

**Ocean Science Literacy for School and Society**  
**Syllabus**  
**BIOL/EDMS 400**  
**Spring 2005**

**Instructors:**

- **Dr. Paula Lane,**  
**Assistant Professor of Science Education, School of Education**
  
- **Dr. Karina Nielsen,**  
**Assistant Professor of Biology, School of Science and Technology**

**Course Description:**

All students will participate in seminar and lab activities as well as rich field experiences to understand how science knowledge is created and communicated. Field experiences are designed to compliment the seminar topics related to ocean science. In addition, some field experiences take place in public school settings wherein University students will teach ocean science lessons to students in local K-12 classrooms. Through seminar and field experiences students are able to deepen conceptual understandings of fundamental science concepts, explore teaching as a career, develop strategies for teaching science to others, and become familiar with the state standards for science education.

**Course Goals and Objectives:**

Course focus is on rigorous ocean science content. Knowledge in science will be fostered by critical examination of concepts using inquiry while considering the role pedagogy plays in constructing deeper understandings. Course goals include fostering an appreciation of science education for a literate society and allowing the exploration of science education as a viable career. The course will combine ocean science instruction using inquiry-based teaching methods and learning pedagogy with supervised teaching experiences in a local school classrooms. Students will practice communicating scientific knowledge and receive mentoring on how to improve their presentations. Upon completion of the course students will have a deeper conceptual foundation of fundamental ocean science content knowledge.

This course will begin to prepare the multiple subject credential candidate for teaching science in the elementary classroom. Upon successful completion of the course, students will be able to: A. Use state and national standards for classroom science planning and teaching. B. Develop and modify science lessons for diverse learners. C. Develop and implement inquiry-based science lessons. D. Integrate science lessons with math and language arts. E. Use the web to identify and collect quality science lessons. F. Conduct a variety of assessments with students and analyze these products to alter teaching.

**Units: 4**

This innovative course is designed to support learning of both ocean science content and teaching methods. Learning of the content and teaching strategies, or pedagogy, require

3 hours per week of seminar and an additional 15 hours during the semester spent in the field for all students. Field work will consist of teaching lessons to students in local schools, trips to the Bodega Marine Laboratory and other coastal locations. These field class sessions held off campus will be coordinated with the instructors and will take place outside of the scheduled seminar time.

**Required Texts:**

1. Oceanography: An Invitation to Marine Science (5th Ed). 2005.  
Tom Garrison  
Publisher: Brooks/Cole; Belmont, CA
2. Course Reader

**Assessment and Evaluation:**

Attendance, class participation, in-class quick writes	30
Teaching in the field	30
Written assignments	30
<u>Final presentations and self-evaluation</u>	<u>10</u>
<b>TOTAL POINTS AVAILABLE</b>	<b>100</b>

**Class Session Components:**

- Hands-on science tasks
- Assessments
- Discussion
- Preparation to teach in the field
- Presentations
- Video analysis of teaching

**Field Components:**

All students are required to teach 4-5 approved ocean science lessons in a K-12 local classroom, aligned to state standards, under the supervision of the instructors. In addition, there are required field trips to **Bodega Marine Lab, other coastal locations.**

**Course Schedule:**

<b>Week</b>	<b>Date</b>	<b>Topic</b>	<b>Assignments</b>
1	Jan 31	Intro to Teaching Science: Mollusk Madness Experiment	
2	Feb 7	The Process of Science: Rocky Seashore	
3	Feb 14	Comparing Teaching Approaches: Rocky Seashore FIELD TRIP: Bodega Marine Lab	
4	Feb 21	Building Towards Inquiry: Sandy	Lesson/Unit

