



**SIMON FRASER UNIVERSITY**

**EDUCATION 416-4**

**E200**

**DESIGNS FOR LEARNING: SECONDARY SCIENCE**

Summer Semester 2009  
 (May 4–August 4, 2009)  
 Room: EDB: 7500B  
 Time: Tuesday, 5:30-9:20 pm

Instructor: Ms. Jas Uppal  
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<b>Prerequisite</b>	401/2 or equivalent
<b>Course Description</b>	This course is designed for prospective and practicing secondary school teachers to explore the fundamentals of learning and teaching 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 group work, and demonstrations. As well, students will be expected to engage in reading, writing, dialogue and research on a selection of topics of which are deemed of fundamental importance to learning secondary science today. Finally, students will continue to develop as reflective practitioners and engage in becoming lifelong learners as well as innovators in science education to promote thinking and inquiry in their classroom.
<b>Course Objectives</b>	<ul style="list-style-type: none"> <li>• Students should become more comfortable teaching secondary science</li> <li>• Students should be able to critically examine the prescribed curriculum and confidently implement it into the science classroom.</li> <li>• Students should be able to plan learning and teaching experiences within consistent theoretical frameworks that support growth in science understanding.</li> </ul>
<b>Topics</b>	<p><i>Range of possible topics to be covered include:</i> current problems of science education; the nature of science; science literacy; theories of learning; students' misconceptions; multiple intelligences; imagination; assessment; First Nations' Indigenous knowledge; curriculum (also assessing the BC curriculum for junior and senior sciences); learning in the lab; using IT and computers.</p> <p>(Students will also have the opportunity to explore additional topics such as gender issues, multicultural issues and First Nations issues as individually chosen)</p>
<b>Assessments</b>	<ol style="list-style-type: none"> <li>1. Class attendance &amp; participation/ readings 15% (Attendance is mandatory for passing the course.)</li> <li>2. Science Connections 10%</li> <li>3. Curriculum Planning Unit: 25%</li> <li>4. Class Presentation/ Lesson: 20%</li> </ol>

	<p>5. Critical Inquiry on Nature of Science: 15%</p> <p>6. Curriculum Reflection/Research: 15%</p>
<p><b>Required Readings</b></p>	<p>Bauer, H.H. (1992). <i>Scientific literacy and the myth of the scientific method</i>. University of Illinois Press. Urbana and Chicago.</p> <p>Duschl, R. (1990). <i>Restructuring science education. The importance of theories and their development</i>. Teacher's College Press, New York.</p> <p>Custom Courseware Readings, compiled by R. Schulz and J. Uppal, Faculty of Education, SFU.</p> <p>Science 8-10; Physics 11/12; Chemistry 11/12; Biology 11/12; <i>Integrated Resource Package (IRP)</i>. (1996). Ministry of Education, B.C (available on-line: <a href="http://www.bced.gov.bc.ca">www.bced.gov.bc.ca</a> )</p> <p>(ADDITIONAL READINGS may be made available in class as topics arise)</p>