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Courses in science writing as literature

Mark Littmann

The best nonfiction science books and articles demonstrate that accurate science can be presented to the public so that it is understandable, yet as gripping as fine fiction. Some of these works serve as examples for students taking science-writing workshops. However, programs in science writing, journalism, English, the sciences, and medicine may benefit from offering a course that explores science writing as literature. Nonfiction books published each year outnumber fiction books by more than six to one, yet relatively few nonfiction literature courses exist, and science-writing-as-literature courses are rare, although popular with students. Courses in science writing as literature are known to have been taught at six universities. Courses have varied in emphasis (biology, medicine, general) and approach (one compared scientists and nonscientists as science writers). This report surveys the readings and features of existing courses.

1. Introduction

Since 1994, a course called Science Writing as Literature has been taught six times (including spring term 2004) by the author as part of the Science Communication Program in the School of Journalism and Electronic Media at the University of Tennessee. The premise of the course is that science—accurate science—can be presented to a general readership so that it is understandable, yet as gripping as fine fiction. Science Writing as Literature is a 3-credit-hour course that offers both undergraduate and graduate credit.

Almost all the science communication programs identified in the *Directory of Science Communication Courses and Programs in the United States* (Dunwoody et al., 1996) offer a course in science writing (or a more specialized course such as environmental writing), but these are writing workshops rather than literature courses that study science writing. These writing workshops use exemplary science writing as models for student writers, but the study of the literature of science writing is not the focus of these courses.

The University of Tennessee course in Science Writing as Literature is unusual but not unique. In the most recent *Directory of Science Communication Courses and Programs in the United States*, no other science-writing-as-literature courses are listed, but correspondence with faculty in some of these programs, an inquiry posted on the NASW-Teach listserv of the National Association of Science Writers, and an Internet search led to the identification of three other courses. This article offers a rationale for science-writing-as-

literature courses and brief descriptions of recently offered courses for the purpose of comparing notes with those who may be teaching or wish to consider teaching science writing as literature.

2. A note about terminology

The dictionary definition of *literature* is anything written. But when the phrases “a work of literature” or “literature course” are used, *literature* means something written that has been canonized by influential people (usually publishers, critics, and teachers) as especially meritorious in some way. Literature courses can be organized around almost any principle: genre, history, nationality, philosophy, politics, sociology, style, individual writers, subject matter, and so on. Frequently, courses are organized on a combination of these categories, such as Marxist plays in Depression-era America.

Courses such as Science Writing as Literature are organized around subject matter, taking as their focus works that incorporate a substantial amount of science (accurate for its period) and the explanation or demonstration of that science for a general audience rather than exclusively for an audience of scientists. By “science,” the teachers of science-writing-as-literature courses mean to include engineering and medicine.

The subject matter of science-writing-as-literature courses can be narrowed down further. One way is by focusing on genre—science fiction or science nonfiction. Another is by focusing on style—such as literary journalism. Another is by period—such as contemporary. Even the subject matter of science can be subdivided—concentrating on biology, for instance.

As the name implies, a nonfiction science-writing-as-literature course takes as its subject matter the *literature of science*, focusing on *creative nonfiction* and frequently *literary journalism*. The *literature of science* is any scientific writing and writing about science, encompassing everything from technical scientific reports to popular science works. A course in science writing as literature might begin by examining the differences between technical science writing (whose audience is other scientists) and popular science writing (whose audience is the general public), but the course centers on popular science writing of good quality. Good-quality popular science writing tries to do more than just convey information: it tries to find ways to make the information memorable and enjoyable. Such science writing is a form of *creative nonfiction*. Some creative nonfiction is referred to as *literary journalism*, a style of creative nonfiction that uses storytelling techniques typical of fiction to present nonfiction stories: a plot with conflict and resolution, in-depth character delineation, extensive scene setting, immersion reporting, and a distinctive narrative voice. When popular science is presented in literary journalism style, it can be called *literary science journalism*.

Examples of literary journalism assigned in science-writing-as-literature courses are John McPhee’s *In Suspect Terrain*, Jon Franklin and Alan Doelp’s *Not Quite a Miracle*, and Tom Wolfe’s *The Right Stuff*. But none of the presently known science-writing-as-literature courses is devoted exclusively to literary journalism (although that would be possible). Creative nonfiction science works read in some of these courses that do not fit the common definition of literary journalism but do have literary merit include Richard Selzer’s “Liver,” Olivia Judson’s *Dr. Tatiana’s Sex Advice to All Creation*, and Rachel Carson’s *Silent Spring*.

