



SENATE COMMITTEE ON CURRICULAR AFFAIRS
COURSE SUBMISSION AND CONSULTATION FORM

Principal Faculty Member(s) Proposing Course

Name	User ID	College	Department
Jayne Park-Martinez	jjp10	Berks College (BK)	Not Available

Academic Home: Berks College (BK)

Type of Proposal: Add Change Drop

Message for Reviewers:

Course Designation

(EARTH 155N) Scientific Controversies and Public Debate

Course Information

Cross-Listed Courses:

Prerequisites:

Corequisites:

Concurrents:

Recommended Preparations:

Abbreviated Title: Science Controvs
Discipline: General Education
Course Listing: Inter-Domain

Special categories for Undergraduate (001-499) courses

Foundations

- Writing/Speaking (GWS)
- Quantification (GQ)

Knowledge Domains

- Health & Wellness (GHW)
- Natural Sciences (GN)
- Arts (GA)
- Humanities (GH)
- Social and Behavioral Sciences (GS)

Additional Designations

- Bachelor of Arts
- International Cultures (IL)
- United States Cultures (US)
- Honors Course
- Common course number - x94, x95, x96, x97, x99
- Writing Across the Curriculum

First-Year Engagement Program

- First-Year Seminar

Miscellaneous

Common Course

GE Learning Objectives

GenEd Learning Objective: Effective Communication

GenEd Learning Objective: Creative Thinking

GenEd Learning Objective: Crit & Analytical Think

GenEd Learning Objective: Global Learning

GenEd Learning Objective: Integrative Thinking

GenEd Learning Objective: Key Literacies

GenEd Learning Objective: Soc Resp & Ethic Reason

Bulletin Listing

Minimum Credits:	3
Maximum Credits:	3
Repeatable:	NO
Department with Curricular Responsibility:	Berks College Science (BKBK_BKSC)
Effective Semester:	FA 2018
Travel Component:	NO

Course Outline

A brief outline or overview of the course content:

EARTH 155N Scientific Controversies and Public Debate is an interdomain course that integrate GN environmental health topics with GH message evaluation. The course is designed to help students critically evaluate messages and learn to distinguish evidence-based information from misinformation. Course content will include case studies of historic and emerging threats to environmental health, relevant science, public relations strategies to sway public opinion, and tools for message evaluation.

A listing of the major topics to be covered with an approximate length of time allotted for their discussion:

Please note: Lines with an "" have been revised based on consultation feedback.

Week 1: Documentary film "Merchants of Doubt" exposes industry strategies to delay government regulation of environmental health threats, reviews historic cases (e.g., The tobacco industry and smoking) and emerging threats (e.g., The fossil fuel industry and global climate change); discusses the role of public relations in shaping public opinion and, ultimately, legislation. **Chapter 6 from the book "Merchants of Doubt" (Oreskes & Conway) that inspired the documentary film, more thoroughly covers the issue of global warming denial and industry disinformation strategies.**

Weeks 2-6: Explore the nature of science, science epistemology, how scientific understanding changes over time, how science finding are characterized and reported, challenges in science communication, **pseudoscience**, and targeted science topics that are (or are perceived to be) controversial, such as global climate change, and conclusions and recommendations from the Intergovernmental Panel on Climate Change (IPCC). **Carl Sagan's "The Fine Art of Baloney Detection" from The Demon Haunted World will introduce students to strategies, such as recognizing logical and rhetorical fallacies, to distinguish between evidence-based and disinformation-based arguments.**

The science content that instructors choose to target is flexible. Possible topics, which are reinforced by recommended course materials, include: smoking, secondhand smoke, flame retardants, nuclear energy, ozone hole, global climate change, acid rain, junk science, rBGH milk, biosolids, pesticides, and endocrine disrupting chemicals.

