills	Taught	0	0	0	0	0	0	0	0	0	1
	Practiced	0	0	0	0	0	0	0	0	0	0
	Assessed	0	0	0	0	0	0	0	0	0	0
	Overall	0	0	0	0	0	0	0	0	0	1
Self-Management	Taught	1	1	1	1	1	1	1	0	0	0
	Practiced	3	3	3	3	3	3	3	2	2	2
	Assessed	1	1	1	1	1	1	1	2	2	2
	Overall	3	3	3	3	3	3	3	2	2	2
Commercial Awareness	Taught	0	0	0	0	0	0	0	0	0	0
	Practiced	0	0	0	0	0	0	0	0	0	0
	Assessed	0	0	0	0	0	0	0	0	0	0
	Overall	0	0	0	0	0	0	0	0	0	0
Creative Thinking	Taught	0	0	0	0	0	0	0	0	0	1
	Practiced	0	0	0	0	0	0	1	1	1	2
	Assessed	0	0	0	0	0	0	0	1	1	0
	Overall	0	0	0	0	0	0	0	1	1	1
Positive Attitude	Taught	1	1	1	1	1	1	1	0	0	0
	Practiced	3	3	3	3	3	3	3	0	0	0
	Assessed	1	1	1	1	1	1	1	1	0	0
	Overall	3	3	3	3	3	3	3	1	0	0
IT Skills	Taught	0	0	0	0	0	0	2	2	0	0
	Practiced	0	1	0	0	0	0	3	3	0	1
	Assessed	2	3	0	0	0	0	3	3	0	0
	Overall	1	2	0	0	0	0	3	3	0	1
Career Management	Taught	0	0	0	0	0	0	0	0	0	0
	Practiced	0	0	0	0	0	0	0	0	0	0
	Assessed	0	0	0	0	0	0	0	0	0	0
	Overall	0	0	0	0	0	0	0	0	0	0



		10202	10121	10101	10001	10141	10222	10101	10202	10121	10111
Communication	Taught	0	0	0	0	0	0	0	0	0	0
	Practiced	1	1	1	3	0	1	1	1	1	0
	Assessed	1	1	0	1	0	0	1	1	0	0
	Overall	1	1	1	2	0	1	2	1	1	0
Numeracy	Taught	1	1	1	3	3	3	3	3	3	3
	Practiced	1	1	1	3	3	3	3	3	3	3
	Assessed	1	0	1	3	3	3	3	3	3	3
	Overall	1	1	1	3	3	3	3	3	3	3
Team Working	Taught	0	0	0	0	0	0	0	0	0	0
	Practiced	1	1	1	3	0	1	1	1	1	1
	Assessed	0	0	0	2	0	0	0	0	0	0
	Overall	1	1	1	3	0	1	1	1	1	0
Problem Solving	Taught	2	0	0	1	1	2	2	2	2	3
	Practiced	2	0	0	3	2	3	3	3	3	3
	Assessed	2	0	0	3	2	3	3	3	3	3
	Overall	2	0	0	3	2	3	3	3	2	3
Project Management	Taught	0	0	0	0	0	0	0	0	0	0
	Practiced	0	1	0	2	0	1	1	1	1	0
	Assessed	0	1	0	1	0	0	0	0	0	0
	Overall	0	1	0	2	0	1	1	1	1	0
Research Skills	Taught	1	0	1	0	0	0	0	0	0	0
	Practiced	1	0	1	0	0	0	0	0	0	0
	Assessed	0	0	0	0	0	0	0	0	0	0
	Overall	1	0	1	0	0	0	0	0	0	0
Self-Management	Taught	0	0	0	0	0	0	0	0	0	0
	Practiced	2	2	2	3	1	2	2	2	2	3
	Assessed	2	2	2	1	1	1	1	1	1	0
	Overall	2	2	2	2	1	2	2	2	2	1
Commercial Awareness	Taught	0	0	0	0	0	0	0	0	0	0
	Practiced	0	0	0	0	0	0	0	0	0	0
	Assessed	0	0	0	0	0	0	0	0	0	0
	Overall	0	0	0	0	0	0	0	0	0	0
Creative Thinking	Taught	2	0	2	0	0	0	0	0	0	0
	Practiced	2	0	2	2	2	2	2	2	2	0
	Assessed	2	0	2	1	1	1	1	1	1	0
	Overall	2	0	2	2	2	2	2	2	2	0
Positive Attitude	Taught	0	0	0	0	0	0	0	0	0	0
	Practiced	1	0	1	0	0	0	0	0	0	3
	Assessed	0	0	0	0	0	0	0	0	0	0
	Overall	1	0	1	1	0	0	0	0	0	1
IT Skills	Taught	0	0	0	0	0	0	0	0	0	0
	Practiced	1	0	0	0	0	0	0	0	0	0
	Assessed	0	0	0	0	0	0	0	0	0	0
	Overall	1	0	0	3	0	1	0	0	0	0
Career Management	Taught	0	0	0	0	0	0	0	0	0	0
	Practiced	0	0	0	0	0	0	0	0	0	0
	Assessed	0	0	0	0	0	0	0	0	0	0
	Overall	0	0	0	0	0	0	0	0	0	0

