PRIFYSGOL glyndŵr UNIVERSITY

MODULE SPECIFICATION FORM

Module Title: **Maths and Statistics for Science**	Level: 4	Credit Value: 20

Module code: SCI415	Cost Centre: GAFS	JACS3 code: F100

Semester(s) in which to be offered: 2	With effect from: September 2016

Office use only: To be completed by AQSU:	Date approved: July 2013 Date revised: July 2016 (updated to include BSc Chemistry with Education) Version no: 3

Existing/New: Existing	Title of module being replaced (if any):

Originating School:	Applied Science, Computing & Engineering	Module Leader:	Dr Jixin Yang

Module duration (total hours): Scheduled learning & teaching hours Independent study hours	200 50 150	Status: core/option/elective (identify programme where appropriate):	Core

Programme(s) in which to be offered: BSc (Hons) Forensic Science. BSc (Hons) Chemistry with Green Nanotechnology. BSc (Hons) Chemistry with Education	Pre-requisites per programme (between levels): None

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.

Expected Learning Outcomes:

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

Knowledge and Understanding:

1. Express numbers using scientific notation and significant figures
2. Manipulate algebraic expressions and calculations
3. Interpret and calculate basic numeric measures of average and spread
4. Estimate probabilities
5. Apply basic statistical knowledge to their data processing in laboratory modules

Transferable/Key Skills and other attributes:

- Numeracy
- Time management
- IT skills
- Note Taking

Assessment:

Assessment 1: Coursework of approximately 20 short questions on knowledge and calculations in maths and statistics (50%)

Assessment 2: In-class test (unseen for the maths part and open-book for the statistics part) (50%)

Assessment number	Learning Outcomes to be met	Type of assessment	Weighting	Duration (eg, if exam or presentation)	Word count (or equivalent if appropriate)
1	1-5	Coursework	50%		1,500
2	1-5	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 reading additional course material and 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

Bibliography:

Essential reading:

Monk, P. and Munro, L.J. (2010) *Maths for Chemistry: A chemist's toolkit of calculations (2nd Edition)*, OUP Oxford.

Other indicative reading:

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

Ennos, R. (2000) *Statistical and Data Handling Skills in Biology*, Prentice Hall.