



The University of Southern Queensland

Course specification

The current and official versions of the course specifications are available on the web at <http://www.usq.edu.au/coursespecification/current>.
Please consult the web for updates that may occur during the year.

Description: Teaching Science for Understanding

| Subject | Cat-nbr | Class | Term | Mode | Units | Campus |
|---------|---------|-------|---------|------|-------|-----------|
| EDX | 2260 | 87367 | 1, 2009 | WEB | 1.00 | Toowoomba |

| | |
|-----------------------------------|----------------------------|
| Academic group: | FOEDU |
| Academic org: | FOE002 |
| Student contribution band: | National Priority Teaching |
| ASCED code: | 070100 |

STAFFING

Examiner: Karen Spence
Moderator: Andy Yeh

OTHER REQUISITES

State law in Queensland (Australia) requires that all adults working/undertaking professional experience/researching with children under the age of 18, in the state of Queensland are required to possess a current suitability card (Blue Card). (See "Other Requirements" for further information.)
Also see: <http://www.childcomm.qld.gov.au/employment/bluecard/informationSheets.html>

RATIONALE

For school science teachers to be effective in assisting learners to become scientifically literate, there will be a need for them to have confident and competent teachers of science. This will require teachers to be able to match their knowledge and understanding of the scientific content appropriate to the primary school curriculum with pedagogical approaches that will assist students to develop knowledge of the content and processes of science. In particular, pedagogical content knowledge is of fundamental importance in a teacher's approach to catering for the diverse interests and abilities of learners, and in the ways in which topics, problems or issues are presented in the classroom. An understanding of pedagogy related to specific content knowledge in science, and how this might be interpreted to meet the needs of particular pupils, provides a sound base for effective teaching in these areas. While the overall focus of this course will be primarily on content, the approach taken in the design of this unit is to treat content and pedagogy together. It will expose the students to various pedagogical practices as a background to developing the content.

SYNOPSIS

The aim of the course is to develop students' understanding of content in science, in parallel with their awareness of ways of transforming this understanding of the content so that what they know and the ways they have come to know it become accessible to the children they teach. Students will have the opportunity to examine their own misconceptions, and to understand how such misconceptions might be avoided. Problem-solving skills will be advocated together with an approach to science that incorporates honesty, open-mindedness and information sharing. Content

will include: 1. Selected topics from the Queensland years 1-10 science syllabus content strands (earth and beyond, energy and change, life and living, and natural and processed materials). 2. Application of the notion of pedagogical content knowledge to each content area encountered in #1, and the development of suitably transformed content which would be accessible to learners in the appropriate age groups. NOTE: Minimum enrolment numbers apply to this offering. Should enrolments not reach the minimum number required for on-campus study, students may be transferred to the EXT or WEB offering and advised of this change before semester commences.

OBJECTIVES

The course objectives define the student learning outcomes for a course. The assessment item(s) that may be used to assess student achievement of an objective are shown in parenthesis. On successful completion of this course students will be able to:

1. demonstrate knowledge and understanding of the core learning outcomes of the five content strands of the syllabus (assignment 1 & 2)
2. demonstrate knowledge and understanding of the practices and dispositions of science appropriate to the syllabus (assignment 2)
3. demonstrate knowledge and understanding of how children think and learn about science (assignment 1 & 2)
4. identify strategies for transforming specific content so that it would accessible to children (assignment 1 & 2)
5. identify a range of misconceptions and develop strategies for avoiding these in subsequent teaching. (assignment 1)
6. demonstrate an ability to establish student understanding of science concepts and to identify and deliver appropriate strategies to address these concepts (assignment 2)
7. demonstrate awareness of potential applications of information and communications technologies for science teaching (assignment 1)
8. demonstrate an understanding of the principles of risk management in teaching science safely and effectively (assignment 1)
9. demonstrate a recognition of the social and ethical dimensions of science education (assignment 2)
10. demonstrate competence in written language and scholarly writing including correct spelling, grammar, and bibliographic referencing. (all assignments)

TOPICS

| | Description | Weighting (%) |
|----|---|---------------|
| 1. | Science content from syllabus strands: earth and beyond; energy and change; life and living; natural and processed material; science and society | 50.00 |
| 2. | Theoretical foundations of science education: historical perspective; nature of science; philosophy of science; developmental and constructivist approaches | 15.00 |
| 3. | Pedagogical content knowledge: transformation of content | 15.00 |
| 4. | Interpreting science curriculum | 5.00 |
| 5. | Selecting and creating resources for science education | 10.00 |
| 6. | Responsible science education: safety, social and ethical dimensions | 5.00 |

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).

