SIMON FRASER UNIVERSITY

EDUCATION 476-4

DESIGNS FOR LEARNING: NATURAL SCIENCES

Regular Summer Semester, 1991	Instructor:	Dr. Allan MacKinnon
(May 6 - August 2)	Office:	MPX 8643
Thursdays, 1:00 - 4:50 p.m.	Phone:	291-3432
Location: MPX 7500F		

PREREQUISITE: Educ. 401/402 or equivalent.

GENERAL COMMENTS

This course is intended to provide a comprehensive conceptual framework for making sense of the events of curriculum and instruction in Elementary and Junior Secondary school science; it provides an introduction to thinking about science teaching and the practical skills required to do the job.

Teaching is a highly personal, disciplined art: nobody can tell someone else exactly how to do it, yet it is certainly possible to learn more useful ways to interpret what is happening in front of you as a teacher, and to modify what you do accordingly. In our study of science teaching we will examine the following topics:

a. What is science, and why should it be taught anyway?

b. Using philosophy of science to develop a sound conception of scientific process.

c. What is the "scientific method"? Does it really exist?

d. Are scientists "open-minded" and "objective"?

e. What makes an experiment an experiment?

f. What is the role of human purpose and interest in scientific inquiry?

g. What programs and materials are available to elementary science teachers?

h. How can we interpret what students say and do in the science classroom?

i. How do young children think about particular scientific concepts?

j. Setting realistic and defensible objectives.

k. Blending the same subject matter "content" with different "intentions" for students.

l. Parent and community involvement in science and technology.

m. Arguing for the defensibility of your own science program.

n. Constructing your own science curriculum materials.

o. Analysing and improving science teaching.

p. Tapping the research on science learning.

ASSIGNMENTS AND GRADING

Midterm

A mini-unit plan or theme study encompassing 5-6 lessons, according to a format I shall specify. This is to be accompanied by a short paper that links the specific subject-matter topic to a teaching strategy, which can then be predicted to result in students learning some selected message(s) about science. In addition, I am asking you to argue for the case that such learning is in the best interest of students. **(45%)**

Final

An analysis of a lesson, taught by you to a group of elementary or junior secondary school students. The format for analysis will be given in class. The lesson you choose should be part of your mini-unit plan or theme study that you develop for the mid-term assignment. The point of the exercise will be to identify an aspect of your own teaching-of-science that you would like to improve in the process of implementing your own curriculum plan. **(45%).**

Note: Detailed specification of these assignments is forthcoming. The remaining **10%** of your grade will be based on my assessment of your performance in class.

READINGS

Generally, readings will be xeroxed for you and handed out in class. Additional sources available in the library will be recommended at times.

REQUIRED TEXT

Driver, R., Guesne, E., & Tiberghien, A. (1985). Children's ideas in science. Open University Press.

Goldstein, M., & Goldstein, I. (1978). How we know: An exploration of the scientific process. New York: Da Capo Press.

Wassermann, Selma & Ivany, George. Who's afraid of spiders?

Among the recommended books are the following (these are NOT required):

Hawkins, D. (1974). The informed vision: Essays on learning and human nature. New York: Agathon Press.

Osborne, R.J., and Freyberg, F. (1985). Learning in science: The implications of children's science. Aukland, New Zealand: Heinemann.

Toulmin, S. (1960). The philosophy of science: An introduction. New York: Harper & Row.