

Development of CHEM2012 Scientific Ethics at SWOSU

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Southwestern Oklahoma State University



Outline

- Background
 - SWOSU RCR Training Policy
 - SWOSU Implementation over time
 - Motivations for development of new course
 - INBRE Support for class development
- CHEM2012 Scientific Ethics course development and details
 - Textbook selection and other resources available
 - Delays getting started and eventual Zoom Seminar format
 - Syllabus and organization of the course
 - Written analysis assignments
 - Lead Discussants
- Outcomes
 - Grades
 - Course Evaluations
 - Changes and improvements?

I. Background

- History of SWOSU's RCR Training Policy
 - NSF Ethics Requirement 2007
 - NIH Ethics Requirement 2009
 - SWOSU Develops RCR Training Policy Approved 3/31/2010

Southwestern Oklahoma State University Plan

Southwestern Oklahoma State University (SWOSU) will meet this requirement as described below.

Participation in long-term training and research education programs lasting longer than three months will meet the requirement by research participant's attendance at two 4hour workshops for a minimum total of 8 hours of training. These workshops will be provided as needed at the start of each semester (fall, spring, and summer) for instruction in responsible conduct of research. The curriculum titled Responsible Conduct of Research Training: Making Sense of Complex Problems from the University of Oklahoma Center for Applied Social Research will be used. This training focuses on ethical decision

- Lori Gwyn, Jason Johnson, Tim Hubin from SWOSU Dept. of Chemistry and Physics received training at OU August 2011
- Lori Gwyn, Jason Johnson led 2-day workshop at SWOSU from 2012-2015 (Jorie Edwards and Denise Landrum-Geyer participated in later workshops)
- April 2015 was last campus-wide offering of workshop

Implementation of RCR Training at SWOSU

Participation in short-term training and research education programs lasting three or fewer months will meet the requirement as appropriate to the short-term program. For example, INBRE summer students will be expected to participate in the Weekly Research-related Enrichment meeting that covers Ethics in science and research.

In addition, it is expected that students involved in these programs will receive informal instruction on related topics specific to their project from their faculty mentor during the course of the training or program.

Students in this category may also meet the requirement by using the Public Access Domain of the Responsible Conduct of Research (RCR) Course provided by the Collaborative Institutional Training Initiative (CITI I). CITI is a web-based training tool that has been utilized by over 1000 participating institutions and facilities from round the world to provide training in

Motivations for Scientific Ethics Course 1

- SWOSU Planning for Higher Learning Commission Official Visit on October 5-6, 2020
- Tim Hubin volunteered to work on team for Criterion 2 Integrity: Ethical and Responsible Conduct “**The institution acts with integrity; its conduct is ethical and responsible.**” Chaired by Lori Gwyn
 - First Meeting December 10, 2018
 - Drawn to Core Component 2.E, became lead writer for this component

2.E. The institution's policies and procedures call for responsible acquisition, discovery and application of knowledge by its faculty, staff and students.

1. Institutions supporting basic and applied research maintain professional standards and provide oversight ensuring regulatory compliance, ethical behavior and fiscal accountability.
2. The institution provides effective support services to ensure the integrity of research and scholarly practice conducted by its faculty, staff and students.
3. The institution provides students guidance in the ethics of research and use of information resources.
4. The institution enforces policies on academic honesty and integrity.
 - TJH Recognizes that SWOSU may need to improve this area and/or prove compliance

Motivations for Scientific Ethics Course 2

- OK-INBRE Release Time Grant for Curriculum Development

Oklahoma Regional Universities

Application for Release Time from Teaching for Curriculum Development or Grant Proposal Development



Funds for release time from teaching obligations (up to 5 teaching load credit hours) will be provided to assist faculty members at Oklahoma regional universities in the preparation of grant applications to support (1) biomedical research projects or (2) curriculum redesign and course development intended to improve the preparation of future biomedical researchers.

Semester for which release time is requested: **Fall, 2019**

If this is a summer term, provide summer teaching load and the names of courses from which you will be released.

Working Title for Proposed Grant Application:

Granting Agency and Program:

Submission Deadline:

Working Title for Curriculum Development: **CHEM 2012 / BIOL 5022 Scientific Ethics**

Planned semester for implementation: **Interterm/Summer 2020**

Motivations for Scientific Ethics Course 3

- OK-INBRE Release Time Proposal:

Southwestern Oklahoma State University currently has no permanent mechanism in place for the instruction of undergraduate and graduate students on the “Responsible Conduct of Research”; i.e. “Scientific Ethics”. Multiple SWOSU faculty receive grant funding from either the National Institutes of Health (NIH) or the National Science Foundation (NSF), or both. These federal funding agencies both have requirements that participants in their funded research grants should receive significant training in the responsible conduct of research (RCR). NIH, in particular specifies several basic principles regarding the best practices for instruction on RCR, including:

Therefore, I propose to use the INBRE Release Time Grant to develop a 2-credit hour course at SWOSU titles “Scientific Ethics” which would be offered on a yearly basis that would include all of the aspects of RCR training as specified by NIH and NSF and would be based on face-to-face faculty/student interaction. Resources for the development of this course already identified include: a textbook by Macrina, “Scientific Integrity”, 4th Ed. ASM Press, 2014. ISBN: 978-1-55581-661-2; website

- Grant funded 5h load (\$20.5K) Fall 2019, for first class Summer 2020
 - Hubin becomes Chair Summer 2019, 6 hours load release
 - Hubin’s specialty courses only offered every other year comprise 5 hours load taught Fall 2019.
 - Release time grant is moved to Spring 2020; first class to Summer 2020
 - Spring 2020: COVID PANDEMIC; First class delayed to Summer 2021

II. Course Development

- Selection of Text
 - Well-known and Highly adapted elsewhere
 - Not too focused on Chemistry or Physical Sciences; Biomedical universal appeal
 - Appropriate to undergraduates at any level—researchers start as freshmen
 - “Complete” study of science ethics worthy of 2-credit undergraduate course, not just checking “RCR requirement” boxes (30 hours vs. 8 hour workshop)
 - Source of “Discussion Questions/Scenarios” as suggested by NIH/NSF
 - Rejected Texts: “The Ethical Chemist” Kovac; “On Fact and Fraud” Goodstein
- “Scientific Integrity” 4th Edition (2014), Francis L. Macrina
 - Author is Professor of Dentistry and Vice President of Research at VCU
 - Publisher is American Society for Microbiology
 - 4th Edition shows multiple revisions and broad adoption
 - Many biomedical cases, but makes efforts to use broad scientific topics
 - Level is appropriate; does not assume prior ethics or specific science courses
 - Expansive set of topics, with good early chapter focusing on an Introduction to Ethics, plus “extra” topics: **Ethics and the Scientist; Record Keeping; Science, Technology, and Society; Intellectual Property**

