

**The Ohio State University
Colleges of the Arts and Sciences New Course Request**

Academic Unit _____

Arts and Sciences

Book 3 Listing (e.g., Portuguese) _____

Number	Title	Grad	Level
710 710	Graduate Seminar in Scientific Literacy	Grad	5
18-Character Title Abbreviation		Level	Credit Hours

Summer Autumn WinterX Spring Year 2008

Proposed effective date, choose one quarter and put an "X" after it; and fill in the year. See the OAA curriculum manual for deadlines.

A. Course Offerings Bulletin Information

Follow the instructions in the OAA curriculum manual. If this is a course with decimal subdivisions, then use one New Course Request form for the generic information that will apply to all subdivisions; and use separate forms for each new decimal subdivision, including on each form the information that is unique to that subdivision. If the course offered is less than a quarter or a term, please complete the Flexibly Scheduled/Off Campus/Workshop Request form.

Description (*not to exceed 25 words*): Explores nature of scientific literacy, scientific thought, roots of western science and technology and the relationship between scientific and other forms of literacy

Quarter offered: winter Distribution of class time/contact hours: 4 hours/week class time
 Quarter and contact/class time hours information should be omitted from Book 3 publication (yes or no):

Prerequisite(s): none

Exclusion or limiting clause: _____

Repeatable to a maximum of _____ credit hours.

Cross-listed with: _____

Grade Option (Please check): Letter S/U Progress What course is last in the series? _____

Honors Statement: Yes No GEC: Yes No Admission Condition
 Off-Campus: Yes No EM: Yes No Course: Yes No
 Embedded Honors Statement: Yes No

Other General Course Information: _____
 (e.g. "Taught in English." "Credit does not count toward BSBA degree.")

B. General Information

Subject Code _____ Subsidy Level (V, G, T, B, M, D, or P) M
 If you have questions, please email Jed Dickhaut at dickhaut.1@osu.edu.

- Provide the rationale for proposing this course:
 Success in the workplace and as a citizen require scientific literacy. It is unclear how to change teaching of science to accomplish this. Course explores roots of scientific thought, the nature of science in relation to other modes of thought, relationship of scientific literacy to other forms of literacy and how to fashion effective teaching strategies.

2. Please list Majors/Minors affected by the creation of this new course. Attach revisions of all affected programs. This course is (check one): Required on major(s)/minor(s) A choice on major(s)/minors(s)
 An elective within major(s)/minor(s) A general elective:

3. Indicate the nature of the program adjustments, new funding, and/or withdrawals that make possible the implementation of this new course.
 none

4. Is the approval of this request contingent upon the approval of other course requests or curricular requests?
 Yes No List:

5. If this course is part of a sequence, list the number of the other course(s) in the sequence: NO

6. Expected section size: 10-15 Proposed number of sections per year: 1

7. Do you want prerequisites enforced electronically (see OAA manual for what can be enforced)? Yes No


8. This course has been discussed with and has the concurrence of the following academic units needing this course or with academic units having directly related interests (List units and attach letters and/or forms):
 Not Applicable

9. Attach a course syllabus that includes a topical outline of the course, student learning outcomes and/or course objectives, off-campus field experience, methods of evaluation, and other items as stated in the OAA curriculum manual and e-mail to ascurofc@osu.edu.

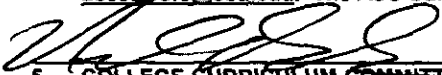
Approval Process The signatures on the lines in ALL CAPS (e.g. ACADEMIC UNIT) are required.

1. Academic Unit Undergraduate Studies Committee Chair Printed Name Date

2. Academic Unit Graduate Studies Committee Chair Printed Name Date

 LINDA G. SCHOEN 5/14/07
 3. ACADEMIC UNIT CHAIR/DIRECTOR Printed Name Date

4. After the Academic Unit Chair/Director signs the request, forward the form to the ASC Curriculum Office, 105 Brown Hall, 190 West 17th Ave. or fax it to 688-5678. Attach the syllabus and any supporting documentation in an e-mail to ascurofc@osu.edu. The ASC Curriculum Office will forward the request to the appropriate committee.

