CHEM 1005 ESSENTIAL CHEMISTRY 2

Credit Points 10

Legacy Code 300803

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Description This unit introduces an investigation of the reactivity of covalent molecules, in particular, of carbon-based compounds. Focusing on introductory chemical dynamics and thermodynamics, students will develop an in-depth understanding of the structure, nomenclature and reactivity of the principal organic functional groups, extending their basic principles of chemistry. They will also understand how molecules are synthesised and the ways they react being important in the function and role of chemistry in biological systems in our domestic and industrial worlds.

School Science

Discipline Chemical Sciences, Not Elsewhere Classified.

Student Contribution Band HECS Band 2 10cp

Check your HECS Band contribution amount via the Fees (https://www.westernsydney.edu.au/currentstudents/current_students/fees/) page.

Level Undergraduate Level 1 subject

Equivalent Subjects CHEM 1002 - Chemistry 2 CHEM 1010 - Medicinal Chemistry CHEM 1006 - Essential Chemistry 2 (WSTC)

Incompatible Subjects LGYB 6352 - Biological Chemistry 12D

Assumed Knowledge

An understanding and competence with basic chemical principles including SI units, chemical symbols, formulas and equations, nomenclature, stoichiometry, the mole concept, bonding, molecular shape and polarity, states and properties of matter, thermodynamics, equilibria, acids and bases, pH and electrochemistry. General Mathematics bands 5 and 6 or Mathematics band 4 or equivalent.

Learning Outcomes

On successful completion of this subject, students should be able to:

1. Explain the structure and function relationship between organic molecules and their physical and chemical properties
2. Recognise and predict the product of the following organic reactions: a) Elimination reaction of alcohols and alkyl halides, b) Addition reactions of alkenes, alkynes, aldehydes and ketones, c) Substitution reactions of alcohols, alkyl halides and carboxylic acid derivatives, d) Redox reactions of alcohols, aldehydes, ketones, carboxylic acids and esters
3. Use experimental data to find the rate law and propose a mechanism for a chemical reaction
4. Explain the basic thermodynamic principles that govern chemical systems
5. Demonstrate competence in the manipulative laboratory skills and deductive skills involved in organic synthesis, thermodynamics and reaction kinetics
6. Record the results of their investigations demonstrating awareness of the conventions of scientific writing and graphical presentations
7. Apply and transfer chemical principles to other contexts such as biological systems

Subject Content

Introduction to Chemical Dynamics: reactions kinetics - 1st order chemical reactions; rate law and mechanisms of reaction
Introduction to Chemical Thermodynamics; Spontaneity of reaction; Entropy; Enthalpy; Hess?f Law
Organic chemistry: structure of principal organic functional groups, nomenclature, physical properties and structure; reaction types - addition, substitution, elimination, redox
Scientific method(s)
Setup and performance of a chemical synthesis, including setup and conducting a reflux, and distillation, use of separating funnel and recrystallisation, measurement of melting point, refractive index
Measurement, graphing and analysis of data

Assessment

The following table summarises the standard assessment tasks for this subject. Please note this is a guide only. Assessment tasks are regularly updated, where there is a difference your Learning Guide takes precedence.

Item	Length	Percent	Threshold	Individual/ Group Task
Laboratory work including post-lab online quiz	6 x 3 hour oncampus practicals; offshore international students 6 x online practicals	25	Y	Individual
Lecture and Tutorial Participation	N/A	5	N	Individual
Workshop quizzes	6 x 1 hour	15	N	Individual
Written Assignment	1,000 words	15	N	Individual
Final Examination	2 hours	40	N	Individual

Prescribed Texts

- Burrows, Andrew; Holman, John; Parsons, Andrew; Pilling, Gwen; Price, Gareth; Chemistry3, introducing Inorganic, Organic and Physical Chemistry; 3rd Edition Oxford University Press. ISBN 978-0-19-873380-5

Teaching Periods