Course Text and Assigned Readings 1

Goal: Cover all chapters of this text



Scientific Integrity

FOURTH EDITION

Text and Cases
in Responsible
Conduct of
Research

FRANCIS L. MACRINA

chapter 1 **Methods, Manners, and the Responsible
Conduct of Research 1**

Francis L. Macrina

*Overview • Scientific Misconduct • Responsible Conduct of Research •
Conclusion • Discussion Questions • Resources*

chapter 2 **Ethics and the Scientist 25**

Bruce A. Fuchs and Francis L. Macrina

*Overview • Ethics and the Scientist • Science as a Profession • Underlying
Philosophical Issues • Utilitarianism • Deontology • Values of the Scientific
Community • Critical Thinking and the Case Study Approach • Moral
Reasoning in the Conduct of Science • Conclusion • Discussion Questions • Case
Studies • Principles and Responsibilities of Research Conduct • Resources*

chapter 3 **Mentoring 53**

Francis L. Macrina

*Overview • Characteristics of the Mentor-Trainee Relationship • Choosing a
Mentor • Foundations of Mentoring • Diversity, Research, and Research
Training • Learning Mentoring Skills • Conclusion • Discussion Questions •
Case Studies • Resources*

Course Text and Assigned Readings 2

chapter 4 **Authorship and Peer Review 83**

Francis L. Macrina

Scientific Publication and Authorship • The Need for Authorship Criteria • Instructions for Authors • Authorship: Definitions, Duties, and Responsibilities • Peer Review • Publication's Changing Landscape • Conclusion • Discussion Questions • Case Studies • Resources

chapter 5 **Use of Humans in Biomedical Experimentation 135**

Paul S. Swerdlow and Francis L. Macrina

Overview • Are You Conducting Human Subjects Research? • The Issue of Informed Consent • IRBs • The IRB and the Informed Consent Issue • Research Exempt from the Federal Regulations • The IRB and Expedited Review • Human Experimentation Involving Special Populations • The Health Insurance Portability and Accountability Act (HIPAA) • Fetal Tissue and Embryonic Stem Cell Research • Conclusion • Discussion Questions • Case Studies • The Declaration of Helsinki • Resources

chapter 6 **Use of Animals in Biomedical Experimentation 173**

Bruce A. Fuchs and Francis L. Macrina

Introduction • Ethical Challenges to the Use of Animals in Research • Practical Matters: Constraints on the Behavior of Scientists • A Continuum of Realities • Conclusion • Discussion Questions • Case Studies • Resources

chapter 7 **Competing Interests in Research 209**

S. Gaylen Bradley

Introduction • Conflict of Effort • Conflict of Conscience • Conflict of Interest • Managing Competing Interests • Conclusion • Discussion Questions • Case Studies • Resources

chapter 8 **Collaborative Research 243**

L. Michelle Bennett and Francis L. Macrina

Overview • Drivers of Collaborative Research • A Case in Point • Challenges of Collaborative Research • The Nature of Collaboration • Collaborative Agreements and Institutional Commitment • Fundamentals for Successful Team and Collaboration Dynamics • Mentoring in the Era of Team Science • Diversity • Authorship • Data Sharing, Custody, and Ownership • Managing Conflict and Promoting Disagreement • Collaborations with Industry • Collaboration with International Partners • Conflict of Interest • Miscellanies • Conclusion • Discussion Questions • Case Studies • Resources

chapter 9 **Research Data and Intellectual Property 287**

Thomas D. Mays and Francis L. Macrina

Introduction • Research Data • Rights in Tangible Personal Property • Trade Secrets • Trademarks • Copyrights • Patents • Patent Law in the Age of Biotechnology • Seeking a Patent • Conclusion • Discussion Questions • Case Studies • Authors' Note • Resources • Glossary

chapter 10 **Scientific Record Keeping 329**

Francis L. Macrina

Introduction • Why Do We Keep Records? • Defining Data • Data Ownership • Data Storage and Retention • Tools of the Trade • Laboratory Record-Keeping Policies • Record-Keeping Practices • Electronic Record Keeping • Conclusion • Discussion Questions • Case Studies • Resources

chapter 11 **Science, Technology, and Society 361**

Cindy L. Munro and Francis L. Macrina

Responsibilities of Scientists to Society • rDNA Technology • Genetic Technology • DURC • Conclusion • Discussion Questions • Resources

appendix I **Surveys as a Tool for Training in Scientific Integrity 387**

Michael W. Kalichman

appendix II **Student Exercises 413**

appendix III **Standards of Conduct 429**

appendix IV **Sample Protocols for Human and Animal Experimentation 445**

appendix V **Example of a U.S. Patent Specification 489**

appendix VI **Laboratory Notebook Instructions 503**

appendix VII **Safe Laboratory Practices Resources 509**

Additional Resources Utilized

- “Moral Reasoning in Scientific Research: Cases for Teaching and Assessment” Muriel J. Bebeau, et. al. 1995, Indiana University Wkshp
 - Freely shared resource developed many years ago
 - Detailed, page-long, Ethical Scenarios suitable for in-depth discussion
 - Logical, step-wise method for evaluating ethical scenarios
 - Check sheets for students to use for each scenario
 - Annotated check sheets for instructor to help evaluate student responses
 - Not 100% Overlap with Macrina Text
- NAPRI (National Advisory Panel on Research Integrity) Website
 - www.research-ethics.org
 - Could be used as complete course; freely available for use
 - More streamlined in content than I wanted for 2-credit course
 - Covered some areas that matched with Macrina text, but not Bebeau scenarios
 - Provided shorter case studies that were used to diversify discussions in class

Scheduling

- New Class Issues
 - No major currently requires the course; would there be a clientele?
 - Contractual requirement of research funding resulting in “required” course?
 - How would it be classified to get RUSO approval? CHEM2012 = Seminar/Topics
 - Should students be required to take the class? Who should pay for it?
- When to teach this class?
 - Fall Semester: might miss student enrollment for students just becoming involved in research and/or recruited during the semester
 - Spring Semester: would catch newly recruited research students; would catch students making summer research commitments on campus
 - Summer Interterm: SWOSU used this for 2-day RCR workshop; allows focus on single course immersion experience; allows for faculty compensation; allows training of students prior to full-time summer research positions
- Teaching Method
 - In person is optimal and was the original plan
 - Zoom Seminar 2021: COVID; Students Don't Have Place to Live in Wfd; still allows for live discussion. Not asynchronous. Everyone live at same time.

Schedule 2021

Schedule, CHEM 2012, Scientific Ethics, Interterm 2021 (May 3-14)

	Monday	Tuesday	Wednesday	Thursday	Friday
	May 3	May 4	May 5	May 6	May 7
<u>9:00-11:30 AM</u>	Course Policies Ch 1 Lecture Research Misconduct Discussion: Marty Brown	Ch 2 Lecture Ethics Background Discussion: Diane Archer	Ch 3 Lecture Mentoring Discussion: Bob Bailey	Ch 4 Lecture Authorship and Peer Review Discussion: Suzanne Booth	Ch 5 Lecture Use of Human Subjects Discussion: Dr. Jacqui
	<u>Lead Discussants:</u>	<u>Lead Discussants:</u>	<u>Lead Discussants:</u>	<u>Lead Discussants:</u>	<u>Lead Discussants:</u>
<u>Homework Due Beginning of Class</u>		Written Assignment 1 Marty Brown Ch 1		Written Assignment 2 Diane Archer Ch 1-2	Written Assignment 3 Bob Bailey Ch 3
	May 10	May 11	May 12	May 13	May 14
<u>9:00-11:30 AM</u>	Ch 6 Lecture Use of Animal Subjects Discussion: Jenny Ito	Ch 7 Lecture Conflicts of Interest Discussion: Charlie West	Ch 8 Lecture Scientific Collaborations Discussion: Cole/Hunter	Ch 9-10 Lecture Data Management, Record Keeping, and Intellectual Property Discussion: Jessica Banks	Ch 11 Lecture Responsibilities of Scientists to Society Discussion: Required Covid Vaccinations?
	<u>Lead Discussants:</u>	<u>Lead Discussants:</u>	<u>Lead Discussants:</u>	<u>Lead Discussants:</u>	<u>Lead Discussants:</u>
<u>Homework Due Beginning of Class</u>		Written Assignment 4 Jenny Ito Ch 6	Written Assignment 5 Charlie West Ch 7		Written Assignment 6 Jessica Banks Ch 9-10

