

UMassAmherst

# Creating Access to Knowledge: Ethics in Science & Engineering

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# Center for Public Policy: Public Engagement Project

- Dissemination = availability + accessibility
- Making research accessible means
  - outsiders know how to find the research
  - the research speaks to needs of a community or other stakeholders
  - the findings are in language and a format that will be read and understood by the end users
  - the researcher is engaged in interactions with people using the research, both in terms of creating research questions and in transferring the findings to the relevant end users
- The Public Engagement Project of CPPA, CRF, and SBS:
  - Communication: media training, interacting with community organizations, talking to policymakers
  - Writing: op-ed writing, fact sheets, and other non-academic formats
  - Networking: how to build and maintain professional networks with businesses, organizations, community groups, media, lawyers, etc.



## NCDG: Building Global Capacity



- Faculty, post-doctoral and doctoral fellows
- Visiting fellows from the U.S., China, Turkey, Netherlands, Switzerland, Spain, Mexico, Chile, Germany, Austria, Sri Lanka, Korea and Japan
- International workshops on social science research, e-rulemaking, authentication and time-critical information services
- Research design and methods workshops
- Seminar series with value-added online content
- Collaborative research projects
- International partners from several countries



# NCDG: Collaborative Projects and Catalysis

## Projects

- Open Source
- Connecting to Congress
- Local government responses to demand for broadband
- Center for Computational Politics
- Mobile emergency response in rural settings
- Aboriginal Canada Portal

## Collaborating Institutions

- OHIM, Alicante, Spain
- Congressional Management Foundation
- European Union
- IBM
- University of Tokyo
- MIT
- Digital Nations Foundation, Santiago, Chile
- Univ. of California Riverside
- Ohio State University
- Carnegie Mellon
- Fulbright Commission
- Claremont Graduate School
- Government of Canada



# IDEESE - Cross-Disciplinary Practical Research



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co-PI, Computer  
Science



**Marc Achermann**  
co-PI, Physics



**Ronald Sandler**  
Ethicist,  
Philosophy,  
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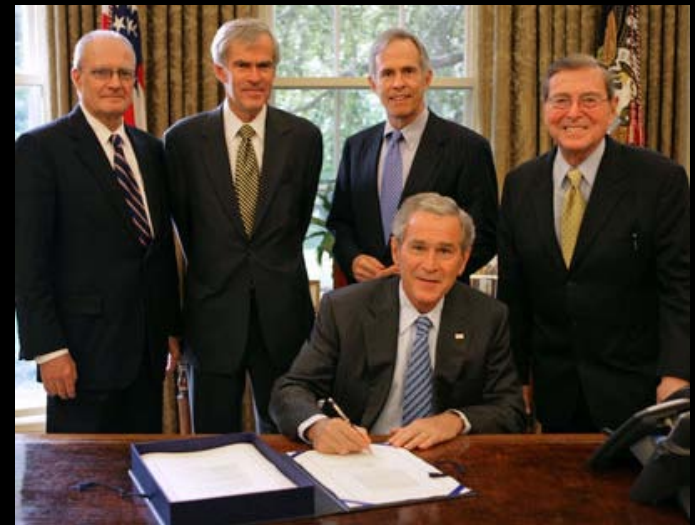
## Beta Site: Ethics in Science and Engineering National Clearinghouse (ESENCE)

- Marilyn Billings, co-PI - UMA Library, Scholarly Communications
- Jessica Adamick - ESENCE librarian
- Michelle Goncalves - project manager
- Jane Fountain, PI
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# Beta Site Library – Background

- America COMPETES Act
  - As of October 1, 2009, National Science Foundation (NSF) proposals must include a plan for appropriate training and oversight in the responsible and ethical conduct of research to graduate undergraduate, and postdoctoral researchers
  
- NSF Response: two beta sites
  - NAE OnlineEthics upgrades
  - UMass Digital Library Beta Site
  - Inform an RFP for a national digital library for ethics in science and engineering



President Bush signs the America COMPETES Act in 2007

(Source: daylife.com)



# ACA Provisions of Interest to the Research Community

- Section 7008: Postdoctoral Research Fellows
- Section 7009: Responsible Conduct of Research
- Section 7010: Reporting of Research Results
- Section 7013: Cost Sharing





# Implementation

- Section 7008 provisions are included in relevant sections of the Grant Proposal Guide (GPG), the FastLane Project Reporting System, and the Representative Activities of Broader Impacts document and are available on the NSF website.
- Each proposal that includes postdoctoral researchers must describe, in a supplementary document of one page, the mentoring activities that will be provided for such individuals. "This one-page limitation also is applied to proposals with subawards, and, separately submitted collaborative proposals."



