

University College of the Cayman Islands

ASSOCIATE DEGREE SYLLABUS

COURSE NAME: CORE CHEMISTRY/LAB

COURSE #: CHE 202

COURSE DESCRIPTION

This course provides a more in depth look at the fundamental laws of chemistry and the physical principles governing chemical reactions. As well as building on concepts developed earlier, new topics such as chemical equilibria, kinetics and organic reaction mechanisms are introduced.

Credits: 4

Prerequisite: CH 201

COURSE OBJECTIVES

1. demonstrate knowledge and understanding in relation to laws, definitions, concepts and theories for a given topic.
2. familiarize themselves with the terminology, conventions, symbols, quantities and units used for respective topics.
3. operate scientific instruments and perform basic laboratory techniques.
4. analyze and evaluate numerical and other data and draw inferences.
5. compare relationships in the Periodic Table (particularly in Group VII).
6. understand the role of chemistry in everyday life.
7. apply acquired knowledge to novel situations.
8. evaluate information and hypotheses critically.

COURSE CONTENT

I SOLIDS

Lattice structure of crystalline solids: ionic, simple molecular, giant molecular, hydrogen-bonded and metallic bonding
Structure of solids and physical properties
Unit cell, metallic radii, ionic radii and radius ratio.

II GASES

Composition of gases in the atmosphere
Ideal gas law

- Stoichiometry of reactions involving gases
- III SOLUTIONS**
Ions in solution
Reacting masses and molar concentrations
- IV TYPES OF REACTION**
Acid/Base
Redox
Precipitation
- V REACTION KINETICS**
Factors affecting rate
Collision theory
- VI EQUILIBRIA**
Reversible reactions and dynamic equilibrium (qualitative)
Le Chatelier's Principle
- VII PERIODICITY and Group VII**
Reactions of elements with oxygen, chlorine and water
Variation in oxidation number of the oxides and chlorides of sodium to phosphorus
Acid/base behaviour of the above oxides and their hydroxides
Similarities and trends in properties of Group VII elements (halogens)
Relative reactivity of elements as oxidizing agents
Some reactions of halide ions
Manufacture of chlorine
Important uses of halogens and their compounds
- VII ORGANIC CHEMISTRY**
Addition Polymers
Alkenes, halogenoalkenes, alcohols, phenols, carboxylic acids and esters
Reaction mechanisms, nucleophilic addition, radical reactions.
- VIII SPECTROSCOPY**
Interaction of radiation with matter
Infra-red spectroscopy
Mass spectrometry (organic molecules)

ASSESSMENT

Laboratory/Assignments	20%
Mid-Term Test	20%
Final Examination	<u>60%</u>
Total	100%

REQUIRED TEXTBOOK(S)

The following textbook will be required for this course:

1. **Burton et al.**, *Salter's Advanced Chemical Ideas*, Heinemann. 2000

REFERENCES

- Burton et al.**, *Salter's Advanced Chemical Storylines*, Heinemann. 2000