

NATS 0008 FUNDAMENTALS OF SCIENCE (WSTC)

Credit Points 10

Legacy Code 900105

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Description In its broadest sense, science is an evolving body of skills, theories and knowledge about the nature of the world, based on observation, measurement and experiment. In order to begin participating in tertiary science studies, students require a fundamental toolkit of scientific literacy that includes key concepts, language, and skills. This unit provides an overview of, and grounding in, fundamental scientific concepts including the nature of matter and energy, and the flow of energy and cycling of matter through key processes in the biosphere. Integrating these concepts within a framework of a contemporary issue, climate change, enables students to build skills in applying scientific concepts, methods and problem-solving techniques, as well as furthering an understanding of interrelationships between science and other aspects of society. The unit imparts a basic body of essential scientific knowledge, as well as facilitating skills in collecting and analysing information and writing coherent explanations within a scientific framework.

School Western Sydney The College

Discipline Natural and Physical 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 0 Preparatory subject

Equivalent Subjects NATS 0007 - Fundamentals of Science (UWSCFS)

Restrictions Students must be enrolled at The College in a Foundation Studies program.

Learning Outcomes

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

1. Solve real life problems involving mathematical concepts and construct appropriate graphs, charts and tables and interpret them.
2. Extract information from written text, graphs and tables and critically evaluate this information and evidence.
3. Describe the structure of the atom and relate this to the formation of molecules and ions.
4. Identify chemical compounds which make up organisms and classify organic molecules according to the arrangement of the chemical bonds
5. Describe energy changes in chemical reactions and identify and explain chemical reactions important in the environment.
6. Explain the role of living systems in the cycling of matter and flow of energy
7. Apply the principles of the Scientific Method to solving problems in science and assesses conclusions in relation to evidence and sources.
8. Describe energy changes in chemical reactions and identify and explain chemical reactions important in the environment.

Subject Content

Topic 1 Basic Mathematical Operations and Data Handling
Basic mathematical operations with whole numbers, decimals and fractions
Ratio, rates and percentages
Graphing and Data handling
Basic Statistics
Topic 2 Simple and Complex Substances
Atomic structure and the periodic table
Molecules and Ions
Solutions
Topic 3 Biologically Important Molecules
Organic molecules and functional groups
Carbohydrates, lipids, nucleic acids and proteins
Acids, Bases, Salts and Buffers
Topic 4 Chemical Reactions and Energy
Types of reactions- acid/base, redox, combustion
Energy changes and stability
Enthalpy, bond energy and Hess's Law
Topic 5 Biochemical Reactions and Energy
Living systems as open systems: flow of energy and cycling of matter in the biosphere
Uphill or downhill? Energy-consuming and energy-producing reactions
ATP as the link between energy-consuming and energy-producing reactions
Two great global cycles: photosynthesis and cellular respiration
Topic 6 Applying Concepts: Global

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
Intra-session exam	1 hr	10	N	Individual
Short Answer	1.5 hrs	20	N	Individual
Portfolio	1500 words (completed in class)	40	N	Individual
End of Session Exam	2 hrs and 20 mins	30	N	Individual

Prescribed Texts

- The College Fundamentals of Science Student Workbook
- The College Fundamentals of Science Laboratory Manual

Teaching Periods