Proposals that do not describe mentoring activities for postdoctoral researchers will be returned without review.



## Section 7009: Responsible Conduct of Research

“The Director shall require that each institution that applies for financial assistance from the Foundation for science and engineering research or education describe in its grant proposal a plan to provide appropriate training and oversight in the responsible and ethical conduct of research to undergraduate students, graduate students, and postdoctoral researchers, participating in the proposed research project.”



## Responsible Conduct of Research

Beginning January 1, 2009, NSF requires that at the time of proposal submission to NSF, a proposing institution's AOR must certify that *the institution has a plan to provide appropriate training and oversight in the responsible and ethical conduct of research to undergraduates, graduate students, and postdoctoral researchers who will be supported by NSF to conduct research.*



## Responsible Conduct of Research

- Proposed implementation:
- Training plans are not required within proposals
- Standard Award Conditions modified: institutions must require RCR training
- NSF will support development of an online digital library to include research findings, pedagogical materials, and promising practices regarding the ethical and responsible conduct of research.



# Beta Site – Strategic Priorities

- Interdisciplinary
  - Include life, physical and social sciences, policy, and engineering
  
- International
  - IDEESE expertise and emphasis
  - Trans-national politics; cross-boundary organizations
  - Cross-cultural individual and social behavior
  
- Web 2.0
  - Web 2.0, digital commons and “next generation” web-based tools and apps
  - Knowledge sharing tools
  - Interactivity



# Beta Site – Sample Content

## ■ Research

- Use social science research to inform our understanding of ethics: individual, group, organizational, networks, national, trans-national
- Examine the antecedents of ethical behavior and misconduct
- Empirically based best practices: expert consensus on effective ethics teaching and training

## ■ Training Materials

- Case studies, syllabi, teaching modules, training packages
- Underlying social science research

## ■ Other Resources

- *Codes of Conduct*: professional societies and organizations in science and engineering
- *Disciplinary Actions*: examples of how unethical behavior is handled at different universities (best and good practices; lessons learned)



## IDEESE - Ethics in an International Context

- Labs, organizations, and projects are increasingly global in scope
  - Thus, scientists and engineers need to understand how
    - international consensus on ethical concerns is forged
    - how persistent differences in national preferences are handled
    - how national governments coordinate regulatory responses to transnational challenges in science and engineering
- **But** ethics education remains US-focused and poorly integrated into graduate curricula
- IDEESE: International Dimensions of Ethics in Science and Engineering





## International Dimensions Project – Objectives

- Research and develop education materials (in-depth case studies and analytical frameworks) to examine international dimensions of ethics in science and engineering
- Properties:
  1. **Accessible** to graduate science and engineering instructors
  2. **Insertable** by busy instructors into current science and engineering courses
  3. **Engaging** for graduate students with no previous ethics training



## IDEESE – International Case Studies

- Reporting Incidences of SARS
- Bhopal Plant Disaster
- EU-US Dispute over Regulation of GMOs
- South Korean Stem Cell Research Scandal
- Intergovernmental Panel on Climate Change 2001-2009
- Narmada Dam controversy
- And others...





# Bhopal Case and Teaching Notes

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## Science, Technology & Society Initiative

@ the University of Massachusetts Amherst

### Case Studies

Visit our **Case** page for additional case studies.

### Teaching Modules

Consider using these case studies with IDEESE teaching modules.

Visit our **module** page for more information.

### About IDEESE

Learn **About** the IDEESE project, the **People** on our research team, or go back to our **Home** page.

## IDEESE: Cases - Bhopal Plant Disaster

### HOW TO USE THE CASE MATERIALS:

The IDEESE Bhopal Plant Disaster Case Study includes a situation summary and eight appendices. THERE ARE A LOT OF READING MATERIALS. We do not expect instructors and students to read through all our resources. Instead, we expect instructors to assign the most appropriate appendices to their students according to their classroom goals. The remaining materials can be used as optional reading assignments for students who want to explore the subject matter in more depth or from a different angle.

Although the case study may be incorporated into your existing syllabi, IDEESE also offers teaching [modules](#) that help to focus the case on various dimensions of international ethics. We have outlined [10 examples of how to use the modules, case, and appendices together](#).

We especially recommend using this case to teach [Workplace Ethics in Transnational Contexts](#)

Instructors can download **presentation slides** for use in the classroom [here](#).

Finally, we also welcome feedback on our case materials. Please contact the Program Manager at [mgoncalves@pubpol.umass.edu](mailto:mgoncalves@pubpol.umass.edu) with your comments or suggestions.

