



The University of Southern Queensland

Course specification

Description: Science for Teachers

Subject	Cat-nbr	Class	Term	Mode	Units	Campus
SCI	1912	30303	1, 2004	ONC	1.00	TWMBBA

Academic group:	FOSCI
Academic org:	FOS002
Student contribution band:	2
ASCED code:	019999

STAFFING

Examiner: Alfio Parisi

Moderator: Kerry Withers

RATIONALE

Teachers require a broad, general knowledge and appreciation of the sciences in order to be able to teach science competently and confidently at pre-school and primary school. Teachers need to be scientifically literate and to understand the nature of science itself through exposure to the processes and ideas of science and the arguments in the philosophy of science. This course is specifically designed to develop a stronger background in the content and processes of science in general, and to develop a positive attitude towards science, technology and society.

SYNOPSIS

The course covers the broad, general principles and concepts of science and their relationship to the Queensland School Curriculum Council (QSCC) Years 1 - 10 Science Syllabus. Students will engage in laboratory, workshop and field studies to extend and develop their knowledge of the concepts and methods in the natural, physical and earth sciences.

OBJECTIVES

On successful completion of this course students will be able to:

- demonstrate a knowledge and understanding of the nature of science and its historical development;
- demonstrate a knowledge of appropriate science content;
- demonstrate an understanding of the importance of classification and the criteria used in its development;
- demonstrate a broad knowledge of the vocabulary of science;
- demonstrate competence in practical science activities designed for the year 1-10 levels;

- demonstrate an understanding of the importance of the processes of science;
- record accurately and interpret observations;
- demonstrate an understanding of the relationship between science and technology;
- demonstrate an initial understanding of the basic philosophy and the five (5) core content areas of the Queensland School Curriculum Council (QSCC) Years 1 - 10 Science Syllabus.

TOPICS

Description	Weighting (%)
1. Nature of Science: Concepts and methods; Neutrality and authority in science; Ethics; Controversy; Safety.	4.00
2. Systematics: The method and purpose of classification; Examples - the elements; "fossils"; Animals, plants and minerals.	2.00
3. Life and living: The living cell; Biodiversity; Plant and animal biology; Characteristics of life; The biosphere; Ecosystems.	18.00
4. Technology in scientific development. Measurement of distance, angles, time. Telescopes and microscopes.	4.00
5. Motion, forces and energy: Energy in natural processes; Sources of energy; Structures and machines; Heat and combustion.	12.00
6. Attraction and repulsion, Gravity, Magnetism.	4.00
7. Electricity and static electricity. Sound, Light.	12.00
8. Planet Earth: Its nature; Minerals, rocks and soils; Earthquakes and volcanoes.	8.00
9. The nature and origin of the universe/galaxy/solar system.	8.00
10. Water and air. Atmosphere. The water cycle - rivers, lakes and oceans.	4.00
11. Natural and processed materials : Elements; Atomic structure; States of matter; Temperature and pressure; Properties of matter; Physical and chemical changes; Reactions; Solutions; Acids and bases.	12.00
12. Futures perspectives in relation to science, technology and society.	8.00
13. Content organisation in science teaching including inquiry, problem-solving, integration and constructivism.	4.00

TEXT and MATERIALS required to be PURCHASED or ACCESSED:

ALL textbooks and materials are available for purchase from USQ BOOKSHOP (unless otherwise stated). Orders may be placed via secure internet, free fax 1800642453, phone 07 46312742 (within Australia), or mail. Overseas students should fax +61 7 46311743, or phone +61 7 46312742. For costs, further details, and internet ordering, use the 'Textbook Search' facility at <http://bookshop.usq.edu.au> click 'Semester', then enter your 'Course Code' (no spaces).

Blough, GO & Schwartz, J 1990, *Elementary school science and how to teach it*, 8th edn, Harcourt Brace, Fort Worth.

Parisi, A, Close, B and Carr-Spencer, W 2004, *SCI1912 Instructional Guide*, University of Southern Queensland, Toowoomba.

REFERENCE MATERIALS:

Reference materials are materials that, if accessed by students, may improve their knowledge and understanding of the material in the course and enrich their learning experience.