3. Rationale for a science-writing-as-literature course

A course in science writing as literature might be a valid and valuable offering in a journalism or English curriculum, especially in conjunction with a science communication or science writing or nonfiction writing program.

First, a science-writing-as-literature course demonstrates that nonfiction writing in general, and nonfiction writing about science in particular, can be as artistic and exciting as good fiction. A course in science writing as literature allows students to consider the use of plot, characters, action, setting, and language manifested in a different genre—science nonfiction.

Second, a science-writing-as-literature course helps students to discover how writers have made scientific information interesting and understandable to the general public. That communication skill is important in our increasingly technological society for people who have choices to make and who want to understand how nature works.

Third, a science-writing-as-literature course is interdisciplinary, a trait sought by some colleges and universities. Students in the course explore science presented in literary form and literature as a vehicle for science.

Fourth, although many English departments have creative writing programs and some of those include creative nonfiction *writing*, only a small minority of English departments offer courses in nonfiction *literature*. Yet the number of nonfiction titles published each year exceeds the number of fiction titles by a ratio of more than 6 to 1. For 2001, *The Bowker Annual: Library and Book Trade Almanac* reports that 98,620 nonfiction titles were issued, compared to 15,867 fiction titles (Barr, 2002: 548). Thus, a vast amount of literature goes unexamined for literary merit by students.

Fifth, the literature of science writing is attractive not just to students in a science communication program or to students majoring in journalism, public relations, and broadcasting, but also to students in many different fields throughout the university. In Science Writing as Literature at the University of Tennessee, the students enrolled have come from everywhere on campus: anthropology, cell biology, English, entomology, exercise physiology, health education, information sciences, nursing, philosophy, physics, psychology, speech communication, and College Scholars (an interdisciplinary honors major). Since 2000, science majors have averaged one-third of the enrollment. This mixture of science and humanities majors in the class generates lively and well-informed discussions.

Sixth, the course provides an intensive exposure to creative and effective science writing, which can provide inspiration and a set of strategies and tools for students who may wish to try their hand at science writing.

4. A course featuring biology

An Internet search for science-writing-as-literature courses identified one other, created and taught for the first time in spring term 2003 by Barry Palevitz, professor of plant biology at the University of Georgia. The course, also called Science Writing as Literature, has a plant biology course number. The students in the course (ten undergraduates and one graduate) came from a variety of majors, including English, physics, Romance languages, communications, and biology. The class had no prerequisites. “My only criteria for accepting students into the course,” says Palevitz, “were a love of reading, a willingness to talk about what they read, and an interest in science. Generally the discussions were candid and animated” (personal communication, 16 June 2003).

Palevitz's Science Writing as Literature course assigned both fiction and nonfiction. Central to his course were Dr. Suess' *The Lorax*, Dava Sobel's *Galileo's Daughter*, and Richard Preston's *The Cobra Event*. Palevitz's nonfiction reading list included selections from Charles Darwin, Stephen Jay Gould, and E.O. Wilson, plus Aldo Leopold's *A Sand County Almanac*, Vincent Dethier's *Crickets and Katydid*s, *Concerts and Solos*, Ira Levin's *The Boys from Brazil*, and Janisse Ray's *Ecology of a Cracker Childhood*. His readings from science-informed fiction included selections from Ray Bradbury's *The Martian Chronicles*, Robin Cook's *Vector*, Barbara Kingsolver's *Prodigal Summer*, Verlyn Klinkenborg's *The Rural Life*, and Mary Shelley's *Frankenstein*. Of his first offering of Science Writing as Literature, Palevitz notes, "Because I am a biologist by trade, we read only biology." Next time, however, his list will include cosmology, physics, science history, and anthropology.

5. A course featuring medicine

For spring term 2000 at King College in Bristol, Tennessee, adjunct faculty member Claire Betterton created and taught Science and Medical Writing, an upper-division science-writing-as-literature course that attracted 21 students. Most were science majors—in mathematics, engineering, computer science, and pre-med—but there were also majors in business, English, and religion.

Her reading list included all or selections from Diane Ackerman's *A Natural History of the Senses*, Paul de Kruif's *The Microbe Hunters*, Annie Dillard's *Pilgrim at Tinker Creek*, Loren Eiseley's *The Star Thrower*, Michael Faraday's "The Chemical History of a Candle," Jon Franklin's "To Catch a Mouse" and "Mrs. Kelly's Monster," Alan Lightman's *Dance for Two*, Mark Littmann's *Planets Beyond*, John McPhee's *In Suspect Terrain*, Berton Roueche's *The Medical Detectives*, Richard Selzer's *Mortal Lessons*, Dava Sobel's *Longitude*, and Lewis Thomas' *The Lives of a Cell*. Betterton reports that the response to the course was very favorable, and she would have taught the course again had she and her husband not moved away (personal communication, 18 September 2003).