		10212	10131	10232	10951	10282	10242	20101	20212	20302	20401
Communication	Taught	0	0	0	0	0	0	2	2	2	1
	Practiced	0	1	0	0	0	0	1	1	1	0
	Assessed	0	0	1	0	1	0	1	1	1	1
	Overall	0	0	0	0	0	1	0	1	1	1
Numeracy	Taught	3	3	3	3	3	3	1	1	1	1
	Practiced	3	3	3	3	3	3	1	1	1	1
	Assessed	3	3	3	3	3	3	1	1	1	1
	Overall	3	3	3	3	3	3	1	1	1	1
Team Working	Taught	0	0	0	0	0	0	0	0	0	0
	Practiced	1	1	1	0	0	0	0	0	0	0
	Assessed	0	0	0	0	0	0	1	0	1	0
	Overall	1	0	0	0	0	0	0	0	0	0
Problem Solving	Taught	3	3	3	3	3	3	3	2	3	2
	Practiced	3	3	3	3	3	3	3	2	2	2
	Assessed	3	3	3	3	3	3	3	3	2	2
	Overall	3	3	3	3	3	3	3	2	2	2
Project Management	Taught	0	0	0	0	1	0	0	0	0	0
	Practiced	0	0	1	0	1	0	0	0	0	0
	Assessed	0	0	2	0	3	0	0	0	0	0
	Overall	0	0	1	0	2	0	0	0	0	0
Research Skills	Taught	0	0	0	0	0	0	0	0	0	0
	Practiced	1	0	0	0	0	0	0	0	0	0
	Assessed	0	0	0	0	0	0	0	0	0	0
	Overall	0	0	0	0	0	0	0	0	0	0
Self-Management	Taught	0	0	0	0	0	0	0	0	0	0
	Practiced	3	3	3	3	3	3	1	2	2	1
	Assessed	0	0	0	0	0	0	0	0	0	0
	Overall	1	1	1	1	1	1	1	2	2	1
Commercial Awareness	Taught	0	0	0	0	0	0	0	0	0	0
	Practiced	0	0	0	0	0	0	0	0	0	0
	Assessed	0	0	0	0	0	0	0	0	0	0
	Overall	0	0	0	0	0	0	0	0	0	0
Creative Thinking	Taught	0	0	0	0	0	0	0	0	0	0
	Practiced	0	0	0	0	1	0	0	0	0	0
	Assessed	0	0	0	0	0	0	0	0	0	0
	Overall	0	0	0	0	0	0	0	0	0	0
Positive Attitude	Taught	0	0	0	0	0	0	0	0	0	0
	Practiced	3	3	3	3	3	3	0	0	0	0
	Assessed	0	0	0	0	0	0	0	0	0	0
	Overall	1	1	1	1	1	1	0	0	0	0
IT Skills	Taught	0	0	0	0	3	0	0	0	0	0
	Practiced	0	0	2	0	3	0	0	0	0	0
	Assessed	0	0	3	0	3	0	0	0	0	0
	Overall	0	0	2	0	3	0	0	0	0	0
Career Management	Taught	0	0	0	0	0	0	0	0	0	0
	Practiced	0	0	0	0	0	0	0	0	0	0
	Assessed	0	0	0	0	0	0	0	0	0	0
	Overall	0	0	0	0	0	0	0	0	0	0

		20602	20722	20712	20802	20812	20111	20951	20142	20912	20122
Communication	Taught	1	1	2	2	3	2	3	3	3	3
	Practiced	2	1	2	2	2	3	2	2	2	1
	Assessed	1	1	2	2	2	2	1	2	0	2
	Overall	1	1	2	2	2	2	2	2	2	2
Numeracy	Taught	1	1	3	3	2	1	3	1	3	1
	Practiced	1	1	2	2	2	2	3	1	3	2
	Assessed	1	1	3	3	2	2	3	1	3	1
	Overall	1	1	3	3	2	2	3	1	3	1
Team Working	Taught	0	0	0	0	0	0	0	0	0	0
	Practiced	0	0	1	2	2	1	1	2	1	1
	Assessed	0	0	0	0	0	0	0	1	0	0
	Overall	0	0	0	1	1	0	0	1	0	1
Problem Solving	Taught	3	2	2	2	2	3	2	3	3	3
	Practiced	3	2	3	2	2	3	3	2	3	3
	Assessed	2	2	3	2	2	3	3	3	2	3
	Overall	3	2	3	2	2	3	3	3	3	3
Project Management	Taught	0	0	1	1	2	0	0	0	0	0
	Practiced	0	0	2	2	2	1	1	0	2	0
	Assessed	0	0	3	2	0	0	0	0	0	0
	Overall	0	0	2	2	1	0	0	0	1	0
Research Skills	Taught	0	0	1	1	1	0	0	0	0	0
	Practiced	0	0	2	2	2	0	1	0	1	0
	Assessed	0	0	2	0	1	0	0	0	0	0
	Overall	0	0	2	1	1	0	0	0	0	0
Self-Management	Taught	0	0	0	0	0	0	0	0	0	0
	Practiced	2	2	2	2	2	2	2	2	2	2
	Assessed	0	0	2	2	2	1	2	1	2	0
	Overall	2	2	1	1	1	0	1	1	1	2
Commercial Awareness	Taught	0	0	0	0	0	0	1	0	1	0
	Practiced	0	0	0	0	1	0	2	0	2	0
	Assessed	0	0	0	0	0	0	0	0	1	0
	Overall	0	0	0	0	0	0	1	0	1	0
Creative Thinking	Taught	0	0	0	0	1	0	1	0	1	0
	Practiced	0	0	2	1	2	0	2	0	2	1
	Assessed	0	0	2	2	1	0	1	0	1	0
	Overall	0	0	2	1	1	0	1	0	1	1
Positive Attitude	Taught	0	0	1	1	0	0	0	0	0	0
	Practiced	0	0	2	1	0	0	0	0	0	2
	Assessed	0	0	1	0	0	0	0	0	0	0
	Overall	0	0	1	0	0	0	0	0	0	2
IT Skills	Taught	0	0	0	0	3	0	0	0	0	0
	Practiced	0	0	0	0	3	0	0	0	0	0
	Assessed	0	0	0	0	3	0	0	0	0	0
	Overall	0	0	0	0	3	0	0	0	0	0
Career Management	Taught	0	0	0	0	0	0	0	0	0	0
	Practiced	0	0	0	0	0	0	0	0	0	0
	Assessed	0	0	0	0	0	0	0	0	0	0
	Overall	0	0	0	0	0	0	0	0	0	0

