The College

University Foundation Studies

NATS0007
FUNDAMENTALS OF SCIENCE

2022

SUBJECT OUTLINE

Last amended:	February 2022

Western Sydney University The College
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Subject name	Fundamentals of Science
Subject number	NATS0007
Coordinator	Phillip Newman
Session	2022.1
Handbook summary	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 subject 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 subject 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.
Credit point value	10 credit points
Prerequisite/s	
Corequisite/s	
Subject incompatible with and not to be counted for credit with	
Assumed knowledge	
Subject level	Level Z — Non-award preparatory subject
Attendance requirements	Students are expected to attend at least 80% of classes. Educational research consistently demonstrates that this attendance level is associated with a high likelihood of achieving a passing grade.
Laboratory inductions	**All Science, Engineering, Construction Management and Health Science students are required to complete an online laboratory induction at the beginning of each term.** Before you can participate in the practical activities you are required to complete an online laboratory induction and pass an assessment based on this activity.

	You will be informed of the procedure for completing the laboratory induction via vUWS. It is the responsibility of the individual student to complete the laboratory induction and pass the assessment before the first practical activity takes place. Students who have not completed the laboratory induction and assessment will not be permitted to enter the laboratory. Any student who misses a practical activity will receive a mark of zero for that activity.
Enrolment restrictions	
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, and 7. apply the principles of the Scientific Method to solving problems in science and assess conclusions in relation to evidence and sources.
Subject content	In this subject, students will learn about: • basic mathematical operations and data handling • simple and complex substances • biologically important molecules • chemical reactions and energy • biochemical reactions and energy, and • applying concepts: global climate change.
Mode of delivery	This subject will consist of two three-hour tutorial/workshops each week plus online activities via the subject's vUWS site.
Online learning requirements	
Essential requirements	**Essential texts** The College *Fundamentals of science student workbook*, Western Sydney University The College, Sydney. The College *Fundamentals of science laboratory manual*, Western Sydney University The College, Sydney. **Further resources** Alford, D & Hill, J 2009, *Excel HSC biology*, Pascal Press, Glebe. Alford, D & Hill, J 2009, *Excel preliminary biology*, Pascal Press, Glebe.

Brotherton, J & Mudie, K 2009, *Heinemann biology activity manual*, Reed International Books, Melbourne.

Collins, D et al. 1999, *Nelson biology VCE units 1 & 2*, Nelson Thomson Learning, South Melbourne.

Collins, D et al. 1999, *Nelson biology VCE units 3 & 4*, Nelson Thomson Learning, South Melbourne.

Heffernan, D et al. 2002, *Spotlight biology preliminary*, Science Press, Marrickville.

Heffernan, D et al. 2008, *Spotlight biology HSC*, Science Press, Marrickville.

Kinnear, J & Martin, M 2004, *Biology 1*, Jacaranda, Milton.

Kinnear, J & Martin, M 2004, *Biology 2*, Jacaranda, Milton.

Essential equipment

- Laboratory coat
- Safety goggles

ASSESSMENT ITEMS AND WEIGHTING

Assessment for this subject will be based on the following components:

Task	Weighting	Learning outcomes assessed	Mandatory task
1. Portfolio a. Part A: Class-based activities (10%) b. Part B: Reflective learning journal — three submissions (15%) c. Part C: Laboratory log/workbook — three submissions (15%)	40%	1–7	Yes
2. Short answer test (data handling) — 1 hour	10%	1, 2, 7	Yes
3. Short answer (midterm) exam — 1.5 hours	20%	1–5	Yes
4. End-of-term short answer exam — 2 hours	30%	1–7	Yes
TOTAL	100%		

For details of assessment due dates, please refer to the learning guide for this subject.

All marks will be determined in accordance with The College Assessment Policy.

All assessment tasks are mandatory unless otherwise specified. Should a student fail to attempt/submit the first formal assessment task in a subject, they will be deemed to be at risk and will need to follow an intervention plan in order not to receive a Fail Non-Submission (FNS) grade. However, failure to attempt/submit all other mandatory assessment tasks will result in an immediate FNS grade for the subject.

Students must attain a mark of at least 50% overall in order to pass the subject.

Successful completion of this subject will not be counted for academic credit in any future studies at Western Sydney University.

