F78SC Statistics for Science

COURSE DETAILS
Course Code: F78SC
Full Course Title: Statistics for Science
SCQF Level: 8
SCAF Credits: 15
Available as Elective: No

DELIVERY LEVEL
Undergraduate: Yes  Postgraduate Taught: No  Postgraduate Research: No

COURSE AIMS

• To develop an understanding of standard statistical techniques applied in the sciences including confidence intervals, hypothesis tests, and regression models
• To develop proficiency in applying these methods in the analysis of experimental data using standard statistical packages

LEARNING OUTCOMES – SUBJECT MASTERY

After studying this module, students should be able to:

• Understand the application of statistical testing and regression in a scientific context
• Apply these methods to investigate practical problems in a scientific context
• Use their statistical expertise to draw valid conclusions from experimental data

LEARNING OUTCOMES – PERSONAL ABILITIES

At the end of this module students should be able to:

• Demonstrate facility with an appropriate statistical package
• Demonstrate an appreciation of the scientific problems to which statistical methods can be applied
• Present results from a statistical analysis in a way that demonstrates that they have understood the technical and broader issues of statistical methodology as applied in practical situations
• Manage time in order to meet report deadlines and to discuss statistical problems confidently with peers and colleagues

SYLLABUS

Probability: Addition law, complementary events, independence, conditional probability, Bayes rule
Probability distributions: Binomial and Normal distributions

Statistical tests: Central Limit Theorem, confidence intervals for means and differences, hypothesis testing, t test, chi square tests.

Regression: Principal Linear regression, introduction to ANOVA, Pearson correlation, assays, non-linear regression.

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