Syllabus

CHEM 2012 Scientific Ethics, Interterm 2021

May 3-14, 2021

Instructor: Dr. Tim Hubin

Office Hours: MTWR 1:00-3:00; CPP 204B

Phone: 580-774-3026

Canvas Site: <https://swosu.instructure.com/>

Email: tim.hubin@swosu.edu

Website: <http://faculty.swosu.edu/tim.hubin/>

Time and Place: MTWRF 9:00-11:30, Zoom/Webinar

Text: Macrina, Scientific Integrity, 4th Ed. ASM Press, 2014. ISBN: 978-1-55581-661-2

Course Goals and Objectives:

A. Research Misconduct

1. Express the principles that sustain the research enterprise.
2. Define the expectations of the scientist, including the positive responsibility to track the responsible conduct of research.
3. Make a distinction between the aspiring goals of the scientist and the legal duties for the responsible conduct of research.
4. Describe steps for addressing allegations of scientific fraud or misconduct and apply them to case studies.
5. Discuss the proper step for whistle blowers and conditions under which adverse consequences might be reduced.

Attendance – Attendance (via Zoom) is essential to your mastery of the material, and so is expected. Students with unexcused absences may have their final letter grade lowered or be dropped from the class. Necessary absences that can be anticipated should be cleared with the instructor before the absence occurs. When an absence is unavoidable, the student should explain it to the instructor prior to the absence (preferably) or at the next class meeting. **The absent student must still complete the homework assignment for the missed class period. In order to make up the missed class time, each absence will be made up through an additional ethical analysis using the same format as the assigned written assignments for the “regular” written assignments from the class. Make-up assignment “case studies” will be taken from the following website (<http://research-ethics.org/topics/>) and chosen from the corresponding subject of the day that was missed (if you miss Ch 3 on Mentoring, you will choose a scenario from the Mentoring section of the website, under the “Discussion” tab). You will include a copy/pasted version of the scenario, along with your analysis.*

Content Delivery and Assessment: There will be multiple opportunities for you to learn the material for this course

1. Read the text. Before material is covered in class, you are expected to have read the relevant chapters. There will be an objective quiz on Canvas accompanying each chapter. After reading each chapter and taking the quiz, a good goal would be to feel comfortable with about 25% of the assigned content at this point.

2. Quizzes. Each day (starting day 2), we will have an objective (multiple choice/true false/matching/etc.) quiz covering the definitions, rules, lists, etc.... discussed in the previous day's lecture notes. These quizzes are meant to cover the factual part of this class, rather than the moral reasoning and opinion part of this class, which will be the focus of discussion and written assignments discussed below. Studying the lecture notes would be the best way to prepare. **There will be one quiz due prior to each day's class on days 2-10; 9 quizzes x 5pts = 45 points.**

3. Lecture. Power Point slides of the lecture presentations are available prior to each lecture period. You may bring them to class and take extra notes on them if you wish. Listening carefully to the presentation and asking questions when you don't understand something are the expected behaviors during lecture. The goal of the lecture is to explain the content in a slightly different way than the text, to provide additional examples, and to elaborate on the particularly challenging material. After the lecture, you should feel comfortable with about 50% of the class content.

4. Discussion. Scientific Ethics is a topic that should be explored by reading and discussing case studies of real and/or hypothetical ethical situations. We will be spending time discussing cases each class period—every student is welcome to participate in any discussion. But, each student will serve as a “Lead Discussant” on 3 class days. These students must participate in each portion of the discussion of the case study for the day. **Lead Discussants will receive 15 pts for their efforts, for a total of 45 points for the class.** After lecture/discussion, the goal is for you to feel comfortable with about 75% of the content.

5. Written Assignments. Six written assignment will come from your analysis of one detailed case studies from other sources. The important aspect of the assignment is that you begin to apply the concepts from the reading and the lecture/discussion to new situations and problems. After doing the case studies, I would expect about 100% mastery of the material. **There will be 6 written assignments at 20pts each = 120 points**

Evaluation:	Quizzes	5 points x 9 Quizzes = 45 points
	Lead Discussant	15 points x 3 Days = 45 points
	Written Assignments	20 points x 6 Assignments = 120 points
	Total	= 210 points

***Grading Scale:** A = 89.5-100% B = 79.5-89.4% C = 69.5-79.4% D = 59.5-69.4% F = 59.4% and below

*Any missed class period must be made up with a “Make-Up Analysis” that receives at least a 70% grade. Students not completing a “Make-Up Analysis” with at least a 70% grade for each missed day of class will receive an “I” grade until their “Make-Up Analyses)” are completed with a satisfactory grade.

Typical Class Day Schedule/Structure

- Start the class: questions or issues; preview of the day; housekeeping
- Display the day's Ethical Scenario for 15 minutes; everyone reads and writes initial responses to Bebeau's prompts
- Initial round of discussion with lead discussants on screen (20+ min)
 - TJH asks each Lead Discussant about one of the items outlined by Bebeau
 - Points of Ethical Conflict
 - Interested Parties
 - Duties and Obligations (of scenario's protagonist/title character)
 - *Proposed Course of Action (for protagonist)—TJH Added*
 - *Consequences (of the Proposed Course of Action)*
 - All other students can now contribute any additional thoughts questions
- Lecture: (45-60 min) TJH presents concepts from Macrina chapter
 - TJH describes personal examples, when possible, from ~30 years of Research
 - Students ask question or make comments as the lecture proceeds
- Final round of discussion (20+ min): revisit Scenario and Lead Discussants
 - Bebeau: diverse discussion viewpoints should lead to some changes in view
 - TJH: growth and conceptual knowledge from lecture also prompts changes

Objective Quiz

Question 2

Which of the following best names the behavior of a scientist "making up data"?

- Creativity
- Plagiarism
- Falsification
- Fabrication

Question 3

Which of the following best names the behavior of a scientist "manipulating some factor that introduces inaccuracies into the research record"?

- Creativity
- Plagiarism
- Falsification
- Fabrication

Lecture

Chapter 4: Authorship and Peer Review

A. Scientific Publication and Peer Review



1. Overview

- a. Why do scientists publish their findings?
 - i. Report findings so other scientist know what we've found
 - ii. Allows evaluation and places them in context with larger body of knowledge
 - iii. Credits other scientists and their work that helped us build our work on
 - iv. Allows others to repeat or extend on our work—verification
 - v. Attributes who gets credit (and takes responsibility) for the work reported
 - vi. Archive our work and make is accessible for the future
- b. Robert K. Merton "The Coin of the Realm"
 - i. Recognition from employer, granting agency, other scientists depends on publications
 - ii. "The goal of scientific research is publication." Robert Day
 - iii. Research is a unique profession that requires you write about what you do.
 - iv. TJH: Job as a scientist is essentially writing: lectures, exams, grant proposals, recommendation letters, posters, talks, scientific papers, books. You do the lab work (or have others do it with/for you) so you have something to write about.
 - v. Donald Kennedy: "All the...experiments...aren't anything until we write them up. In the world of scholarship, we are what we write."



