



## MODULE SPECIFICATION

Part 1: Information			
Module Title	Statistical Reasoning		
Module Code	UFMFPA-30-1	Level	Level 4
For implementation from	2018-19		
UWE Credit Rating	30	ECTS Credit Rating	15
Faculty	Faculty of Environment & Technology	Field	Engineering, Design and Mathematics
Department	FET Dept of Engin Design & Mathematics		
Contributes towards	Mathematics and Statistics [Sep][SW][Frenchay][4yrs] BSc (Hons) 2018-19 Mathematics [Sep][SW][Frenchay][4yrs] BSc (Hons) 2018-19 Mathematics [Sep][SW][Frenchay][5yrs] MMath 2018-19 Mathematics with Qualified Teacher Status (QTS) [Sep][FT][Frenchay][3yrs] BSc (Hons) 2018-19 Statistics [Sep][FT][Frenchay][3yrs] BSc (Hons) 2018-19 Mathematics and Statistics [Sep][FT][Frenchay][3yrs] BSc (Hons) 2018-19 Mathematics [Sep][FT][Frenchay][4yrs] MMath 2018-19 Mathematics [Sep][FT][Frenchay][3yrs] BSc (Hons) 2018-19		
Module type:	Standard		
Pre-requisites	None		
Excluded Combinations	None		
Co- requisites	None		
Module Entry requirements	None		

**Part 2: Description**

**Educational Aims:** In this module students will be introduced to the reasoning behind statistics which will be balanced with analysis and exploration of real data that reflect the widespread application of statistics to virtually every profession and academic discipline

**Outline Syllabus:** Types of data. Data collection methods. Sampling methods.

Exploratory data analysis, methods of exploring, summarising and illustrating data.

Probability. Probability distributions. Bayes Theorem. Mathematical expectation. Moments. Elementary moment generating functions.

Discrete and continuous probability distributions including binomial, Poisson, uniform, exponential, normal.

Estimation. Sampling distributions. Confidence intervals.

Hypothesis testing: Z-tests, t-tests, F-test for variances, Chi-square tests for contingency tables and goodness of fit, nonparametric tests.

Introduction to correlation and regression.

Additive and multiplicative time series models; calculating and interpreting

Index numbers

**Teaching and Learning Methods:** The module will comprise lectures, computer practicals and classroom tutorials and will make use of statistical computer packages (e.g. MINITAB, R). Emphasis will be on the choice of analysis and on the interpretation and communication of results.

Students will be encouraged to develop critical awareness, intuition and interpretive skills in the application of statistical procedures. To prepare for assessment, students are expected to undertake self-directed learning addition to the directed learning which supports taught classes.

Scheduled teaching hours takes the form of:

Whole group lectures used to deliver new material and to consolidate previous material;

Small group computer practicals with data-driven activities designed to allow students to apply their knowledge and develop statistical literacy;

Small group classroom tutorials with activities designed to reinforce and enhance students understanding of the lecture material.

Contact time: 72 hours

Assimilation and development of knowledge: 150 hours

Coursework preparation: 22 hours

Examination preparation: 56 hours

TOTAL: 300 HOURS

## STUDENT AND ACADEMIC SERVICES

Part 3: Assessment			
Component A consists of an examination that is summative and assesses students' understanding of concepts and techniques together with their ability to apply them.			
Component B consists of three short assignments designed to test understanding of material and report writing			
First Sit Components	Final Assessment	Element weighting	Description
Written Assignment - Component B		8.5 %	Assignment 1
Written Assignment - Component B		8.25 %	Assignment 2
Written Assignment - Component B		8.25 %	Assignment 3
Examination - Component A	✓	75 %	Written examination (3 hours)
Resit Components	Final Assessment	Element weighting	Description
Written Assignment - Component B		25 %	Single assignment
Examination - Component A	✓	75 %	Written examination (3 hours)

Part 4: Teaching and Learning Methods											
Learning Outcomes	On successful completion of this module students will be able to:										
	<table border="1"> <thead> <tr> <th colspan="2">Module Learning Outcomes</th> </tr> </thead> <tbody> <tr> <td>MO1</td> <td>Show a detailed knowledge and understanding of the basic concepts of probability theory and the basic methods of statistical inference</td> </tr> <tr> <td>MO2</td> <td>Identify, perform, and draw conclusions from appropriate statistical analyses of data sets</td> </tr> <tr> <td>MO3</td> <td>Apply Statistical packages to aid statistical analysis</td> </tr> <tr> <td>MO4</td> <td>Communicate the results of a statistical analysis in the form of a written report.</td> </tr> </tbody> </table>	Module Learning Outcomes		MO1	Show a detailed knowledge and understanding of the basic concepts of probability theory and the basic methods of statistical inference	MO2	Identify, perform, and draw conclusions from appropriate statistical analyses of data sets	MO3	Apply Statistical packages to aid statistical analysis	MO4	Communicate the results of a statistical analysis in the form of a written report.
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Contact Hours	<b>Contact Hours</b>										
	<b>Independent Study Hours:</b>										
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STUDENT AND ACADEMIC SERVICES

	<b>Scheduled Learning and Teaching Hours:</b>	
	Face-to-face learning	72
	<b>Total Scheduled Learning and Teaching Hours:</b>	72
	<b>Hours to be allocated</b>	300
	<b>Allocated Hours</b>	300
Reading List	<p><i>The reading list for this module can be accessed via the following link:</i></p> <p><a href="https://uwe.rl.talis.com/modules/ufmfpa-30-1.html">https://uwe.rl.talis.com/modules/ufmfpa-30-1.html</a></p>	