		20222	20502	20512	20802	20902	20201	20411	20701	20962	20132
Communication	Taught	3	2	2	2	3	1	2	2	2	2
	Practiced	3	1	1	1	2	1	1	0	2	1
	Assessed	3	2	2	3	3	0	1	0	0	1
	Overall	3	2	2	2	2	1	1	1	1	1
Numeracy	Taught	1	3	3	3	3	3	3	3	2	3
	Practiced	1	3	3	3	3	1	3	3	2	2
	Assessed	1	3	3	3	2	3	3	3	3	3
	Overall	1	3	3	3	3	2	3	3	2	3
Team Working	Taught	0	0	0	0	0	0	0	0	0	0
	Practiced	1	0	1	1	1	0	0	0	0	0
	Assessed	0	0	0	0	0	0	0	0	0	0
	Overall	1	0	1	1	1	0	0	0	0	0
Problem Solving	Taught	3	3	3	3	3	1	3	3	3	3
	Practiced	3	3	3	3	3	2	3	3	2	2
	Assessed	3	3	3	3	3	3	3	3	2	3
	Overall	3	3	3	3	3	2	3	3	2	3
Project Management	Taught	0	0	0	0	0	0	0	0	0	0
	Practiced	0	0	0	0	0	0	0	0	0	0
	Assessed	0	0	0	0	0	0	0	0	0	0
	Overall	0	0	0	0	0	0	0	0	0	0
Research Skills	Taught	0	0	0	0	0	0	0	0	0	0
	Practiced	0	0	0	0	0	0	0	0	0	0
	Assessed	0	0	0	0	0	0	0	0	0	0
	Overall	0	0	0	0	0	0	0	0	0	0
Self-Management	Taught	0	0	0	0	0	0	0	0	0	0
	Practiced	2	2	2	2	2	0	0	0	0	0
	Assessed	0	0	0	0	0	0	0	0	0	0
	Overall	2	2	2	2	2	0	0	0	0	0
Commercial Awareness	Taught	0	0	0	0	0	0	0	0	0	0
	Practiced	0	0	0	0	0	0	0	0	0	0
	Assessed	0	0	0	0	0	0	0	0	0	0
	Overall	0	0	0	0	0	0	0	0	0	0
Creative Thinking	Taught	0	0	0	0	0	0	0	0	0	0
	Practiced	1	1	1	1	1	0	0	0	0	0
	Assessed	0	0	0	0	0	0	0	0	0	0
	Overall	1	1	1	1	1	0	0	0	0	0
Positive Attitude	Taught	0	0	0	0	0	0	0	0	0	0
	Practiced	2	2	2	2	2	0	0	0	0	0
	Assessed	0	0	0	0	0	0	0	0	0	0
	Overall	2	2	2	2	2	0	0	0	0	0
IT Skills	Taught	0	0	0	0	0	0	0	0	0	0
	Practiced	0	0	0	0	0	0	0	0	0	0
	Assessed	0	0	0	0	0	0	0	0	0	0
	Overall	0	0	0	0	0	0	0	0	0	0
Career Management	Taught	0	0	0	2	1	0	0	0	0	0
	Practiced	0	2	2	0	0	0	0	0	0	0
	Assessed	0	0	0	0	0	0	0	0	0	0
	Overall	0	2	2	2	1	0	0	0	0	0

