

**SIMON FRASER UNIVERSITY  
SUMMER SEMESTER 2007**

**EDUC 475-4  
DESIGNS FOR LEARNING: SECONDARY  
MATHEMATICS  
(E01.00)**

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Thursday 6:00-9:50 pm (UCFV Abbotsford) Room A210

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**PREREQUISITE:** EDUC 401/402

**DESCRIPTION**

The mathematics curriculum in British Columbia has undergone major changes in the last few years. New content areas such as data analysis, statistics and probability have been added; traditional topics such as geometry have been revised and extended. Implementation of the curriculum now involves regular use of manipulatives and calculators by the students. Learning and assessment practices are becoming increasingly aligned with the most recent theories of mathematics education. In the 'reflective practitioner' model of teaching, the teacher is continually reviewing and interweaving theory, content and practice.

This course is designed for prospective and practicing elementary school teachers who wish to explore the fundamentals of the learning/teaching process as it applies to mathematics. Using the provincial Instructional Resource Package as an organizing framework, the class will review content and implementation. The course will draw on the latest research in mathematics learning, and will show how such findings may be used in the classroom. Goals for students in this course include: (1) developing familiarity with theories of mathematics learning and their application in the classroom; (2) developing expertise with the use of resources such as manipulatives and calculators; (3) beginning or continuing the accumulation of classroom and professional resources; and (4) increasing confidence and competence in one's abilities as a mathematician.

**LIST OF TOPICS**

- |                                     |                                       |
|-------------------------------------|---------------------------------------|
| ● Theories of mathematics learning  | ● Reform mathematics & constructivism |
| ● Space and Measurement             | ● Number and number operations        |
| ● Estimation and mental computation | ● Geometry                            |
| ● Problem solving                   | ● Data analysis                       |
| ● Technology in the classroom       | ● Assessment & Evaluation             |
| ● Arithmetic operations             | ● B.C. curriculum                     |

**REQUIREMENTS**

Students will be expected to attend all classes, and to participate fully in class work and discussions and complete a number of assignments. Specific details will be discussed during first session. Assignments may include the following:

- problem-solving assignments in which students keep a journal to record their efforts and solutions over a period of time
- group problem-solving assignments in which students work collaboratively in small groups on a problem and report to the class as a whole on their experiences and solutions
- a presentation to the class demonstrating an idea, activity, or technique for teaching mathematics or a presentation/ “dramatic enactment” of a diagnosis and remediation of a fictional interaction between a teacher and student(s)
- brief written commentaries on selected journal and web materials relevant to class discussion
- a choice of (i) a midterm examination based on text reading; (ii) a research paper on topic negotiated with instructor; (iii) an evaluation (with class presentation) of a website or software with respect to its use in a classroom

### **REQUIRED TEXTS**

Van de Walle, John A. & Folk, Sandra (2005) *Elementary and Middle School Mathematics: Teaching Developmentally (First Canadian Edition)*. Toronto: Pearson Education Canada. ISBN: 0-205-42077-X

British Columbia Ministry of Education (2006). *Mathematics K to 7: Curriculum support materials*. (available at [http://www.bced.gov.bc.ca/irp/program\\_delivery/mathk7.htm](http://www.bced.gov.bc.ca/irp/program_delivery/mathk7.htm))

### **RECOMMENDED RESOURCES**

Access to internet and e-mail. It is anticipated that substantial use of FirstClass accounts will be made after the first two sessions.