

**SCHOOL OF JOURNALISM
USC ANNENBERG SCHOOL FOR COMMUNICATION**

JOUR 499 Science, Society and the News
Fall 2007
4 units

Schedule/Syllabus

Day/Time: Wednesday, 2-5:20 p.m.
Classroom: ASC 228

Professor: K.C. Cole

Course Description

It's not an overstatement to say that science permeates every aspect of our society—from arts and commerce to politics and defense. Yet its influence, especially in news coverage, is for the most part invisible. Virtually every public policy question depends upon science in some way or another to provide the “truth” on which good decisions can be made. What's more, science provides the philosophical underpinnings of our world view—those all-encompassing perspectives that ultimately determine how we treat each other as well as our environment. As the physicist Max Born put it: “The physics of one era is the metaphysics of the next.”

Today, the relationship between science and society is particularly troubled. With hundreds of self-styled “experts” proclaiming various kinds of “truth” in media ranging from books to the internet, the public doesn't know what to believe. Scientists have come out by the thousands to protest what they see as a distortion and misuse of science on the part of the government for ideological ends. And yet, just as much as society depends on science, so science depends on the rest of society for financial as well as “moral” support.

Science and society influence each other in a multitude of ways that go far beyond the scope of one course. This particular course, therefore, will provide an overview designed to make students aware of the science implicit in every aspect of life and also of the societal influences on every aspect of science. Students will learn how to look at the news from a science perspective. Conversely, they will learn to look at science stories from a societal perspective. Most important, they will become familiar with science stories of critical importance to society that are hardly covered by the press at all.

This is not a top-down course. Students are expected to do research, form independent opinions, and argue with the professor as well as other students in the class.

Course Requirements

Every week, each student will find one news story that isn't about science but that could be informed by science (or perhaps even *is* informed by science) and write a half-page to one page reaction/evaluation; each student will also find one science story that does (or doesn't) do a good job of showing connections to the broader society, and do the same.

Every week, each student will submit a one to two page reaction/evaluation of reading and/or lecture materials that shows understanding of subject matter and more important that raises questions and notes points of confusion.

Every student will be a member of a small group of students responsible for keeping track of one of these subject areas: Science in Court, Science of Life and Death, Science and National Security, Science and Politics, Science on Mars, Science and Energy, Science and Risk, Science and Arts. Every few weeks, we'll take class time for one of these groups to bring us up to date on goings-on in their area. The presentations will be graded.

By mid-term, each student will write a 1000-1500 word story or well-researched commentary on some aspect of the area his or her group is following. The story will be revised at least once.

By end of term, each student will write final paper of 2000-2500 on a relevant subject area of their choice—though NOT the same subject as the mid-term paper story. The paper will be revised at least once.

Caveat

All readings and speakers are subject to revision and rescheduling as news develops in the covered subject areas.

Textbooks

The Universe and the Teacup: The Mathematics of Truth and Beauty.
The New Atlantis: A Journal of Technology and Society, Spring 2005.

Grading

Weekly reports on news stories: 10 %
 Weekly reports on readings and lectures: 10 %
 Class presentations on group topic: 15 %
 Class participation: 10 %
 Mid-term paper: 20%
 Final paper: 35%

Plagiarism/Academic Integrity

Plagiarism is defined as taking ideas or writings from another and passing them off as one's own; in journalism, this includes appropriating another writer's reporting without clear attribution. The following is the School of Journalism's policy on academic integrity as published in the university catalogue: Since its founding, the USC School of Journalism has maintained a commitment to the highest standard of ethical conduct and academic excellence. Any student found guilty of plagiarism, fabrication, cheating on examinations, or purchasing papers or other assignments will receive a failing grade in the course and be dismissed as a major from the School of Journalism. There are no exceptions to this policy."

Academic Accommodations

Any student requesting academic accommodations based on a disability is required to register with Disability Services and Programs (DSP) each semester. A letter of verification for approved accommodations can be obtained from DSP. Please be sure the letter is delivered to me as early in the semester as possible. DSP is located in STU 301 and is open 8:30 a.m. – 5:00 p.m., Monday through Friday. The phone number for DSP is 213-740-0776.

Internships

The value of professional internships as part of the overall educational experience of our students has long been recognized by the School of Journalism. Accordingly, while internships are not required for successful completion of this course, any student enrolled in this course who undertakes and completes an approved, non-paid internship during this semester shall earn academic extra credit herein of an amount equal to one percent of the total available semester points for this course.

Week One (August 29): What's Science Got to Do with It?