Week 7: Overview of iMedia with multimedia specialist Carla Seward introduces students to the video project—the goal of which is to examine challenges in traditional science messaging and then overcome these messaging problems to promote science literacy in the general public. Students' video project will combine accurate science content with compelling storytelling to inform the public about the environmental health risks of, for example, endocrine disrupting chemicals in personal care products with implications for human and aquatic health, and strategies to avoid risk. During week 7, students will choose an environmental health topic and in small groups, begin scripting and storyboarding their video concept.

Weeks 8-12: Explore the development and influence of public relations (PR) in the United States via the book "Toxic Sludge is Good for You" by John Stauber and Sheldon Rampton. The book reviews PR techniques for message manipulation and communication using case studies from 1900's onward in U.S. history. Students will be guided to consider how industry and science messaging has shaped their own perceptions of risk. Public relations techniques discussed include grassroots and grassroots organizing, news as advertising, advocacy advertising, integrated communications, subliminal message reinforcement, lobbying, think tanks, front groups, corporate espionage, crisis management, politicizing issues, and the video news release. **A discussion on the Ethicality of Green Advertising (from the book Talking green; exploring contemporary issues in environmental communications by Ahern & Bortree) will help students better understand the spectrum of indirect, non-conscious advertising techniques and their potential ethical implications, whether used to promote consumption, or environmentally responsible behavior.** Instructor resources include concept maps for each topic to help guide students' critical thinking. Also during weeks 8-12, students will continue their video project, including shooting and editing their video, and then uploading it to BOX for review by their peers, instructor, and Carla Seward.

Weeks 13-15: Based on constructive feedback, student groups will re-edit their videos and then upload the final product to BOX for evaluation. Students final videos will be shown during the "Student Academy Awards" and the campus community will be invited to attend. The best videos will be made available to BCTV—Community media for Berks Co. and Reading, PA to promote science literacy in the general public.

Course Description:

EARTH 155N Scientific Controversies and Public Debate is an introduction to critical thinking about the messages consumers get from public relations (PR) on behalf of industry, and from scientists regarding environmental health risks. Because such messages may be contradictory, the course seeks to help students understand the extent to which message communication influences our perception of risk. The course is designed to familiarize students with science topics that, because of message manipulation, are (or historically were) perceived as controversial (e.g., smoking, secondhand smoke, flame retardants, nuclear energy, the ozone hole, global climate change, acid rain, junk science, rBGH milk, biosolids, pesticides, vaccines, and endocrine disrupting chemicals). Students will learn the science and environmental health risks underlying several controversial topics. They will be guided to consider how industry and science messaging has shaped their own perceptions of risk. Then, using tools for effective communication, and avoiding communication pitfalls and deceptive tactics, students will combine accurate science content with compelling storytelling in a professional-quality video to inform the public about a targeted environmental health risk and persuade the public to avoid that risk.

EARTH 155N focuses on the intersection between science and communication in the realm of environmental health. The course guides students to closely examine controversial environmental health topics, learn the science to understand public health risks, learn strategies to identify false or misleading arguments, and then think critically about industry and science messaging, including the impact of such messaging on their own lives.

EARTH 155N Scientific Controversies and Public Debate is an interdomain course that integrate GN environmental health topics with GH message evaluation. It has no prerequisites, and is designed for students who may be unfamiliar with, or have only introductory knowledge of controversial environmental health topics, the norms of science communication, and public relations techniques.

The name(s) of the faculty member(s) responsible for the development of the course:

1 Name: Jayne Park-Martinez (jip10)

Title:

Phone:

Address:

Campus: BK

City:

Fax:

Course Justification

Instructional, Educational, and Course Objectives:

This section should define what the student is expected to learn and what skills the student will develop.

Please note: Lines with an "*" have been revised based on consultation feedback.

