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BIOENGINEERING 695/COMMUNICATIONS 500  
DCE 95R1

**Investigative Science Reporting:  
Separating Fact from Fantasy**

Spring Quarter, 1990 - 4 credit hours  
1 evening/week, 4-6:30 PM

First Meeting: Thursday, March 29, 1990; 4:00 PM, 112 EMCB

Instructor/  
Coordinator

J.D. Andrade, Chairman, Department of Bioengineering  
Phone: 581-4379

Format:

1 or 2 short lectures and an extended discussion one evening each week. A short paper is required on each weekly topic. There will also be a weekly one hour discussion session for students enrolled for credit.

Enrollment:

The course is designed for advanced undergraduates and for graduate students in Communications, English, Law, Engineering or Science. Professional journalists and interested faculty are urged to attend and participate.

Description/  
Objectives

Science, medicine, engineering, and technology are very popular topics in the mass media and in the court room. Companies, universities, government, and other institutions are eager to report their findings and discoveries to the public. The public is very receptive to science and related news. Most journalists have little scientific or technical education or background. Most scientists, physicians, or engineers have little experience in presenting their work to journalists or to the lay public.

This course will use a case study approach to examine the following questions:

- What is science news?
- How can journalists separate science fact from science fantasy?
- What and who are credible and reliable technical sources?
- How should scientists respond to press inquiries?
- Who are credible and reliable journalists and publications?

Output:

The course lectures and discussions will be taped and transcribed into a book format for possible publication.

Texts/Readings:

S.M. Friedman, S. Dunwoody, and C.L. Rogers, eds. Scientists and Journalists: Reporting Science as News, The Free Press (Macmillan), 1986.

D. Nelkin, Selling Science, W.H. Freeman, 1987.

The School Catalog  
Sci Writing  
E. Yates  
Carolyn Dean  
Maggie  
John Cummings  
5/7/86

Collated &  
revised

Utah Med  
Utah Hist Press  
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BIOENGINEERING 695/COMMUNICATIONS 500

**Tentative Lecture - Discussion Topics**

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| Week 1, March 29 | J. Andrade - Science, Engineering, and Technology Fields, specialties, majors, and experts. The scientific method; scientific uncertainty, safety, regulation, cost-benefit analyses.   |
| Week 2, April 5  | P. Fogle, Director, News and Information Services, University of Utah -- representing science to the media.<br>E. Yates, Science Reporter, KSL TV - Science and Engineering Reporting in the Television Media. Panel  |
| Week 3, April 12 | C. Samuelson, Vice President for Health Science - Medicine and Health Care: Fields and specialties, medical research, ethics.<br><br>J. Dwan, Director of Community Relations, University of Utah Medical Center - The Barney Clark Artificial Heart Story. Panel |
| Week 4, April 19 | J. Andrade - Science Fact or Science Fantasy: Peer review and the scientific publication process. A "discovery" scenario. Panel   |
| Week 5, April 26 | P. Fogle, Director of News Services, University of Utah - Cold Fusion: The press release, investigative reporting, follow-up. Panel   |
| Week 6, May 4-5  | J. Holbrook, Health Effects of Tobacco--Medicine and the Press. Panel   |
| Week 7, May 10   | Invited Lecturer to be announced. Panel   |
| Week 8, May 17   | Scientific and Technical Experts in the Court Room Lecture and Panel.   |
| Week 9, May 24   | Science and Advertising Lecture and Panel.  |
| Week 10, May 31  | J. Andrade - Investigative Science Reporting: Key questions, credible sources and experts, ethics, responsibility, objectivity. Where do we go from here?   |

Note: Panels will consist of 2-3 individuals who will provide comments and aid the general discussion.

Announcing.....