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B. Authorship Criteria



1. **Historically, who got to be an author on a paper was vaguely defined**
 - a. Misunderstandings, confusion, hard feelings resulted
 - b. Journals, societies, publishers, funding agencies now have clearer policies
2. **Author has to have a stake in the research**
 - a. Single-author papers are very rare in modern science
 - b. Multilayered labs with students, technicians, postdocs, collaborators all have a stake
 - c. Defining who has a stake in a paper can still be complicated
3. **Authorship guidelines**
 - a. No experimental, technical, or intellectual contribution: not an author
 - b. Key experiment and data interpretation: clearly an author
 - c. Gray areas still remain with less clear-cut examples; will discuss more



C. Instructions for Authors

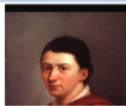
1. Overview

- a. Each journal (sometimes grouped by a publisher) has an on-line available document providing details for how to prepare a paper for that journal (was 1st issue of year)
- b. What kind of science does this journal publish
- c. What kind of articles does it accept: communications, full papers, reviews?
- d. General policies and philosophy of publication

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3. Philosophy of Review

- a. Reviewer's job
 - i. Help the Editor make a good decision on the acceptability of the paper
 - ii. Help authors communicate their work in best way
- b. Job is not to be an adversary. Best reviewers want best outcome for the authors.
 - i. Attacking or Belittling reviews don't do anyone any good. Editor may end up having to get another review if one is clearly hostile
 - ii. Hard for author and reviewer to communicate clearly if hostility present



Every philosophical review ought to be a philosophy of reviews at the same time.

~ Karl Wilhelm Friedrich Schlegel

4. Confidentiality

- a. A submitted manuscript is confidential and can't be shared with others
- b. Occasionally, can get assistance from a specialist with Editor's permission
- c. Trainees often asked to do the review for a busy mentor
 - i. Should seek permission from Editor to do this
 - ii. Good learning experience, but Editor sought expert
 - iii. TJH: my first review(s) were done in this way as a postdoc. I wrote up a review, but my mentor edited and submitted it as his review
- d. Never directly contact the authors; generally anonymous review
- e. Editor serves as conduit for all (formal, written) communication



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5. Criteria for Evaluating Merit of a Manuscript

- a. Does the manuscript clearly state the problem being addressed in context of literature
 - i. Are proper literature citations to the underlying work given
 - ii. Are the problem/solution/data/results original
 1. Doesn't have to be brand new, no one ever thought of it before
 2. Can be extension of previous work if new data obtained
 3. More original work can either be easier, or harder, to get published
- b. Did authors use the right techniques and research design?
 - i. Descriptions of methods must allow for independent verification
 - ii. New methods must be completely described; published methods can be cited
- c. Is the data presented clearly and effectively?
 - i. Are figures and tables clear, legible, appropriate, show what is desired?
 - ii. Commonly, much data is now sent to a "Supporting Information" document
- d. Discussion and Conclusions supported by the data? Not speculation?
- e. Is writing correct and free from mistakes
 - i. TJH: used to spend time pointing out every single error. Can comment if bad.
 - ii. Not reviewer's job. Publishers have editorial staff to do this



6. Writing the Review

- a. Format varies by journal.
 - i. Can be mostly freeform, with a few set "radiobuttons" Accept, Reject, Revise
 - ii. Some journals have a set of specific questions they want answered
 - iii. Often short summary, followed by places reviewer has questions or concerns

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Ethical Scenario (Bebeau) 1

Developing a Well-Reasoned Response to a Moral Problem in Scientific Research¹

Muriel J. Bebeau
University of Minnesota

“When evaluating arguments, it might be important to point out that an argument that fails to attend to one or more issues, or to project important consequences, or to consider the perspectives of others interested in the decision is not necessarily an indefensible argument, but it might be less persuasive than an argument that has attended to the full scope of issues, interested parties, consequences, etc. Generally, the more comprehensive argument is not only more convincing, but less vulnerable to counterargument.” Muriel Bebeau

How does one decide whether a response is well-reasoned? What criteria apply? Can the adequacy of a response to a moral problem be reliably judged? These are questions of concern to students in an ethics course. Responses can be judged based on these criteria:

- (A) Whether the response addresses each of the **issues and points of ethical conflict** presented in the case or problem;
- (B) Whether each **interested party’s** legitimate expectations are considered;
- (C) Whether the **consequences** of acting are recognized, specifically described (not just generally mentioned), and incorporated into the decision; and
- (D) Whether each of the **duties or obligations** of the protagonist are described and grounded in moral considerations.

These are the criteria generally used to evaluate the adequacy of responses to ethical problems. Persons with training in ethical analysis can reliably rate and rank the adequacy of the arguments for a chosen response. The purpose of this paper is to help you understand the criteria for judging the adequacy of moral arguments so you can develop a strong argument in defense of your position on the problem presented to you.

Ethical Scenario (Bebeau) 1

Developing a Well-Reasoned Response to a Moral Problem in Scientific Research¹

Muriel J. Bebeau
University of Minnesota

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Proposed course of action for protagonist

CPOPC

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Ethical Scenario (Bebeau) 2

The Marty Brown Case

Marty Brown, a plant biologist at a major research university, is investigating the potential utility of transgenic tobacco plants as “factories” for the production of foreign proteins. The potential benefit of this research to human medicine is clear. For instance, the non-plant gene that Brown is working with right now is human Factor VIII, a protein essential for blood clotting and the protein that most people with hemophilia lack.

In his current experiment, Brown has introduced a construct of the Factor VIII gene into tobacco and has 100 transgenic plants that he is studying in a developmental time course. He is following both Factor VIII production and the plants’ growth to assess the effect of the foreign gene on the plant’s development, and vice versa.

Brown is excited about the success of his experiment thus far, and he feels that the potential uses for his findings make it imperative that he publish as soon as possible. A disease-free, inexpensive source of Human Factor VIII would be of great benefit to hemophiliacs, who run the risk of contracting disease from plasma-derived sources and who must find a way to pay about \$100,000 per year for their treatment. The urgency is all the more real to Brown, whose infant son is a hemophiliac. The sooner Brown’s promising results are published, the sooner other scientists will be able to follow his line of work, and the sooner his discovery can have a practical, clinical impact.

One Friday, late in January, Brown checks on the 100 transgenic tobacco plants that have now been in the greenhouse for about a month. He discovers that twelve of them are beginning to look sickly. Their leaves are drooping a bit and turning yellow on the edges. He records this in his notebook, and also notes that all of these plants are close to the door. Later, in the lab, when he checks his previous results, he finds that these twelve plants have been producing Factor VIII at a consistently higher level than the other plants. Only one other plant had Factor VIII in this range, although quite a few came close.

Feeling pressed for time, Brown decides not to investigate the cause of the poorer growth of the twelve plants any further. He concludes that because they happen to be near the greenhouse door, they have been repeatedly exposed to lower temperatures than the other plants, and that this is the problem. He records this conclusion in his notebook along with the other entries.

