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| Module Title: | 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 two theory classes of one hour duration in both components per week. One 1.5 hour practical per week (alternating between physics and chemistry) |
| Module Aim: | The aim of this module is to explore the principles of physics and chemistry and to develop practical laboratory skills as they relate to health and sports science. |
| Learning Outcomes | |
| <i>On successful completion of this module the learner should be able to:</i> | |
| LO1 | Apply theoretical knowledge and understanding of key elements of Chemistry and Physics from the perspective of health, rehab and sports sciences. |
| LO2 | Practice scientific procedures, including recording and analysing experimental data. |
| LO3 | Students should show competence in a laboratory setting working independently or as part of a team. Apply the appropriate safety procedures in the laboratory. |
| Pre-requisite learning | |
| Module Recommendations | |
| <i>This is prior learning (or a practical skill) that is recommended before enrolment in this module.</i> | |
| No recommendations listed | |
| Incompatible Modules | |
| <i>These are modules which have learning outcomes that are too similar to the learning outcomes of this module.</i> | |
| No incompatible modules listed | |
| Co-requisite Modules | |
| No Co-requisite modules listed | |
| Requirements | |
| <i>This is prior learning (or a practical skill) that is mandatory before enrolment in this module is allowed.</i> | |
| No requirements listed | |

Module Content & Assessment

Indicative Content

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 the Naming of Chemical Formulae

Chemistry: Chemical Equations and Redox Equations

Chemical Equations and Experimental Calculations. Oxidation and Reduction.

Chemistry: Rates of Reactions and Chemical Equilibrium

Properties of Liquids and Solutions: 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: Waves

Longitudinal and transverse. Wavelength. Frequency. Interference. Diffraction. Doppler shift. Resonance. Wave forms.

Physics: Light

Laws of reflection and refraction. Image formation in plane mirrors, curved mirrors and lens. Applications of curved mirror and lens. Wave nature of light. Dispersion. Polarisation. Eye sight.

Physics: Sound

Frequency. Speed of sound. Harmonics. Resonance. Sound intensity. Ultra sound and medical imaging.

Physics: Electromagnetism

Electric and magnetic forces. Electric current. Voltage. Resistivity. Resistance. Capacitors. AC and DC current. Electrical safety. Electromagnetic Spectrum.

Physics: Radioactivity

Radioactive decay. Biological and physical half life. Decay constant. Medical physics.

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 • Light: refraction and reflection and image formation. • Wavelength and frequency. Speed of sound in air. • Electrical circuits.

| Assessment Breakdown | % |
|----------------------------------|--------|
| Continuous Assessment | 10.00% |
| Practical | 40.00% |
| End of Module Formal Examination | 50.00% |

Special Regulation

Students must achieve a minimum grade (35%) in both the CA theory and Practical, and the final exam.

Continuous Assessment

| Assessment Type | Assessment Description | Outcome addressed | % of total | Assessment Date |
|-----------------|------------------------|-------------------|------------|-----------------|
| Other | CA exams | 1 | 10.00 | Ongoing |

No Project

Practical

| Assessment Type | Assessment Description | Outcome addressed | % of total | Assessment Date |
|-----------------------------|------------------------|-------------------|------------|-----------------|
| Practical/Skills Evaluation | Practical Log Book | 2,3 | 40.00 | Every Week |

End of Module Formal Examination

| Assessment Type | Assessment Description | Outcome addressed | % of total | Assessment Date |
|-----------------|------------------------|-------------------|------------|-----------------|
| Formal Exam | n/a | 1 | 50.00 | End-of-Semester |

Module Workload

| Workload: Full Time | | |
|----------------------------|--------------------|--|
| <i>Workload Type</i> | <i>Frequency</i> | <i>Average Weekly Learner Workload</i> |
| Lecture | 12 Weeks per Stage | 4.00 |
| Laboratory | 12 Weeks per Stage | 1.50 |
| Independent Learning | 15 Weeks per Stage | 3.93 |
| Total Hours | | 125.00 |

Module Delivered In

| Programme Code | Programme | Semester | Delivery |
|----------------|---|----------|-----------|
| CW_SASPS_B | Bachelor of Science (Honours) in Sport and Exercise Science | 2 | Mandatory |
| CW_SASRA_B | Bachelor of Science (Honours) in Sports Rehabilitation and Athletic Therapy | 2 | Mandatory |
| CW_SASAC_B | Bachelor of Science (Honours) in Strength and Conditioning | 2 | Mandatory |
| CW_SAPHS_C | Higher Certificate in Science in Physiology and Health Science | 2 | Mandatory |