

SIMON FRASER UNIVERSITY

EDUCATION 475-4:

DESIGNS FOR LEARNING: ELEMENTARY MATHEMATICS

Fall Semester, 1990
Monday, 4:30 - 8:20 p.m.
Location: MPX 7500

Instructor: Dr. Tom O'Shea
Office: MPX 8642
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PREREQUISITES: Education 401/402, or equivalent

The mathematics curriculum in British Columbia has undergone major change in the last few years. The revised curriculum includes new topics such as data analysis and probability, and other topics, such as geometry, receive greater emphasis. Calculators have become a natural component of the school program. Students are expected to use manipulative materials as a major vehicle for learning.

This course is designed for prospective and practising elementary school teachers who wish to explore the fundamentals of the learning/teaching process as it applies to mathematics. The course will draw on the latest research in mathematics learning, and will show how such findings may be used in the classroom. Students will be expected to become familiar with and confident in the use of a variety of manipulative materials such as geo-boards, logic blocks, and coloured rods. They will also explore the realities of mathematical learning by examining their own learning powers and patterns. On completion of the course it is hoped that participants will feel more at ease with the subject of mathematics, be able to deal confidently with the prescribed curriculum, and be able to plan mathematical instruction within a consistent framework.

OUTLINE OF TOPICS

- Theories of mathematics learning
- Problem solving
- Measurement
- Arithmetic operations
- Rational numbers
- Geometry
- Estimation
- Ratio and proportion
- Data analysis
- Technology
- Algebra
- Evaluation and remediation

TYPICAL REQUIREMENTS

Students will be expected to attend all classes, and to participate fully in classwork and discussions. Specific assignments will depend on the number and backgrounds of students enrolled in the course, but students should expect to complete the following:

- a problem-solving assignment in which students keep a journal to record their efforts over a period of time.
- an assignment related to the authorized series of elementary textbooks in British Columbia.
- an assignment that requires students to examine a number of professional journals related to the teaching of mathematics
- a lesson development assignment related to the B.C. Mathematics Curriculum Guide, Grades 1-8.

In addition, each student will be expected to complete a project related to his or her own interests, as negotiated with the instructor.

TEXTBOOK

Post, T.R. (ed.). (1988). Teaching mathematics in grades K-8: Research based methods. Toronto: Allyn and Bacon.