		20972	31051	32031	32112	34001	34032	35012	35021	36032	39012
Communication	Taught	2	1	0	0	2	1	0	0	1	0
	Practiced	2	2	0	0	2	2	1	1	2	0
	Assessed	0	1	1	1	1	1	1	1	3	0
	Overall	2	1	0	0	2	1	1	1	2	0
Numeracy	Taught	3	2	3	2	3	2	1	1	3	2
	Practiced	3	3	3	2	2	2	3	3	2	3
	Assessed	3	3	3	2	2	2	2	2	1	2
	Overall	3	3	3	2	2	2	2	2	2	2
Team Working	Taught	0	0	0	0	0	0	0	0	0	0
	Practiced	0	0	1	0	0	0	0	0	0	0
	Assessed	0	0	0	0	0	0	0	0	0	0
	Overall	0	0	0	0	0	0	0	0	0	0
Problem Solving	Taught	2	2	1	1	3	2	1	1	3	1
	Practiced	2	2	1	1	2	2	2	2	3	2
	Assessed	3	1	2	1	2	1	2	2	3	2
	Overall	2	2	1	1	2	2	2	2	3	2
Project Management	Taught	0	0	0	0	0	0	0	0	0	0
	Practiced	0	0	0	0	0	0	0	0	0	0
	Assessed	0	0	0	0	0	0	0	0	0	0
	Overall	0	0	0	0	0	0	0	0	0	0
Research Skills	Taught	0	0	0	0	0	0	0	0	1	0
	Practiced	0	0	0	0	0	0	0	0	1	0
	Assessed	0	0	0	0	0	0	0	0	0	0
	Overall	0	0	0	0	0	0	0	0	1	0
Self-Management	Taught	0	0	0	0	0	0	0	0	0	0
	Practiced	0	2	0	0	0	0	0	0	0	0
	Assessed	0	0	0	0	0	0	0	0	0	0
	Overall	0	0	0	0	0	0	0	0	0	0
Commercial Awareness	Taught	0	0	2	0	0	0	2	2	3	2
	Practiced	0	0	2	0	0	0	1	1	2	2
	Assessed	0	0	1	0	0	0	1	1	3	2
	Overall	0	0	2	0	0	0	1	1	3	2
Creative Thinking	Taught	0	0	2	2	1	0	1	1	2	0
	Practiced	0	3	1	1	1	1	1	1	2	1
	Assessed	0	2	1	0	1	1	1	1	3	1
	Overall	0	2	1	0	1	1	1	1	2	1
Positive Attitude	Taught	0	0	0	0	0	0	0	0	0	0
	Practiced	0	0	0	0	0	0	0	0	0	0
	Assessed	0	1	1	1	1	1	1	1	1	1
	Overall	0	0	0	0	0	0	0	0	0	0
IT Skills	Taught	0	0	2	0	0	0	0	0	3	1
	Practiced	0	0	0	0	0	0	0	1	3	0
	Assessed	0	0	0	0	0	0	0	0	3	0
	Overall	0	0	0	0	0	0	0	0	3	0
Career Management	Taught	0	0	0	0	0	0	0	0	0	0
	Practiced	0	0	0	0	0	0	0	0	0	0
	Assessed	0	0	0	0	0	0	0	0	0	0
	Overall	0	0	0	0	0	0	0	0	0	0

		39032	38032	36032	38152	38052	37012	38061	38091	38011	38001
Communication	Taught	0	1	1	1	1	1	1	1	1	1
	Practiced	0	1	1	1	1	1	1	1	1	1
	Assessed	0	1	1	1	1	1	1	1	1	1
	Overall	0	1	1	1	1	1	1	1	1	1
Numeracy	Taught	2	2	1	3	2	1	1	2	1	1
	Practiced	3	1	1	2	2	1	1	2	1	2
	Assessed	2	2	2	3	2	2	2	3	2	2
	Overall	2	2	2	3	2	2	2	2	2	2
Team Working	Taught	0	0	0	0	0	0	0	0	0	0
	Practiced	0	0	0	0	0	0	0	0	0	0
	Assessed	0	0	0	0	0	0	0	0	0	0
	Overall	0	0	0	0	0	0	0	0	0	0
Problem Solving	Taught	1	2	1	1	2	2	1	1	1	2
	Practiced	2	2	2	2	2	2	2	2	2	2
	Assessed	2	2	2	2	2	2	2	2	2	2
	Overall	2	2	2	2	2	2	2	2	2	2
Project Management	Taught	0	0	0	0	0	0	0	0	0	0
	Practiced	0	0	0	0	0	0	0	2	0	0
	Assessed	0	0	0	0	0	0	0	2	0	0
	Overall	0	0	0	0	0	0	0	2	0	0
Research Skills	Taught	0	0	0	0	0	0	0	0	0	0
	Practiced	0	1	2	2	2	2	2	2	2	1
	Assessed	0	0	0	0	0	0	0	0	0	0
	Overall	0	1	1	1	1	1	1	1	1	1
Self-Management	Taught	0	0	0	0	0	0	0	0	0	0
	Practiced	0	0	1	1	1	1	1	2	1	0
	Assessed	0	0	0	0	0	0	0	0	0	0
	Overall	0	0	1	1	1	1	1	1	1	0
Commercial Awareness	Taught	2	0	0	0	0	0	0	0	0	0
	Practiced	2	0	0	0	0	0	0	0	0	0
	Assessed	1	0	0	0	0	0	0	0	0	0
	Overall	2	0	0	0	0	0	0	0	0	0
Creative Thinking	Taught	0	0	0	0	0	0	0	0	0	0
	Practiced	0	0	0	0	0	0	0	0	0	0
	Assessed	0	0	0	0	0	0	0	0	0	0
	Overall	0	0	0	0	0	0	0	0	0	0
Positive Attitude	Taught	0	0	0	0	0	0	0	0	0	0
	Practiced	0	0	0	0	0	0	0	0	0	0
	Assessed	1	1	1	1	1	1	1	1	1	1
	Overall	0	0	0	0	0	0	0	0	0	0
IT Skills	Taught	1	2	1	3	1	0	0	3	1	0
	Practiced	0	0	0	3	1	0	0	3	0	0
	Assessed	0	0	0	3	1	0	0	3	0	0
	Overall	0	1	1	3	1	0	0	3	1	0
Career Management	Taught	0	0	0	0	0	0	0	0	0	0
	Practiced	0	0	0	0	0	0	0	0	0	0
	Assessed	0	0	0	0	0	0	0	0	0	0
	Overall	0	0	0	0	0	0	0	0	0	0