 Alex Baker 5/11/07
 5. COLLEGE CURRICULUM COMMITTEE Printed Name Date

6. ARTS AND SCIENCES EXECUTIVE DEAN Printed Name Date

7. Graduate School (if appropriate) Printed Name Date

8. University Honors Center (if appropriate) Printed Name Date

9. Office of International Education (if appropriate) Printed Name Date

10. ACADEMIC AFFAIRS Printed Name Date

Arts and Sciences 720
A Graduate Seminar in Scientific Literacy
Winter 2008

Instructor: Professor Susan Fisher
Department of Entomology
400 Aronoff Laboratory
Phone: 292-8209
Email: fisher.14@osu.edu

Course Rationale: It is increasingly clear that success in the workplace and effectiveness as a citizen require scientific literacy. Despite the growing need to be scientifically literate, there is significant debate over what the term actually means and a growing consensus that our methods for teaching scientific literacy succeed only in making science inaccessible and irrelevant to students. Evidence of the problem is all around us: In 1980, the Ohio Poll determined that 80% of Ohioans believed in a geocentric universe in which the sun revolves around earth. In 2000, 76% of Ohioans agreed with this view. In 2005, 60% of Ohioans agreed with the statement: "Humans were created in their present form about 6,000 years ago." Recent efforts by the State Board of Education to amend science standards to permit inclusion of "Intelligent Design" as a **scientific** alternative to evolution suggests that not only are our citizens ignorant of scientific content, but that they have difficulty separating scientific thought from other modes of thinking.

This is a foundational course that ^{has} several goals:

To define scientific literacies and understand the different types of scientific literacies;

To develop an understanding of the historical roots of western science and technology;

To understand the nature of science and how it is different from other modes of thought;

To explore the relationship between scientific literacy and other forms of literacy, e.g., written, visual, spatial;

To probe how the teaching of science must change in order to achieve scientific literacy and the role of technology in facilitating this change;

To understand the relationship between science literacy, ethics and the citizen scientist.
To explore the relationship between science, ethics and moral reasoning.

Class meeting schedule: T,R 1:30-3:18

Office hours by appointment

Class Format: The Tuesday class meeting will normally consist of a didactic lecture and discussion led by Professor Fisher on the topic selected for the week. Thursdays will be devoted to student seminars and discussions.

Grading and Evaluation: Seminars are designed to foster independent thinking through discussion of assigned readings and leadership of seminars. Your grades will be determined as follows:

Assigned readings: Several readings will be assigned to the class each week. When possible, the materials will be posted on Carmen. Sometimes, the readings will be available on-line. Books will be placed on reserve in the library. Students are expected to have read the materials before coming to class on Tuesday. In addition, students are asked to come to class prepared with written questions derived from the readings and assessments of the readings. You may be called upon in class to share your questions. The quality of the questions will be evaluated for their insight, comprehension and originality and will constitute 10% of the final grade.

Student Journals: Students will write and turn in 5 1-2 page papers based on the weekly readings. These are not to be synopses of the readings. Rather, the journal entries are meant to analyze the reading materials, present strengths and weaknesses, comment on the cogency (or lack thereof) of the arguments made and connections to other areas of scientific literacy. The journals are due at the end of week eight. Twenty percent of the final grade will be determined by the journal entries. Please note, the journals are not meant to be merely an expression of your opinion about the reading materials. An analysis of the material is expected.

On-line student evaluation of journal entries will occur during weeks 4-8 of the quarter. Each student will be asked to file one of his journal entries on Carmen which he considers particularly well done. Other students in the class will comment on the entry. Students may respond to posted comments on Carmen as well to facilitate a discussion of relevant issues.

Student Seminars: Each student will be responsible for leading a Thursday seminar during the quarter. Each student will choose and disseminate reading material to the class at least 2 days prior to the seminar. Each student seminar will consist of a review of pertinent literature in the field, a 40-60 minute presentation of the material, followed by a one-hour discussion led by the student. Finally, the student seminar leader will write a 10 page paper on his or her topic that summarizes the literature and presents ideas for further exploration. Papers are due at the end of week nine. Seventy percent of the final grade will be determined from the seminar and paper. A list of topics that students might choose will be disseminated the first week of class. However, you are not limited to this

list. Approval of the topic by the instructor by the second Monday of the quarter is required.

Absences and Late Work: Delayed work will suffer reduced credit. A reduction of 20% of the possible points is levied for each day late unless a valid medical excuse is presented.

Academic Misconduct: OSU has a strict code of academic conduct that requires us to report any and all cases of suspected misconduct (e.g. cheating on exams, plagiarism etc.) to the OSU Committee on Academic Misconduct for adjudication. I adhere to this policy.

