

INSTRUCTOR: DR. SHARON MASON

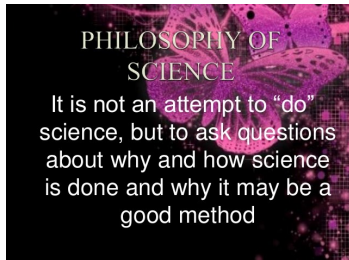
PHILOSOPHY OF SCIENCE

COURSE SYLLABUS FALL 2019

COURSE DESCRIPTION

Scientific inquiry has transformed our *understanding* of the world we live in: its fundamental laws, characteristics of species, molecular structures, chemical interactions, etc. Our increasing scientific knowledge has also transformed our *interactions* with the world, as we use scientific knowledge to develop technologies (such as engineering and medicine) that have radically altered almost every aspect of modern-day life. But what, exactly, is science? What is the difference between “real” science and “pseudoscience”? When do we have enough evidence to accept a scientific theory, and what counts as relevant evidence? What are we doing when we “accept” a scientific theory, anyway? Are scientific theories and scientific frameworks “real” descriptions of the world, or are they something else? Is scientific objectivity possible? How does science make progress, and what is a *scientific revolution*? Do scientists have any moral responsibilities in regard to the projects they pursue or the knowledge they produce? How is scientific knowledge communicated?

In this class, we will explore these and other questions in a combined historical & contemporary introduction to the philosophy of science.



This course fulfills Upper Division CORE “I” (Critical Inquiry) and “C” (Effective Communication) requirements. It also fulfills 3 credit hours in the “Epistemology & Metaphysics” area for philosophy.

There are no prerequisites.

COURSE OBJECTIVES:

- ◇ To philosophically examine scientific knowledge and critically engage with key theories, developments, and problems in philosophy of science
- ◇ To develop skill in understanding and critiquing written scholarship in the field
- ◇ To practice academic writing, gaining skill and comfort in expressing one’s thoughts and discussing them with others
- ◇ To cultivate curiosity, open-mindedness, and intellectual autonomy through the various practices and activities in this course

COURSE INFORMATION

PHIL 3380

CRN 23595

Location: Irby 307

Time: TR, 12:15-1:30p

CONTACT INFORMATION

Office Location: Irby 118d

Office Hours:
MWF 10-11am,
& by appointment

Email: smason@uca.edu

Office Phone: 501-450-5590

“IN SO FAR AS A SCIENTIFIC STATEMENT SPEAKS ABOUT REALITY, IT MUST BE FALSIFIABLE: AND IN SO FAR AS IT IS NOT FALSIFIABLE, IT DOES NOT SPEAK ABOUT REALITY.”

-KARL POPPER

COURSE TEXTS

Ladyman, J. (2002). *Understanding Philosophy of Science*. New York, NY: Routledge.

Resnik, D. B. (2007). *The Price of Truth: How Money Affects the Norms of Science*. New York, NY: Oxford University Press.

Kuhn, T. S. (2012). *The Structure of Scientific Revolutions*. Chicago, IL: University of Chicago Press.

All other readings are labeled [BB] and are available on Blackboard under "Resources."

"SCIENTIFIC KNOWLEDGE...IS NOT THE STATIC END POINT OF INQUIRY, BUT A COGNITIVE OR INTELLECTUAL EXPRESSION OF AN ONGOING INTERACTION WITH OUR NATURAL AND SOCIAL ENVIRONMENTS."

-HELEN LONGINO

GRADING CRITERIA

550 points, allocated in the following way:

- ◆ Attendance/Participation (60 points)
- ◆ Writing Assignments (200 points)
- ◆ Exams (240 points)
- ◆ Reflective Learning Presentations (50 points)



"Science is but an image of the truth."
- Francis Bacon

CLASSROOM CONDUCT STATEMENT

This course is designed to encourage you to think deeply about controversial issues, and as we go along you will almost certainly encounter viewpoints that challenge your own beliefs. I encourage you to view these challenges as opportunities to learn about perspectives that may differ widely from your own and to practice the skill of interacting respectfully and sympathetically with someone, despite the fact that you may strongly disagree with their point of view. Although debate and critical analysis are encouraged, it should be clear that we will not discriminate against or criticize members of this classroom community based on gender, ethnic origin, sexual orientation, disability, or religion. Everyone is welcome here.

WRITING PRACTICE (200 POINTS)



This course fulfills one upper division C (Effective Communication) requirement. As a result, effective written communication will be a primary focus of this course. **Expect to write a lot; you will become a better writer with practice.**

You should plan on completing one writing assignment each week. Most of these will be 1-2 page writing check-ins. On weeks where a longer exam is due, the exam will count as your

writing assignment. Also, *expect to read portions of your writing out loud to the class several times during the semester.* Most Thursdays we will begin by reading and discussing your writing assignments for the week.

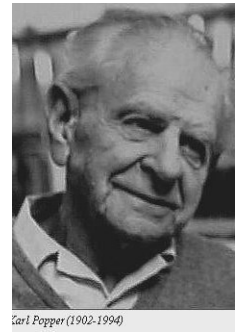
Assignments that do not meet the minimum requirements will be returned to the student once for revision.

ATTENDANCE/PARTICIPATION (60 POINTS)

A lot of the work for this course happens *in class*. Students who do not attend class regularly will not benefit from the course as much as those who do attend regularly. Attendance and active participation in the class are, therefore, required.

Attendance: Each student may take up to 2 absences for any reason. **Absences in excess of 2 will result in a deduction of 1% from your overall grade per absence, with no upper bound.** In cases of an emergency, sickness, death in the family, etc., a student may receive additional excused absences provided that the student notifies me right away and provides appropriate documentation.

