

<b>Module Code:</b>	SCI428
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<b>Module Title:</b>	Maths and Statistics for Science
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<b>Level:</b>	4	<b>Credit Value:</b>	20
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<b>Cost Centre(s):</b>	GAFS	<u>JACS3</u> code:	F100
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<b>School:</b>	Applied Science, Computing & Engineering	<b>Module Leader:</b>	Dr Jixin Yang
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Scheduled learning and teaching hours	36 hrs
Guided independent study	164 hrs
Placement	0 hrs
<b>Module duration (total hours)</b>	<b>200 hrs</b>

<b>Programme(s) in which to be offered (not including exit awards)</b>	Core	Option
BSc (Hons) Forensic Science	✓	<input type="checkbox"/>
BSc (Hons) Chemistry	✓	<input type="checkbox"/>

<b>Pre-requisites</b>
None.

**Office use only**

**Initial approval:** Mar 18 - validation of BSc Chemistry

**Version no: 1**

**With effect from:** Sept 18

**Date and details of revision:**

**Version no:**

## Module Aims

A proper understanding of science, both pure and applied, requires a student to have a good working knowledge and understanding of mathematics. This module will bring students up to the required level for university science programme. Basic statistics, probability and data analysis will also be covered in this module to facilitate the students with essential skills of data processing for their later modules.

## Intended Learning Outcomes

Key skills for employability

- KS1 Written, oral and media communication skills
- KS2 Leadership, team working and networking skills
- KS3 Opportunity, creativity and problem solving skills
- KS4 Information technology skills and digital literacy
- KS5 Information management skills
- KS6 Research skills
- KS7 Intercultural and sustainability skills
- KS8 Career management skills
- KS9 Learning to learn (managing personal and professional development, self-management)
- KS10 Numeracy

At the end of this module, students will be able to

Key Skills

At the end of this module, students will be able to		Key Skills	
1	Express numbers using scientific notation and significant figures.	KS1	KS10
2	Manipulate algebraic expressions and calculations.	KS3	KS4
		KS10	
3	Interpret and calculate basic numeric measures of average and spread.	KS3	KS10
4	Estimate probabilities and perform hypothesis tests.	KS3	KS5
		KS10	
5	Apply basic statistical knowledge to their data processing in laboratory modules.	KS3	KS4
		KS5	KS10

**Transferable skills and other attributes**

- Numeracy
- Time management
- IT skills
- Note Taking

### Derogations

N/A.

### Assessment:

#### Indicative Assessment Tasks:

Assessment 1: Coursework of approximately 20 short questions in total on knowledge and calculations in maths and statistics (50%). There will be two submission dates. The first one will be around the middle of the semester and the second one near the end of semester.

Assessment 2: In-class tests (unseen for the maths part and open-book for the statistics part) (50%). The first one will occur around the middle of the semester and the second one near the end of semester.

Assessment number	Learning Outcomes to be met	Type of assessment	Weighting (%)	Duration (if exam)	Word count (or equivalent if appropriate)
1	1,2,3,4,5	Coursework	50		1500
2	1,2,3,4,5	In-class test	50	2 hours	

### Learning and Teaching Strategies:

#### Methods of delivery:

Lectures  
 Problem solving workshops  
 Directed study via Moodle  
 VLE Student directed study

The basic factual material will be delivered by means of lectures. Lectures will be supported by workshops in which the students will be able to test their knowledge and understanding of the concepts covered. Students will further be able to develop their knowledge and understanding by attempting problem sets and quizzes on Moodle VLE. Independent student-directed learning will enable students to delve more deeply into the subject material, enhancing their learning, while developing their IT skills. External links of maths support are available for students to practice and self-test their mathematical skills.

### Syllabus outline:

- Numbers, scientific notation and significant figures
- Algebra and manipulation of algebraic expressions

- Plotting and interpreting graphs
- Powers, indices, exponentials and logarithms
- Some simple rules of differentiation
- Integration: reversing differentiation
- Fundamental knowledge in geometry and trigonometry
- Introduction to statistics
- Introduction to probability
- Normal distribution
- Basic t-test
- Regression and calibration

**Indicative Bibliography:****Essential reading**

Monk, P. and Munro, L.J. (2010), *Maths for Chemistry: A Chemist's Toolkit of calculations*. 2nd ed. Oxford: Oxford University Press.

**Other indicative reading**

Boardman, S. Clough, T. and Evans, D. (2004) *Advancing Maths for AQA, Pure Core Maths 1 & 2*. Oxford: Heinemann.

Ennos, R. (2011), *Statistical and data handling skills in biology*. 3rd ed. Essex: Pearson Education Limited.