Early the following week, Brown is working on integrating his most recent transgenic plant data into the first draft of the manuscript on which he is working. He has entitled it “Human Factor VIII Production in Transgenic Tobacco Has No Deleterious Effect on Plant Growth.” When Brown comes to the data on the twelve sickly plants, he considers whether he should exclude these plants from his analysis. He thinks that doing so would be justified because of the plants’ proximity to the greenhouse door. In addition, the paper would be more impressive without the uncertainty associated with the data from these plants. He weighs the relevance of the data from those twelve plants against the principle that there is nothing wrong with excluding outliers and irrelevant data. Besides, he thinks these results are too important to risk letting them get held up in the review process.

Should Brown leave out the data from those twelve plants? Why or why not?

Notes for Discussion and Assessment

The Marty Brown Case

As of December 1995 (when this case was being prepared), Human Factor VIII from recombinant sources was available in the final stages of FDA testing. However, it was expensive, and it may not have had quite the same properties as the plasma-derived protein.

Most hemophiliacs today use clotting factor preparations derived from plasma. These preparations are carefully screened and then purified to reduce the risk of infection. However, nothing is 100% safe, and all these extra steps cost money. There are approved preparations of clotting factor with different degrees of purity; the more pure, the more costly. Thus, one’s risk of disease is related to one’s ability to pay. In the early 1980s, the cost to treat a hemophiliac was about \$10,000 per year. Today, that cost is close to \$100,000. The cost of one unit of clotting factor has gone from \$0.08 to between \$0.50 and \$1.00. (Thanks to the Louisville Red Cross Blood Center for this information.)

1. Issues and Points of Conflict

Brown’s obligation to do all he can to help and protect his son vs. his obligation to use sound, objective scientific judgment.

2. Interested Parties

Brown has an interest in

- seeing that a safe and relatively inexpensive source of Factor VIII is found as soon as possible.
- being the one who receives the prestige and recognition associated with being the discoverer of a relatively inexpensive way to produce disease-free Factor VIII.
- receiving royalties should his work lead to a patent.
- maintaining his reputation as a careful, thorough scientific investigator.

Brown’s students and associates have an interest in

3. Consequences

There are several possible consequences to Brown, notably to his **research**, to his **reputation and career**, and to his **claim for priority**.

If Brown excludes the data for the twelve plants and publishes without further investigating the cause of the plants’ malaise, he could be advancing progress in the search for a new source of

4. Brown’s Obligations

To carry out careful, thorough research. A scientist has an obligation to carry out carefully designed experiments in which relevant variables are identified, and either measured or controlled. He/she needs to be ready to investigate uncertainties that arise. A scientist has an obligation to be technically competent and keep complete notes.

To use sound, objective scientific judgment, both in conducting experiments and in interpreting

Ethical Scenario (Bebeau) 3

Hubin Written Assignment Details

After Class Written Assignment (Read Attached Essay by Muriel Bebeau for details and tips)

1. Paragraph 1 will simply be to type up your **initial response** paragraph from the in-class discussion. Don't try to "fix it" in terms of the ethical responses (although complete sentences would be appreciated). We are looking for growth and deeper analysis from this initial response as the starting point. Part of this class and these assignments is to widen our awareness of Issues/Parties/Duties/Consequences, so it is useful to see where we start from. **3 points** will be given for growth and reassessment from this starting point.
2. Paragraph 2 will focus on identifying and discussing various Issues and **Points of Ethical Conflict**. It is difficult to respond to ethical situations effectively without identifying what the conflicts are. Identify as fully as you can as many of these conflicts as you can. Don't just say "plagiarism"; say "subject A using subject B's idea from a class in subject A's proposal is plagiarism". There are often 3-5 identifiable conflicts in a scenario. **(5 points)**
3. Paragraph 3 will be about identifying all of the Interested Parties within and surrounding the scenario. The protagonist is always an interested party, but there are often multiple surrounding layers of others: coworkers, research supervisor, colleagues, university, other workers in the field or readers of the published research, etc. There often at least 5 identifiable parties. They should not only be identified, but there particular interest(s) discussed as well. **(3 points)**
4. Paragraph 4 will require identification and discussion of the **Duties and Obligations** of the scenario's protagonist (person in the title of the scenario). There are often 6-10 identifiable duties in a scenario. Some of them are present in most/all scenarios: "to maintain his/her integrity" or "to carry out thorough, honest research". But there are also duties unique and specific to that protagonist/scenario. **(5 points)**
5. Paragraph 5 will focus on your "final" **proposed Course(s) of Action for the protagonist, and the Consequences of the Proposed Action(s) to the various interested parties (not just the protagonist)**. There won't necessarily be a direct correspondence of one consequence per identified party from paragraph 3. For example, there may be identifiable consequences to the protagonists career, reputation, conscience, family, etc... that all stem from only one interested party (the protagonist). Focus on consequences that are (a) highly likely, and (b) particularly severe. There are infinite potential consequences that are not likely and not severe which do not have to be addressed. **(4 points)**

Additional Discussion

1. Use for makeup written assignments if student missed class—Student Selects (on Topic that was missed)

2. Used if discussion on Bebeau scenario was more clear-cut or was not generating much new at the end of class

a) In some chapters, the topics were diverse, and I wanted to look at multiple ethical aspects, not just one large scenario

b) Did not follow Bebeau's list of tasks. Allowed more free-form discussion and thoughts

The screenshot shows a web browser window with the URL research-ethics.org/topics/collaboration/#discussion. The page header includes navigation links: Home, Topics, Collaboration. The main content area has a sidebar menu with options: Overview, Animal Subjects, Authorship, Biosecurity, Collaboration (highlighted), Conflicts of Interest, Data Management, Human Subjects, Mentoring, Peer Review, Publication, Research Misconduct, and Social Responsibility. The main content area has tabs: Summary, Background, Regulations and Guidelines, Discussion (highlighted), and Resources. A 'Case Study 3' window is open, containing the following text:

Case Study 3

Two graduate students (Sven and Oren) in the same research group in a political science department submit a paper to a conference. The paper utilizes publicly available data in a new way to study the role of the judiciary in regulating conflict in Nigeria. After seeing the paper on the agenda of an upcoming conference, another student (Corey) in the same research group in the same department contacts the PI (Dr. Smith). Corey claims that his dissertation proposal was on the same topic, also in Nigeria, and accuses Sven and Oren of plagiarism. He argues that his proposal gives him the exclusive right within the group to publish on the data, even though he has not had the chance to do anything with it yet. Sven and Oren argue that the data are publicly available, that they weren't aware of the contents of Corey's proposal, and that Corey would not have any recourse to even contact them if they weren't in the same research group. Dr. Smith concludes that research group members have a responsibility to avail themselves of each other's dissertation proposals, and that Sven and Oren should include Corey as a coauthor on the paper.

Additional Conflict of Interest Cases (Macrina)

Andre Cesar is completing his degree at Research University. He has conducted some successful and exciting research in the laboratory of Dr. Ellen Zinderoff. Dr. Zinderoff's project was supported in part by a research contract with Innovations, Inc. Dr. Zinderoff and the members of her laboratory developed new, rapid, accurate assays that can be adapted to kits for direct sale to the public. Innovations, Inc., is considering developing and marketing these kits but has not made a definite decision. Leaper Enterprises offers Andre a position in a new unit of the company to apply his training to develop kits based on the technology that he learned and helped develop in Dr. Zinderoff's laboratory. Discuss any conflict that Andre may have in accepting a position in a company that competes with Dr. Zinderoff's sponsor. How is the situation altered if Andre was paid or not paid by funds from Innovations, Inc., while a student?