		32001	33001	36001	36041	39001	39991	32012	32062	35032	34011
Communication	Taught	1	1	1	1	1	3	1	1	1	1
	Practiced	0	0	0	0	0	3	0	0	0	2
	Assessed	1	1	1	1	1	3	1	1	1	2
	Overall	1	1	1	1	1	3	1	1	1	2
Numeracy	Taught	3	2	3	3	2	2	3	3	2	3
	Practiced	3	1	3	3	2	1	3	3	2	2
	Assessed	3	1	3	3	2	0	3	3	2	2
	Overall	3	2	3	3	2	2	3	3	2	2
Team Working	Taught	0	0	0	0	0	3	0	0	0	0
	Practiced	0	0	0	0	0	3	0	0	0	1
	Assessed	0	0	0	0	0	3	0	0	0	0
	Overall	0	0	0	0	0	3	0	0	0	0
Problem Solving	Taught	2	2	2	2	2	1	2	2	2	3
	Practiced	2	2	2	2	2	0	2	2	2	2
	Assessed	2	2	2	2	2	1	2	2	2	2
	Overall	2	2	2	2	2	1	2	2	2	2
Project Management	Taught	0	0	0	0	0	0	0	0	0	0
	Practiced	0	1	0	0	1	2	1	0	1	2
	Assessed	0	1	0	0	1	2	1	0	0	0
	Overall	0	1	0	0	1	2	1	0	1	1
Research Skills	Taught	0	0	0	0	0	3	0	0	0	0
	Practiced	1	0	1	0	1	3	0	0	0	2
	Assessed	0	0	0	0	0	3	0	0	0	0
	Overall	0	0	0	0	0	3	0	0	0	1
Self-Management	Taught	0	0	0	0	0	1	0	0	0	0
	Practiced	3	3	3	3	3	3	3	3	3	2
	Assessed	3	3	3	3	3	3	3	3	3	0
	Overall	2	2	2	2	2	3	2	2	2	1
Commercial Awareness	Taught	0	1	0	1	0	3	0	0	0	0
	Practiced	0	0	0	0	0	3	0	0	0	0
	Assessed	0	0	0	0	0	3	0	0	0	0
	Overall	0	1	0	1	0	3	0	0	0	0
Creative Thinking	Taught	0	1	0	0	0	0	0	0	0	0
	Practiced	0	2	0	0	0	2	0	0	0	1
	Assessed	0	1	0	0	0	1	0	0	0	0
	Overall	0	1	0	0	0	2	0	0	0	0
Positive Attitude	Taught	0	0	0	0	0	0	0	0	0	0
	Practiced	3	3	3	3	3	2	3	3	3	1
	Assessed	3	3	3	3	3	2	3	3	3	1
	Overall	3	3	3	3	3	2	3	3	3	1
IT Skills	Taught	0	0	0	0	0	0	0	0	0	0
	Practiced	0	0	1	0	0	2	0	0	0	0
	Assessed	0	0	0	0	0	1	0	0	0	0
	Overall	0	0	0	0	0	1	0	0	0	0
Career Management	Taught	0	0	0	0	0	3	0	0	0	0
	Practiced	0	0	0	0	0	3	0	0	0	0
	Assessed	0	0	0	0	0	3	0	0	0	0
	Overall	0	0	0	0	0	3	0	0	0	0

		34042	35001	35132	38071	Project	PASS	STEM	Mock
Communication	Taught	1	1	1	1	2	2	0	0
	Practiced	2	2	2	2	3	3	3	1
	Assessed	2	2	2	2	3	0	1	3
	Overall	2	2	2	2	3	3	2	1
Numeracy	Taught	3	3	3	3	3	0	0	0
	Practiced	2	2	2	2	2	3	0	0
	Assessed	2	3	2	2	2	0	0	0
	Overall	2	3	2	2	1	2	0	0
Team Working	Taught	0	0	0	0	0	3	0	0
	Practiced	1	2	1	1	0	3	3	0
	Assessed	0	0	0	0	0	0	0	0
	Overall	0	1	0	0	0	2	1	0
Problem Solving	Taught	3	2	2	2	1	2	0	2
	Practiced	2	2	2	2	2	3	0	2
	Assessed	2	2	2	2	2	0	0	2
	Overall	2	2	2	2	2	2	0	2
Project Management	Taught	0	0	0	0	2	3	0	0
	Practiced	2	2	2	2	3	3	0	2
	Assessed	0	0	0	0	3	0	0	0
	Overall	1	1	1	1	3	2	0	1
Research Skills	Taught	0	0	0	1	1	0	0	0
	Practiced	2	2	2	2	3	0	2	3
	Assessed	0	0	0	0	3	0	0	3
	Overall	1	1	1	1	3	0	1	2
Self-Management	Taught	0	0	0	0	0	0	0	0
	Practiced	2	2	2	2	3	3	3	3
	Assessed	1	0	0	0	2	0	0	2
	Overall	1	1	1	1	2	1	1	2
Commercial Awareness	Taught	0	0	0	0	0	0	0	3
	Practiced	0	0	0	0	0	0	0	3
	Assessed	0	0	0	0	0	0	0	3
	Overall	0	0	0	0	0	0	0	3
Creative Thinking	Taught	0	0	0	0	0	0	0	3
	Practiced	1	2	1	2	2	3	3	2
	Assessed	0	0	0	0	2	0	0	2
	Overall	0	1	0	1	2	1	1	2
Positive Attitude	Taught	0	0	0	0	0	3	0	3
	Practiced	1	1	1	1	1	3	3	3
	Assessed	1	1	1	1	1	3	0	3
	Overall	1	1	1	1	1	3	1	3
IT Skills	Taught	0	0	0	0	3	0	0	0
	Practiced	0	0	0	0	3	0	0	0
	Assessed	0	0	0	0	3	0	0	0
	Overall	0	0	0	0	3	0	0	0
Career Management	Taught	0	1	0	1	0	0	0	3
	Practiced	0	0	0	0	0	0	0	3
	Assessed	0	0	0	0	0	0	0	3
	Overall	0	0	0	0	0	0	0	3