6. A course comparing scientists and nonscientists as science writers

Jonathan Weiner, Pulitzer Prize-winning author of *The Beak of the Finch*, has taught science-writing-as-literature courses as a visiting professor at Princeton University (1999), Rockefeller University (2000, 2001), and Arizona State University (2001). In his syllabus, Weiner describes his approach: "Darwin and Thoreau both wrote about ants, but their texts could hardly be less alike, even though the two authors were contemporaries. We will read a series of texts in which a scientist and a writer look at the same subject, and we will examine the different pleasures we get from each" (personal communication, 3 December 2003).

The duos included Charles Darwin and Herman Melville writing about the Galapagos Islands, and Peter Medawar and Virginia Woolf writing about death and the naturalist. Weiner also explores the earliest popular science writing, again by both scientists (Galileo and Van Leeuwenhoek) and nonscientists (Lucretius and Fontanelle). Furthermore, he examines the spectrum stretching from science nonfiction to fiction-that-incorporates-science, as exhibited in three works by Richard Preston: "The Shoemaker Comets" section of *First Light*, *The Hot Zone*, and the beginning of *The Cobra Event*. Of these books, Weiner says, "The first reads like a novel. The second reads like a thriller. The third is a thriller."

Weiner has widely varying reading lists for Nature and the Writer (his course at Princeton) and Science and Literature (at Rockefeller) that include nonfiction by himself, John Tyler Bonner, Jared Diamond, Annie Dillard, James Gleick, Primo Levi, Bill McKibben, John McPhee, Dava Sobel, Oliver Sacks, E.O. Wilson, and Robert Wright; plus fiction by Andrea Barrett, Sue Hubbell, Sanjay Nigam, and Richard Power.

7. John McPhee

The most famous nonfiction literature course is probably The Literature of Fact, taught since 1975 at Princeton University by Pulitzer Prize-winning author John McPhee. It is widely cited as a science-writing-as-literature course, but McPhee disavows this label. “My course is not devoted to science writing . . . It’s a plain writing course with no thematic base . . . There’s no syllabus. Reading varies each year. Mostly, I give them books of mine to read (such as *The Deltoid Pumpkin Seed* and *Looking for a Ship*)” (personal communication, 21 November 2003).

8. Literature of medicine in medical schools

The literature of science and medicine is taught in an increasing number of medical schools. The rationale for these courses is that literature offers doctors-in-training:

- Insight into the values and experiences of doctors, patients, and families
- Increased skills in observation, interpretation, and imagination
- Models for clarity in language
- Enriched moral education
- The ability to adopt other people’s perspectives, to follow a complex story, and “to recognize the multiple, often contradictory meanings of events that befall human beings”
- Enhanced tolerance for the uncertainties of clinical practice
- Encouragement to empathize with their patients (Hunter et al., 1995).

These literature courses span a broad range of focus and content. Some are writing workshops. Of those that are literature courses, some feature primarily nonfiction books and articles about medicine, especially those written by physicians. Other courses assign only works by medical doctors, but the genre may be poetry, fiction, or nonfiction and the subject may or may not be medical or scientific. These literature courses are almost all discussion-based seminars. They are electives, tend to meet for fewer hours than regular college or graduate school courses, and are usually non-graded.

Although many medical humanities offerings are literature courses, none seem to be science-writing-as-literature courses. Instead, the readings serve as bases for the discussion of ethical, psychological, and sociological issues raised by the stories, rather than focusing on the literary artistry of the work and how the scientific and medical information in the text is conveyed and to what effect.

Medical humanities courses, including literature, have become so prominent in the training of doctors that in October 2003 the journal *Academic Medicine* published a special themed issue on medical humanities programs, featuring articles and reports by the faculty of 31 medical humanities departments.

9. Courses in the literature of nature

Although science-writing-as-literature courses seem to be rare, there are numerous “literature of nature” courses. Some are nature-writing workshops, but most are literature courses that focus on the analysis of existing texts. The Association for the Study of Literature and Environment, an affiliate of the Modern Language Association, displays at its website (<http://www.asle.umn.edu/>) the syllabi for nearly 150 courses that study the literature of nature across the genres of nonfiction, fiction, poetry, and sometimes theater and film. Their reading lists typically contain at least as much fiction as nonfiction. Most literature-of-nature courses are offered by English departments, but departments of environmental studies, geography, and American studies are represented as well.