Introductions and expectations. Course overview. Some obvious and not so obvious ways in which science is part of every (news) story, and also ways in which every science story—no matter how obscure the subject matter—has repercussions for society. Some basic scientific concepts that are implicit in almost every story and yet are often misunderstood, e.g.: the nature of causes and correlations, quality and quantity, uncertainty, what constitutes an “explanation.”

Divide into small groups that will take on one particular area to follow through-out the course.

Cole lecture on Perception, Evidence and Illusion.

Reading for next week

The Universe and the Teacup, Chapters 4, 5, 6, 7 and 8 (pages 41- 96)

Hand-outs on science and society, including: “The Nexus: Where Science Meets Society,” Presidential Address by Shirley Ann Jackson, American Association for the Advancement of Science, December 2005

Writing for next week

A short, informal bio on yourself, your background, interests, philosophies.

Week Two (September 5): Science and the Future of American Society

The role of the United States in the world scientific community and how it is changing. Is the U.S. really a nation of science illiterates? If so, how did that happen, and why does it matter? The role of the spectator in science.

We will also discuss the philosophical import of our views about the natural world—from religious fundamentalism to What the Bleep Do we Know. What quantum mechanics and relativity have to say about morality, fairness and objectivity.

Reading for next week (hand-outs):

“Lowering Expectations at Science’s Frontier,” New York Times, January 15, 2006

“Neuroscientists Welcome Dalai Lama With Mostly Open Arms,” Science, November 18, 2005

“Undoing Darwin,” Columbia Journalism Review Sept/Oct 2005

“Darwin in the Dock,” The New Yorker, December 5, 2005

Week Three (September 12): Science and the Alternatives (String Theory Meets Intelligent Design)

What IS science and how can it be differentiated from non-science? Why is evolutionary biology considered science, but intelligent design is not? Is it legit for the Dalai Lama to address the Society for Neuroscience? Is string theory science or mere mathematical navel gazing? How well does science police itself against outright fraud?

Possible speaker TBA.

Readings for next week

The Universe and the Teacup Chapters 12 and 13, pages 129 – 171

Also hand-outs, including:

“You Can’t Rely on Firearm Forensics,” *New Scientist*, November 26, 2005

“Don’t Even Think about Lying,” *Wired*, January 2006-01-04

“How We Forget to Remember,” *Los Angeles Times*, January 26, 1995

“Memory for Fact, Fiction, and Misinformation,” *Psychological Science*, 2005

Week Four (September 19): Science in Court (From O.J. to Eyewitness Testimony)

Like scientific laboratories, courtrooms are places where the “truth” is expected to emerge from a convergence of evidence and logical argument. But how good is the evidence used in courts? Are eyewitnesses reliable? What about fingerprints, recovered memories, ballistics, lie detectors, DNA analysis?

Presentations to class by students in group following *Science in the Courts*. The presentations will be graded.

Discussion of mid-term paper.

Readings for next week Hand-outs including:

“Brain’s Use of Shortcuts Can Be a Route to Bias,” *Los Angeles Times* May 1, 1995

“The Consequences of Race for Police Officers’ Responses to Criminal Suspects,” *Psychological Science*, 2005

“Knowing is Half the Battle,” *Psychological Science* 2005

“U.S. Plans Suit to Stop Minority-Only Programs,” *Science*, November 25th, 2005

“A Growing Number: Many Say Racial Classifications are Meaningless and Unscientific,” *Chronicle of Higher Education*, February 17th, 1995

“Race and Color,” by Jared Diamond, *Discover* 1994

“The Story in Our Genes,” *Time*, 1995

Writing for next week: Write a short proposal for your commentary/story. Make sure it has a lead paragraph, and some sense of how you will research the subject and organize the piece.

Week Five (September 26): Science and Bias (I.Q., Race, Gender and Social Consequences)

One of the scientific factors that muddies up the business of “truth seeking” in court as well as in many other aspects of society is implicit bias—usually unconscious prejudices based both on innate perceptual proclivities and also on misconceptions about science. The book *The Bell Curve*, for example, relied on both faulty mathematical and biological reasoning to argue that race was linked with I.Q. scores. Psychologists are beginning to understand the mechanisms behind stereotyping and their consequences; institutions such as the Southern Poverty Law Center are attempting to bring them into the court room. It’s likely that these “default assumptions” play into the dearth of minorities and women in science as well.

Short presentations to class by students in group following Science and Bias.

