

## MODULE SPECIFICATION – UNDERGRADUATE PROGRAMMES

### KEY FACTS

Module name	Applications of Information Technology
Module code	AS1055
School	Cass Business School
Department or equivalent	UG Programme
UK credits	25
ECTS	12.5
Level	4
Delivery location (partnership programmes only)	

### MODULE SUMMARY

#### Module outline and aims

The tasks undertaken at work by actuarial trainees or by students on placement or internship require a thorough practical capability in the use of information technology. Starting from the basics, this module introduces you to Excel, VBA and two statistical packages (Minitab and R), and also explains the standard of documentation which is required of model developers in the office environment. The lectures and practical sessions are scheduled in such a way that you are able to use the IT tools presented in this module to solve problems generated by concepts introduced in other modules on the programme.

This module aims to:

- Provide instruction in the use of Minitab to produce elementary statistical displays;
- Provide a working knowledge of Excel up to the level required for standard office work;
- Provide an introduction to programming in VBA for Excel, to the level where you can write macros and user-defined functions to assist in carrying out analytical tasks;
- Provide an introduction to R and to explain both its underlying data structures and the way it can be used to perform standard statistical tasks and produce statistical illustrations;
- Explain the reasons for technical standards of documentation and give instruction in how to apply them in practice;
- Describe how to structure and prepare a report with mathematical/statistical content, outlining the results of an investigation.

### Content outline

- (1) Introduction to the use of Minitab for elementary statistical tasks and statistical displays.
- (2) Introduction to Microsoft Excel: references, ranges, formatting; formulas, arithmetical operations, string operations, sorting; worksheet functions; IF; lookup functions; charts; financial functions, array functions; Solver and Goal Seek; controls and forms; data tables; conditional sums; conditional formatting; toolpaks.
- (3) Introduction to VBA for Excel: modules and macros; user-defined subroutines and functions; data types; input from, and output to, the worksheet; IF...THEN...ELSE; loops and iteration; select case; forms.
- (4) Introduction to statistics with R: data types, data input, statistical graphs, hypothesis testing, confidence intervals, linear regression; elements of statistical modelling.
- (5) Standards of documentation: how to make your worksheets and VBA code user-friendly; technical actuarial standards (TAS) and The Actuaries Code.
- (6) How to structure a report; use of Equation Editor in Word 2007 for technical typing.

### **WHAT WILL I BE EXPECTED TO ACHIEVE?**

**On successful completion of this module, you will be expected to be able to:**

#### Knowledge and understanding:

- Demonstrate understanding of the way in which VBA interprets a sequence of instructions.
- Understand the purpose and the level of detail required in an audit trail.
- Demonstrate understanding of the data structures used by R.

#### Skills:

- Construct a spreadsheet to perform simple tasks.
- Edit and document a spreadsheet so that it is suitable for someone else to use.
- Use statistical software to produce illustrative graphical displays.
- Use statistical software to carry out statistical modelling, perform linear regression, construct confidence intervals and test hypotheses.
- Write a simple program in VBA.

- Write a report summarising the findings of an investigation.

Values and attitudes:

- Comply with the spirit of the Technical Actuarial Standards.
- Understand and abide by the relevant part of The Actuaries Code - Section 5.

## HOW WILL I LEARN?

Each week there will be two hours of lectures and a two-hour lab session. The worksheets for the lab sessions will be published on Moodle.

*Teaching pattern:*

Teaching component	Teaching type	Contact hours	Self-directed study hours	Placement hours	Total student learning hours
Lab Session	Practical classes and workshops	40	30	0	80
Lecture	Lecture	10	10	0	20
On-line Lecture	On-line lecture	30	30	0	60
Surgery Lab	Practical Class	10	0	0	10
Group work	Seminar	0	90	0	90
<b>TOTALS:</b>		<b>90</b>	<b>160</b>	<b>0</b>	<b>250</b>

## WHAT TYPES OF ASSESSMENT AND FEEDBACK CAN I EXPECT?

Assessments

Assessment will be by group coursework (5 tasks based on the lab worksheets, weighted at 10% each) and by individual invigilated computer practical assessments (one in January, one in April, weighted at 25% each).

*Assessment pattern:*

Assessment component	Assessment type	Weighting	Minimum qualifying mark	Pass/Fail?
May Practical Invigilated Test	Written Exam	25	40	N/A

Coursework 1	Written assignment including essay	10	40	N/A
Coursework 2	Written assignment including essay	10	40	N/A
Coursework 3	Written assignment including essay	10	40	N/A
Coursework 4	Written assignment including essay	10	40	N/A
Coursework 5	Written assignment including essay	10	40	N/A
January Practical Invigilated Test	Written Exam	25	40	N/A

#### Assessment criteria

Assessment Criteria are descriptions of the skills, knowledge or attributes students need to demonstrate in order to complete an assessment successfully and Grade-Related Criteria are descriptions of the skills, knowledge or attributes students need to demonstrate to achieve a certain grade or mark in an assessment. Assessment Criteria and Grade-Related Criteria for module assessments will be made available to students prior to an assessment taking place. More information will be available from the module leader.

#### Feedback on assessment

Following an assessment, students will be given their marks and feedback in line with the Assessment Regulations and Policy.

All assessments will be submitted online using Moodle's Assignment tool. Individual feedback will be returned within 3 weeks via Moodle. For each coursework task a general overview of points which relate to several of the submitted tasks will be uploaded to Moodle shortly after the individual coursework feedback is returned to the students. A general commentary on the invigilated practical assessments will also be uploaded to Moodle.

#### Assessment Regulations

In order to pass the module and acquire the associated credit, a student must complete or be exempted from the assessment component(s) and achieve an aggregate Module Mark of 40%.

#### **INDICATIVE READING LIST**

Johnson, S. (2007), Brilliant Microsoft Excel 2007, Harlow: Pearson Prentice Hall; ISBN 978-0-132-05890-2.

Dalgaard, P. (2008), Introductory Statistics with R, New York: Springer; ISBN 978-0-387-79053-4.

Braun, W. J. and Murdoch, D. J. (2007), A First Course in Statistical Programming with R, Cambridge: CUP; ISBN 978-0-521-69424-7.

Mawer, P. (2009), The Actuaries Code, available from  
<http://www.actuaries.org.uk/sites/all/files/documents/pdf/actuariescode20091001.pdf>.

Version: 3.0

Version date: May 2015

For use from: 2015-16

**Appendix:** see <http://www.hesa.ac.uk/content/view/1805/296/> for the full list of JACS codes and descriptions

**CODES**

HESA Code	Description	Price Group
133	Business and Management Studies	D

JACS Code	Description	Percentage (%)
N323	The application of statistical concepts within the financial industry.	100