Most often, the syllabi describe the purpose of these literature-of-nature courses as one of the following:

- Tracing the literary history and the changing perspectives of nature writing, typically from the howling wilderness of the eighteenth century through the transcendentalism of the nineteenth century to the realism and environmental alarm of the twentieth century
- Exploring man’s relationship to nature, often with the explicit intention of bringing students closer to nature in a philosophical or ethical sense, and involving the question of how people should live
- Studying different views of nature.

These literature-of-nature courses resemble science-writing-as-literature courses in that their subject is in the realm of science, and almost all of them discuss the esthetics of their readings. However, based on their syllabi, these literature-of-nature courses differ from the science-writing-as-literature courses examined here in that no mention is made of studying the works for their scientific content and analyzing how and to what effect the writer communicated it. If there are literature-of-nature courses that more closely resemble Jonathan Weiner’s *Nature and the Writer* and the other science-writing-as-literature courses described in this article, the author would be grateful to hear about them. Literature-of-nature courses that examine the communication of science might be thought of as science-writing-as-literature courses with a special emphasis.

10. A closer look at one science-writing-as-literature course

The Science Writing as Literature course at the University of Tennessee has a seminar format. The class proceeds by discussion, with the instructor helping students make empirical discoveries about the works. The instructor lectures as seldom and as briefly as possible, primarily to identify techniques an author is using that may be unfamiliar to students, leading into a discussion of the effects of those techniques. Explanations might include tropes (such as synecdoche), archetypes (such as *eirón* and *alazón*), story presentation (such as *in medias res*), and styles (such as literary journalism).

For the first article or two the class reads, the instructor leads the discussion, examining the problems the author faced in telling the story dramatically—including trying to communicate that particular part of science—and how the author solved those problems. The instructor urges students to notice how a work affects them and then to determine how the writer, for better or worse, achieved that effect.

In subsequent class meetings, each student takes the lead in introducing an author and

work, asking questions, and guiding the discussion. From time to time, the instructor asks a question or makes a comment to call attention to a special quality of the work, if it appears that the students might not raise it.

Students are encouraged to express their true reactions to the work under discussion and to examine the reasons for their reactions. Besides the books and articles listed in this report, two or three additional articles are assigned that appear to be literary science writing by well-known writers but which the instructor thinks are seriously flawed in one way or another (inaccuracies, inadequate explanations, author intrusiveness). The students are not warned that these exercises are intended to test their ability and willingness to be critical. At the heart of the course is the philosophy that to qualify as science writing, the work must be scientifically accurate for its time. It quickly loses stature and all credibility as errors mount. It may be highly entertaining, but it is not science writing.

Written work required of Science Writing as Literature students consists of a series of short essays, on designated works, due just before discussion of that work begins. In these essays students judge whether a designated book “works” and, if so, why. What techniques did the author use successfully and how do those techniques affect a reader? If the selection didn’t work, what went wrong? Students are allowed wide latitude in the nature of their essays. An essay may be a close textual analysis, a comparison with a different work by that author or another author, an examination of a recurring theme or technique the author used, a book review—just about any informed reaction is encouraged. Discouraged are essays that go no further than a presentation of other people’s ideas.

The Science Writing as Literature reading list strives for variety (see Table 1). The 2003 offering included medicine, biology, botany, zoology, anthropology, geology, physics, chemistry, astronomy, space exploration, and navigation. Many of the assigned works are recent, even newly published, making them seem more relevant and surprising. Other books are older and have been pivotal works in the history of science writing. Rachel Carson’s *Silent Spring* (1962) might be said to have ushered in the modern era of science writing. Galileo’s *Sidereus Nuncius* (*The Sidereal Messenger*) (1610) might be viewed as one of the earliest attempts at writing popular science, with Galileo seeking to bring the first discoveries of his telescope to the attention of an audience far wider than astronomers.

The works read in Science Writing as Literature contrast in type and style: first person and third person accounts; essays and feature stories; adult books and children’s books; histories and “nonfiction novels”; authors instantly recognizable by their styles and others not. One or two readings in the course explore the use of science writing in fiction, such as Richard Selzer’s “Pages from a Wound-Dresser’s Diary,” about the state of medicine during the American Civil War, or (to some degree) Bertolt Brecht’s play *Galileo*, about astronomy in the early 1600s. The works read also range from relatively easy (Dava Sobel’s *Longitude*) to more challenging (John McPhee’s *In Suspect Terrain* and Richard Selzer’s “Liver”).