		Beach	Proposals Due
5	Feb 28	Blank Slates or Clever Minds: Sandy Beach FIELD TRIP: Elementary Classroom	
6	Mar 7	Questioning Strategies: Wetlands	
7	Mar 14	Questions Lab: Wetlands, ESL DEMONSTRATION LESSON	Field: Observe teacher and classroom
8	Mar 21	Promoting Discussion: Kelp Forest	
9	Mar 28	Assessment: Kelp Forest	Field: Teach
10	April 4	Designing Lessons: Open Ocean	Field: Teach
11	April 11	Creating an Inclusive Learning Environment: Open Ocean,	Field: Teach
12	April 25	Consultations on Teaching	Field: Teach
13	May 2	Consultations on Teaching	Field: Teach
14	May 9	Analysis of Teaching Videos	
15	May 16	Self-Assessments: To Teach or Not to Teach	
16	May ?	(Exam Week) Synthesis of Learning	Presentation of Final Projects

### **Attendance Policy:**

The activities and discussions that take place during class cannot be made up or duplicated--they are lost to you if you are not present in class when these events take place. If you must miss a class, please notify the instructor as soon as possible. **Missing more than two classes may result in a lowering of the course grade.** In addition, please make every effort to be on time so that you do not disturb your peers who may have already begun an activity or discussion.

### **Disability Accommodations:**

If you have a disability that requires accommodation in this class, you must notify the instructor before the third week of class regarding the nature of the accommodation you need. You must register with the SSU campus Disability Resource Center located in Salazar 1049, (Phone: 707-664-2677). The Center will then provide you written documentation of your verified disability and the recommended accommodations, which you must present to the instructor.

### **SSU Policy on Cheating and Plagiarism:**

It is the policy of Sonoma State University to be pro-active in dealing with issues of cheating and plagiarism. Faculty are encouraged to discuss with students academic ethics and the formulation of one's own intellectual material. It is also the policy of Sonoma State University to impose sanctions on students who cheat or plagiarize. Students are

expected to be honest in meeting the requirements of the courses in which they are enrolled. Cheating or plagiarism is dishonest, undermines the necessary trust upon which relations between students and faculty are based, and is unacceptable conduct. Students who engage in cheating or plagiarism will be subject to academic sanctions, including a lowered or failing grade in a course; and the possibility of an additional administrative sanction, including probation, suspension, or expulsion.

### **Bibliography of Readings:**

*Executive Summary: An Ocean Blueprint for the 21<sup>st</sup> Century*, U.S Commission on Ocean Policy, pp. xxxi-liv, 2004, Public Domain.

*The Nature of Science and Habits Of Mind*, from Benchmarks for Science Literacy, American Association for the Advancement of Science Project 2061, pp. 3-8; 281-287, © 1993, Oxford University Press.

*Improving Instruction*, from Achieving Scientific Literacy: From Purposes to Practices, Roger W. Bybee, pp. 167-186, © 1997, Heinemann.

*A Scientist's Perspective on Inquiry and Inquiry in the National Science Education Standards*, from Inquiry and the National Science Education Standards: A Guide for Teaching and Learning, National Academy of Science, pp. Xi-xiv; pp. 13-37, © 2000, National Academy Press.

*Children's Own Concepts*, from Primary Science: Taking The Plunge, Roger Osborne (Wynne Harlen, Ed.), pp. 75-91, © 1985, Heinemann Educational.

*The Right Question at the Right Time*, from Primary Science: Taking The Plunge, Jos Elstgeest (Wynne Harlen, Ed.), pp. 36-46, © 1985, Heinemann Educational.

*Helping Children Raise Questions-And Answering Them*, from Primary Science: Taking The Plunge, Sheila Jelly (Wynne Harlen, Ed.), pp. 47-57, © 1985, Heinemann Educational.

*Dialogic Instruction: When Recitation Becomes Conversation*, from Opening Dialogue: Understanding the Dynamics of Language and Learning in the English Classroom, Martin Nystrand, pp. ix-xii; pp.1-29, © 1997, Teachers College Press.

*The Case for Strengthening Assessment in the Science Classroom*, from Classroom Assessment and the National Science Education Standards, National Academy of Sciences, pp. 11-21, © 2001, National Academy Press.

*What Is Backward Design?*, from Understanding by Design, Grant Wiggins and Jay McTighe, pp. 7-19, © 1998, Merrill Prentice Hall.

*What Teachers Need to Know About Language*, from English Language Learners: Informing Our Practice, California Journal of Science Education, pp. 5-68, © 2003, California Science Teachers Association.