## 3.4 Analysis of current employability skills

### 3.4.1 Extra Curricular Activities

The three extra curricular activities that have been audited have scored highly in almost all areas. In particular, the PASS scheme scored highly as students are developing their numeracy and problem solving skills. All activities scored particularly highly in communication and team working skill, as well as positive attitude to work. We all agree that if a student were to take part in each of the three activities, then they would be able to demonstrate examples of almost all of the employability skills.

### 3.4.2 First Year Introduction

Most of the first year modules are similar in structure and therefore cover similar skills. They all cover a mixture of theorems, definitions, methods and examples in lectures and students get to put their knowledge into practice when doing problem sheets and attending supervisions. Apart from the assessed problem sheets, almost all modules are assessed by exams.

#### Well evidenced skills

All modules involve a lot of **problem solving** and **numeracy** due to the nature of a mathematics degree. We would argue that both skills are an integral part of the degree course. **Creative thinking** and **self management** have also scored highly in the first year courses, but we think that more can be done to encourage students to develop these skills even more. The module that got the highest scores overall was **Mathematical Workshop**. A reason for this is that it includes a lot of team-working and IT-skills such as Matlab; two areas that other first year courses are lacking. It also gained high scores for **problem solving** and **self-management**.

#### Areas for improvement

**Career management**, **research** and **commercial awareness skills** all scored badly in first year course units, as they are not taught, practised or assessed to any great extent in any of the first year modules. Probability (MATH10141) was the module that received the lowest scores in the audit. The main reason for this is that it doesn't have any small group tutorials and therefore students do not get extensive time to practise their **communication skills**.

### 3.4.3 Second Year

#### Introduction

In the first semester of the second year, students have no choice about what modules to take, but they must choose six of the 18 available modules in the second semester. The employability skills that a student is able to gain depends upon which modules they choose. Overall, the results of the audit for the second semester are very similar to the results of the first semester.

#### Well evidenced skills

In general, most courses scored highly in **numeracy** and **problem solving**, and generally scored highly for practised **communication** skills. Introduction to Financial Mathematics (MATH20912) is the module that gained the highest scores in the audit, particularly in **commercial awareness**.

#### Areas for improvement

Most maths modules have very low scores in **project management**, **commercial awareness** and **career management skills**.

### 3.4.4 Third Year Introduction

Third year students choose the modules that they take in each semester. The University of Manchester offers around 50 courses at this level and so we have audited only a cross section of the available units.

#### Well evidenced skills

**Communication** skills, **numeracy** and **problem solving** skills are taught, practiced as well as assessed optimally. During the example classes, students can practice **communication** and **team working** skills by discussing where they get stuck when doing the example sheets or doing revision with others. They can also improve their **research** skills by reading related books or using appropriate search engine when they find the lecture notes are not enough to help them understand.

Students are given an outline of the course at the very beginning. They can practice **project management** skills by designing a schedule of their individual study and evaluating the outcome by checking their answer for the example sheet using the online solution. Mathematical Programming (MATH39012) and Statistical Computing (MATH38091) are examples of modules that scored highly for **IT** skills. Time Series (MATH38032), Generalized Linear Models (MATH38052) and Social Statistics (MATH38152) involve R-code in representing and analyzing data. Students are also required to use R-code in completing their coursework in Social Statistics, Generalized Linear Models and Statistical Computing.

The undergraduate project module (MATH30011) scored very highly in most areas, particularly as students taking this course have to give an oral presentation at the end of the semester. The extent to which some of the skills are covered in this module depend on the choice of project, for example, more statistical based projects might involve more **numeracy** skills, and some projects may involve a certain amount of **commercial awareness**. This module is able to score highly where others don't, for example, **project management** skills are required, as students are expected to work independently with little input from their supervisor. It is also a good way to develop **IT** skills, as it is often necessary to learn how to use new programmes such as LaTeX.

**Commercial awareness** and **career management** skills both have very low scores overall, but Career Management Skills (MATH39991) scored very highly in both of these skills.

### **Areas for improvement**

**Team working, project management, research skills, self-management, creative thinking** and **positive attitude** to work generally scored badly.

### **3.5 Suggested minor changes**

The following suggestions have been made that could be incorporated into any of the current courses in order to improve the employability skills of students.

#### **Varying the content of examples sheets**

As it stands, problems are usually set based on the material presented during lectures. We propose that lecturers should include more research based questions where students are required to find out information that has not been made available by the lecturer. Students would therefore be given the opportunity to develop their research skills during the course of their degree.

#### **Peer-assessed Marking**

We suggest that lecturers adopt the idea of peer-assessed marking for example sheets so that each student will have feedback on their work, and will also be encouraged to complete the examples sheets (which are currently not mandatory). This would improve students written communication skills for both the person marking and the writer. This would also improve self-management as they would have to better organize their time.

