MODULE SPECIFICATION – UNDERGRADUATE PROGRAMMES

KEY FACTS

Module name	Extreme Event Statistics
Module code	AS3015
School	Cass Business School
Department or equivalent	UG Programme
UK credits	15
ECTS	7.5
Level	6
Delivery location (partnership programmes only)	

MODULE SUMMARY

Module outline and aims

To present this modern statistical discipline in the context of finance, insurance and the environment.

The course aims to provide an understanding of the appropriate use of univariate extreme value techniques, and the practical ability to apply the methods and obtain estimates of risk and uncertainty given suitable data.

Whereas much of statistics in concerned with modelling processes when at typical levels, and within the range of observed data, extreme value theory attempts to estimate the probability of rare events at extreme high or low levels of a process. The behaviour of the extremes of a process are characterised and inference made about events that may not have happened before.

The course looks at the theory and application associated with modelling the occurrence of extreme events. This can involve looking only at maxima or minima within fixed periods or studying the behaviour of events that exceed certain thresholds.

Application areas will include economics, insurance and the environment.

Content outline

This is an advanced applied statistics course and depends on a sound knowledge of the mathematical statistics studied at Part 2 in Probability and Statistics 2. You should have a good grasp of the principles of estimation, in particular maximum likelihood, confidence intervals and statistical inference. As a guide, the EES course is best suited to those students who obtain at least 60% in the PS2 examination. Anyone wishing to join the course who did not do so well in PS2, should seek further advice.

You should also note that EES has been a topic forming the basis of a number of final year projects. You should be aware that with EES being a final year elective, any project based on EES will need to contain work that extends the material contained in the

course. In other words, projects should not predominantly be material that is substantially the same as the course material.

Pre-requisite Module
AS2101 Probability & Statistics 2

WHAT WILL I BE EXPECTED TO ACHIEVE?

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

Knowledge and understanding:

- Understand the applications of statistical inference within the extreme value framework.

- Understand the illustration of statistical inference within the extreme value framework.

Skills:

- Present reasoned arguments in clear concise English

- Use mathematics to solve quantitative problems

- Use statistical inference for the generalised extreme value distribution.

- Communicate effectively with non-specialists in the area

- Develop and present reasoned arguments

- Use the threshold exceedance approach.

- Fit the generalised Pareto distribution.

Values and attitudes:

- Be aware of the underlying assumptions and the limitations of different methods

- Be aware of the possible shortcomings in data collection

- Appreciate the scope of the use of software in extreme value analysis

- Be aware of the responsibility of a statistician to draw conclusions that are only justified by proper analysis of the data.

HOW WILL I LEARN?

Lectures.

Teaching pattern:

Teaching	Teaching	Contact	Self-	Placement	Total

component	type	hours	directed study hours	hours	student learning hours
Lectures	Lecture	30	120	0	150
TOTALS:		**30**	**120**	**0**	**150**

WHAT TYPES OF ASSESSMENT AND FEEDBACK CAN I EXPECT?

Assessments

Coursework and exam.

Assessment pattern:

Assessment component	Assessment type	Weighting	Minimum qualifying mark	Pass/Fail?
Coursework 1	Written assignment, including essay	10	0	N/A
Coursework 2	Written assignment, including essay	10	0	N/A
Exam	Written Exam	80	0	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. More information on the timing and type of feedback that will be provided for each assessment will be available from the module leader.

Assessment Regulations

The Pass mark for the module is 40%. Any minimum qualifying marks for specific assessments are listed in the table above. The weighting of the different components can also be found above. The Programme Specification contains information on what happens if you fail an assessment component or the module.

INDICATIVE READING LIST

An Introduction to Statistical Modelling of Extreme Values, Coles, S. (Springer Series in Statistics) (2007)

Version: 2.0
Version date: July 2013
For use from: 2013-14

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
24	Mathematics	C

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