

## INQ 120-K1

## Science and the Good Life

Spring 2023

Class Mtgs: Lucas 217, MWF 1:10-2:10

Instructor: Daniel Robb

Office: Massengill 243

Office Hrs: T 10-11:30, Th 2-3:30

(15 min Zoom appts via [calendly.com/daniel\\_robb](https://calendly.com/daniel_robb) )

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### **Course Description:**

Many key issues facing us as a society have important scientific or quantitative components. This leads one to ask: In what ways is scientific and quantitative literacy necessary to leading a good and ethical life in the 21st century? As science progresses, energy sources are becoming more or less expensive and available. Technological developments in biology and nanotechnology are enabling us to alter the capabilities of organisms in novel ways. How should our ethical thinking be adapted as these capabilities continue to develop? As we educate ourselves about the science behind these topics, we will engage with various ethical thinkers in an effort to clarify the relevance of scientific and quantitative literacy, and technological progress, to the good and ethical life in the 21st century.

### **Materials and Textbooks:**

- *What Every Student Should Know About Preparing Effective Oral Presentations*, by Martin R. Cox, Pearson, 1st edition (2006). ISBN-13: 978-0205505456
- *Ethical Argument: Critical Thinking in Ethics*, by Hugh Mercer Curtler, Oxford University Press, 2nd edition (2004). ISBN-13: 978-0195173161.
- *Stat-Spotting: A Field Guide to Identifying Dubious Data*, by Joel Best, University of California Press: Paperback, 2nd edition (2013). ISBN-13: 978-0520279988
- *Energy for Future Presidents*, by R. Muller, Norton & Company (2013). ISBN-13: 978-0393345100
- *Frankenstein's Cat: Cuddling Up to Biotech's Brave New Beasts*, by Emily Anthes, Scientific American / Farrar, Straus and Giroux (2014). ISBN-13: 978-0374534240.

### **Intended Learning Outcomes:**

1. Students will be able to formulate and evaluate arguments about ethical positions.
2. Students will be able to describe connections between the course topic and broader traditions of critical reflections on the good life.
3. Students will be able to give an effective oral presentation.
4. Students will be able to write a paper with a clear thesis, cogent argumentation, effective organization, and a minimum of sentence-level errors.
5. Students will connect course content to their lives.

### **Instruction in Oral Presentation:**

A significant goal of INQ 120 is instruction and practice in oral presentation. Delivering effective oral presentations depends on both (i) an understanding of sound principles for oral presentation and (ii) the opportunity to apply those principles by giving presentations and learning from experience. To this end, we will read about and discuss sound principles of oral presentation, and view online examples of more and less effective presentations. You will begin with short individual informal reports to the class, and then progress to planning and delivering two longer group presentations. You will receive constructive feedback from your peers and from me for both group oral presentations.

### **Attendance Policy:**

If you have a temperature of 100.4 or higher or other COVID symptoms, don't come to class. Call Health Services immediately. Do not come to class or go to any public area on campus. In order for your absence to be excused, you must give Health Services permission to notify me that you have consulted them about COVID symptoms. If Health Services informs you that you should isolate and not attend class for multiple days, inform me so that we can make a plan to keep you current in the course. All absences caused by consultation with Health Services about coronavirus symptoms or isolation ordered by Health Services will be excused but you will need to do the work and graded assignments even if we extend a deadline for you.

This course's policy for all other absences is that you are expected to attend every class. This benefits your education as well as that of your classmates. In addition, you need to be in class to participate in the in-class activities which form part of the class participation grade. If you are going to be absent for a valid reason, I must be notified in advance. If 3 classes are missed without prior notification, I will issue a warning; missing a fourth class without prior notification will result in being dropped from the class with a grade of DF. You are accountable for all work missed due to absence. I will provide class materials for a missed class but will not re-teach the class during office hours.

### **Teaching Methods:**

The main method of instruction will be class discussion of the readings, with continued effort to explore and refine our thinking on the central questions posed in the course description. During each unit, you will be required to contribute to and read a collaborative class blog in response to the readings and class discussion. I will occasionally deliver brief lectures to present and clarify certain information from the readings. As part of your instruction in oral presentation, you will be required to give several brief oral reports during class, as a way of progressing to the longer group oral presentations. At the end of the semester, you will write an inquiry-focused term paper on an issue in the field of biotechnology and bio-engineering. Students will have the opportunity to give and receive peer reviews of both oral presentations and the rough draft of their term paper.

