

--MODULE DESCRIPTOR

MODULE TITLE	Probability Theory for Engineers		
MODULE CODE	EL1901 (L4)	CREDIT VALUE	10 UK CREDITS / 5 ECTS
SCHOOL	SCHOOL OF SCIENCES		

MODULE AIMS

The aims of the module are to:

- Give students a grounding in the basic concepts and techniques of probability theory and applied statistics.
- Develop students' critical and analytical skills in using statistics in practice
- Develop students' skills in solving statistical problems.

MODULE CONTENT

Indicative syllabus content:

Set Theory: Definition of a set, equality, subsets, power sets (including order). Venn diagrams. Union, intersection, difference, complement, Cartesian product (and properties).

Basic Statistics: Mean, Mode, Median, Variance, Standard Deviation, Percentiles, Interquartile range, Statistical plots.

Counting: Factorial, permutations and combinations.

Probability: Axioms of probability. Addition and multiplication laws of probability. Marginal and conditional probability (Bayes Theorem).

Random Variables and Probability Distributions: Discrete and continuous probability distributions. Basic probability distributions: Gaussian, Binomial, Poisson and applications.

Correlation and regression: The product-moment correlation coefficient for two variables. Simple linear regression with one independent variable.

Use of statistical packages in analysing data will appear as relevant in the syllabus, with an emphasis on the use of the spreadsheet software Excel.

INTENDED LEARNING OUTCOMES

On successful completion of this module a student will be able to:

1. Assess, analyse and interpret basic statistical problems.
2. Present results of basic statistical analyses (both descriptive and inferential).
3. Demonstrate understanding of simple probability and statistical concepts.
4. Construct and apply probability distributions.

TEACHING METHODS

The module will be delivered on campus, with weekly lecture/tutorial sessions. Printed notes will be given for each part of the course. Concepts and underlying theory will be explored in the lecture period. Students will learn through a formative process of tackling the exercises at the end of each section, with feedback and extension in tutorials. Students will be taught to use the spreadsheet software Excel to help with their statistical calculations. The material taught will be tested by a portfolio practical assignments and tests.

ASSESSMENT METHODS

This module is assessed through a portfolio.