Critical Science Communication:  
Separating Fact From Fantasy

Bioengineering 695 or  
Communications 500

Spring Quarter, 1990  
3 Credit Hours

Instructor: J. D. Andrade, Phone: 581-4379

One afternoon per week, 4-6:30 pm

Science, medicine, engineering, and technology are very popular topics in the mass media and in the court room. Companies, universities, government, and other institutions are eager to report their findings and discoveries to the public. The public is very receptive to science and related news. Most journalists have little scientific or technical education or background. Most scientists, physicians, or engineers have little experience in presenting their work to journalists or to the lay public.

This course will use a case study approach to examine these issues.

The course is designed for advanced undergraduates and for graduate students in Communications, English, Law, Engineering or Science. Professional journalists and interested faculty are urged to attend and participate.

MEMORANDUM

To: Students in Critical Science Communication Course  
From: J.D. Andrade *J.D. Andrade*  
Date: June 15, 1990  
Subject: Wrap-up

ONE: FINAL EXAMINATION

I enjoyed your responses on the final exam and have attempted to summarize some of them below. I graded the exam on the basis of 1) completeness in the answering of each question, and 2) considered originality and creativity -- that is, if you had come up with any ideas and concepts that had not been discussed extensively in class. The exams were read and graded while driving to and from Oregon last weekend, and, therefore, I did not make many notations on each individual exam paper; but the comments below should suffice:

The scores ranged from 83 to 100.

Question 1: How to enhance interactions between scientists and journalists,

- A. Try to get communications and science students together.
- B. Change the curricula for both programs, and require courses like this one.
- C. University PR Dept to sponsor socials.
- D. PR Dept to request the appointment of a Department liaison between the Departments and PR.
- E. Organize lab tours for journalists and organize newsroom and t.v. room tours for scientists.
- F. Have joint science and journalism writing workshops.
- G. University sponsor an annual symposium on science communication.
- H. Encourage technical societies to have social activities for journalists, special sessions and symposia, lay copies or press releases of the more interesting papers.

The most difficult part of this question was how to evaluate the outcome of such enhanced interactions. The most

quantitative was to measure the increase in the number of scientists quoted in the press, particularly in the number of first contacts, that is, new sources.

Question 2: How to encourage and enhance exposure of scientists to the media,

- A. Get science leaders and prestigious scientists involved as role models.
- B. Make interactions with the media mandatory, or at least expected, as part of the retention, promotion, and tenure process in universities, perhaps even require one or more popular articles in addition to the technical peer reviewed articles normally used to support promotion and tenure.

How to encourage media professionals to widen and expand their source pool? -- Basically meet the experts events organized by technical societies and Universities.

Question 3: Dealing with peer review,

A great majority of students felt that reporters should be permitted at technical conferences, although many of you suggested that they be permitted only at special sessions organized for the press. Generally you suggested that if they were permitted to attend they should be able to participate, although this was far from unanimous. It was nearly unanimous that they should not be required to have any particular technical degree in order to attend or participate in scientific meetings. The majority, although by no means unanimous, felt that there should be popular science summaries or press releases of the more important papers available at such meetings. Probably the main thing to come out of this question was the suggestion that virtually all technical societies should have special sessions for the journalists and the general public.

Question 4: Redesign the course,

Most of you felt that it should be of less hours and work, possibly two hours, and it should attempt to incorporate the following topics:

- The role of science and public policy.
- Fraud in science.
- Fringe and pseudo-science.
- Field trips, both to newspaper and t.v. rooms as well as to scientific labs.
- Get editors involved.
- Have a "burned" scientist as a guest, as well as a visible scientist with good experience with the press as a guest.



Oral presentations and mock press conferences would be useful.

More extensive panel discussions involving students. One of you suggested that the course be combined with a scientific conference which would be held in town and integrated with the course; the students would attend the conference, monitor how the press attended and participated, and monitor the outcome by following the stories which appear in local t.v. and press during, and subsequent to, the conference.