Skamp, K 2007, *Teaching Primary Science Constructively*, 3rd edn, Thomson Learning, South Melbourne.

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.

Whether you are on, or off campus, the USQ Library is an excellent source of information <http://www.usq.edu.au/library>. The gateway to education resources is here ... <http://www.usq.edu.au/library/faculties/education/default.htm>

Fleer, M, Jane, B & Hardy, T 2007, *Science for children: developing a personal approach*, 3rd edn, Pearson Education Australia, Sydney.

Martin, DJ 2006, *Elementary science methods*, 4th edn, Thomson Wadsworth, Belmont, CA.

Peters, JM & Gega PC 2006, *Science in elementary education*, 10th edn, Merrill, Upper Saddle River.

STUDENT WORKLOAD REQUIREMENTS

| ACTIVITY | HOURS |
|-------------------|-------|
| Directed Study | 70.00 |
| Independent Study | 40.00 |

ASSESSMENT DETAILS

| Description | Marks out of | Wtg (%) | Due date |
|-------------|--------------|---------|-----------------------------|
| ASSIGNMENT1 | 50.00 | 50.00 | 03 Apr 2009 (see note 1) |
| ASSIGNMENT2 | 50.00 | 50.00 | 29 May 2009 |

NOTES

1. APA style is the referencing system required in this course. Students should use APA style in their assignments to format details of the information sources they have cited in their work. The USQ library provides advice on how to format information sources using this system. http://www.usq.edu.au/library/help/ehelp/ref_guides/apastyle/default.htm

IMPORTANT ASSESSMENT INFORMATION

- 1 Attendance requirements:

There are no attendance requirements for this course. However, it is the students' responsibility 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.

- 2 Requirements for students to complete each assessment item satisfactorily:
To satisfactorily complete an individual assessment item a student must achieve at least 50% of the marks.
- 3 Penalties for late submission of required work:
If students submit assignments after the due date without (prior) approval of the examiner then a penalty of 5% of the total marks gained by the student for the assignment may apply for each working day late up to ten working days at which time a mark of zero may be recorded. No assignments will be accepted after model answers have been posted.
- 4 Requirements for student to be awarded a passing grade in the course:
To be assured of receiving a passing grade a student must achieve at least 50% of the total weighted marks available for the course.
- 5 Method used to combine assessment results to attain final grade:
The final grades for students will be assigned on the basis of the aggregate of the weighted marks obtained for each of the summative assessment items in the course.
- 6 Examination information:
There is no examination in this course.
- 7 Examination period when Deferred/Supplementary examinations will be held:
As there are no examinations in this course, there will be no deferred or supplementary examinations.
- 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>

OTHER REQUIREMENTS

- 1 Students will require access to e-mail and have Internet access to USQConnect for this course.
- 2 **IMPORTANT NOTE: Working with Children:** State law in Queensland requires that all adults (including university students, pre-service educators, trainers, vocational teachers, industry educators) working with children under the age of 18, in the State of Queensland*, obtain approval before commencing such work. Many education courses include a practical component (professional experience, project work, research, assessment etc.) that may require engagement with children under the age of 18. It is your responsibility to ensure that you possess a current suitability card (Blue Card) before commencing any practical components of this course. **DO NOT PARTICIPATE IN ANY PRACTICAL EXPERIENCE WITH CHILDREN UNDER 18 UNLESS YOU POSSESS A CURRENT 'BLUE CARD'**. For further information:
<http://www.childcomm.qld.gov.au/employment/bluecard/informationSheets.html> *If you are undertaking practical experience outside the State of Queensland, Australia you should check local requirements.