



The University of Southern Queensland

Course specification

Description: Learning and Teaching Mathematics: Early Childhood Years

Subject	Cat-nbr	Class	Term	Mode	Units	Campus
ECE	2020	31245	1, 2004	ONC	1.00	WIBAY

Academic group:	FOEDU
Academic org:	FOE004
Student contribution band:	1
ASCED code:	070101

STAFFING

Examiner: Deborah Geoghegan

Moderator: Noel Geoghegan

RATIONALE

Children develop many sophisticated mathematical ideas long before they enter formal schooling. Appreciation of the early stages of mathematical thinking, and awareness of ways to sustain the continuity of each child's developing mathematical ideas are foundational to teaching mathematics in the early years. Teachers' decisions about the content and character of educational experiences have important consequences on children's emerging mathematical thinking. A problem-centred approach to learning, and engagement of children in meaningful experiences are hallmarks of a program that supports developing mathematical thinking.

SYNOPSIS

The course is based upon the study of children as they emerge as mathematical thinkers. While revisiting some of their own mathematical concepts pre-service teachers will gain first-hand knowledge of the concepts and processes involved in working with a community of early mathematical learners. The content areas of Number, Operation, Pattern, Spatial Relationships, Measurement, and Data Analysis will be explored. Students will be challenged by working with mathematics at their own level yet at the same time relating the processes of learning and teaching to the young child's context. By working as creative problem solvers students will develop their own mathematics as well as gain insight into the learning and teaching of mathematics in the early years. This course explores the characteristic developmental processes and range of mathematical ideas of young children for setting appropriate goals in mathematics education in the early childhood years.

OBJECTIVES

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

- develop early childhood mathematics education programs based on state, national and international perspectives;
- analyse and critically research curriculum development that relates to mathematics education in early education;
- enhance access and equity in early childhood mathematics;
- demonstrate ability to plan effectively for a problem-centered and creative mathematics learning environment;
- be familiar with the organisation required for effective mathematics learning environments in the early years;
- develop a repertoire of mathematics concepts and teaching strategies appropriate for facilitating early mathematical thinking.

TOPICS

Description	Weighting (%)
1. P-3 mathematics curriculum documents	5.00
2. Theories related to mathematics curriculum development in early childhood classrooms	10.00
3. Emerging trends and recent perspectives related to early childhood mathematics curricula	10.00
4. Planning and designing multilevel mathematics programs in the early years	5.00
5. Programming for the integration of mathematics with other subjects	5.00
6. The role of the educator in facilitating mathematics learning	10.00
7. Leadership and advocacy for equity in mathematics education	5.00
8. The emergence of mathematical language	5.00
9. The place of creativity in the emergence of mathematical thinking	10.00
10. Problem-centred learning in early mathematical experiences	10.00
11. Appropriate resources for facilitating learning and teaching in the early years	5.00
12. Number, Measurement, Space and Data Handling: early conceptual development	10.00
13. The use of information technology in the early years of mathematical development	5.00
14. The development of positive attitudes in thinking mathematically	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).

Sperry Smith, S 2001, *Early childhood mathematics*, 2nd edn, Allyn and Bacon, Boston, MA.

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.

PLEASE NOTE: "Teaching Children Mathematics" from NCTM (called The Arithmetic Teacher prior to 1994) will be a useful journal as a reference for this course.

Anderson, C (ed) 1998, *Building Number Sense [braille]: The Number System. Investigations in Number, Data, and Space Series*, Dale Seymour, Menlo Park, CA.

Bobis, J, Mulligan, J, Lowrie, T & Taplin, M 1999, *Mathematics for Children: Challenging Children to Think*, Prentice Hall, Frenchs Forest, NSW.

Griffiths, R 1994, Mathematics and play, *The Excellence of Play*, Open University Press, Buckingham, England.

Mannigel, D 1998, *Young Children as Mathematicians: Theory and Practice for Teaching*, 2nd edn, Social Science Press, Katoomba, NSW.

Moomaw, S & Hieronymous, B 1995, *More Than Counting: Whole Math Activities for Preschool and Kindergarten*, Redleaf Press, St Paul, MN.

Perry, B & Conroy, J 1994, *Early Childhood and Primary Mathematics: A Participative Text for Teachers*, Harcourt Brace, Sydney.

Richardson, K 1997, *Math Time: The Learning Environment*, Educational Enrichment, Norman, OK.

Shaw, J & Blake, S 1998, *Mathematics for Young Children*, Merrill, Upper Saddle River, NJ.

Yelland, N, Butler, D & Diezmann, C 1999, *Early Mathematical Explorations*, Pearson Publishing Solutions, Needham Heights, MA.

STUDENT WORKLOAD REQUIREMENTS:

ACTIVITY	HOURS
Assessment	30.00
Directed Study	50.00
Private Study	80.00

ASSESSMENT DETAILS

Description	Marks out of	Wtg(%)	Due date
ESSAY ON MATHS IN EC	30.00	30.00	02 Mar 2004 (see note 1)
IN-CLASS PRESENTATION	30.00	30.00	02 Mar 2004 (see note 2)
EXAMINATION	40.00	40.00	END S1 (see note 3)

NOTES:

1. Dates to be notified in class.
2. Dates to be notified in class.
3. As per examination timetable.

IMPORTANT ASSESSMENT INFORMATION

- 1 Attendance requirements:
(b) 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:
(a) To complete each of the assessment items satisfactorily, students must obtain at least 50% of the marks available (or at least a grade of C-) for each assessment item.
- 3 Penalties for late submission of required work:
If assignments are submitted after the due date without an approved extension of time, University penalties may be applied.
- 4 Requirements for student to be awarded a passing grade in the course:
(a) To be assured of a passing grade, students must demonstrate, via the summative assessment items, that they have achieved the required minimum standards in relation to the objectives of the course by satisfactorily completing all summative assessment items (the examination and assignments).
- 5 Method used to combine assessment results to attain final grade:
(a) 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:
(b) 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:
(b) 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.

ASSESSMENT NOTES

- 1 (a) The due date for an assignment is the date by which a student must submit the assignment to the USQ. The onus is on the student to provide proof of the submission date, if requested by the Examiner. (b) If requested, students will be required to provide a copy of assignments submitted for assessment purposes. Such copies should be despatched to USQ within 24 hours of receipt of a request being made. (c) The examiner may grant an extension of the due date of an assignment in extenuating circumstances. (d) The Faculty will normally only accept assessments that have been written, typed or printed on paper-based media. (e) The Faculty will NOT accept submission of assignments by facsimile.