

# **Introduction to the UCS Scientific Integrity Curriculum Guide**

## **I. Introduction**

Politicization of science has become one of scientists' top concerns as more examples of compromised federal scientific integrity are revealed. As of February 2008, more than 15,000 U.S. scientists have joined the Union of Concerned Scientists (UCS) in calling for reforms that will restore integrity to science-based policy making.

Supporting scientific integrity is not a partisan issue. A healthy democracy depends on the role independent science plays in helping to craft decisions that affect public health, safety, and the environment.

To ensure that science continues to serve society and that the scientists who conduct taxpayer-funded research continue to produce quality work, UCS has led the nation in calling for the end of pervasive political interference in independent science. As part of that continuing effort, we have created this curriculum guide to aide instructors in teaching this subject.

This curriculum guide is intended to be a versatile platform upon which teachers in a variety of disciplines can build an informative and interactive classroom experience. Instructors are encouraged to modify and supplement this guide, tailoring the lessons to their own teaching styles and students. The information in the guide represents only a small sampling of the material available on this vital issue.

## **II. Overview of the Curriculum Guide**

The guide provides lecture slides along with worksheets, suggested homework and essay assignments, and group activities. Other resources include links to more information, newspaper articles, and scholarly papers, providing both instructor and student with a good starting point for further study.

These materials are intended for an undergraduate-level course, but selections can be easily scaled up or down in difficulty. The lecture slides are written so teachers need little prior knowledge of the subject matter in order to conduct an engaging class. The worksheets and homework assignments are intended to spark classroom discussion and critical thinking about the issues threatening scientific integrity.

UCS continually pursues new developments in the politicization of federal science, and the UCS webpage will be a valuable resource for teachers wishing to include the most recent examples and solutions. We recommend the following pages:

UCS Scientific Integrity Homepage: [http://www.ucsusa.org/scientific\\_integrity/](http://www.ucsusa.org/scientific_integrity/)

UCS A to Z Guide of Political Interference: <http://www.ucsusa.org/atoz/>

UCS Restoring Scientific Integrity: [http://www.ucsusa.org/scientific\\_integrity/restoring/](http://www.ucsusa.org/scientific_integrity/restoring/)

### III. Using the Curriculum Guide

#### **1. Classroom Lectures**

The curriculum guide provides PowerPoint slides for a one- or two-lecture class in scientific integrity. For a third lecture, any one or a combination of the worksheets provided could offer a starting point for an engaging class discussion. The sources for all of the slides are listed in a separate document.

The lectures first introduce the student to the boundary between science and politics, and define politicization of science. Some background on the scientific process is offered so that students unfamiliar with science will better understand when that process has been compromised. The slides continue with multiple examples of politicization of science, and conclude with consequences and solutions.

The end of the two-lecture presentation has a few additional longer examples of political interference in science which can be used as replacements for the examples included in the main lecture. Teachers are encouraged to supplement or simplify the slides according to their teaching style and areas of expertise.

#### **2. Worksheets**

Five worksheets accompany the curriculum guide, each created to provide complementary information and thoughtful analysis of the complexities of scientific policy making. The questions on the worksheets, for the most part, ask students to offer supportable opinions, and can be used as individual or small-group activities in class or as homework assignments.

Each worksheet has a companion document that offers the instructor examples of appropriate responses. A references document is provided separately, which could serve as a platform for further research into the issues presented.

The worksheets cover the following topics:

- **Consequences**—Students are presented with four real examples of political interference in science and asked to categorize each example by the type of politicization involved. They are then asked what consequences could be expected from each example; these can be a combination of broad or narrow effects.
- **Scientific consensus**—This worksheet seeks to broaden the student's understanding of scientific consensus and its importance to the scientific community. Common misconceptions about scientific consensus are analyzed, as well as problems associated with how scientific consensus is addressed by policy makers and the media—particularly the problem of false balance in news articles.
- **Primary documents**—Because most reports of politicization come from leaked documents or “whistleblower” scientists, students are presented with the primary sources used to document and report on two real-world examples of political interference in federal science. This exercise gives students the opportunity to

analyze the same sources and facts that the media and groups such as UCS use for their own investigations.

- **Advisory committees**—Advisory committees have been one of the most frequent targets of politicization, so this worksheet is designed to give students a closer look at the role and composition of scientific panels. Students are asked to consider several real-world examples and to analyze the method and consequences of the interference.
- **Media policy**—Another opportunity for students to learn about a pervasive method of political interference in science, this time by examining the role of public affairs offices at federal agencies. UCS has conducted multiple surveys of federal scientists that illustrate the degree to which political interference has influenced agencies' media policies; a sampling of survey results is provided along with questions to gauge students' opinions of these results.

### 3. Assignments

Ideas for short homework assignments or projects are provided in three major categories: utilizing newspapers, participating in representative democracy, and engaging in public outreach. Specific projects include writing a letter to the editor, preparing a briefing memo for an elected official, and creating outreach materials such as brochures or ads. Many can be easily translated into classroom or group activities.

As many courses contain end-of-semester research papers, the curriculum guide also provides suggestions for research topics. Students who are particularly interested in the issue of scientific integrity can use these as starting points for a longer-term project.

### 4. Resources

The curriculum guide also offers background information on the issue of scientific integrity, along with dozens of links to newspaper articles, scholarly journal reviews, and analyses from other nonprofit groups. These resources provide both student and teacher with material for further study or research papers in specific subject areas, and help teachers tailor the classroom experience for specific courses.

### IV. Conclusion

Independent, unfettered scientific discovery has served as a cornerstone for our country's prosperity and leadership in technology and medicine, but our continued progress is being compromised by pervasive political interference in federal science. The Union of Concerned Scientists created this Scientific Integrity Curriculum Guide based on the assumption that an educated and watchful public is the best means of preventing further politicization and ensuring the safety and health of future generations.

UCS will continue to improve and expand this guide, and welcomes your feedback on specific improvements. Please let us know what you think by sending an email to [rsi@ucsusa.org](mailto:rsi@ucsusa.org). Thank you for your commitment to protecting independent science!