

MODULE SPECIFICATION

Please contact the Quality Enhancement Office for guidance completing this form on QEO-General@salford.ac.uk

This form is available to download from http://www.governance.salford.ac.uk/page/aqa_forms

Date of completion of this version of Module Specification: 29/09/2017				
Date of approval by the PARP: Click here to enter a date.				
1. Module Title: (Full title and short title no more than 30 characters) Introduction to Probability and Statistics			2.CRN: 52785	
3.University module code:		4.HESA/JACS subject area code ¹ :		
5.Level: Level 3	6.Credit Value: 20	7.ECTS Value ⁱⁱ : 10	8.Length of module in semesters: 2	9.Month(s) in which to be offered ⁱⁱⁱ : September
10.Module Status ^{iv} New	11.Title of Module being replaced (<i>if any</i>):		12.With effect from ^v (academic year): September 2018	
13.Originating School: School of Computing, Science & Engineering		14.Module Leader(s) TBC		
15.Programme(s) in which to be offered ^{vi} : BSc Mathematics with Foundation Year BSc Financial Mathematics with Foundation Year				
16.Pre-requisites (<i>between levels</i>):		17.Co-requisites (<i>within a level</i>):		
18.Indicative learning hours (breakdown of hours required) ^{vii} 200				
Lecture	46	Fieldwork		
Seminar		External visits		
Tutorial	23	Work based learning		
Project supervision		Guided independent study		131
Demonstration Practical classes and workshops		Placement		
Supervised time in studio/workshop		Year abroad		
Other – please specify ^{viii}				
19.Percentage of module taught by School(s) other than originating School: 0%				
20.Aims of Module ^{ix} : (maximum of 5) <ol style="list-style-type: none"> 1. Provide a level of knowledge, understanding and competence in basic Mathematics to allow progression onto a technical or scientific degree. 2. To develop analytical and numerical problem solving skills in basic Mathematics. 				
21.Intended Learning Outcomes ^x				

Knowledge and Understanding (maximum of 5)^{xi}

On successful completion the student will be able to:

- (1) Understand and correctly interpret scientific and statistical graphs.
- (2) Develop sound theoretical and applied knowledge of hypothesis testing models.
- (3) Provide a description of the statistical method used for data analysis, including a discussion of advantages, disadvantages, and necessary assumptions.

Transferable/Key Skills and other attributes (maximum of 5)

On completion the student will be able to:

- (1) Interpret data and demonstrate findings.
- (2) Numbers: find, extract and analyse data from many sources.
- (3) Communication: communicate mathematical and statistical information effectively.
- (4) IT: be able to apply specialised software packages to statistically analyse data.

22. Module mark calculation: Method A**23. Assessment components (in chronological order of submission/examination date)**

Denote final assessment component in box marked **final assessment component (99)**

Type of assessment	Identify which ILO is met by number ^{xii}	Weighting %	Duration	Word count	Component pass required ^{xiii}	E Submission	Assessment organised by
Statistics Portfolio - Coursework	1-4	50			No	Yes	School
					Choose an item.	Choose an item.	Choose an item.
Final assessment component (99) Examination	1-4	50	2 hours		No	No	SID
24. Is ethical approval for the module required?	No		25. Is ethical approval for an assessment component required? ^{xiv}		No		

26. Learning, teaching and assessment strategies:

The module comprises:

46 hours of lectures which are a blend of teacher-centred delivery of important concepts, flipped-classroom and learner-centred delivery for application of concepts in problem solving.

23 hours of problem solving tutorial classes in which students embark on assisted problem solving exercises.

The portfolio element is a combination of set exercises and a class test.