### **Feedback and Evaluation:**

I will assign numerical grades to all your work. I *may* curve your final grades (upward), but otherwise you can expect to receive an "A" for 90-100, a "B" for 80-89, etc. You will receive rubrics describing how the oral presentations and term papers will be evaluated by me, as well as for use in the peer evaluations.

<u>Oral presentations:</u>	30% (2 @ 15% each)	<u>Term paper:</u>	25%
<u>Oral peer evals:</u>	10% (2 @ 5% each)	<u>Term paper (peer evals):</u>	10%
<u>Class blog entries:</u>	10%	<u>Brief oral reports:</u>	5%
<u>Participation/reading quizzes:</u>	10%		

Oral presentations will be researched and given *in groups* of 2-4 students. Each group will select its own topic, subject to my approval as appropriate. I will supply you with the grading rubric to be used in evaluating the presentation. The presentations should last for 30-40 minutes, with 10-15 minutes allotted for questions.

Oral presentation peer evaluations will be submitted by each student for one of the other groups' presentations. The evaluation should accurately but constructively assess the other group's presentation, using a supplied rubric and additional comments.

The 6-8 page term paper will be researched and written *individually*. You will be supplied with the grading rubric that I will use to evaluate the term papers. There will be a rough draft worth 1/3 of the term paper grade, and a revised (final) version worth the remaining 2/3 of the term paper grade.

Term paper peer evaluation: In the peer evaluation, you will provide constructive criticism on the content and style of the rough draft of another student's term paper.

Written blog entries: As a supplement to class discussion, we will use a collaborative class blog. During each of the three course units, you will be required to contribute at least three (3) substantive comments to the class blog, for a total of nine (9) comments over the entire semester; more comments than this are welcome of course. Comments should actively engage the issue and previous comments; they do not need to be polished, but they should be understandable and grammatically correct. I will provide you with feedback on your blog contributions after each course unit.

Brief oral reports: Over the semester, each student will give one-two brief (1-2 minute) oral summaries of topics from the reading during class discussion. These will be evaluated for their clarity and usefulness to class discussion.

Class participation/quizzes: You are expected to attend class consistently, and to be prepared having done the assigned readings. There will be one (unannounced) reading comprehension quiz during each unit, for a total of three during the semester. You are expected to listen and engage actively in class discussion.

### **Descriptions of principal assignments:**

The first oral presentation will concern a current issue of societal and ethical relevance in which the interpretation of numerical statistics and data plays an important role. We will investigate several sample case studies of this type during the first unit. Your task will be to present the arguments on both sides of the issue, explain how data and statistics are being used to support each side of the argument, and comment on how the selection and presentation of numerical data affects the ethical and/or policy arguments surrounding the issue. The presentation should last 30-40 minutes, with 10-15 minutes set aside for questions.

The second oral presentation will concern a specific issue facing our nation and the world: the most ethically and economically sound balance of energy sources to use in the short-, medium- and long-term future. Each group will present an argument for the most ethical and strategic use of various energy sources moving forward for a specific country from this list: USA, France, Germany, Japan, China, and Russia. The presentation will draw on the scientific background of nuclear energy and power covered in the course, as well as incorporating principles of ethical argument. Again, the presentation should last 30-40 minutes, with 10-15 minutes for questions.

The written term paper will concern a topic in the area of bio-ethics and bio-engineering. I will provide a list of possible topics; you may also propose your own topic, subject to my approval. The paper should draw on the scientific background covered in the course, and should incorporate the principles of ethical argument explored earlier in the course. The goal of the paper, however, rather than to only present factual information, is to identify, explain and clarify the key questions which need to be better understood in order to reason clearly about the particular issue, and to form effective policy regarding the issue.

### **Policy on Late Work:**

It greatly benefits you to turn in your work on time, so that you stay current in the course and learn and grow more. Assignments are due at class-time on the due date. For scheduling reasons, and out of consideration to your classmates, your oral presentations and your term paper peer evaluation cannot be accepted late. For other assignments, I will grade with a 10% lateness deduction if turned in by 5:00PM on the due date. Following that, assignments will receive a further 10% lateness deduction for each school day that they are late.