Student Work

Scientific Ethics

Written Analysis

The Charlie West Case

This was a particularly complex case. There are numerous obligations that West must acknowledge before coming to his decision including those to his family, present employer, and the institution where he will have his future career. One thing is clear in this entire scenario; West should not plagiarize someone else's work even if it betters his chance at career success. By plagiarizing, West runs the risk of damaging his reputation and facing serious reprimands. It seemed initially that the best way for West to go forward would be to talk to the principal scientist of the lab he is currently working in, Wilson, and request a three-day extension in order to finish his grant proposal in time. Though it will be difficult, West might just be able to finish the "Background" of his proposal. West can then commit to finishing Wilson's paper the following day. This gives West the opportunity to finish his proposal without having to compromise his integrity.

The **points of ethical conflict** in this case cover a range of areas stretching from upholding present family duties to preparing for future opportunities. The main ethical concern for this case is somewhat obvious: West's plagiarism. Knowingly taking someone else's work and attempting to pass it on as your own is clearly unethical. The original author of the stolen work has the right to their own words, and West's actions could result in serious consequences. Another conflict, often faced by successful scientists, is the conflict of upholding the commitments made to West's family while also trying to establish a respectable image or reputation for himself. West likely feels that the arrival of his first child means that spending time with family has grown in importance. However, by doing so, he is limiting his time spent trying to further his career through the grant proposal. This is a case where West must sort out what area he prioritizes. The final conflict that can be seen with West is one which stems from the struggle of commitment to his current employer versus that of his future boss. Wilson wants West to finish the scientific paper which they have been attempting to work on for months, but the chair of the HSU biology department, who will soon be West's boss, wants him to submit a grant proposal to bring the university funding. West will need to evaluate where his loyalties lie when making his decision. The prospect of a new job and a better position can act as a strong influencer in this scenario.

The **parties of interest** in this case were relatively easy to see. West is the main scientist over who this case covers, and, as a result, his interest in this case is evident. His current boss would also be listed as a party of interest. Professor Wilson is the lead scientist in the lab where West works. Wilson's desire is for him to carry out the experiments that the group have been working on in order to produce a paper *before* a competing lab beats them to it. Likewise, the chair of the HSU Biology Department is also eager for West's effort on a project. The chair wants West to bring in funding for the university and the prestige that could result from the addition of a respectable young scientist. West's family (his wife and child) have a unique interest in this case because any decision that West choose in this instance will impact the amount of time he spends at home or time spent on personal tasks. The presence of an infant in West's life creates a tremendous stressor for both him and his wife, so his wife may require more of his time. A significant party of interest would be the author of the paper which West is considering plagiarizing. This scientist could be affected significantly if West goes through with this action. He/she is the one which deserves the credit, so maintaining their integrity of the original proposal in his/her main objective in this case. The final party which can be mentioned is the organization which oversees and regulates the reviewing of grant proposals. The NIH's interest in this case is that the standards for credible proposals be upheld for all those who apply. If West decides to plagiarize, this group will be the main one to solve the issue.

This case was filled with conflicting **obligations**, and trying to fulfil them all will be nearly impossible for West. As all scientists, West has an **obligation to himself** to try and further his career as well as build his prestige. Finishing the grant proposal would be a crucial step in earning tenure and becoming a member of the HSU faculty. His desire for respectability would also help him provide for his family thereby fulfilling his duty to them. As a husband and father, he has an obligation to provide for his wife and child. However, part of that obligation includes spending time with both of them which would be affected if he decides to focus fully on finishing the proposal or finalizing Wilson's paper. Wilson presents West with another obligation. West has spent a significant amount of time in this lab and is in the last year of his post-doctoral career. This means that West likely has a relationship with Wilson who has been extremely lenient with his lack of progress in the past. West will have to consider if he wants to continue to push Wilson's patience or finally commit his time to finishing the experiments he promised to do. West has a similar obligation to the biology chair because he is hoping to become part of the faculty at HSU. The grant proposal which has caused so much grief in this case is near the top of West's priorities, and he owes it to his future boss to make every effort in being the scientist that the university wants. As a scientist, West must uphold his duty to NIH and remain credible in his research. This organization expects all applicants to adhere to the rules and regulations set forth by the NIH and, by plagiarizing, West would fail to meet these standards. He has a duty to be the respectable applicant that the NIH is requiring. West has an obligation to his fellow scientist who was the author of the original paper. When this author sent in his proposal, he expected it to be reviewed with the same level of confidentiality which the NIH promises to all. If word of West's plagiarism were to reach the original scientist, he/she will feel cheated and possibly betrayed by a fellow scientist.

After **considering** all of the parties involved and the obligations West must meet, I have determined that the best **course of action** for West to follow would be for him to approach Wilson and respectfully request large time slots during the three days prior to the NIH deadline in order to finish the proposal before focusing his full attention on the project. West would be wise to enlist the help of experienced scientists to help him write the remainder of his proposal. He could reassure Wilson that the experiments would get his full attention *as soon as* he has submitted the proposal. This is the least harmful choice to each party. For West, requesting time for his proposal would give him the opportunity to finish his work without having to cheat. Getting help from more experienced scientists would increase his chances of finishing because they might be able to give him advice on how to write the background. The NIH would see this course of action in a positive light. The standards set by this organization would be met and the integrity of the proposal would be intact. Another party which would benefit would be the chair of the biology department. The chair could be satisfied knowing that West submitted his proposal because it could mean an increase in university funding. The original author of the **article would** only benefit from West's decision because his/her work would be safe from plagiarism. The only **downside** which could occur would be that the original author would not get any extra recognition that could come from the publicity of the incident. However, not every party will see this decision as desirable. Although Wilson may find slight satisfaction in the fact that West's full attention would be on his project within the span of only three days, this test of his patience may lead to an increase in tension between West and himself. West's last year at this lab might be somewhat unenjoyable. His family would likely be saddened by the decrease in time West will be able to spend with them, but they can take comfort in the chance of a better future that will come with West's new position. The most important thing for West to do in the future would be to manage his time better and learn to rank his priorities.

Student Discussion

- (Written permission was obtained from all five students to use this discussion)

BMJ Global Health Gur-Arie et al 2021 Health Care Personnel and COVID Vaccination.pdf - Drawboard PDF



BMJ Global Health

No Job, No Job? Ethical Issues in Mandatory COVID-19 Vaccination of Healthcare Personnel

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INTRODUCTION

The COVID-19 pandemic continues, but its potential end is in sight. The first COVID-19 vaccines have been distributed.^{1,2} Multiple vaccine allocation plans rooted in fair, just and equitable global vaccine allocation aim to maximise the benefits of vaccination programmes.^{3,4} One common factor in COVID-19 vaccine allocation plans to date is the prioritisation of healthcare personnel (HCP). We define HCP as all frontline workers at healthcare settings including but not limited to: physicians, nurses, physicians' assistants, laboratory technicians, students on rotation, administrative staff, cleaning personnel and security staff. Though hierarchies of vaccine prioritisation among different groups of HCP have been proposed, this analysis focuses on HCP generally as a population.⁵ Prioritising HCP to receive COVID-19 vaccines is relatively uncontroversial and commonly justified by HCP's right to be protected from occupational infection, the need to maintain healthcare staffing, and/or the protection of patients from being infected by HCP.⁶

The pandemic emergency has exacerbated shortages in healthcare staffing and resources,⁸ heightening the importance of protecting HCP. Vaccinating HCP against COVID-19 first could therefore help to maximise the benefit of a limited resource,⁹ assuming that vaccinated HCP continue to care for patients, including those infected with COVID-19. Vaccinated HCP may also impose less risk of disease transmission to patients, as documented in other infectious disease contexts including influenza and hepatitis B.^{10,11} All of these justifications are arguably related to HCP's professional commitment to protect patients.