Readings for next week (hand-outs):

Forward to *Microcosmos*, by Lewis Thomas

Introduction to *Microcosmos*, by Lynn Margulis

The Future of Life, by E. O. Wilson (excerpt)

“The Proper Study of Mankind,” *The Economist* December 24th, 2005

“How Life Shapes the Brainscape,” *New Scientist*, November 2005

“Upsetting our Sense of Self,” *Los Angeles Times*

Week Six (October 3): Science and Homo Sapiens (What Science Tells Us About Who We Are)

Why do people who readily accept quantum mechanics and relativity refuse to accept Darwin's theories? Why do people get upset over the thought of human cloning when such clones would be less alike than identical twins? The more science tells us about who we are and how we are related to the rest of the cosmos, the more discomfort such ideas can create. What happens to our view of ourselves when we learn that everyone on Earth is descending from a dozen "uber" mothers in Africa? That our bodies are populated (and perhaps directed) by microbes? That our behaviors are uncannily similar to those of certain species of primates?

Possible speaker: Amy Parish, Visiting Professor of Anthropology, USC

Discussion of proposals for commentary.

Readings for next week Hand-outs including:

"Twilight for the Enlightenment?" Science, April 8, 2005

"Seeking Life As We Know It," Los Angeles Times

Writing for next week: midterm paper.

Week Seven (October 10): Science of Life and Death (From Embryonic stem cells to Terry Shiavo)

Other issues that tend to generate heat in society are those that revolve around matters of life and death. Abortion, embryonic stem cell research, end of life decisions all have scientific aspects that are rarely discussed. What does biology have to tell us about when life begins? What happens when a person dies? Do we even know what life is? What are the implications for finding life on other planets?

Short presentations to class by students in group following Science of Life and Death.

Midterm paper (commentary) due

Readings for next week Hand-outs including:

The Universe and the Teacup Chapters 9, 10 and 11. Pages 99 – 127

The Geometry of Voting, pages 1 – 20.

A Beautiful Math, by Tom Siegfried. Excerpt.

Week Eight (October 17): Science and Social Choice (Voting and Fairness)

When people go to the polls, they assume that the most popular person will be elected. But as it turns out, our voting system is riddled with paradoxes that can result in the election of a least popular candidate. The science behind choice—known as Game Theory—has a lot to tell us not only about voting, but also about how to fairly divide up airwaves, telescope time or goods in a divorce.

Midterm paper returned and discussed. Possible speaker: Tom Siegfried

Readings for next week (hand-outs including):

“Fighting Terror with Science,” American Psychological Society,” May 2005

“Proliferation Is Key Issue in Nuclear Power Resurgence,” Physics Today July 2005 (this may go with energy)

“Sixty Years On, Is the World Any Safer?” New Scientist, July 16, 2005

“Warheads Aren’t Forever,” Bulletin of the Atomic Scientists, Sept/Oct 2005

“U.S. Nuclear Forces, 2006,” Bulletin of the Atomic Scientists, Jan/Feb 2006

Writing for next week: Revise of midterm.

Week Nine (October 24): Science and National Security (Weapons and Hope)

What is a weapon of mass destruction, really? Most people have no clue about the difference between conventional and nuclear weapons, how many missiles are on “ready alert” (probably thousands), or issues involved in the stockpiling and stewardship of such weapons—even though there is no graver danger to society. Science (including psychology) also comes into natural security in countless other ways.

Short presentations to class by students in group following Science and National Security

Readings for next week:

“Science Fiction: Coverage That’s Balanced Beyond Belief,” Columbia Journalism Review Nov/Dec 2004

“Patriot Games,” The Economist December 24th, 2005

“Requiem for an Office,” Bulletin of the Atomic Scientists, Sept/Oct 2005

Writing for next week: Lead paragraph, proposal and outline for final paper.

Week Ten (October 31): Science and Politics (An Uneasy Partnership Falls on Bad Times)

Science and government depend on the other and yet they often find themselves at odds. This has been especially true in recent years when scientists have objected to government interference in both the practice and use (or misuse) of scientific information. Many scientists see a parallel with the Post-WWII McCarthy era, when scientists (physicists in particular) were punished for political beliefs—most famously, J. Robert Oppenheimer. Governments in search of prestige can also put pressure on scientists to publish dubious results, as in the case of South Korean researcher Hwang Woo-suk. The fact that science itself is intensely international adds to both the tensions and opportunities.

View film: *The Day After Trinity*, by Jon Else

Short presentations to class by students in group following *Science and Politics*

Readings for next week (hand-outs including):

“Getting Space Exploration Right,” *The New Atlantis*, Spring 2005

“NASA Starts Squeezing to Fit Missions Into Tight Budget,” *Science* December 9, 2005

“Hearing Highlights Dispute Over Hubble’s Future,” *Science* February 11, 2005

“The Wrong Stuff,” *The New York Review of Books*, April 8, 2004

“NASA: Back to Eating Seed Corn,” *Science* November 25th, 2005

“Exploring the Universe,” *Physics Today*, April 2005

“Scorched Earth,” Robert Park, *New York Times*, Jan. 15, 2006

Week Eleven (November 7): Science on Mars (Wither NASA?)