#### **Awarding a small percentage of final mark for students attendance at examples classes**

Even a small percentage awarded to student for their attendance, for example 3% would encourage more people to attend examples classes and develop some important skills such as communication, team working and problem solving.

#### **Opportunities to present orally during examples classes**

Examples classes currently do not require students' direct participation. If it were required for the students to present the solution to a question during examples classes, then they would be developing their oral communication skills as well as engaging more fully with the lecture material.

#### **Encouragement by lecturers**

One way of improving employability skills is to make students aware that developing these skills is important during the graduate recruitment process and their subsequent careers. To this end, it would be useful for lecturers to make them aware that by attending and contributing during examples classes for example, they are improving their employability skills as well as improving their mathematics.

## **Chapter 4 - Proposals for new modules**

### **4.1 Group Project Module Proposal**

#### **4.1.1 Overview**

We suggest that, in a similar way to the Undergraduate Project (MATH30011), students inform academic staff of their area of interest and they are paired with a researcher in the relevant field. For example, students could be asked to choose their preference from the areas of finance, statistics, applied mathematics or pure mathematics. However we also want to group students with similar mathematical interests so that they can complete a project together. The project will consist of either a piece of research, statistical analysis, or mathematical modelling, depending on the project. At the end of the semester, each student will be required to give an individual presentation about what they have contributed and how the group worked together.

#### **4.1.2 Resources**

To complete the project, students will need written resources, such as those available in the library. The current university computers (with their included software) will be appropriate for writing up the project and possibly carrying out calculations (depending on the topic).

#### **4.1.3 Timing**

A problem with the current project modules is that the final project is drafted in the third year, and so those students who wish to use their project as evidence (of either their research skill, style of communication or attitude to work) they are unable to do so unless they save their job application until late in the third year. However, the School finds that most students are applying for positions in their second year (whether they be full-time positions or internships), and so completing the group project in the second year would be beneficial from an employment point of view. The groups would meet every so often in a supervised environment, for example once every two weeks with their supervisor. To make the project more appealing to both academics and students, the project should be completed around week 10, so that work can be assessed in good time and presentations can be completed before exam season.

#### **4.1.4 Learning Objectives**

Ideally, after completing the module, students would be able to:

- Function as a useful part of a team and contribute to a final project completed by the group as a whole
- Manage the people involved in the team (even if only for a short period), organizing roles and collating individuals' work, where appropriate
- Carry out individual research, return relevant information and identify where their own research affects others' work
- Contribute to verbal group discussions

- Reflect on their mistakes and use feedback throughout the semester to improve the final piece of work
- Type up a piece of mathematics using a computer package
- Deliver an oral presentation concerning their own contribution to the project

#### **4.1.5 Potential Problems**

##### **How to assess students individually when they have completed the project as a part of a group**

The trickiest part of setting a module like this is ensuring that the mark everyone gets is reflective of both the amount of work that they have put in and the amount of actual mathematics that they have individually contributed. Ideally, everyone would do the same amount of maths, and there would be none in any group whose role is solely to type up or organize research.

This can be achieved by sharing roles amongst the group. Each individual would take their turn managing the project, collating information, organizing the next meeting or taking minutes, doing research and completing the hard maths behind a problem. Each student would be assessed on how they performed when in each role.

Assessment would be completed by judging the completed project on how well it answers the problem and also on how well the maths is communicated. Furthermore, students will be asked to present their interpretation of the project to assessors, similarly to how the individual project is currently presented.

Additional assessment could take place by way of peer-review. Each student awards marks to their peers based on their effectiveness of communication and/or contribution to discussions.

## **4.2 Proposal to improve IT skills: LaTeX-classes**

### **4.2.1 Overview**

LaTeX classes, either optional or as part of a module. We have a few different ideas of how this could be run:

- As a one day workshop for third year students to prepare them for their final projects. Preferably during the start of the year and either run by postgraduate or fourth year students.
- As part of the Practical Statistics or Mathematical Workshop module when writing up projects.
- As optional support classes available for everyone, either run by postgraduates or by the students themselves in a project structured similarly to the PASS scheme.

### **4.2.2 Resources**

- A booked time in the computer cluster and software installed on all computers.
- Facilitators who can lead the sessions -either voluntary or paid.

### **4.2.3 Time Frame**

Either during one day or a few afternoons.

### **4.2.4 Benefits/ Skills developed**

A knowledge of LaTeX will particularly be useful for anyone doing a project, but the main idea is to integrate IT-skills more at all levels and to make students more comfortable with using computers in their work. A lot of students who only have very basic IT-skills might find computer intensive modules intimidating at first, and although LaTeX might not be requested particularly by employers it can be an easy way of introducing students to basic script writing and programming concepts. Hopefully it can also give students the interest and confidence to develop more advanced skills later on.

### **4.2.5 Potential Difficulties**

- Finding a good time and place? Possibly wednesday afternoons, in the small section of the computer cluster.
- Is it possible to integrate this into Practical Statistics/ Mathematical Workshop? Will it be too complicated and time consuming?

## 4.3 Suggested extensions to extra-curricular activities

### 4.3.1 Mock Interview Scheme Overview

Extending the mock interview programme to include two presentations for second year students, a mock online test, cover-letter and group exercise (a case study discussion and a role play exercise).

