The University of Southern Queensland

Course Specification

Description: Science for Teachers						
Subject	Cat-Nbr	Class	Term	Mode	Units	Campus
SCI	1912	10336	1, 2002	ONC	1.00	TWMBA

Academic Group: FOSCI
Academic Org: FOS002
HECS Band: 2
ASCED Code: 019999

STAFFING

Examiner: Alfio Parisi
Moderator: Robert Learmonth

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 pre-school and primary school levels;

- demonstrate an understanding of the importance of the processes of science;
- demonstrate an ability to 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
14. Practical Sessions and Workshops. The processes and concepts of the content of science will be illustrated with a series of hands-on activities. Most of these activities should be suitable or adaptable for use with early childhood and/or primary classes. Safety aspects and their importance will be emphasised.	0.00

TEXT and MATERIALS required to be PURCHASED or ACCESSED:

Books can be ordered by fax or telephone. For costs and further details use the 'Book Search' facility at http://bookshop.usq.edu.au by entering the author or title of the text.

Texts and materials to be purchased:

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

Close, B. and Carr-Spencer, W., 2002 *61901 Instructional Guide*, Toowoomba, USQ.

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.

References for examinable readings will be given to students during the presentation of this unit.

Campbell, N.A., Mitchell, L.G. & Reece, J.B. 1997 *Biology: Concepts and connections*, 2nd edn, Menlo Park, California: Benjamin Cummings.

Cross, R. 1996 *Teaching primary science: Empowering children for their world*, Melbourne, Longman.

Hewitt, P.G., Suchocki, J. and Hewitt, L.A., 1998 *Conceptual physical sciences*, 2nd edn, Menlo Park, California: Addison Wesley Longman.

Knox, B., Ladiges, P. and Evans, B., 1994 *Biology*, Sydney: McGraw- Hill Book Company.

Skamp, K. (ed.), 1998 *Teaching primary science constructively*, Sydney: Harcourt Brace.

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

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

STUDENT WORKLOAD REQUIREMENTS

ACTIVITY	HOURS
Examinations	3
Lectures	25
Practical Experience	26
Private Study	112

ASSESSMENT DETAILS

Description	Marks Out of	Wtg(%)	Required	Due Date
PRACTICAL REPORTS	75.00	25.00	Y	04 Mar 2002 (see note 1)
QUIZZES ON PRACTICAL	50.00	25.00	Y	04 Mar 2002 (see note 2)
CLOSED EXAM 2HRS 30MIN	150.00	50.00	Y	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.

OTHER REQUIREMENTS

1 Attendance Requirements It is the students' responsibility to actively participate in all classes scheduled for them, and to study all material provided to them or required to be accessed by them, and to be informed of course-related activities and administration, to maximise their chance of meeting the objectives of the course. Students must attend at least 80% of the practical sessions in the course and demonstrate by their involvement in these sessions, that they have achieved the theoretical and practical objectives of the course. Medical certificates and other appropriate documentation do NOT exempt students from the attendance requirements for this course. Closed-in shoes and long hair tied back are required for all practical sessions.

2 Requirements to Satisfactorily Complete each Assessment Item To satisfactorily complete the quizzes, practical reports and examination, students must obtain at least 50% of the marks available for each assessment item. Medical Certificates and other appropriate documentation for a maximum of two (2) weeks, are taken into consideration when calculating final quiz marks and granting short extensions on practical report submissions.

3 Minimum Requirements to Pass the Course To be assured of a pass in the course, students must obtain an overall mark of at least 55%. Students with valid documentation who fail to attend three (3) practical sessions may be issued with an I - Incomplete result. This will depend on the results achieved in the unit assessments. Submission of written make-up work will be required by semester 2, week 4 of the current academic year.

4 Grading Final grades for students will be determined by the addition of the marks obtained in each assessment item, weighted as in the Assessment Details, and by considering the students' level of achievement of the objectives of the course.

5 Supplementary and Deferred Examinations Students who do not perform satisfactorily in quizzes or in the examination, may, at the discretion of the Examiner, be granted a supplementary examination. This will apply even if students have obtained an overall passing grade. Students will be granted a deferred

examination only if they perform satisfactorily in all other assessment items. Deferred and/or supplementary examinations will be held in Semester 3 of the current academic year.

6 Assignments In accordance with the University's Policy on Assignments (Regulation 5.6.1), the Examiner of a course may grant an extension of the due date of a practical report in extenuating circumstances. This policy may be found in the USQ Handbook, the Distance Education Study Guide and the Faculty of Sciences' Orientation Handbook for new on-campus students. All students are advised to study and follow the guidelines associated with this policy. Students must retain a copy of any practical report submitted. This must be produced within 48 hours if required by the Examiner.

7 Examinations Closed Examinations: Candidates are allowed to bring only writing and drawing instruments into the examination.
