



Nature Care College

Chemistry

DESCRIPTION	This one-year unit of study is essential in helping you understand the human condition at a cellular level. The course will explore the fundamentals of chemistry and enable you to identify the many substances in common use.	
DURATION	72 hours	
LEARNING OUTCOMES	By the conclusion of the module, students should be able to: <ol style="list-style-type: none">1. Explain the types and components of matter and the principles of their interaction.2. Explain the interaction between particles and their consequences, in particular for living organisms.3. Explain the principles of electron and proton transfer reactions and their significance for living organisms.4. Explain the basic principles of organic chemistry and identify the range of compounds.5. Explain the basic principles of the organic chemistry of oxygen, nitrogen, sulphur and phosphorous.	
TEACHING METHOD	Lectures Tutorials	
ASSESSMENT	Formative Examination Process - Mid Term	50%
	Formative Examination Process - End of Term	50%
	Pass mark	60%
	Both components must be passed at 60% in order to pass this subject satisfactorily.	
COMPETENCIES PARTIAL COMPLETION	Successful completion of this unit of study is in partial completion of the following Health Training Package HLT07 Units of Competency: HLTAP501A – Analyse Health Information	
ATTENDANCE	80% minimum.	
PRE-REQUISITES	Nil. Note: However, if no prior knowledge of Chemistry then the Introduction to Chemistry course is highly recommended.	
CO-REQUISITES	Nil.	
MATERIALS REQUIRED	Notebook, pen.	

TEXTBOOKS**Compulsory:**

Bettelheim & March. 2004. *Introduction to General, Organic & Biochemistry*. 9th Edition. Thomson

Recommended Reading / References:

Timberlake, K. 2003. *Chemistry*. 9th Edition. Pearson Education.
Smith R, 2004. *Conquering Chemistry*. 4th Edition. McGraw Hill.
New Scientist Journal

WEEK-BY-WEEK OUTLINE**TERM 1**

WEEK 1	Introduction Chemistry and matter, Elements and compounds, Atoms and ions, Ionic and molecular compounds
WEEK 2	Atomic structure Structure of the atom, Atomic number and mass number, isotopes, forming ions
WEEK 3	The Periodic Table of Elements Electron arrangements in the atom Lewis (Electron Dot) formulae
WEEK 4	Electronic structure Forming ions, the octet rule, anions and cations, ionic and covalent bonds
WEEK 5	Ionic compounds Calculating formula weights
WEEK 6	Mid term Exam
WEEK 7	Molecular compounds Covalent bonds, properties of molecular compounds, naming molecular compounds
WEEK 8	Chemical reactions Chemical equations, balancing chemical equations
WEEK 9	Equilibrium reactions Molecular collisions, activation energy, exothermic and endothermic reactions, catalyst reactions, reversible reactions and equilibrium, Le Chatelier's Principle
WEEK 10	More ionic compounds Polyatomic compounds, coordination complexes, Ligands and coordination number, chelation and nutrition
WEEK 11	Polar covalent compounds Polarity and electronegativity, polar molecules and forces between molecules
WEEK 12	End of Term Exam

TERM 2

WEEK 1-2	The Mole/Avogadro's number
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WEEK 3	Solutions Formation of ionic solutions Solubility Colloids and suspensions Osmosis and dialysis
WEEK 4	Gases Properties of gases Gas pressure, volume and temperature Blood gases
WEEK 5	Acids and Bases Electrolytes Acids and Bases The pH scale
WEEK 6	Mid-Term Exam
Week 7	Oxidation and Reduction
WEEK 8-10	Introduction to Organic Compounds Hydrocarbons Alkanes/Alkenes Structural isomers Naming Alkanes/Alkenes Drawing a structural formula Alkane properties Cycloalkanes Cis-Trans isomers Hydrogenation, halogenation, hydration and hydrohalogenation
WEEK 11	Alkynes and aromatic hydrocarbons REVISION
WEEK 12	End of Term Exam

TERM 3

WEEK 1	Oxygen containing Functional Groups Alcohols and phenols Ethers
WEEK 2	Oxygen containing Functional Groups Aldehydes Ketones
WEEK 3	Oxygen containing Functional Groups Carboxylic acids Esters
WEEKS 4	Nitrogen containing Functional Groups Amines Amides Alkaloids Some sulphur containing functional groups
WEEK 5	MID TERM EXAM
WEEK 6	Lipids Fatty Acids Waxes, fats and oils Triglycerides – chemical properties
WEEK 7	Carbohydrates and chirality Monosaccharides
WEEK 8	Carbohydrates Disaccharides and polysaccharides
WEEK 9	Proteins Amino acids The peptide bond Protein structure
WEEK 10	Nucleic acids
WEEK 11	Biological phosphorus and sulphur containing compounds
WEEK 12	END OF TERM EXAM

Please be respectful of your fellow students and arrive on time for classes. Please ensure all mobile phones are turned off prior to the commencement of class.