



The University of Southern Queensland

Course specification

Description: Mathematics for Teachers

| Subject | Cat-nbr | Class | Term | Mode | Units | Campus |
|---------|---------|-------|---------|------|-------|--------|
| MAC | 1901 | 34354 | 2, 2004 | ONC | 1.00 | TWMBA |

| | |
|-----------------------------------|--------|
| Academic group: | FOSCI |
| Academic org: | FOS003 |
| Student contribution band: | 2 |
| ASCED code: | 010101 |

STAFFING

Examiner: Leo Crameri
Moderator: Walter Spunde

RATIONALE

Prospective teachers of mathematics need a substantive and comprehensive knowledge of the content and discourse of mathematics if they are to develop in their students a mathematical power - the ability to explore, conjecture and reason logically and to use a variety of mathematical methods effectively to solve problems. They also need a level of understanding and appreciation of mathematics higher than that expected of students at primary and junior high schools. Consequently, a clearer perspective of the role and importance of mathematics will be gained. This course is designed to meet the needs of preservice teachers of Years 1 to 7 and will be of benefit also to preservice teachers of Years 8 and 9.

SYNOPSIS

Students will be able to develop and extend their knowledge and understanding of mathematics and school mathematics through a variety of experiences involving problem solving, mathematical communication, reasoning and connecting mathematics, its ideas and its applications in the world around us. By working collaboratively and independently, students will be encouraged to think mathematically, and through many success experiences, gain confidence in solving mathematical problems. The content of the course will include the following topics: problem solving; inductive and deductive reasoning; numeration systems; number systems and number sense; describing, analysing and graphing data; geometry and topology.

OBJECTIVES

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

1. demonstrate a knowledge and understanding of various fundamental mathematical concepts and procedures and the connections among them;
2. demonstrate a knowledge of problem solving strategies;
3. reason mathematically and solve problems;
4. communicate mathematical ideas effectively at different levels of formality;
5. analyse real-world situations through the use of mathematical concepts and processes;
6. use calculators and computers as tools to represent mathematical ideas, to construct different representations of mathematical concepts and to solve problems;
7. show an appreciation of the dynamic nature of mathematics, the contributions of different cultures and individuals to the development of mathematics and the important role that mathematics plays in culture and society today;
8. work collaboratively, independently and confidently in doing mathematics; and
9. display a disposition to explore mathematical ideas and solve problems.

TOPICS

| Description | Weighting (%) |
|---|---------------|
| 1. Mathematical reasoning and problem solving | 30.00 |
| 2. Numeration systems; Numbers and their properties | 40.00 |
| 3. Working with data, geometry and topology | 30.00 |

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).

Bennett A B Jr & Nelson L T 2001, *Mathematics for Elementary Teachers A Conceptual Approach*, McGraw-Hill, Boston.
(4th/5th edn)

Bennett A B Jr & Nelson L T 2001, *Mathematics for Elementary Teachers An Activity Approach*, McGraw-Hill, Boston.
(4th/5th edn)

Study Book 2004, *Course MAC1901 Mathematics for Teachers*, USQ Distance Education Centre, 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.

Australian Education Council 1991, *A National Statement on Mathematics for Australian Schools*, Curriculum Corporation, Carlton, Vic.

Bassarear, T. 2001, *Mathematics for Elementary School Teachers*, 2nd edn, Houghton Mifflin, Boston.

Musser, G.L. & Burger, W.F. 2001, *Mathematics for Elementary Teachers: A Contemporary Approach*, 5th edn, John Wiley, New York.

Sonnabend, T. 1997, *Mathematics for Elementary Teachers: An Interactive Approach*, 2nd edn, Saunders College Publishing, Fort Worth.

STUDENT WORKLOAD REQUIREMENTS:

| ACTIVITY | HOURS |
|----------------|-------|
| Assessment | 20.00 |
| Directed Study | 45.00 |
| Examinations | 2.00 |
| Lectures | 26.00 |
| Private Study | 45.00 |
| Tutorial | 26.00 |

ASSESSMENT DETAILS

| Description | Marks out of | Wtg(%) | Due date |
|----------------------------|--------------|--------|-----------------------------|
| WORKSHOP PROBLEM-SOLVING | 20.00 | 20.00 | 20 Jul 2004 (see note 1) |
| ASSIGNMENT A | 30.00 | 10.00 | 19 Aug 2004 |
| ASSIGNMENT B | 30.00 | 10.00 | 16 Sep 2004 |
| 2HR RESTRICTED EXAMINATION | 60.00 | 60.00 | END S2 (see note 2) |

NOTES:

1. Submission of these problem-solving tasks are made on a weekly basis.
2. Examination dates will be available during the Semester. Please refer to 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, tutorials, 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.

- 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 10% of the total marks gained by the student 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 a passing grade in the course students must complete each assessment item satisfactorily.
- 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:
In a Restricted Examination, candidates are allowed access to specific materials during the examination. The only materials that candidates may use in the restricted examination for this course are: writing materials (non-electronic and free from material which could give the student an unfair advantage in the examination); calculators which cannot hold textual information (students must indicate on their examination paper the make and model of any calculator(s) they use during the examination; English translation dictionaries (but not technical dictionaries); Students whose first language is not English, may, with the Examiner's approval, take an appropriate non- electronic translation dictionary into the examination. Students who wish to use a translation dictionary **MUST** request and receive written approval from the Examiner at least one week before the examination date. Translation dictionaries will be subject to perusal and may be removed from the candidate's possession until appropriate disciplinary action is completed if found to contain material that could give the candidate an unfair advantage.
- 7 Examination period when Deferred/Supplementary examinations will be held:
Any Deferred or Supplementary examinations for this course will be held during the next examination period.
- 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.