### CASE STUDY:



[Case-Situation Summary](#) [489 KB, pdf]: The situation summary is a 7 page document detailing the industrial accident at the Union Carbide factory in India that immediately killed 2,000 people, injured another 200,000 to 300,000 more, and immediately raised questions about plant safety and corporate responsibility around the world.



[Case Contents](#) [201 KB, pdf]: This file outlines the contents for the entire case study. It should serve as a cover page if all materials are printed out and act as a guide for instructors in choosing which appendices to assign.



## APPENDICES:

*The Bhopal case includes 8 appendices. Instructors should select and assign appendices appropriate to the module or learning objectives for the class session.*



**Appendix A: Chronology** [356 KB, pdf]: The chronology is a 17 page document outlining the events leading up to and following the plant explosion. Dates outlined range from 1956 to 2007. The chronology is also color-coded to aid in identifying city and state measures relating to Bhopal, relevant Indian business legislation, casualties, and changes in economic conditions.



**Appendix B: Stakeholders and Level of Responsibility** [461 KB, pdf]: Appendix B is designed to encourage students to consider the perspectives of various stakeholders associated with the Bhopal disaster including the government, the UC Corporation, and the victims. It also includes suggested outside readings and the following materials: 1.) H-O-T Analysis of Industrial Accidents Applied to Bhopal Gas Leak, 2.) Stakeholder Orientations in Industrial Disasters Table, 3.) Stakeholder Effects and Responses Table, 4.) Comparison of Features of MIC plants in West Virginia and Bhopal, and 5.) a student exercise: Identifying Responsibilities.



**Appendix C: Economic/Industrial climate of India** [359 KB, pdf]: As the title suggests, Appendix C will provide students an overview of the economic and industrial climate in India at the time of the Bhopal disaster. The appendix includes 1.) IDEESE essay on India's Approach to Economic Development, 2.) Excerpt from *Report of the 9th International Symposium on the Prevention of Occupational Accidents and Diseases in the Chemical Industry*, "Chemical Industries in India, summer 1984", 3.) Excerpts from and Comments on Union of India Foreign Exchange Regulation Act 1973, 4.) The Government of India, Planning Commission, 4th Five-Year Plan, and 5.) Government of India Tenth Five Year Plan: 2002-07.



**Appendix D: Union Carbide Corporation** [233 KB, pdf]: Appendix D provides details on the Union Carbide Corporation including how the corporation is organized, what safety issues they were aware of at the Bhopal Plant (1982) and their West Virginia facility (1985).



**Appendix E: Issues in Chemical Processing** [282 KB, pdf]: Appendix E is designed specifically with scientists in mind. It addresses the toxicity of chemicals at the Bhopal Plant, the types of hazards in manufacturing and using industrial products, the types of hazards in product use and consumption, and outlines notes on making the chemical SEVIN.



**Appendix F: Assessing Responsibility: The Legal/Regulatory System** [319 KB, pdf]: Appendix F examines the policy changes and litigation resulting from Bhopal disaster. It includes a Note on Indian Supreme Court decisions regarding the Bhopal disaster, Western European and United States policy information about chemical plant hazards, and links to several relevant Supreme Court decisions.



**Appendix G: Assessing Responsibility: The Engineers and Scientists** [220 KB, pdf]: Appendix G uses excerpts from legal proceedings to create "Contrasting Views of Responsibility for the Bhopal Disaster" and to assess the levels of responsibility for engineers and scientists involved in the UCC and Bhopal Plant.



**Appendix H: Assessing Responsibility: Technical Expertise and Managers** [226 KB, pdf]: Appendix H uses IEEE and ASME Codes of Ethics to assess what levels of responsibility professional societies consider managers to have. The essay "Engineers and Managers" by MJ Peterson explains what options managers have when faced with an ethical dilemma.



## Wrapping Up

- Openness promotes discovery and innovation
- Knowledge sharing includes cross-disciplinary, multiple stakeholder and multiple community communication and dissemination
- Knowledge and discovery are global. UMass can now be simultaneously local and global in reach.



## Links & Resources

- **ESENCE Beta Site:** [www.umass.edu/sts/digitallibrary](http://www.umass.edu/sts/digitallibrary)
- **International Dimensions of Ethics Education:** [www.umass.edu/sts/ethics](http://www.umass.edu/sts/ethics)
- **National Center for Digital Government:** [ncdg.org](http://ncdg.org)
- **Science, Technology and Society Initiative:** [umass.edu/sts](http://umass.edu/sts)
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