1. Students will be able to describe the nature of science, science epistemology, **how to distinguish between science and pseudoscience**, and explain how scientific understanding is one of several ways of knowing about the world. (GN Domain Objective: Explain the methods of inquiry in the natural science fields and describe how the contributions of these fields complement inquiry in other areas.)
2. Students will be able to identify positive societal outcomes generated by enhanced science literacy, for example, by sharing students' public service videos. (GN Domain Objective: Identify societal or philosophical implications of discoveries in the natural sciences, as well as their potential to address contemporary problems.)
3. Students will be able to compare and contrast their own understanding and perception of environmental health risk before and after reading a scientific explanation of current and predicted environmental health outcomes. (GN Domain Objective: Demonstrate informed understandings of scientific claims and their applications)
4. Students will be able to compare and contrast communication in the humanities with scientific communication, and discuss strategies to improve scientific communications intended for the general public,**as well as strategies the public can use to identify false and/or misleading arguments.** (GH Domain Objective: Demonstrate competence in critical thinking about topics and texts in the humanities through clear and well-reasoned responses.)
5. Students will be able to judge how deceptive and misleading tactics employed by the public relations industry has shaped their own perceptions of environmental health risk. (GH Domain Objective: Critically evaluate texts in the humanities-whether verbal, visual, or digital—and identify and explain moral or ethical dimensions within the disciplines of the humanities.)
6. Students will be able to recall specific case studies that illustrate the growth of the public relations industry in the U.S. through time (1900 to present). (GH Domain Objective: Demonstrate knowledge of major cultural currents, issues, and developments through time, including evidence of exposure to unfamiliar material that challenges their curiosity and stretches their intellectual range.)
7. Students will be able to integrate accurate science content and the norms of science communication with compelling storytelling to create a professional-quality video to inform the public about a targeted environmental health risk and how to avoid that risk. (General Education Learning Objective: Effective Communication; and General Education Learning Objective: Integrative Thinking.)

Evaluation Methods:

Include a statement that explains how the achievement of the educational objective identified above will be assessed. The procedures for determining students' grades should be specifically identified.

Please note: Lines with an "*" have been revised based on consultation feedback.

1. Students will be able to describe the nature of science, science epistemology, **how to distinguish between science and pseudoscience**, and explain how scientific understanding is one of several ways of knowing about the world. (GN Domain Objective: Explain the methods of inquiry in the natural science fields and describe how the contributions of these fields complement inquiry in other areas.)

Direct assessment, formal: Formative quizzes and a summative exam will measure students' understanding of the nature of science, science epistemology **and how to distinguish between science and pseudoscience.** Grades on quizzes and the exam will count for a portion of students' final course grade.

2. Students will be able to identify positive societal outcomes generated by enhanced science literacy, for example, by sharing students' public service videos. (GN Domain Objective: Identify societal or philosophical implications of discoveries in the natural sciences, as well as their potential to address contemporary problems.)

Direct assessment, formal: Formative quizzes and a summative exam will measure students' knowledge of the societal benefits of science literacy. Grades on quizzes and the exam will count for a portion of students' final course grade.

3. Students will be able to compare and contrast their own understanding and perception of environmental health risk before and after reading a scientific explanation of current and predicted environmental health outcomes. (GN Domain Objective: Demonstrate informed understandings of scientific claims and their applications)

Direct assessment, informal: Reflective journal assignments will measure students' understanding of well-established scientific findings and their implications for environmental health, as well as analyzing the implications of scientific uncertainty. Grades on reflective journal assignments will count for a portion of students' final course grade.

4. Students will be able to compare and contrast communication in the humanities with scientific communication, and discuss strategies to improve scientific communications intended for the general public, **as well as strategies the public can use to identify false and/or misleading arguments.** (GH Domain Objective: Demonstrate competence in critical thinking about topics and texts in the humanities through clear and well-reasoned responses.)

Direct assessment, informal: Reflective journal assignments will measure students' ability to critique communication styles and offer reasonable strategies to improve science communication without compromising the norms of scientific reporting.** Reflective journal assignments will also measure students' ability to identify false and/or misleading arguments presented in course materials.** Grades on reflective journal assignments will count for a portion of students' final course grade.

5. Students will be able to judge how deceptive and misleading tactics employed by the public relations industry has shaped their own perceptions of environmental health risk. (GH Domain Objective: Critically evaluate texts in the humanities—whether verbal, visual, or digital—and identify and explain moral or ethical dimensions within the disciplines of the humanities.)