Question 5: Writing Exercise/Press Release,

A selection of the most interesting headlines, at least from my perspective:

Chemophobia Epidemic  
Just Say No To Chemistry  
Chemistry Gets a Bumm Rap  
Are You A Chemophobic?  
Chemistry: A Dirty Word?  
Complex Chemical Issues Worry Environmentalists  
Scientific Literacy, The Cure For Chemophobia  
Chemophobia, Do You Have It?  
Chemical Phobia Causing Problems

Question 6: Your acting presidency,

Many of you felt that the University should apologize for the cold fusion actions, that it should clearly separate the administrative and the scientific mistakes, and that it should put cold fusion on the back burner and treat it as it does any other research activity or project at the University. You felt the new acting president should emphasize the credibility of the University, and should downplay cold fusion and let the past go. You felt the incident should be used to help improve and enhance scientific communication and peer review. He or she should put an increased emphasis on the academic side of the University, including undergraduate education and teaching. He should emphasize cohesion of the University as a whole, he should make it clear that the University is a public institution and there will be full public disclosure of all appropriate activities, incidents, and events on campus. You made it clear that you did not want the lawyers to control.

Question 7: Your question,

Several of you anticipated a question on cold fusion and the U administration; others on the nature of science communication and problems.

The following questions were also noted:

Change in public school education to increase science literacy.

What did you get out of the course?  
Is there bias in peer review?  
How and why are scientists misunderstood?  
What was missing from the course?  
How did you benefit from the course?

Question 8: The most interesting topic,

Cold Fusion, followed by How Journalists Approach Scientists, and The Peer Review Process. The least interesting topics was a three way tie between the sessions on law, advertising, and smoking. Several of you felt that we spent too much time on cold fusion, and too much emphasis on U of U PR activities.

Clearly the majority of the questions were designed to provide input for me to help in designing and carrying out a second edition of this course.

THE ISSUES PROJECTS:

The Issues Projects were all very well done and very informative. The grades ranged from 15 to 20, with 20 being the maximum possible score. A list of authors and titles is given below:

Television and Health: What Exactly Are We Being Told?, by Nolan Hurley, Jr.  
From Newhart To Nova: The Explosion of Science on Television, by R.R. Goodwin.  
Bridging the Gap Between the Two Cultures: ~~General General~~  
Education for Science and Engineering Students, by Eleanor V. Goodall.  
Physicians and Advertising: Gift Giving in Medicine, by Lisa D. Marley  
Reviewing Peer Review, by Patrick Campbell.  
Defense Department control of Scientific Research and Development, by Pat Veillette.  
Communication in the Medical Curriculum, by T.J. Richards.  
Speak Out! Scientists and Engineers Must Communicate and Must Communicate Well, by David L. Wells.  
Translating Medical News to the Public: Can Newspapers Tell The Story?, by Todd M. Boyce.  
~~Investigating Science Reporting: Separating Fact from Fantasy.~~ The Many Lives of a Technical Paper, by Darren H. Larsen.  
Proposition 99: A look at California's anti-smoking campaign, by Brooke Bogus.  
Environmental Risk and Society -- the Role of Science and the Media, by Mark Case.

Communication of Science in the Classroom: A  
Students Viewpoint, by Troy R. Torgerson.

I have made copies of all of these for my own files and  
hope to have time during the summer to read and digest them  
more fully and carefully.

WRITING PROJECTS:

The Writing Projects were also graded on a maximum of 20  
points, and the scores ranged from 14 to 20. Again, everyone  
did a very good job. I was somewhat unsure of this project,  
but now I am very pleased with the results. You all really  
got into it, took it seriously, and did it very effectively.  
It is also clear that all of you have the potential for  
second careers as science writers and science journalists,  
and even science fiction authors! The tabloid write-ups were  
especially entertaining and creative. It was clear that many  
of you enjoyed this part of the assignment the most. I did  
not read them as thoroughly as I would have liked. I have  
kept copies of many of them, and would like to include  
several in the book. If yours is selected I will certainly  
be in touch with you for permission and possibly for some  
editing and rewriting. All but one of you chose to start  
with a peer review technical paper and rewrite it into the  
various versions. Brook Bogus, however, tracked a peer  
reviewed medical article through the popular press, and then  
analyzed the results, including how the original information  
was somewhat distorted and misrepresented in the popular  
press -- very interesting! For your information and amusement  
the authors and titles of the popular science versions of the  
papers are listed below.