HOW COMPLICATED CAN VACCINATING HCP AGAINST COVID-19 BE?

On face value, vaccinating HCP against COVID-19 first sounds simple: healthcare

Summary box

- ▶ Mandating COVID-19 vaccination of healthcare personnel (HCP) could maximise vaccine uptake, but risks exacerbating breakdowns in trust between HCP and their institutions.
- ▶ Ethical arguments for mandating COVID-19 vaccination of HCP appeal to their duties to 'do no harm' and to care for patients, but the fulfilment of these duties requires a safe working environment.
- ▶ We argue for policies aimed at strengthening HCP's trust in healthcare systems by addressing HCP concerns, including the institutional factors that have put them at risk of infection throughout the COVID-19 pandemic, before considering a COVID-19 vaccine mandate.

systems will receive COVID-19 vaccines, distribute them to their HCP, and HCP will be vaccinated. Though such a scenario sounds plausible, vaccine hesitancy among the general public and HCP was rising globally at record rates even before COVID-19.^{12,13} Previous research has documented the prevalence of vaccine hesitancy among HCP regarding COVID-19 vaccines.¹⁴⁻¹⁷ Potential contributors to COVID-19 vaccine hesitancy among HCP include safety concerns, doubts about effectiveness (in terms of individual protection and/or reduction of transmission), and perceived low risks of infection among HCP who do not treat patients with COVID-19.¹¹ Similar factors contribute to vaccine hesitancy towards seasonal influenza vaccination among HCP,¹⁸ which has been a documented challenge in raising seasonal influenza vaccine uptake among HCP in some settings for decades, despite established evidence of safety and effectiveness.^{18,19} This raises the question: what kinds of policies aimed at increasing COVID-19 vaccine uptake among HCP would be ethically justifiable? Overarching consensus to prioritise HCP to receive COVID-19 vaccines is undoubtedly

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1/5

2

2

20

117%

BMJ

Gur-Arie R, et al. *BMJ Global Health* 2021;6:e004877. doi:10.1136/bmjgh-2020-004877

1

III. Outcomes

- Point Distribution (Fall 2009)
 - Canvas Quizzes: 45 points
 - Lead Discussants: 45 points
 - Written Analyses of Ethical Scenarios: 120 points
 - TOTAL = 210 pts
- Grade Distribution
 - All 15 students received A's
 - Percent range: 93.4% to 99.1%

**CHEM2012 Scientific Ethics
Lead Discussant Evaluation Checklist**

Name: _____
 Case: _____
 Date: _____

Initial Discussion Prior to Lecture (5 points)

Valid Point of Conflict Identified	0	1	
Valid Interested Party Identified	0	1	
Valid Obligations of Protagonist Identified	0	1	
Initial Course of Action Reasonable	0	1	
Valid Consequences Identified	0	1	

In Depth Discussion Following Lecture (10 point)

Points of Conflict Expanded and Incorporate Lecture/Discussion	0	1	2
Interested Party Expanded and Incorporate Lecture/ Discussion	0	1	2
Obligations Expanded and Incorporate Lecture/ Discussion	0	1	2
Course(s) of Action Reasonable and Reflect Lecture/ Discussion	0	1	2
Consequences Expanded and Incorporate Lecture/ Discussion	0	1	2

Total Points Earned: _____ (15 points possible)

The Marty Brown Case Evaluation Checklist		Student's name:
Side 1 position (yes or no)		
Side 2 position (yes or no)		
Issues and Points of Conflict (5 points; 3=5; 2=4; 1=3)		
Brown's duty to help son vs. to exercise good judgment		
Brown's interest in priority vs. maintaining reputation		
broad interest in quick results vs. broad interest in effective use of limited resources		
Subtotal:		
Interested Parties (3 points; 4-5=3; 2-3=2; 1=1)		
Brown		
Brown's students and associates		
other workers in the field		
Brown's department and university		
hemophiliacs and their families		
Subtotal:		
Consequences (4 points; 6-8=4; 4-5=3; 2-3=2; 1=1)		
to Brown's research		
to Brown's reputation and career		
to Brown's claim for priority		
to Brown's students, colleagues, department, and university		
to other workers in the field		
to the journal that publishes the study		
to hemophiliacs and their families		
to science in general		
Subtotal:		
Brown's Obligations (5 points; 6-8=5; 4-5=4; 3=3; 2=2; 1=1)		
to carry out careful, thorough research		
to use sound, objective judgment		
to publish honest reports of research		
to publish in a timely fashion		
to do all he can to help his son		
to use expertise to help other people		
to protect his career and family		
to maintain his integrity		
Subtotal:		
Reassess (3 points)		
Total (20 points possible):		


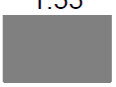

Course Evaluations by Students (n = 15)

2. Initially, my interest in this subject was						
Response Option	Weight	Frequency	Percent	Percent Responses		
Very High	(1)	0	0.00%			
High	(2)	4	33.33%			
Moderate	(3)	7	58.33%			
Low	(4)	1	8.33%			
Very Low	(5)	0	0.00%			
				0 25 50 100	Question	
Response Rate				Mean		STD
12/15 (80.00%)				2.75		0.62




3. At this time, my interest in this subject is						
Response Option	Weight	Frequency	Percent	Percent Responses		
Very High	(1)	1	8.33%			
High	(2)	8	66.67%			
Moderate	(3)	2	16.67%			
Low	(4)	1	8.33%			
Very Low	(5)	0	0.00%			
				0 25 50 100	Question	
Response Rate				Mean		STD
12/15 (80.00%)				2.25		0.75

Course Evaluations by Students (n = 15)

6. Course required meaningful work and study.


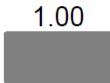
Response Option	Weight	Frequency	Percent	Percent Responses	
Strongly Agree	(1)	8	66.67%		 1.33
Agree	(2)	4	33.33%		
Sometimes Agree	(3)	0	0.00%		
Disagree	(4)	0	0.00%		
Strongly Disagree	(5)	0	0.00%		
				0 25 50 100	Question
Response Rate				Mean	STD
12/15 (80.00%)				1.33	0.49

7. Text(s) or course materials were helpful.


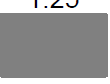

Response Option	Weight	Frequency	Percent	Percent Responses	
Strongly Agree	(1)	5	41.67%		 1.58
Agree	(2)	7	58.33%		
Sometimes Agree	(3)	0	0.00%		
Disagree	(4)	0	0.00%		
Strongly Disagree	(5)	0	0.00%		
				0 25 50 100	Question
Response Rate				Mean	STD
12/15 (80.00%)				1.58	0.51

Course Evaluations by Students (n = 15)