Direct assessment, informal: Reflective journal assignments will measure students' ability to evaluate the consequences of dishonest communication for the public's perception of risk, and actual risk exposure. Grades on reflective journal assignments will count for a portion of students' final course grade.

6. Students will be able to recall specific case studies that illustrate the growth of the public relations industry in the U.S. through time (1900 to present). (GH Domain Objective: Demonstrate knowledge of major cultural currents, issues, and developments through time, including evidence of exposure to unfamiliar material that challenges their curiosity and stretches their intellectual range.)

Direct assessment, formal: Formative quizzes and a summative exam will measure students' knowledge of specific case studies that illustrate the development of the PR industry through time. Grades on quizzes and the exam will count for a portion of students' final course grade.

7. Students will be able to integrate accurate science content and the norms of science communication with compelling storytelling to create a professional-quality video to inform the public about a targeted environmental health risk and how to avoid that risk. (General Education Learning Objective: Effective Communication; and General Education Learning Objective: Integrative Thinking.)

Direct assessment, informal: Students' scripts, storyboards, and videos will be evaluated using a rubric to measure students' ability to integrate what they have learned about effective communication and persuasion, with what they have learned about the nature of science and the values and norms of accurate scientific reporting.

Relationship/Linkage of Course to Other Courses:

This statement should relate the course to existing or proposed new courses. It should provide a rationale for the level of instruction, for any prerequisites that may be specified, or for the course's role as a prerequisite for other courses. EARTH 155N Scientific Controversies and Public Debate is a new Interdomain General Education course, not a revision of an existing course.

Relationship of Course to Major, Option, Minor, or General Education:

This statement should explain how the course will contribute to the major, option, or minor and indicate how it may function as a service course for other departments.

This course is designed to fulfill a General Education, Integrated, Interdomain (N) course requirement for the GH and GN domains. This course is not required for any major, option, or minor in the Penn State system.

A description of any special facilities:

No special facilities are required.

Frequency of Offering and Enrollment:

The course will be offered every other fall, with an average enrollment of 40 students.

Alignment with General Education Objectives

- EFFECTIVE COMMUNICATION** – the ability to exchange information and ideas in oral, written, and visual form in ways that allow for informed and persuasive discourse that builds trust and respect among those engaged in that exchange, and helps create environments where creative ideas and problem-solving flourish.
- KEY LITERACIES** – the ability to identify, interpret, create, communicate and compute using materials in a variety of media and contexts. Literacy acquired in multiple areas, such as textual, quantitative, information/technology, health, intercultural, historical, aesthetic, linguistic (world languages), and scientific, enables individuals to achieve their goals, to develop their knowledge and potential, to lead healthy and productive lives, and to participate fully in their community and wider society.
- CRITICAL AND ANALYTICAL THINKING** – the habit of mind characterized by comprehensive exploration of issues, ideas, artifacts, and events before accepting or formulating a conclusion. It is the intellectually disciplined process of conceptualizing, applying, analyzing, synthesizing, and/or evaluating information gathered from, or generated by, observation, experience, reflection, reasoning, or communication, as a guide to belief and action.
- INTEGRATIVE THINKING** – the ability to synthesize knowledge across multiple domains, modes of inquiry, historical periods, and perspectives, as well as the ability to identify linkages between existing knowledge and new information. Individuals who engage in integrative thinking are able to transfer knowledge within and beyond their current contexts.
- CREATIVE THINKING** – the capacity to synthesize existing ideas, images, or expertise in original ways and the experience of performing, making, thinking, or acting in an imaginative way that may be characterized by innovation, divergent thinking, and intellectual risk taking.
- GLOBAL LEARNING** – the intellectually disciplined abilities to analyze similarities and differences among cultures; evaluate natural, physical, social, cultural, historical, and economic legacies and hierarchies; and engage as community members and leaders who will continue to deal with the intricacies of an ever-changing world. Individuals should acquire the ability to analyze power; identify and critique interdependent global, regional, and local cultures and systems; and evaluate the implications for people's lives.
- SOCIAL RESPONSIBILITY AND ETHICAL REASONING** – the ability to assess one's own values within the social context of problems, recognize ethical issues in a variety of settings, describe how different perspectives might be applied to ethical dilemmas, and consider the ramifications of alternative actions. Individuals should acquire the self-knowledge and leadership skills needed to play a role in creating and maintaining healthy, civil, safe, and thriving communities.