### **Academic Integrity:**

To ensure fairness across the class, the College academic integrity policies are enforced. Presentation groups may freely share information and ideas within the group and with me, and potentially with a tutor from the Writing Center. For all assignments other than group presentations, the work turned in must be your own, discuss only with me and potentially a Writing Center tutor. Please familiarize yourself with the College's academic integrity policies.

### **The Writing Center:**

**The Writing Center @ Roanoke College**, located on the Lower Level of Fintel Library (Room 15), offers free tutorials focused on writing projects and oral presentations for students working in any field. Writers and presenters at all levels of competence may visit the Writing Center at any point in their process—including brainstorming, drafting, organizing, editing, or polishing presentation skills—to talk with trained peer tutors in informal, one-on-one sessions. The Writing Center is open Sunday through Thursday from 4 to 9 PM. Simply stop in, or schedule an appointment at [www.roanoke.edu/writingcenter](http://www.roanoke.edu/writingcenter). Questions? Email [writingcenter@roanoke.edu](mailto:writingcenter@roanoke.edu) or call 540-375-4949.

### **Accessible Education Services:**

**Accessible Education Services (AES)** is located in the Goode-Pasfield Center for Learning and Teaching in **Fintel Library**. AES provides reasonable accommodations to students with documented disabilities. To register for services, students must self-identify to AES, complete the registration process, and provide current documentation of a disability along with recommendations from the qualified specialist. Please contact Becky Harman, Assistant Director of Academic Services for Accessible Education, at 540-375-2247 or by e-mail at [aes@roanoke.edu](mailto:aes@roanoke.edu) to schedule an appointment. If you have registered with AES in the past and would like to receive academic accommodations for this semester, please contact Becky Harman at your earliest convenience to schedule an appointment and/or obtain your accommodation letter for the current semester.

Class	Date	Class Topic	Reading	Due
<b>UNIT 1: Ethical argument and statistics</b>				
1	Jan. 18	Introduction to the course		
2	20	Ethical argument: relativism and objectivism	Curtler 1: p. 1-39	
3	23	Principles of ethical arguments	Curtler 2: p. 40-75	
4	25	Structuring ethical arguments	Curtler 3: p. 76-127	
5	27	Justification of ethical claims; case studies	Curtler 4: p. 128-140	
6	30	Case studies in ethical argument	Curtler 5: p. 141-158	
7	Feb. 1	Uses and misuses of statistics	Best A,B,C	
8	3	Uses and misuses of statistics; Case study (gun control)	Best D,E,F; videos	
9	6	Uses and misuses of statistics	Best G,H,I	
10	8	Uses and misuses of statistics; Case study (cancer screening)	Best J,K,L,M; videos	Pres. topics
11	10	No class (research topics)		
12	13	Effective oral presentation (Zoom class)	Cox 1	
13	15	Work on presentations		
14	17	Effective oral presentation	Cox 2	
15	20	Oral Presentations		
16	22	Oral Presentations		Evals
17	24	Oral Presentations		Evals
<b>UNIT 2: Energy sources</b>				
17	27	Nuclear power	Muller p. 9-25, 179-98	Evals
18	Mar. 1	Fossil fuels	Muller p. 77-111	
19	3	Climate change	Muller p. 38-76	
<b>Spring Break</b>				
20	13	Alternative energy I	Muller p. 145-78	
21	15	Alternative energy II	Muller p. 219-246	Pres. topics
22	17	Energy policy	Muller p. 291-305	
23	20	Review discussion		
24	22	Work on presentations		
25	24	Oral Presentations		
26	27	Oral Presentations		Evals
27	29	Oral Presentations		Evals
<b>UNIT 3: Bio-engineering and bioethics</b>				
28	31	Genetics 101 (video-making!)	Videos	Evals
29	Apr 3	Biotech/bioethics: Case study (Genetically engineered foods)	Handout	
30	5	Bio-engineering of organisms	Anthes 1: p. 3-55	
	7	<b>Good Friday</b>		
31	10	Bio-engineering of organisms	Anthes 2: p. 56-101	
32	12	Bio-engineering of organisms	Anthes 3: p. 102-142	
33	14	Bio-engineering of organisms	Anthes 4: p. 143-181	Paper topic
34	17	Human enhancement	Handout	
35	19	Writing workshop		
36	21	Writing workshop		Rough draft
37	24	Writing workshop		Peer review
38	25	No class (work on revised paper)		
	29	( During Exam Period: April 29, 8:30-11:30)		Revised paper

You are expected to spend at least 12 hours of work each week inside and outside of class.