Campbell, NA, Reece, JB, Mitchell, LG & Taylor, MR 2003, *Biology: Concepts and connections*, 4th edn, Benjamin/Cummings, Menlo Park, California.

Hewitt, PG, Suchocki, J and Hewitt, LA 1999, *Conceptual physical sciences*, 2nd edn, Addison Wesley Longman, Menlo Park, California.

Knox, B, Ladiges, P and Evans, B 2001, *Biology*, McGraw-Hill Book Company, Sydney.

Peters, JM & Gege, PC 2002, *Science in elementary education*, 9th edn, Merrill Prentice Hall, Upper Saddle River, NJ.

Skamp, K (ed) 2004, *Teaching primary science constructively*, Harcourt Brace, Marrickville.

Starr, C and Taggart, R 1998, *Biology: The unity and diversity of life*, 8th edn, Wadsworth Publishing, Belmont, CA.

Trefil, J & Hazen, RM 1999, *The sciences: An integrated approach*, 2nd edn, John Wiley & Sons Inc, New York.

(Reference for examinable readings will be given to students during the presentation of this course.)

Wenham, M 1995, *Understanding primary science: Ideas, concepts and explanations*, Paul Chapman Publishing, London.

STUDENT WORKLOAD REQUIREMENTS:

ACTIVITY	HOURS
Examinations	2.50
Laboratory or Practical Classes	26.00
Lectures	23.00
Private Study	118.00

ASSESSMENT DETAILS

Description	Marks out of	Wtg(%)	Due date
PRACTICAL REPORTS	75.00	25.00	02 Mar 2004 (see note 1)
QUIZZES ON PRACTICAL	50.00	25.00	02 Mar 2004 (see note 2)
2HRS 30MIN CLOSED EXAM	170.00	50.00	END S1 (see note 3)

NOTES:

1. Please refer to the due dates in the prac manual for the practical reports
2. Please refer to the due dates in the prac manual for the quizzes on practicals
3. Examination dates will be available during the Semester. Please refer to the examination timetable when published.

IMPORTANT ASSESSMENT INFORMATION

- 1 Attendance requirements:
It is the students' responsibility to attend and participate appropriately in all activities (such as lectures, laboratories and practical work) scheduled for them, and to study all material provided to them or required to be accessed by them to maximise their chance of meeting the objectives of the course and to be informed of course-related activities and administration. To maximize their chances of satisfying the objectives of the practical component of the course, students should attend and actively participate in the laboratory sessions in the course.
- 2 Requirements for students to complete each assessment item satisfactorily:
To complete each of the assessment items satisfactorily, students must obtain at least 50% of the marks available for each assessment item.
- 3 Penalties for late submission of required work:
If students submit assignments after the due date without prior approval then a penalty of 20% of the total marks available for the assignment will apply for each working day late.
- 4 Requirements for student to be awarded a passing grade in the course:
To be assured of receiving a passing grade a student must attempt all of the summative assessment items, achieve at least 50% in the examination, achieve an aggregated mark of at least 50% in the total marks allocated for the assignments, and at least 50% of the available weighted marks for the summative assessment items.
- 5 Method used to combine assessment results to attain final grade:
The final grades for students will be assigned on the basis of the weighted aggregate of the marks (or grades) obtained for each of the summative assessment items in the course.
- 6 Examination information:
In a Closed Examination, candidates are allowed to bring only writing and drawing instruments into the examination.

- 7 Examination period when Deferred/Supplementary examinations will be held:
Any Deferred or Supplementary examinations for this course will be held during the examination period at the end of the semester of the next offering of this course.
- 8 University Regulations:
Students should read USQ Regulations 5.1 Definitions, 5.6. Assessment, and 5.10 Academic Misconduct for further information and to avoid actions which might contravene University Regulations. These regulations can be found at the URL <http://www.usq.edu.au/corporateservices/calendar/part5.htm> or in the current USQ Handbook.

ASSESSMENT NOTES

- 9 Students must retain a copy of each item submitted for assessment. This must be produced within 24 hours if required by the Examiner.
- 10 In order to attend laboratory classes, students must provide and wear appropriate personal protective equipment. This shall include a laboratory coat, closed in shoes, and safety glasses. Such equipment must be approved by supervising staff. Failure to provide and wear the appropriate safety equipment will result in students being excluded from classes.