

**SIMON FRASER UNIVERSITY
SUMMER SEMESTER 2007**

**EDUC 416-4
DESIGNS FOR LEARNING: SECONDARY SCIENCE
(D01.00)**

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Tuesday 1:00-4:50 pm
EDB 7500B

PREREQUISITE: EDUC 401/402. Educ 405 desired.

COURSE DESCRIPTION:

This course is designed for prospective and practicing secondary school teachers who wish to explore the fundamentals of teaching and learning science. The aim of the course is for students to develop a critical and practical philosophy of science education. The course will draw on the literature of science education and philosophy of science in order to show how these findings have relevance for the classroom. Students will become familiar and confident with a variety of learning theories, instructional and assessment strategies, including implementing effective whole group, small group and individual work, and demonstrations. As well, students will be expected to engage in dialogue and research on a selection of topics which are deemed of fundamental importance to learning secondary science today. Finally, students will prepare themselves for becoming lifelong learners and innovators in science education, continuing in their development as reflective practitioners.

Objectives: On completion of the course students should feel more capable about teaching secondary science, be able to deal confidently and critically with the prescribed curriculum, and be able to plan teaching and learning activities within consistent frameworks that support growth in science understanding.

Topics: current problems of science education; the nature of science; science literacy; theories of learning; students' misconceptions; multiple intelligences; imagination; assessment; curriculum (also assessing the BC curriculum for junior science, secondary biology, physics and chemistry); learning in the lab; using IT and computers.
(Students will also have the opportunity to explore additional topics such as gender issues, multicultural issues and First Nations issues as individually chosen)

Assignments:

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| 1. Critical Inquiry: | 15% |
| 2. Science Demonstration: | 10% |
| 3. Curriculum Planning Unit: | 25% |
| 4. Class Presentation (Lesson): | 25% |

5. Curriculum Research Paper: 25%
6. Class participation and attentiveness to all assigned readings
(REQUIRED FOR COURSE CREDIT)

Required Readings:

Ebenezer, J. V. and Haggerty, S.M. (1999). *Becoming a secondary school science teacher*. Upper Saddle River, New Jersey: Merrill.
Science 8-10; Physics 11/12; Chemistry 11/12; Biology 11/12; Integrated Resource Package (IRP). (1996). Ministry of Education, B.C
(available on-line: www.bced.gov.bc.ca)

Recommended readings:

Kuhn, T. S. (1970). *The structure of scientific revolutions*. 3rd edition. Chicago and London: The University of Chicago Press. (Copies in Library)
Osborne, R. and Freyberg, P. (1985). *Learning in science. The implications of children's science*. London: Heinemann. (Copies in Library)

(ADDITIONAL READINGS will be made available)