Scientists May Soon be Able to Control Your Mind.  
A Vision of the Future.  
Researchers Develop New Type of Electrode Array.  
by Patrick K. Campbell.

American Doctor Discovers Cure for Falls!  
Are You In Danger of Falling? New Medical  
Techniques Will Tell You.  
A New Clinical Examination Procedure that will  
Identify Elderly People with an Increased Risk of  
Falling.

by Peter M. Budnick.

Plastic Knees Improve Patient Health.  
Manufacturing Methods Suspect in Artificial Knee  
Failures.  
Heat Pressing Implicated in Knee Prosthesis Failure  
by T. Boyce.

Mad Scientists Create Frankenstein Cats!!!  
New Method Offers Hope for Paralyzed.

A New Method for Monitoring Activity in Sensory  
Nerves.  
by Elaenor Goodall.

Doctors Use Plumber's Helper to Clean Clogged  
Arteries.  
New Catheter Unblocks Clogged Arteries.  
Catheter Cleans Out Clogged Arteries.  
by David Wells.

Mild Drinking Causes Cancer!  
New Study Shows Milk, Cancer Link.  
Milk -- The Drink of Death?  
by R.R. Goodwin.

Do the Canadians Have Better Health Care for Less?  
Is the Canadian Health Care System a Better  
Bargain?  
What is More Important to Save Lives: Short-term of  
Long-Term Care?  
by Dan Baker.

Refined Failure Criteria for Composites.  
Lighter, Stronger Aircraft, Latest Developments in  
Composite Materials Allow Better and Safer Designs.  
U. Researchers Now Able to Predict Aircraft  
Failure.  
by Pat Veillette.

Bionic Baby Born with Artificial Heart -- Amazing  
Pictures Inside!!  
Small Boy Kept Alive by a Small Pump for 12 Hours  
as he Awaits Heart Transplantation.  
Saving Children with Pumps -- a new technique may  
buy more time for hundreds of children now waiting  
hopelessly for heart transplants.  
by Troy R. Torgerson.

Exercise Causes Brittle Bones in Women!  
Medical Study Links Exercise to Osteoporosis.  
Bone Density and Menstruation in Women Runners: A  
link to Osteoporosis?  
by Lisa D. Marley.

New Microchip May Bring Electronics Out of Lab,  
Into Brains (Microchip May Replace Brain Cells).  
New Microchip May Bring Electronics Out of Lab,  
Into Home.  
Inexpensive Electronics.  
by Darren H. Larsen.

Researchers Want to Grow Artificial Cells to Detect  
Poison.  
by Nolan Hurley Jr.

Man Has "Womb-Like" Feelings After Brain Transplant.

Fetal Brain Cell Transplant for Treating Parkinson's.

Fetal Brain Cell Implant Effective in Treating Parkinson's Disease.

by T.J. Richards.

WEEKLY WRITING ASSIGNMENTS:

They were graded on a scale of 1 to 5, with most of you receiving scores of 3 to 5 for each weekly assignment. The critique of the three Newsweek articles was graded on a scale from 0 to 10, with all of the scores in the 7 to 10 range. I apologize for not making more comments and suggestions on the individual assignments and papers. I assure you that they were all read.

Lisa Marley provided me with a copy of the 1988 article by William DeVries titled, "The Physician, the Media, and the Spectacular Case," which I should have seen and distributed in class. Here it is for your summer reading enjoyment.

Course grades ranged from B+ to A, and there were several incompletes. Your course grade is on the upper left corner of the final exam.