The Science Literacy Program (SLP) at the University of Oregon

Co-Directors - Judith Eisen (Biology), Michael Raymer (Physics)
Program Coordinator (tba) - PhD level position (NTT but continuing)

Funded by the Howard Hughes Medical Institute (at $1.5M)

• a broad faculty initiative of the research faculty
• emphasis on general science literacy courses for non-science majors
• across Physics, Biology, Chemistry, and Geology
• engagement of undergraduate and graduate science majors in co-teaching courses for non-science majors
• new patterns of interaction within UO and an infrastructure to support different ways of working together across disciplinary lines, across roles (faculty, graduate students, undergraduate students)
• strong support from Department Heads and College Dean
# Needs and Activities of Participants

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<th>Participants</th>
<th>Needs of Participants</th>
<th>Activities</th>
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| Non-science Students | greater science literacy  
( as defined tentatively above)  
| enroll in courses taught using active learning |                                                        |
| Science Students   | competence in communication and new teaching pedagogy  
• skill to engage public  
• stimulation to pursue teaching career  
• deeper understanding of subject  
• ability to understand public policy | co-instruct courses with faculty;  
co-develop courses with faculty;  
attend training workshops |
| Faculty            | better teaching skills;  
increased interest in teaching General Science courses;  
collegial and institutional support and recognition | develop & teach courses;  
develop tools;  
mentor co-instructors;  
attend training workshops |
Science Literacy Program Fellows - Undergraduate and Graduate Science Majors

- co-instruct courses with faculty
  - successful in earlier trials with grad students
  - now trying with undergrads
- co-develop new courses with faculty
- reinvent existing course with faculty
- attend journal club and training workshops
- enroll in new course exploring contemporary issues in pedagogical and social aspects of science literacy
  1) research into teaching pedagogy & techniques
  2) research into outcomes assessment

Time commitment:
- 50% of time for 1-4 terms (funded by HHMI grant)
- remainder of support on regular research grant or other
- optional enrollment in SLP courses for credit
Science Literacy Journal Club

Read and discuss current results in science education research

Winter Term 2011

WEEKS 1, 2  Interactive, Inquiry-based Lecture Structure
WEEKS 3, 4  Assessment
WEEKS 5, 6  Peer Instruction
WEEKS 7, 8  ISLE-Investigative Science Learning Environment
WEEKS 9,10  Multiple Choice Questions

authors: Sokoloff, Thornton, Mazur, Etkina, Redish, Wieman ...

~20 participants from 4 departments;
undergrads, grads, faculty, staff working together in self-guided activity;
alternate weeks are activity based or reading based
Ways that student teaching fellows enhance existing and new general science courses.

- For faculty, working with student fellows is stimulating and invigorating, improving course quality.

- Student fellows bring a fresh, honest approach to using modern pedagogy methods.

- Student fellows can model scientific learning for undergrads, and communicate with them closer to their own level.

- Having student fellows lecture for a portion of a class period can re-engage a class that might be drifting off.

- Having two co-instructors allows for in-class dialog between them, showing that a class is not strictly one-way.

- Student fellows can check homework assignments for clarity and relevance.
New Courses being taught or under development

1. Scientific Revolutions (geology, physics, cross listed)
evolution, quantum mechanics, and global climate change

Kuhn’s *Structure of Scientific Revolutions*,

We will use these examples to consider how science is taught in general education college courses, and to develop better ways of communicating these concepts.

2. Quantum Mechanics and the Molecules of Life (chemistry, physics, cross listed)
quantum mechanics, information, molecular orbitals, protein structure, DNA

Schrödinger’s *What is Life?*

We will consider how to use the concept of modeling to understand science

3. The Human Genome & Human Diseases (biology, chemistry, cross listed)

4. Course on pedagogy (tba)
Faculty Participation

- Enable faculty to develop new multidisciplinary general education science courses

Requirements for this to work:
1) departmental cooperation
2) regular course buyouts for course development
3) involvement of student teaching fellows
4) modern pedagogy & techniques
5) involvement of and enhancement of UO Teaching Effectiveness Program
6) Develop means to provide credit/incentives to involved faculty
Program Assessment (the Hardest Part)

• Assessment of success of general education science courses
  1) Are non-science students more science literate?
  2) Develop assessment strategies
  3) Implement recommendations

• Assessment of success of SLP fellows
  1) Are they better teachers/communicators - assess what they have learned and strategies
  2) Implement recommendations