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.