Political interference in science can stop research in its tracks whether it has to do with embryonic stem cells or astrophysics. One interesting case study involves the direction NASA has taken since the announcement of the Moon to Mars initiative. The immediate fall-out was of course the cancellation of servicing for Hubble Space Telescope, but many other physics and astronomy missions were severely affected as well. With billions of dollars at stake, how do decisions get made about how NASA spends its money?

Short presentations to class by students in group following *Science on Mars*.

Readings for next week (hand-outs including):

“Out of Gas,” by David Goodstein (excerpt)

“Toward a Hydrogen Economy,” Science Magazine, special section, August 13, 2004

“Thoughts on Long-Term Energy Supplies: Scientists and the Silent Lie,” Physics Today, July 2004

“Nuclear Power’s Expanding Territory,” Science, August 19, 2005

“Scientists Try to Resolve Nuclear Problem With an Old Technology Made New Again,” New York Times, December 27th, 2005

The Universe and the Teacup, Chapter 2: Exponential Amplification. Pages 17-26

Proposals for final paper returned and discussed.

Writing for next week: Final paper due. Bring copies for classmates.

Week Twelve (November 14): Science and Energy (Running on Empty)

If the Earth were flat (and infinite) there would be no problem finding energy supplies (or places to put our garbage, for that matter). Alas, we live on a rather small sphere, and the energy we depend on—while originally from the sun—is in forms that are fast running out. Is the solution more drilling for oil and gas? A return to coal? Nuclear Power? Renewable energy? What about Hydrogen? It is astonishing how many news stories on basic energy issues fail to take the larger picture into account.

Possible Guest Speaker, David Goodstein of Caltech, author of “Out of Gas.”

Short presentations to class by students in group following Science and Energy.

Readings for next week (hand-outs including):

“Risky Business,” Science October 8, 04

“Cell Phones Simulate Premature Aging,” Discover, January 2006

“Our Final Hour,” by Sir Martin Rees (excerpt)

The Universe and the Teacup Chapter 3 pages 27-38

Editing for next week Thoughtful and thorough edit of classmate’s final paper.

Week Thirteen (November 21): The Science of Risk (Apocalypse Soon?)

Human beings are notoriously bad at risk assessment—a failing that is rarely reflected in news coverage and has huge implications for public policy. We worry about negligible quantities of chemicals in foods and terrorists on airplanes—and spend billions to protect ourselves from these threats—while ignoring much more likely killers. Even when we worry about the right things, it’s often for the wrong reasons: Cell phones don’t cause cancer; but they do cause significant death and injury through inattention. While parents try to make playgrounds and toys risk-free, nuclear weapons and asteroids don’t get near the attention they deserve. Meanwhile, the desire for a “risk-free” society makes life difficult for scientists, who can’t make real discoveries unless they can risk coming up empty handed.

Short presentations to class by students in group following Science and Risk

Discussion of final paper.

Readings for next week

Copenhagen, by Michael Frayn

Galapagos, by Kurt Vonnegut

“The Accelerating Expansion of the Universe,” by John Updike (Physics Today, April 2005)

Writing for next week Revise of final paper due.

Week Fourteen (November 28): Science and the Arts

When asked if a proposed new particle accelerator would in any way aid the national defense, the physicist Robert Wilson replied that it would not—but that it would make us a nation of better poets and painters. The relationship between science and art is ancient and intense. Scientists have long been inspired by the arts; some believe it’s likely that quantum mechanics was in part inspired by cubist paintings. And artists are not shy about taking science as their subject matter: Novelists, playwrights, paintings, choreographers, composers and poets have all done so with great success.

Short presentations to class by students in group following Science and the Arts

Readings for next week (hand-outs including):

Science and the Moral Life, by Max Otto (excerpt)

Our Final Hour, by Martin Rees (excerpt)

Silent Spring, by Rachel Carson (excerpt)

“Ethics Growing out of Science?” by Roald Hoffmann

“Daedalus and Icarus Revisited,” *The New Atlantis*, Spring 2005

Week Fifteen (December 5th): Science and the Moral Life

When scientists make discoveries, should they send them out into the world with nary a thought as to how they might be used? Or do they have some responsibility for what they discover—and create? In the post Hiroshima years, many physicists agonized over this issue; today, the worry is as likely to come from biologists and chemists. People often forget that the greatest modern scientist of all—Albert Einstein—considered moral questions more important than physical ones.

Revise of final paper returned and discussed.

Unfinished business.

Week Sixteen (Finals Week, no class):

Further revises of both papers recommended.