As with any literature course, there is far more to read than time to read it, especially with the careful analysis required of students for class discussions and essays. As many books as possible are read in their entirety, but sometimes representative sections of books are assigned instead, such as Rachel Carson’s *Silent Spring*, David Quammen’s *The Song of the Dodo*, and Olivia Judson’s *Dr. Tatiana’s Sex Advice to All Creation*.

The reading load in the University of Tennessee’s Science Writing as Literature course averages about 125 pages a week for undergraduates and 150 for graduates. Some class periods are devoted to a single essay (e.g., Richard Selzer’s “Liver”). Two or three class periods are spent on longer works.

When possible, the authors themselves speak to the class about their work. Knoxville-based writers Doris Gove (*Red-Spotted Newt*) and Harry (Hap) Y. McSween Jr. (*Stardust to*

Table 1. Reading list for Science Writing as Literature, spring semester 2003, University of Tennessee (where only portions of a single-author book are assigned, these are given in parentheses after the citation)

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- Ackerman, D. (1995) "Why Leaves Turn Color in the Fall," in T. Anton and R. McCord (eds) *The New Science Journalists*, pp. 229–34. New York: Ballantine Books.
- Carson, R. (1962) *Silent Spring*. Boston: Houghton Mifflin. (Chapters 1, 2, 3, 8, 15.)
- Eiseley, L. (1978) "The Judgment of the Birds," "The Long Loneliness," "Man the Firemaker," "The Innocent Fox," "The Bird and the Machine," and "The Fire Apes," in *The Star Thrower*. New York: Times Books.
- Franklin, J. and Doelp, A. (1983) *Not Quite a Miracle: Brain Surgeons and Their Patients on the Frontier of Medicine*. New York: Doubleday.
- Gawande, A. (2002, January 28) "The Learning Curve," *The New Yorker*, 77(45): 52–61.
- Gove, D. (1994) *Red-Spotted Newt*. New York: Atheneum.
- Judson, O. (2002) *Dr. Tatiana's Sex Advice to All Creation*. New York: Henry Holt. (Chapters 6, 7, 13.)
- Kanigel, R. (1988) "An Ordinary Miracle," in Robert Gannon (ed.) (1991) *Best Science Writing: Readings and Insights*, pp. 3–17. Phoenix: Oryx Press.
- Lovell, J. and Kluger, J. (1994) *Lost Moon: The Perilous Voyage of Apollo 13*. Boston: Houghton Mifflin. (Prologue and Chapters 1 and 2.)
- McPhee, J. (1981) *Basin and Range*. New York: Farrar Straus Giroux.
- Pollan, M. (2001) *The Botany of Desire: A Plant's Eye View of the World*. New York: Random House. (Chapter 1.)
- Quammen, D. (1996) *The Song of the Dodo: Island Biogeography in an Age of Extinctions*. New York: Simon & Schuster. (Pages 9–114.)
- Quammen, D. (1998) "To Live and Die in L.A.," and "Strawberries Under Ice," in *Wild Thoughts from Wild Places*. New York: Scribner.
- Quammen, D. (2001) "The Boilerplate Rhino," in *The Boilerplate Rhino: Nature in the Eye of the Beholder*. New York: Simon & Schuster.
- Rogers, M. (1973) "Totality—A Report," in Robert Gannon (1991) (ed.) *Best Science Writing: Readings and Insights*, pp. 168–85. Phoenix: Oryx Press.
- Sacks, O. (1999) "Brilliant Light," in James Gleick (ed.) *The Best American Science Writing 2000*, pp. 179–208. New York: HarperCollins.
- Sapolsky, R. (1993, March) "The Young and the Reckless," *Discover* 4(3): 58–64.
- Selzer, R. (1976) "Liver," in *Mortal Lessons: Notes on the Art of Surgery*. New York: Simon & Schuster.
- Selzer, R. (1979) "Pages from a Wound-Dresser's Diary," "At St. Raphael's," "Sarcophagus," and "Tube Feeding," in *Confessions of a Knife*. New York: Simon & Schuster.
- Sobel, D. (1995) *Longitude*. New York: Walker.
- Wolfe, T. (1979) *The Right Stuff*. New York: Farrar Straus Giroux.
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Planets) appear in person; others, such as Jon Franklin, Robert Kanigel, Sonny Kleinfield, and Dava Sobel, have spoken to the students by conference telephone.

