

## MODULE DESCRIPTOR

### Module Title

Statistics and Research Method for Biomedical Engineers

Reference	ENM408	Version	1
Created	October 2022	SCQF Level	SCQF 11
Approved	January 2023	SCQF Points	15
Amended		ECTS Points	7.5

### Aims of Module

None.

### Learning Outcomes for Module

On completion of this module, students are expected to be able to:

- 1 Systematically gather, synthesise and critique relevant research literature to develop and support a well-defined research question.
- 2 Critically appraise the state of art data collection methods across the biomedical technology field.
- 3 Develop a research proposal with specific aim or hypothesis and justify experimental design and method
- 4 Apply advanced statistical analysis to optimise data and to make a complex process quantitatively robust.
- 5 Critically analyse and evaluate of large data set to ascertain accuracy of conclusion, impact and ethical implications in the relevant field.

### Indicative Module Content

Research methodologies; the research process, primary and secondary research, quantitative and qualitative methodologies, research question, research aims and objectives. Systematic reviews. Research tools. Critical appraisal. Critical writing. Synthesis and integration of literature. Selection of measurement tools with reference to reliability, validity, sensitivity, specificity and utility. Developing a research proposal. Academic writing, data analysis and evaluation, excel, SPSS, large data, curve fitting for bivariate data, hypothesis testing, Pearson coefficient, T-test, descriptive and inferential statistics, parametric and non-parametric analysis, Taguchi method, normal distribution, robust data collection. Ethics: research governance, ethical issues in research, Inclusion, equity, diversity and belonging.

### Module Delivery

Lectures, tutorials, laboratory, software training sessions along with case study and private study/discussions.

**Indicative Student Workload**

	Full Time	Part Time
Contact Hours	30	N/A
Non-Contact Hours	120	N/A
Placement/Work-Based Learning Experience [Notional] Hours	N/A	N/A
TOTAL	150	N/A
<i>Actual Placement hours for professional, statutory or regulatory body</i>		

**ASSESSMENT PLAN**

If a major/minor model is used and box is ticked, % weightings below are indicative only.

**Component 1**

Type: Coursework Weighting: 100% Outcomes Assessed: 1, 2, 3, 4, 5

Description: Research proposal including methodology and application of data analysis

**MODULE PERFORMANCE DESCRIPTOR****Explanatory Text**

Minimum grade D is required to pass the module.

Module Grade	Minimum Requirements to achieve Module Grade:
<b>A</b>	A
<b>B</b>	B
<b>C</b>	C
<b>D</b>	D
<b>E</b>	E
<b>F</b>	F
<b>NS</b>	Non-submission of work by published deadline or non-attendance for examination

**Module Requirements**

Prerequisites for Module	None.
Corequisites for module	None.
Precluded Modules	None.

**INDICATIVE BIBLIOGRAPHY**

- 1 Statistics for Biomedical Engineers and Scientists King, Andrew P. (Andrew Peter), author.; Eckersley, Robert J., London: Academic Press,2019, ISBN:978-0-08-102939-8
- 2 SPSS for Starters and 2nd Levelers,Cleophas, Ton J; Zwinderman, Aeilko H, 2015, 2nd Edition, Springer Cham, ISBN:978-3-319-20600-4