27. Syllabus outline:

- Basic statistics: mean, median, mode, standard deviation and variance, quartiles.
- How to load data and compute basic statistics from those data using "R programming language".
- Statistical graphs and their interpretation: bar plots, stem-and-leaf diagrams.
- Compute confidence interval: understand confidence intervals and z-scores table.
- Properties of probabilities plus probability mass/density function, probability cumulative function.
- Understand the concept of sample space, law of total probabilities, Bayes' theorem and their applications.
- Draw the graph of a given probability distribution.
- Application of combinatorics to probabilities (how to compute the number of possible combinations of objects).
- Expectation and variance of random variables.
- Properties of variance and different ways to compute variance.
- Relationship between variance of a random variable and its mean.

- Hypothesis testing (z-score test, t-test).
- Apply statistical tests to problems involving the comparison of two populations.
- Basic understanding of central limit theorem.
- Nonparametric statistics (Wilcoxon rank-sum test).

28. Indicative texts and/or other learning materials/resources^{xv}:

- Introduction to statistics. By Ronald E Walpole. New York: Macmillan; London.
- Probability & Statistics for Engineers & Scientists. By Ronald E. Walpole, Raymond H. Myers, Sharon L. Myers, Keying Ye. Pearson; 9th edition.
- Multivariate Data Analysis. By Joseph F. Hair Jr, William C. Black, Barry J. Babin, Rolph E. Anderson. Pearson; 7th edition.
- Probability and Statistics for Engineers and Scientists. By Anthony J. Hayter. Duxbury Press; 4th edition.
- Applied Statistics and Probability for Engineers. By Douglas C. Montgomery and George C. Runger. John Wiley & Sons; 6th edition.

For Office Use only:

QEO Comments:

- ⁱ See UoS guidance notes on selecting JACS codes (http://www.planning.salford.ac.uk/jacs_codes/) see HESA JACS Codes webpage <http://www.hesa.ac.uk/index.php/content/view/356/233/>
- ⁱⁱ The ECTS value is half of the module credit value
- ⁱⁱⁱ Please indicate the month (s) in which delivery of the module will commence.
- ^{iv} Amendments to the title or credit value constitute a new module.
- ^v If the delivery month of the module is to be available for different intakes of a programme, please indicate this here. E.g. Module effective from Sept 2014 – to state the module is to be available for Sept 2014 intake & Feb 2014 intake.
- ^{vi} The module will only be attached to programmes specified in this section. Any approved module can be available as a stand-alone module.
- ^{vii} These categories are used for the Key Information Set which currently applies only to full time undergraduate students only but please include for all students – for more information including definitions see http://www.qaa.ac.uk/Publications/InformationAndGuidance/Documents/contact_hours.pdf and http://www.hesa.ac.uk/component/option.com_studrec/task.show_file/Itemid.233/mnl.13061/href.Calculations_methods.html/#LearningandTeaching
- ^{viii} The 'other' category should not be used for learning undertaken by full undergraduate students as 'other' is not used in KIS categories
- ^{ix} The aims should express the purpose of the module.
- ^x The intended learning outcomes should detail the knowledge, understanding and skills that students will be able to demonstrate on successful completion.
- ^{xi} In some circumstances it may be necessary to have more than 5 intended learning outcomes. You will be asked to provide your rationale for this in discussion at the USP.
- ^{xii} For example, if the assessment is an essay and the essay meets ILOs number 1-4 and 6-7, state 1-4,6-7
- ^{xiii} If Method B is used for module mark calculation, indicate Yes to specify the assessment component(s) to be passed in order to pass the module
- ^{xiv} Please specify component(s) for which ethical approval is required.
- ^{xv} The "Indicative texts and/or learning materials/resources" box should include a maximum of five items for new modules. These should be formatted using the University's agreed referencing style for the subject area (usually APA Harvard System 6th). See http://www.salford.ac.uk/library/infolit/tool#referencing_tab for more information. The texts should normally be recent texts (i.e. within the last six years) unless they are a particularly "classic" text. For existing modules, the "Indicative texts and/or learning materials/resources" box should include a link for PARP reviewers and readers to the comprehensive reading list at <http://lasu.salford.ac.uk>