What component(s) of the course will help students achieve the General Education Learning Objectives covered in the course? Provide evidence that students in the course have adequate opportunities to achieve the identified learning objectives.

**Please note: Lines with an "*" have been revised based on consultation feedback.

To help students achieve the General Education Learning Objective of Effective Communication, students will observe and discuss communication in multiple formats (visual, oral, and written), and then apply what they have learned by creating their own informative and persuasive video. More specifically, during Week 1, students will view, discuss, and analyze the communication abilities and tactics of scientists and PR industry experts. During week 2, students will learn how science findings are characterized and reported. During weeks 3-6, students will read and discuss a peer-reviewed scientific publication designed for a public audience. Students will be guided to reflect on their reading experiences, including: author assumptions about their audience, narrative style, ease or difficulty with language comprehension, and how students' reading experience could be improved. During week 7, Carla Seward will present an overview of iMedia, which introduces students to their video project—the goal of which is to examine challenges in traditional science messaging and then overcome these messaging problems to promote science literacy in the general public.** During this time, students will be learning about direct and indirect (non-conscious or subliminal) marketing approaches. The ethical implications of the latter, in particular, will be important to discuss as students create their persuasive videos.** Students will work in small groups to script, storyboard, shoot, edit, and revise their video during weeks 8-14, guided by instructor feedback. Students will present their videos in week 15 during the "Student Academy Awards".

To help students achieve the General Education Learning Objective of Integrative Thinking, students will integrate accurate science content with compelling storytelling to effectively communicate to the general public about a targeted environmental health risk, and how to avoid that risk. More specifically, during weeks 1-6, students will be guided to reflect on what works and doesn't work in traditional science and industry communication. During week 7, when students begin scripting and storyboarding, they will practice integrative thinking by solving the problem of wrapping scientific facts around a compelling story. This interdisciplinary approach will involve some compromises. For example, traditional science communication is evidence-based, understated, and strives to be objective and dispassionate. However, a compelling story involves emotion and human interest. Thus, during weeks 8-14, students will have to reflect on the challenges of an interdisciplinary approach and ultimately compromise in a way that does not **violate traditional ethical frameworks**, the goal of good communication or the integrity of the science.

How will students be assessed to determine their attainment of the Learning Objective(s) of General Education covered in this course? This assessment must be included as a portion of the student's overall performance in this course.

To assess their attainment of both the General Education Effective Communication Learning Objective and the General Education Integrative Thinking Learning Objective, students' scripts, storyboards, and videos will be evaluated using a rubric to measure students' ability to integrate what they have learned about effective communication and persuasion, including the accuracy of their scientific explanation, with what they have learned about the nature of science and the values and norms of scientific reporting. Students' grades on their scripts, storyboards, and videos will represent a portion of the students' overall grade in the course.

General Education Domain Criteria

General Education Designation: Inter-Domain

GH Criteria

- Explain the methods of inquiry in humanities fields and describe how the contributions of these fields complement inquiry in other areas
- Demonstrate competence in critical thinking about topics and texts in the humanities through clear and well-reasoned responses
- Critically evaluate texts in the humanities— whether verbal, visual, or digital— and identify and explain moral or ethical dimensions within the disciplines of the humanities
- Demonstrate knowledge of major cultural currents, issues, and developments through time, including evidence of exposure to unfamiliar material that challenges their curiosity and stretches their intellectual range
- Become familiar with groups, individuals, ideas, or events that have influenced the experiences and values of different communities

What components of the course will help students achieve the domain criteria selected above?

