



The University of Southern Queensland

## Course Specification

### Description: Learning and Teaching Maths: Early Childhood Yrs

Subject	Cat-Nbr	Class	Term	Mode	Units	Campus
ECE	2020	10787	1, 2002	ONC	1.00	TWMBBA

<b>Academic Group:</b>	FOEDU
<b>Academic Org:</b>	FOE004
<b>HECS Band:</b>	1
<b>ASCED Code:</b>	070101

### STAFFING

Examiner: Noel Geoghegan

Moderator: Deborah 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 critically research and 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:**

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.

Sperry Smith, S. (1997). *Early childhood mathematics*, Needham Heights, MA: Allyn and Bacon.

## **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.

Recommended reference materials are materials (books, CD's audiotapes, videotapes, URL's etc) that, if accessible to students, may improve the students' knowledge and understanding of the material in the course. Use of these materials could, indirectly, improve the

Students are not expected to purchase these materials and are not required to read them.

Reference materials in the Library: It is expected that the USQ Library will hold a copy of most reference materials listed in Course Specifications for access by on-campus students and external students studying in Australia.

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.

Bobis, J., Mulligan, J., Lowrie, T. & Taplin, M. (1999). *Mathematics for children*, Sydney: Prentice Hall.

Griffiths, R. (1994). Mathematics and play. In J. Moyles (Ed.). *The excellence of play*, Philadelphia: Open University Press.

Kliman, M. & Russel, S.J. (1998). *Building number sense*, Cambridge, MA: Dale Seymour.

Mannigel, D. (1992). *Young children as mathematicians*, Wentworth Falls: Social Science press.

Moomaw, S. & Hieronymous, B. (1995). *More than counting: Whole math activities for preschool and kindergarten.*, St Paul, MN: Redleaf Press.

National Council of Teachers of Mathematics (1989). *Curriculum and evaluation standards for school mathematics*, Reston, VA. NCTM.

Perry, B. & Conroy, J. (1994). *Early Childhood and Primary Mathematics*, Sydney: Harcourt Brace.

Richardson, K (1997). *Math Time: The learning environment*, Norman, OK: Educational Enrichment.

Shaw, J. & Blake, S. (1998). *Mathematics for Young children*, Columbus, OH: Prentice Hall.

Yelland, N., Butler, D. & Diezmann, C. (1999). *Early mathematical explorations*, Needham Heights, MA: Pearson Publishing Solutions.

## STUDENT WORKLOAD REQUIREMENTS

ACTIVITY	HOURS
Directed Study	55
Lectures	14
Private Study	78
Tutorial	28

## ASSESSMENT DETAILS

Description	Marks Out of	Wtg(%)	Required	Due Date
ESSAY ON MATHEMATICS IN EARLY	999.00	30.00	Y	04 Mar 2002 (see note 1)
IN-CLASS PRESENTATION	999.00	30.00	Y	04 Mar 2002 (see note 2)
EXAMINATION 3 HOURS	999.00	40.00	Y	END S1 (see note 3)

### NOTES:

1. Further details about the due dates are detailed in the assessment section of the Course Specifications.
2. Further details about the due dates are detailed in the assessment section of the Course Specifications.
3. Further details about the due dates are detailed in the assessment section of the Course Specifications.

## OTHER REQUIREMENTS

- 1 When there is more than one marker for a single item of assessment, the distribution patterns and means for the different markers will be compared and marks adjusted if necessary.
  - 2 Marking criteria are provided in course material as mark sheets/guides or as part of assignment specifications.
  - 3 Summative assessment items will be given a numerical score.
  - 4 Course Grades will be calculated by aggregating the weighted result or numerical score for each summative assessment item.
  - 5 All assessment items must be submitted and passed overall.
  - 6 If assignments are submitted after the due date without an approved extension of time, University penalties will apply.
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