8. Assignments and tests adequately sampled the material covered.


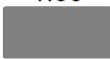
Response Option	Weight	Frequency	Percent	Percent Responses		
Strongly Agree	(1)	12	100.00%		 1.00	
Agree	(2)	0	0.00%			
Sometimes Agree	(3)	0	0.00%			
Disagree	(4)	0	0.00%			
Strongly Disagree	(5)	0	0.00%			
				0 25 50 100	Question	
Response Rate				Mean		STD
12/15 (80.00%)				1.00		0.00

9. Course expanded my knowledge, comprehension, and/or skills.


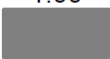
Response Option	Weight	Frequency	Percent	Percent Responses		
Strongly Agree	(1)	9	75.00%		 1.25	
Agree	(2)	3	25.00%			
Sometimes Agree	(3)	0	0.00%			
Disagree	(4)	0	0.00%			
Strongly Disagree	(5)	0	0.00%			
				0 25 50 100	Question	
Response Rate				Mean		STD
12/15 (80.00%)				1.25		0.45

Course Evaluations by Students (n = 15)

18. Students were treated in a fair and impartial manner.

Response Option	Weight	Frequency	Percent	Percent Responses		
Strongly Agree	(1)	12	100.00%		 1.00	
Agree	(2)	0	0.00%			
Sometimes Agree	(3)	0	0.00%			
Disagree	(4)	0	0.00%			
Strongly Disagree	(5)	0	0.00%			
				0 25 50 100	Question	
Response Rate				Mean		STD
12/15 (80.00%)				1.00		0.00

19. Students were treated with respect.

Response Option	Weight	Frequency	Percent	Percent Responses		
Strongly Agree	(1)	12	100.00%		 1.00	
Agree	(2)	0	0.00%			
Sometimes Agree	(3)	0	0.00%			
Disagree	(4)	0	0.00%			
Strongly Disagree	(5)	0	0.00%			
				0 25 50 100	Question	
Response Rate				Mean		STD
12/15 (80.00%)				1.00		0.00

Mean of Means Calculations	Mean			
Mean of the Means for Questions 6-20	1.13			

Student Evaluation Comments

- **Open comments as for every SWOSU Course**
 - “Dr. Hubin created a nice balance between various learning methods! The lecture were a little long but his stories were helpful and fun. I definitely think this course is worth the time!”
 - “Overall, I'm pretty glad I choose to take this course. It gave me really good information about a career path that I'm interested in, but that my program doesn't cover at all, so I'm appreciative I got the opportunity to take the course to learn new things. The amount of work in the two weeks was manageable without being too easy. It was also very refreshing and enjoyable to take a class not related to healthcare after two years of pharm school.”
- **As taught, was this course about right for 2 credit hours? Too much work? Too little work? Would you recommend expanding it into a normal Fall/Spring semester course worth 3 credit hours? Or, contracting it into 1 credit hour course that meets once a week?**
 - “I think it was a good amount of work and we covered the necessary material. I don't think it should be a class that meets 3 times a week. I think it would be best as meeting once a week during the semester.”
 - “I don't think there's enough material to expand to a 3 hour course. I could see a weekly 1 hour course being possible, one discussion/essay per week would be a manageable add-on elective for the Fall or Spring semesters. As is, 2 hours is good for what we did in the time frame.”
 - “In the summer interim, this class works perfect as a 2 credit course with the schedule we have currently. If this was expanded to fall/spring I would think once a week would be efficient and would recommend still over zoom.”

Student Evaluation Comments

- **Do you think there should be objective Exam(s) to earn points for this course, or are you satisfied with the quizzes and written response papers?**
 - “I think the written papers were graded closely enough that exams weren't needed because I put more effort into the essays for a good grade. Quizzes were very easy because of open note, could easily give them closed-note/in-class to add a little more difficulty to the course instead of exams.
 - “Quizzes and written material was appropriate. In the real world with an ethical problem you are always able to go back and review laws you do not have to take a best guess
- **Was there too little discussion and too much lecture? Was there too much discussion? What are your suggestions for balancing these components?**
 - “I would have enjoyed more time spent discussing the topics. The lectures were interesting, but I felt as though I understood more of the concepts when I heard them explained with life-like scenarios. If there is a way to shorten the power points in order to allow more time for discussion, the class could benefit.
 - “I believe the discussion time was perfect. It gave enough time for students to give initial responses to the prompts. After learning new information from the lecture, students can return to the prompt and revise their prior statements.”

Student Evaluation Comments

- **Were the number of “Lead Discussants” on a given day (4 or 5), and the number of opportunities to be “Lead Discussants” (3 times) appropriate? Should everyone have been required to participate in discussion every day? Or did the rotation of Lead Discussants allow everyone to participate significantly without allowing the discussions to be dominated by a few outspoken students?**
 - “I liked the system for the discussions, I have participated in almost the exact system for previous discussion/case study-based courses, and it works well so that everyone gets a reasonable chance to speak in class to earn points without being stressed about not getting to fit in a speaking turn. It would be too much if everyone in the class was required to speak every day.”
- **What is your opinion of the analysis method applied (conflicts, parties, obligations, actions, consequences) for the ethical scenarios? Do you think you will remember it and apply it in your own science career?**
 - “Those are good analysis methods and I definitely have noticed using it already in my daily life with ethical problems that have come up. This class also helped with writing them out and then thinking why someone may feel a certain way.”
 - “I think it’s gonna stick with me not just in science career but just other ethical issues in general. It was an easy method to get the hang of and being able to apply. It took me a paper or two to get exactly what was desired from the rubric, but I had ample feedback to help me.”
 - “The analysis part was always interesting and I will definitely keep it in mind for the future.”

Lessons Learned 1

- Students were genuinely interested and engaged, even with Zoom
 - Many were my own research mentees (9/15) or students I knew (13/15)
 - Most were classic “overachiever” types—they are already doing research
 - Best writer attending to assignment was actually a freshman
 - Some upperclassmen had more experience to bring to the discussions
 - Attendance was essentially perfect with all absences excused either for previously made family/university obligations (softball, another course)
- Course served second purpose as “Intro to Research”
 - Undergraduate students (as opposed to graduate students or postdocs) were often not familiar even with the basics (Publication/Peer Review) notwithstanding the Ethical Considerations
 - Value of the course was increased.
 - Focus was primarily on science (as opposed to other fields) and academic path
- Lecture should probably be shortened
 - This is probably the old science professor in me, but it is difficult not to lecture
 - Most students thought it was too long and needed broken up
 - Could use more alternative discussion topics to provide breaks

Other Options for Change

- Is it ok for all students to get A's?!?! Would Pass/Fail be better? It is essentially a mastery learning situation.
- Surveys are an accepted part of Science Ethics Education
 - Macrina text has a section with many surveys that can be used
 - Surveying student understanding and attitudes before and after chapters or courses is known to help student examine their ethical attitudes
 - Perhaps in-person class would make surveys easier? Or use Canvas?
 - I knew I would fill the time without using surveys so did not implement
- I was disappointed no faculty (one PharmD student) participated
 - Hearing only my stories surely got old
 - Many useful teaching experiences expected from a more diverse pool
 - Not sure how to make this happen. Perhaps rotate or team instructors?
- To be maintained long term, this will need to become part of degree requirement(s) or be supported from some pool of funding if not.