Please note: Lines with an “*” have been revised based on consultation feedback.

To help students demonstrate competence in critical thinking about topics and texts in the humanities through clear and well-reasoned responses, students will be guided through lecture, discussion, and reflective writing to examine the similarities and differences between communication in the humanities and the natural sciences. Students will reflect on the challenges of presenting scientific information to the general public, and the risks of miscommunication. Students will be guided to discuss strategies to improve scientific communications intended for the general public.

To help students critically evaluate texts in the humanities—whether verbal, visual, or digital—and identify and explain moral or ethical dimensions within the disciplines of the humanities, students will be assigned readings that describe the real life consequences of misleading people about environmental health risks, such as smoking, exposure to flame retardants, and farming with, biosolids. Students will be exposed to case studies in both a documentary film and assigned reading. Students will be guided to reflect on the motivation behind misleading the public, consequences to human and environmental health, and strategies to safeguard the public from deception. **Students will also be given examples of direct and indirect (non-conscious or subliminal) marketing and be guided to reflect on the ethical issues associated with indirect marketing.**

To help students demonstrate knowledge of major cultural currents, issues, and developments through time, including evidence of exposure to unfamiliar material that challenges their curiosity and stretches their intellectual range, students will be assigned readings that cover controversial environmental health topics through U.S. history up until present time. These assigned readings will reveal the public relations tactics that some industries have used to mislead the public and delay government regulation, and that continue to be used today. Students will be guided through lecture, and discussion of assigned readings to place the modern fixation on fake news in historic context, and to learn strategies to distinguish evidence-based information from misinformation.

GN Criteria

- Explain the methods of inquiry in the natural science fields and describe how the contributions of these fields complement inquiry in other areas
- Construct evidence-based explanations of natural phenomena
- Demonstrate informed understandings of scientific claims and their applications
- Evaluate the quality of the data, methods, and inferences used to generate scientific knowledge
- Identify societal or philosophical implications of discoveries in the natural sciences, as well as their potential to address contemporary problems

What components of the course will help students achieve the domain criteria selected above?

Please note: Lines with an “*” have been revised based on consultation feedback.

To help students explain the methods of inquiry in the natural science fields and describe how the contributions of these fields complement inquiry in other areas, students will learn about the nature of science and science epistemology. More specifically, students will learn how science works, how new scientific discoveries are made, how scientific understanding changes over time, how scientific findings are characterized and reported, how scientific understanding is only one of several ways of knowing about the world, **and how science differs from pseudoscience.**

To help students identify societal or philosophical implications of discoveries in the natural sciences, as well as their potential to address contemporary problems, students' science learning will focus on several topics in environmental health (at the intersection of human health and the natural and built environment). Students will be guided to identify positive health outcomes that could be associated with enhanced public science literacy, for example, as a result of publically sharing students' integrative videos.

To help students demonstrate informed understandings of scientific claims and their applications, students will build on their introduction to the nature of science and science epistemology by reading and discussing several peer-reviewed scientific publications. Students will be guided to carefully read, consider, and discuss the implications of environmental health risks and how to mitigate those risks. For example, the risks associated with various warming scenarios presented in the Intergovernmental Panel on Climate Change (IPCC) 2014 Synthesis report—Summary for Policymakers.

Integrative Studies

Explain how the intellectual frameworks And methodologies of the two Knowledge Domains will be explicitly addressed in the course and practiced by the students.

The General Education Effective Communication and Integrative Thinking Learning Objectives will be explicitly addressed by student groups creating professional-quality public service videos that educate people both about environmental health risks and risk avoidance. Students will have the opportunity to practice integrating what they have learned about effective communication, the nature of science, and the values and norms of scientific reporting as they draft and revise their scripts, storyboards, and videos based on feedback from their peers, instructor, and multimedia specialist, Carla Seward.

