



MODULE SPECIFICATION

Part 1: Information			
Module Title	Research Methods		
Module Code	UFMFGV-15-M	Level	Level 7
For implementation from	2020-21		
UWE Credit Rating	15	ECTS Credit Rating	7.5
Faculty	Faculty of Environment & Technology	Field	Engineering, Design and Mathematics
Department	FET Dept of Engineering Design & Mathematics		
Module Type:	Standard		
Pre-requisites	None		
Excluded Combinations	None		
Co-requisites	None		
Module Entry Requirements	None		
PSRB Requirements	None		

Part 2: Description
<p>Overview: This module is concerned with the careful use of scientific method, qualitative research and the application of statistical techniques in empirical research. Research Governance including ethics, health and safety, use of human tissue, animal welfare and genetic medication will be delivered. It covers the principles of data quality and method validation.</p> <p>Educational Aims: The aim of this module is to develop research skills required to deliver evidence-based analysis that underpins each core module, where research governance plays a central role.</p> <p>Outline Syllabus:</p> <ul style="list-style-type: none"> • Advanced modelling techniques • Binary, ordinal and nominal logistic regression models: application, theoretical underpinning, model diagnostics. • Discriminant Analysis: applications and interpretation, theoretical underpinning, model diagnostics. • Multivariate Analysis of Variance • Survival Analysis

STUDENT AND ACADEMIC SERVICES

Biomedical research techniques:

- Principles of experimental designs relating to medical studies.
- Determination of sample size for a given study
- Measures of reliability including Intra Class Correlations, Bland-Altman plots, Cohen's kappa
- Analysis of survival data including the proportional hazards survival model, estimation of survival probabilities, Kaplan-Meier survival curves, log rank tests

Industrial Studies:

- Two-level full and fractional factorial designs, central composite and rotatable designs and process optimisation
 - Taguchi methods and their role in product design and quality improvement
- Missing data

Meta-analysis

Introduction to meta-analysis. Systematic reviews, publication bias, effect sizes, random and fixed effects models; examples taken from the empirical literature.

Research Governance

Students will gain an overview of research governance including bioethics and ethical standard frameworks and committees.

Teaching and Learning Methods: Lectures: This module will be delivered in discrete sections, following the subject areas outlined in the syllabus. Each topic area will be introduced with underpinning lectures followed by a series of tutorials where extensive use of case studies will be made.

Tutorials: Tutorials will use indicative lists of questions to guide student learning. It is expected that the tutorial work will be completed before the tutorial. Therefore, the tutorial will engage active discussion on individual and group findings.

Part 3: Assessment

There are two pieces of assessment an examination (Component A) and a written assignment (Component B).

COMPONENT A: The second piece of assessment will be an examination (2 hours). This paper will have a partly seen component which assesses article critique.

COMPONENT B: The coursework is designed to develop their understanding of how qualitative and quantitative data is currently used in the Healthcare Technology field and will test statistical modelling of data and second design concepts. This piece of coursework will involve the analysis of data from relevant data sets such as those important to systemic reviews and research data. This component will assess the student's application statistical modelling.

First Sit Components	Final Assessment	Element weighting	Description
Examination - Component A	✓	50 %	Data analysis paper (2 hours)
Written Assignment - Component B		50 %	Statistical modelling of data and design concepts (1500 words)
Resit Components	Final Assessment	Element weighting	Description
Examination - Component A	✓	50 %	Data analysis paper (2 hours)
Written Assignment - Component B		50 %	Statistical modelling of data and design concepts (1500 words)

Part 4: Teaching and Learning Methods		
Learning Outcomes	On successful completion of this module students will achieve the following learning outcomes:	
	Module Learning Outcomes	Reference
	Apply advanced statistical techniques in empirical research using modern day software [components A and B]	MO1
	Evaluate model diagnostics to inform empirical model building [Components A and B]	MO2
	Interpret and explain a wide variety of empirical statistical models in different context (own analyses or research papers) [Components A and B]	MO3
	Evaluate the role played by statistical design in medicine and industry [Component B]	MO4
	Apply appropriate research governance that is particular to any research project [Component A).	MO5
Contact Hours	Independent Study Hours:	
	Independent study/self-guided study	114
	Total Independent Study Hours:	114
	Scheduled Learning and Teaching Hours:	
	Face-to-face learning	36
	Total Scheduled Learning and Teaching Hours:	36
	Hours to be allocated	150
	Allocated Hours	150
Reading List	The reading list for this module can be accessed via the following link:	

Part 5: Contributes Towards
<p>This module contributes towards the following programmes of study:</p> <p>Health Technology [Sep][FT][Frenchay][1yr] MSc 2020-21</p> <p>Health Technology [Sep][PT][Frenchay][2yrs] MSc 2020-21</p>