Week	Topic
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1	What is Scientific Literacy?
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Godin, B. and Y. Gingras (2000). What is scientific and technological culture and how is it measured? A multidimensional model. *Public Understand. Sci.* 9: 43-58.

Hively, W. (1988). How much science does the public understand? *Am. Scientist* 76: 439-444.

Roth, W.-M. and A.C. Barton (2004). *Rethinking Scientific Literacy*. Routledge Falmer, publisher, N.Y., London, chpts. 1&2.

2	Historical Roots of Scientific & Technological Literacy
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Gates, D. and T. Clifton (1988). Say Goodnight Socrates (Stanford University and the Decline of the West). *Newsweek*, Feb. 1, 1988.

Kuhn, T.S. (1970). *The Structure of Scientific Revolutions*. 2nd Ed. The University of Chicago Press, chpt. 1.

Eugene-Ferguson (1977). The Mind's Eye: Nonverbal Thought in Technology. *Science* 197: 827-836.

Stevens, E. (1995). *The Grammar of the Machine: Technical Literacy in the Early Industrial Expansion in the United States*. Yale University Press.

Hall, A.R. (1973). *The Revolution in Science, 1500-1750*. 3rd Ed. Longman, London, chpts. 1-3.

Burnham, J.C. (1987). *How Superstition Won and Science Lost; Popularizing Science and Health in the US*. Rutgers University Press, New Brunswick, Chpts 1-4.

Brock, W.E. (1987). The Bozeman Chainsaw Massacre. *Discover* (November) 119187: 79-85.

3 **Types of Scientific Reasoning, Objectivity, Disciplinary Differences in the Scientific Methods**

Scott, E. (2004). *Evolution vs. Creationism*. University of California Press, Berkeley, Los Angeles, London, chpts 1 & 2.

Carrier, R. (2001). Test Your Scientific Literacy!
http://www.infidels.org/library/modern/richard_carrier/SciLit.html

Blystone, R.V. and K. Blodgett (2006). The Scientific Method. *CBE Life Sci Educ*. 5(1): 7-11.

Tabak, I., B.K. Smith, W. A. Sandoval and B.J. Reiser (1996). Combining General and Domain-Specific Support for Biological Inquiry. *Proc. ITS*, June, 1996: 1-9.

4 **Science, Pseudoscience, Religion and how to tell the difference**

Scott, E. (2004). Beliefs: Religion, Creationism and Naturalism. In: *Evolution and Creationism*, University of California Press, pp. 47-70.

Clark, J.F.M. (2006). History from the Ground Up: Bugs, Political Economy, And God in Kirby and Spence's *Introduction to Entomology*. *Isis* 97: 28-55.

5 **The Role of Technology in Shaping Science; How do ethics Figure into scientific literacy?**

Gould, S.J. (1998). The Great Asymmetry. *Science* 279: 812-813.

Hall, A.R. *The Revolution in Science, 1500-1750*. Chpts 5,6.

Augustine, N. (1998). What we don't know does hurt us. How scientific Illiteracy hobbles society. *Science* 279: 1640-1641.

6

Redesigning Science Curricula

Hodson, D. (2002). Some Thoughts on Scientific Literacy: Motives, Meanings and Curriculum Implications. *Asian-Pacific Forum on Science Learning and Teaching* 3: 1-5.

7

The Interdependence of Science Literacy and Visual Literacy: Using Art to Teach Science

Wise, M.N. (2006). Making Visible. *Isis* 97: 75-82.

Smith, P. (2006). Art, Science and Visual Culture in Early Modern Europe. *Isis* 97: 83-100.

Morus, I.R. (2006). Seeing and Believing Science. *Isis* 97: 101-110.

Miller, A.I. (2000). *Insights of Genius*. MIT Press.

8

Toward A Citizen Scientist: Scientific Literacy and Public Discourse

Miller, J.D., (1998). The measurement of civic scientific literacy. *Public Understanding of Sci.* 7: 203-223.

Shortland, M. (1994). Advocating science: literacy and public Understanding. *Impact of Science on Society* 38, No. 4: 305-316.

9

Case Study on Sequencing the human genome: How do science and technology determine treatment of disease, cloning, stem cells? Can scientific literacy affect the outcome?

10

Case Study on Global Warming: How do science and technology influence the debate? What is the role of literacy?