Some of the most desirable books for Science Writing as Literature are out of print, which used to be an impediment to their use in the course. Now, however, adequate quantities of almost all these books are available at bargain prices through online used-book services such as Abebooks.com, Amazon.com, Barnesandnoble.com, and Half.com.

Much of this report has been devoted to the relationship of science to a science-writing-as-literature course, because science and nonfiction, singly as well as together, are seldom the subjects of literature courses. That does not mean, however, that students in Science Writing as Literature are not receiving, developing, and applying a clear and deep grasp of literature to works of popular science. This author thinks that literature works by taking readers into a world where they have never been or that they have never fully appreciated before, and enabling them to see it and feel it rather than just being told about it. In this world, they encounter people and things that are new, exciting, and challenging. Readers thereby feel they have become part of that world, part of the story—they are active participants in the discovery of information rather than passive receptacles. As participants,

they have a stake in what happens, so they care about the outcome. Applied to science writing, that means that readers see science as a human activity fraught with obstacles and dilemmas—drama—rather than as a black box from which information seeps. How writers create that world and transport readers is what Science Writing as Literature explores.

Of special interest in the course is the role of the anecdote. In science, an anecdote—a single example—is unconvincing; only many repetitions of the experiment with the same results suggests validity. In science writing, however, an anecdote is the best way to interest readers and to make the work memorable. An anecdote provides story and characters, conflict, tension, action, and resolution that cause readers to care. Science writing that recites statistics to the exclusion of a specific example—that omits story—may offer useful information but does not inspire.

In order to succeed, science writing must maintain accuracy while making science understandable and interesting to the general public. This task is made more difficult (and is frequently misunderstood by scientists) because what makes journalism and literature effective and artful is eschewed by science. The scientific method developed to enhance objectivity and to avoid subjectivity, to rely on statistics rather than the anecdote, and to strive for generalization rather than the unique. Yet, the effect of literature on a reader is subjective rather than objective; what propels literature is the anecdote rather than statistics, and the power of literature comes from the specific rather than the general. So, to convey science to the general public most effectively, science writing must use a methodology antithetical to that of science while presenting the findings and process of science accurately. This dilemma is part of the discussion in Science Writing as Literature.

Science Writing as Literature is not a science-writing workshop, so the students are not specifically learning to write popular science articles; but they are improving their writing skills, as they would in any course that requires a series of analytical essays and that constantly discusses techniques of conveying information to a general audience.

Science Writing as Literature is not an introductory science course, but students learn at least as much science as they would by reading an equivalent amount in, say, the Science Times section of *The New York Times*. The education may be informal, like science presented in museums or documentary films, but it is real. In addition to the scientific information imparted, the course addresses the scientific method—for example, prediction, falsification, and double-blind studies—as these aspects arise in the works assigned or in the class discussion that ensues.

Almost half of the students in Science Writing as Literature are in graduate programs. For graduate credit, in addition to the other work assigned in the course, each student finds a book outside the course's bibliography that might be worth adding to the course in the future, writes an essay about how that work qualifies as literary science writing, and makes a presentation to the class about the book.

The achievement of students in Science Writing as Literature is measured by the quality of their reaction essays (60 percent), their contributions to class discussions (20 percent), their introduction of a particular author and work for the class and their leadership of the discussion of that work (10 percent), and a comprehensive take-home final examination (10 percent).

Science Writing as Literature has proven to be popular with the students who have taken it. In the present university-administered, anonymity-assured Student Assessment of Instruction System, covering the five offerings of Science Writing as Literature from 1994 to 2003, on a scale of 0 (very poor) to 5 (excellent), students have evaluated the “course as a whole” as 4.6.

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References

- Academic Medicine* (2003) 78(10): 951–1014 and 1059–75.
- Barr, C. (contrib. ed.) (2002) *The Bowker Annual: Library and Book Trade Almanac*, 47th edition, p. 548. Medford, NJ: Information Today.
- Dunwoody, S., Crane, E. and Brown, B. (eds) (1996) *Directory of Science Communication Courses and Programs in the United States*, 3rd edition. Madison: University of Wisconsin-Madison. Updated online: <<http://murrow.journalism.wisc.edu/dsc/dsc.cgi>>, with some entries as recent as 2001.
- Hunter, K.M., Charon, R. and Coulehan, J.L. (1995) "The Study of Literature in Medical Education," *Academic Medicine* 70(9): 787–94.

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