Demonstrate that each Of the two domains will receive approximately equal attention, providing evidence from course topics, assignments, or other course components, and that students will integrate material from both domains.

**Please note: Lines with an "*" have been revised based on consultation feedback.

For the GN domain:

Five weeks of the course (weeks 2-6) cover science content, including the nature of science and science epistemology, **pseudoscience**, targeted environmental health risks (e.g., climate change, endocrine disrupting chemicals, and flame retardants) and their avoidance, the norms of science reporting,** and strategies, such as recognizing logical and rhetorical fallacies, to distinguish between evidence-based and disinformation-based arguments.**

For the GH domain:

Five weeks of the course (weeks 7-11) cover humanities content, which includes learning about iMedia, the development of the public relations industry in the U.S., **direct and indirect marketing approaches and their ethical implications**, and how tactics used by the public relations industry have shaped the public's perceptions of environmental health risks through time.

Integrative studies:

The first week of the course is equally divided between the two domains during the viewing and discussion of the documentary film Merchants of Doubt. The last four weeks of the course (weeks 12-15) are equally divided between the two domains, as students: consult with the instructor regarding video issues relative to the science/environmental health content, or Carla Seward regarding issues with the video itself; critique their peers rough cut videos; create captions and descriptions of images/events in their videos; and evaluate their peers final cut videos during the "Student Academy Awards".

Briefly explain the staffing plan. Given that each Inter-Domain course is approved for two Knowledge Domains, it will be taught by an instructor (or instructional team) with appropriate expertise in both domains.

Instructors for EARTH 155N should ideally have a broad background in science because environmental health issues are interdisciplinary by nature, and also because a theory-based discussion of the nature of science and epistemology can be tedious, but an instructor with many and varied first-hand experiences in science can animate that discussion. Because the science content is flexible, instructors can focus on environmental health issues that interest them. Instructors need to be able to identify and discuss aspects of good written and verbal communication, and be familiar with challenges in effective science communication. Jayné Park-Martinez, Instructor in science, has a broad background in science, and appropriate expertise, with a PhD in science education, a MS in hydrogeology, a BS in geology, and self-study and graduate work in environmental health. Dr. Park-Martinez has consulted with Dr. Michele Ramsey, Associate Professor of Communication Arts & Sciences during the development of this proposal. Dr. Park-Martinez will teach the course at Penn State Berks Campus.

Describe the assessments that will be used to determine students' ability to apply integrative thinking.

To assess their ability to apply integrative thinking, students' scripts, storyboards, and videos will be evaluated using a rubric to measure students' ability to integrate what they have learned about effective communication and persuasion, with what they have learned about the nature of science and the values and norms of accurate scientific reporting.

Campuses That Have Offered () Over The Past 4 Years

semester	AB	AL	BK	BR	BW	CR	DS	ER	FE	GA	GV	HB	HN	HY	LV	MA	NK	PC	SH	SL	UP	WB	WC	WS	XC	XP	XS	YK
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Potential Impact

Pre-Requisites

is *listed as a pre-requisite or concurrent course* for the following courses:

Note: Not all courses may be listed here, due to lionpath requirement incompleteness.

No pre-requisites or concurrent courses found

SAMPLE SYLLABUS

****Please note: Lines with an "***" have been revised based on consultation feedback.**

EARTH 155N Scientific Controversies and Public Debate

3 credits

Prerequisites: None

Course Attributes/Designations: GenEd, Integrative/Interdomain (N)

EARTH 155N Scientific Controversies and Public Debate is an introduction to critical thinking about the messages consumers get from public relations (PR) on behalf of industry, and from scientists regarding environmental health risks. Because such messages may be contradictory, the course seeks to help students understand the extent to which message communication influences our perception of risk. The course is designed to familiarize students with science topics that, because of message manipulation, are (or historically were) perceived as controversial (e.g., smoking, secondhand smoke, flame retardants, nuclear energy, the ozone hole, global climate change, acid rain, junk science, rBGH milk, biosolids, pesticides, vaccines, and endocrine disrupting chemicals). Students will learn the science and environmental health risks underlying several controversial topics. They will be guided to consider how industry and science messaging has shaped their own perceptions of risk. Then, using tools for effective communication, and avoiding communication pitfalls and deceptive tactics, students will combine accurate science content with compelling storytelling in a professional-quality video to inform the public about a targeted environmental health risk and persuade the public to avoid that risk.

