ZMAT C1101: Maths and Physical Sciences for Health Science

Module Title:	Maths and Physical Sciences for Health Science
Language of Instruction:	English

Credits:	5

NFQ Level:	6

Module Delivered In	4 programme(s)

Teaching & Learning Strategies:	This module will be taught in 1 maths, 2 physics and 2 chemistry lectures per week. There will be a two hour computer practical per week and a 1.5 hour laboratory practical per week (alternating between physics and chemistry).

Module Aim:	The aim of this module is to provide the student with the fundamental principles of maths, physics and chemistry required for the health and sport sciences and to develop their practical laboratory and computational skills.

Learning Outcomes	
On successful completion of this module the learner should be able to:	
LO1	Describe the theoretical principles of maths, physics and chemistry as applied to health and sport science.
LO2	Apply the appropriate safety procedures in the laboratory for individual and group work.
LO3	Apply scientific, mathematical and statistical techniques and procedures for the analysing and recording of experimental data for health and sport science.

Pre-requisite learning
Module Recommendations *This is prior learning (or a practical skill) that is recommended before enrolment in this module.*
No recommendations listed
Incompatible Modules *These are modules which have learning outcomes that are too similar to the learning outcomes of this module.*
No incompatible modules listed
Co-requisite Modules
No Co-requisite modules listed
Requirements *This is prior learning (or a practical skill) that is mandatory before enrolment in this module is allowed.*
No requirements listed

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Module Content & Assessment

Indicative Content
Maths Exponents, logarithms, significant figures, pH calculations, units of measurement, dimensional analysis and manipulation of formula. Types of data. Questionnaires, surveys and sampling. Measures of central tendency and dispersion. Graphical presentation of functions and data incorporating secondary axis, logarithmic scales and variability indicators. Introduction to correlation and regression. Basic probability, diagnostic tests and the Normal Distribution. Excel and SPSS.
Chemistry: Introduction States of Matter and Observation of Change. Discovery of the Atom, and Electronic Structure.
Chemistry: Shapes, Bonds and Naming of Chemicals Ionic and Covalent Bonds; Electronegativity; Shapes of Molecules and Naming Chemical Compounds
Chemistry: Chemical Equations; Redox Equations and Calculations Chemical Equations; Experimental Calculations and Oxidation and Reduction.
Chemistry: Rates of Reactions and Chemical Equilibrium Rates of Reactions and Chemical Equilibrium.
Chemistry: Acids, Bases and pH Acids, Bases and pH
Chemistry: Organic Chemistry Introduction to chemistry of carbon compounds. IUPAC Nomenclature for alkanes, alkenes, alcohols, aldehydes, carboxylic acids, esters and amines. Brief introduction to the structures of proteins, steroids, analgesics and their uses.
Physics: Measurement Physical standards, SI units, measurements, measurement uncertainty.
Physics: Forces Newtons Laws of motion. Force of gravity. Centripetal force. Conservation of energy. Conservation of momentum. Collisions. Impulse. Centre of mass.
Physics: Pressure Density, atmospheric pressure, pressure in fluids and solids. Youngs modulus. Elastic limit. Blood pressure.
Physics: Heat Temperature scales and thermometers. Specific heat capacity. Latent heat. Conduction, convection and radiation. Expansion of solids, liquids, gases. Gas laws and the kinetic theory of gases. Refrigeration. Perspiration.
PRACTICALS The practical component will • allow students to develop the required technical competencies, attitudes and behaviours • develop problem solving abilities and group skills • Acid-Base, Redox, Precipitation and Complexometric Titrations • pH measurements and buffer solutions • UV-Vis analysis and flame emission analysis of various analytes • Chromatography and other organic techniques • Density • Acceleration due to gravity and pendulum motion. • Hooks law and elastic limit. Computer software applications including Excel and SPSS.

Assessment Breakdown	%
Continuous Assessment	30.00%
Practical	70.00%

Special Regulation
Students must achieve a minimum grade (35%) in both the CA and practical components of the course.

Continuous Assessment

Assessment Type	*Assessment Description*	*Outcome addressed*	*% of total*	*Assessment Date*
Other	CA exams	1,3	30.00	n/a

No Project

Practical

Assessment Type	*Assessment Description*	*Outcome addressed*	*% of total*	*Assessment Date*
Practical/Skills Evaluation	Practical Log Book	2,3	70.00	n/a

No End of Module Formal Examination

SETU Carlow Campus reserves the right to alter the nature and timings of assessment

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Module Workload

Workload: Full Time		
Workload Type	*Frequency*	*Average Weekly Learner Workload*
Lecture	12 Weeks per Stage	5.00
Practicals	12 Weeks per Stage	3.50
Independent Learning	15 Weeks per Stage	1.53
	Total Hours	125.00

Module Delivered In

Programme Code	Programme	Semester	Delivery
CW_SASPS_B	Bachelor of Science (Honours) in Sport and Exercise Science	1	Mandatory
CW_SASRA_B	Bachelor of Science (Honours) in Sports Rehabilitation and Athletic Therapy	1	Mandatory
CW_SASAC_B	Bachelor of Science (Honours) in Strength and Conditioning	1	Mandatory
CW_SAPHS_C	Higher Certificate in Science in Physiology and Health Science	1	Mandatory