

Instructor: John Czworkowski, Ph.D.
Office: 2258 Urey Hall
E-mail: jczworkowski@ucsd.edu (or better: use WebCT e-mail)
Office hours: Wednesdays 2:30–3:45 pm
Course website: <http://webct.ucsd.edu>

Course description and goals:

In this course, we will consider the following questions:

- How does research on human learning translate into practice in the science classroom?
- What are some recent innovations in science instruction that are grounded in research results?
- What kinds of preconceptions do students have about the natural world? How can instructional approaches build new scientific knowledge upon that foundation?
- What is the role of the teacher of science in the classroom? What do science teachers need to do their jobs properly?
- What is unique about science as subject-matter?

Participants in the course will have an opportunity to examine their own understandings about science; they will experience some innovative approaches to science instruction; and they will carry out practice exercises in teaching with their peers in the course. We will expect a productive interplay between this course and the experiences gained in the Practicum in Mathematics & Science Teaching/Learning (EDS 39).

Course materials:

1. Principal readings are from *How People Learn: Brain, Mind, Experience, and School: Expanded Edition* (2000). Free to read on-line at: <http://www.nap.edu/openbook.php?isbn=0309070368>
2. Additional readings and activities to be distributed during the quarter
3. Access to WebCT

Evaluation: Students will be evaluated on the basis of weekly homework assignments, classroom participation, an end-of-quarter in-class presentation, and the final exam. The relative weight of each of these components is as follows:

Homework:	25%
Participation:	25%
Presentation:	25%
Final exam:	25%

Homework: Homework assignments will consist of written analyses, incisive questions, summaries, and reflections based on the assigned readings, classroom discussions, and classroom activities. Students will post their homework assignments to WebCT.

Presentation: Each student will give a presentation during the last two weeks of the course on a science education topic or science teaching activity. Detailed guidelines on the presentation will be described in a separate handout.

Academic integrity is the foundation of a university. A core guideline of academic integrity for students is summed up in the following statement: *No student shall engage in any activity that involves attempting to receive a grade by means other than honest effort.* For details on the responsibilities of students with regard to academic integrity, and the manner in which cases of dishonesty may be handled, please review the UCSD Policy on Integrity of Scholarship at this web page:

<http://www-senate.ucsd.edu/manual/appendices/app2.htm>

- In this course, all assignments, and the final exam, are to be a student's individual work, unless otherwise specified by the instructor.
- Copying or paraphrasing the words or ideas of others without acknowledgment of the source and proper citation is plagiarism, and is therefore a violation of the standards of academic integrity.
- University guidelines require that an instructor report any suspected violation of academic integrity, such as unauthorized collaboration with other students on an assignment, or cheating on an exam.
- Any student found guilty of cheating or plagiarism on any assignment or exam in this course will receive a grade of F for the course.

Approximate course schedule:

Tuesday	Reading assignments and in-class activities
<u>Week 1</u> HPL*: pp. 3–28	In class: an alternative approach to teaching science Read Ch 1: Learning: From Speculation to Science
<u>Week 2</u> HPL: pp. 29–78	Read Ch 2: How Experts Differ from Novices Read Ch 3: Learning and Transfer
<u>Week 3</u> HPL: pp. 79–113	Read Ch 4: How Children Learn
<u>Week 4</u> HPL: pp. 114–154	Read Ch 5: Mind and Brain Read Ch 6: The Design of Learning Environments
<u>Week 5</u> HPL: pp. 155–189	Read Ch 7: Effective Teaching: Examples in History, Mathematics, and Science
<u>Week 6</u> HPL: pp. 190–205	Read Ch 8: Teacher Learning
<u>Week 7</u> HPL: pp. 206–230	Read Ch 9: Technology to Support Learning
<u>Week 8</u>	Supplementary reading assignment
<u>Week 9</u>	In class: presentations/instructional activities
<u>Week 10</u>	In class: presentations/instructional activities

Reading assignments will be discussed in class the week after they are assigned.

* HPL = *How People Learn: Brain, Mind, Experience, and School: Expanded Edition* (2000)