EARTH 155N focuses on the intersection between science and communication in the realm of environmental health. The course guides students to closely examine controversial environmental health topics, learn the science to understand public health risks, ****learn strategies to identify false or misleading arguments****, and then think critically about industry and science messaging, including the impact of such messaging on their own lives. The course consists predominantly of lectures, assigned readings, and an integrative video project. Instructor resources include concept maps for each topic to help guide students' critical thinking. Course assessment includes both direct and indirect assessments. Direct assessment consist of objective quizzes and exams, reflections on assigned readings, and an authentic assessment of students' integrative videos. The indirect assessment will focus on students' perceptions of learning and satisfaction in an end-of-semester survey.

EARTH 155N Scientific Controversies and Public Debate is an interdomain course that integrate GN environmental health topics with GH message evaluation. It has no prerequisites, and is designed for students who may be unfamiliar with, or have only introductory knowledge of controversial environmental health topics, the norms of science communication, and public relations techniques.

Course Learning Objectives:

1. Students will be able to describe the nature of science, science epistemology, ****how to distinguish between science and pseudoscience****, and explain how scientific understanding is one of several ways of knowing about the world.
2. Students will be able to identify positive societal outcomes generated by enhanced science literacy.

3. Students will be able to compare and contrast their own understanding and perception of environmental health risk before and after reading a scientific explanation of current and predicted environmental health outcomes.
4. Students will be able to compare and contrast communication in the humanities with scientific communication, and discuss strategies to improve scientific communications intended for the general public, ****as well as strategies the public can use to identify false and/or misleading arguments.****
5. Students will be able to judge how deceptive and misleading tactics employed by the public relations industry has shaped their own perceptions of environmental health risk.
6. Students will be able to recall specific case studies that illustrate the growth of the public relations industry in the U.S. through time (1900 to present).
7. Students will be able to integrate accurate science content and the norms of science communication with compelling storytelling to create a professional-quality video to inform the public about a targeted environmental health risk, and how to avoid that risk.

Assignments

Assignments for the course consist of assigned readings, quizzes, reflective writings, and objective exams.

Sample Course Schedule

* The science content that instructors choose to target is flexible. Possible topics, which are reinforced by recommended course materials, include: smoking, secondhand smoke, flame retardants, nuclear energy, ozone hole, global climate change, acid rain, junk science, rBGH milk, biosolids, pesticides, and endocrine disrupting chemicals.

Week Topics

- | Week | Topics |
|------|---|
| 1 | Overview of environmental health risks and public relations industry goals, strategies, historic case studies, societal roles |
| 2 | Overview of the nature of science and epistemology; **Pseudoscience** ; Science communication; **Recognizing logical and rhetorical fallacies** |
| 3 | Global climate change **and global warming denial** |
| 4 | Intergovernmental Panel on Climate Change (IPCC) 2014 Synthesis report—Summary for Policymakers |
| 5 | Endocrine disrupting compounds |
| 6 | Flame retardants |
| 7 | Exam 1; Overview of iMedia; History of public relations up to WWI |
| 8 | Case studies: Public relations and the Tobacco industry; Video script due |
| 9 | Case studies: Public relations and corporate espionage; Types of activists; Video storyboard due |

- 10 Grassroots organizing; Case study: Public relations and biosolids; ****Direct vs. Indirect marketing****; Video editing
- 11 Case studies: Public relations and pesticides; The Free Press; Exam 2
- 12 Rough Cut Video critiques
- 13 The Final Cut; Making videos accessible (captioning and descriptions of images/events)
- 14 Student Academy Awards
- 15 Course synthesis; Comprehensive Final Exam