#### Eligibility

The extension will be aimed at second year Mathematics students who have volunteered to participate in the programme and first year Mathematics students who have applied to take part in the programme. The mock internship programme is an extra-curricular activity available just to Mathematics students.

#### Resources Required

- The Careers Service input for presentations-their time and resources to arrange for a place for the mock-online test.
- Case studies and role play exercises that could be obtained through companies that have links with the School of Mathematics. Rooms where these exercises will take place will also need to be arranged.
- Second year volunteers (and maybe even third year volunteers) to run the programme (conduct mock interviews, monitor and judge performances in the group exercises and role play).

#### Main Description

In this programme second and third year students are trained (by external employers) to assess first year students' (as applicants) application forms and to conduct follow-up interviews. The link below contains more information regarding to the programme:

<http://www.maths.manchester.ac.uk/undergraduate/interviewerprog.php>

I believe this is a great programme where all year students can experience the whole job application process so they are more likely to do better in their real ones. But the main problem is applicants did not do enough research on the companies or jobs they are applying for. The question is: do they just need to spend more time to do research on the internet or, as I suppose, they do not know how to do efficient research; how to take notes of the information they've collected and how to represent them in an interviewing environment. I believe that the Career Services can play an active role in teaching these skills. I have two suggestions:

- One or two presentations (provided by Career Services) are given to students who applied for this programme: one at the beginning aiming at introducing job research skills and teaching how to write application forms; one at the middle (before mock interview) aiming at teaching interviewing skills.
- Introduce a mock on-line test, cover letter and group exercise so that the whole



programme becomes more realistic.

### **Benefits/Skills Developed**

- Team working and communication skills through group exercises (for first year participants).
- Awareness of skills required to succeed in a group exercise (for second year volunteers).
- Careers management and research skills.

### **Potential Difficulties**

- There are already brochures on how to write up application forms and prepare for psychometric tests at the careers service so only one presentation is required that will combine the job research skills and teaching interviewing skills.
- The students might not turn up for the presentation as one can find online information on interviewing skills and research skills which will be a waste of time for the careers service.
- An alternative to two presentations could be e-mailing students links to documents detailing how to improve interviewing skills and where to find job details. However a presentation will be more interactive than an e-mail link and could include a role play exercise at the end that will actively improve students interviewing skills. That is an incentive for students to attend the presentation as well.
- Psychometric tests are already available at the careers service and cost 5 pounds per session so including them in the mock interview programme is not necessary. However as a part of the programme they can be more specialized and free so students will actually attend mock-online test sessions. But they will cost the careers service however the university could pay towards that.
- Who will organize the mock online test? If it is the Careers Service then the technical aspects of the test need not to be worried about. If it is the School of Mathematics then they will have to sign on to a source for online tests and arrange for a location that will have to be supervised during the test.
- Case studies will have to be prepared so will the role play scenarios. The School of Mathematics could arrange for a company to provide assistance for writing up case studies and role play scenarios.
- A lack of volunteers could be a problem for running the problem in subsequent years.
- Advertisement is a general problem with the mock interview programme.

### **Time Frame**

The programme will run during the first semester. Presentations will last one to two hours each and the mock online test, group exercises and role play can be done on the same day, lasting 2-3 hours altogether.

## **4.3.2 Real-Life Business Problem**

### **Overview**

Solving real-life problems is a good way to improve students' employability skills. A lot of companies have recognized the value of problem solving and have developed some challenging activities. Some examples are BP's Ultimate field trip and IBM's mainframe challenge. However, not many of them are mathematics related. Our suggestion is to come up with a real-life challenge which focuses on mathematics students. In detail:

- Relevant problem devised by our academics and closely related to our mathematics modules.
- Manageable problems that will challenge participants.
- Prizes, such as an iPad, could be offered to encourage student participation.
- The competition would run as an extra-curricular activity and should be open to all undergraduate students within the School.

### **Resources**

- Lecturers that are willing to help out in this programme and set up the problems.
- Help from maths department to advertise and administer the competition.
- Cost of any prizes.

### **Skills Development**

- Enhance problem solving skills
- Improve commercial awareness
- Improve numeracy skills
- Enhance career management skills

### **Potential Difficulties**

The primary difficulties faced in setting up such a competition would be in relation to academic and administrative support for the programme. Such details will be factored in to a full appraisal as to the benefit of the School trialling a competition along these lines.

## Chapter 5 - Conclusion

This report comprises of the audit completed by undergraduate students from the School of Mathematics, suggested minor changes that can be made to course units, a proposal for a new course module and suggested extensions to current extra-curricular activities.

Over the last five years, the School of Mathematics has substantially increased its in-house programme of careers and employability activity, with schemes such as the Calculating Careers Fair and the Interviewer Training Programme. The completion of this audit, particularly with the guidance of staff at The University of Exeter, has encouraged us to consider not only our extra-curricular activities but how employability skills are and can be embedded within the curriculum. We have been very encouraged to see that students can develop a broad range of skills within our undergraduate programmes and feel that the audit has been a valuable undertaking that will have a lasting impact upon how we think about employability skills within the School.

We intend to share our experiences and learning from the audit with the wider University community. We shall be holding a dissemination event for staff on the 6<sup>th</sup> of July. Of the proposals that have come from this report, that for a group project will be presented to the School Teaching Committee, the extensions to the Mock Interviewer Programme and the Real Life Business Problems will be taken to the School's Careers Team and we expect that LaTeX Classes and the suggested minor changes to current course units will be implemented in the 2012/13 academic year.