Participation: Participation refers to your active involvement in the class by being prepared for class and engaging in classroom discussion. Part of your participation grade will come from being prepared to read and discuss your writing assignment. Distracting behavior such as eating, chronic tardiness, or sleeping in class may also result in your dismissal from the class for the day, without credit for attendance.



Carl Popper (1902-1994)

“THE
ANSWERS YOU
GET DEPEND
ON THE
QUESTIONS
YOU ASK.”

-THOMAS
KUHN

EXAMS (240 POINTS)

There will be three short take-home essay exams, roughly every 5 weeks. The exams will cover material from both the readings and the class lectures/discussions.

Each exam is worth 80 points.

REFLECTIVE LEARNING PRESENTATIONS (50 POINTS)

In these presentations, you will be asked to reflect on your learning this semester and share these reflections with the class. More detailed instructions about the project will be available on Blackboard. All presentations must be given on your scheduled final exam period.

LATE WORK POLICY

Late work will receive a 5% grade reduction per day late up to 7 calendar days after the assignment is due. After 7 days, you will not be able to turn in your work for credit. I make exceptions to this policy if you have an emergency, but **to be considered for an extension, it is your responsibility to notify me in advance (if foreseen), or as soon as possible following the emergency.**

COURSE SCHEDULE



Each reading should be completed before the beginning of class on the date assigned.



		Th, 8/22 Course introduction Read: Ladyman, 1-8
Week 1 8/28-9/1	T, 8/27 Read: Ladyman, 11-30 AND Bacon, <i>Novum Organon</i> <i>From teleology to induction</i>	Th, 8/29 Read: Ladyman, 31-61 Writing Practice (20 points)
Week 2 9/4-9/8	T, 9/3 Read: Ladyman, 62-77; Popper, "Science: Conjectures and Refutations"	Th, 9/5 Read: Ladyman, 77-92 Guest: Dr. Leah Horton, Biology (UCA) Writing Practice (20 points)
Week 3 9/11-9/15	T, 9/10 Read: Lakatos, "Science and Pseudoscience" [BB]; Kaufman & Kaufman, <i>Pseudoscience: The Conspiracy Against Science</i> Pseudoscience	Th, 9/12 Read: Koertge, "Belief Buddies vs. Critical Communities: The Social Organization of Pseudoscience" Writing Practice (20 points)
Week 4 9/18-9/22	T, 9/17 Read: Ladyman, 93-109 AND Kuhn, <i>The Structure of Scientific Revolutions</i> , p. xxxix-42	Th, 9/19 Read: Kuhn, <i>The Structure of Scientific Revolutions</i> , p. 52-91 Writing Practice (20 points)
Week 5 9/25-9/29	T, 9/24 Read: Ladyman, 109-125 AND Kuhn, <i>The Structure of Scientific Revolutions</i> , p. 92-142	Th, 9/26 Kuhn, <i>The Structure of Scientific Revolutions</i> , p. 143-172 Exam Due (80 points)
Week 6 10/2-10/6	T, 10/1 Read: TBD Visit from Kevin Bales	Th, 10/3 Read: Ladyman, 129-161 Scientific Realism Writing Practice (20 points)
Week 7 10/9-10/13	Wed, 10/8 Read: Ladyman, 162-195 Underdetermination	Th, 10/10 Read: Van Fraassen excerpt [BB]; Quine, "Two Dogmas of Empiricism" excerpts [BB] Writing Practice (20 points)

COURSE SCHEDULE



Week 8 10/16-10/20	T, 10/15 Read: Firestein, How Ignorance Drives Science? [BB] Guest: Dr. Will Slaton, Physics (UCA)	Th, 10/17 Fall Break: No Class
Week 9 10/23-10/27	T, 10/22 Read: Tuana, "Revaluating Science, Starting from the Practices of Women" [BB]	Th, 10/24 Read: Case Study—"Are hormones a 'female problem' for animal research?" Writing Practice (20 points)
Week 10 10/30-11/3	T, 10/29 Read: Liam Kofi Bright, "DuBois' democratic defense of the value free ideal" [BB] Guest: Dr. Leah Horton, Biology (UCA)	Th, 10/31 Read: TBD Exam Due (80 points)
Week 11 11/6-11/10	T, 11/5 Read: Resnik Ch. 1 & 2 Intro to Resnik unit	Th, 11/7 Read: Resnik, Ch. 3: "Scientific Objectivity" Writing Practice (20 points)
Week 12 11/13-11/17	T, 11/12 Read: Resnik Ch 4: "Money and the Norms of Science" and "The Doctor Who Drank Infectious Broth, Gave Himself an Ulcer, and Solved a Medical Mystery" [BB]	Th, 11/14 Read: Resnik <u>EITHER</u> Ch. 5, 6, <u>OR</u> 7 Writing Practice (20 points)
Week 13 11/20-11/24	T, 11/19 Read: Douglas, "The moral responsibilities of scientists (tensions between autonomy and responsibility)" [BB]	Th, 11/21 Read: Davies & Horst, "Identities: How Scientists Represent Collectives, Construct Identities, and Make sense of Science" (Ch. 3) [BB] Writing Practice (20 points)
Week 14 11/27-12/1	T, 11/26 Read: Davies & Horst, "Scientific Citizenship" (Ch. 8) [BB]	Th, 11/28 Thanksgiving Break—No Class
Week 15 12/4-12/8	T, 12/3 Read: C. Mooney & S. Kirshenbaum, "Bruising Their Religion" [BB]	Wed, 12/5 Read: Max Weber (1922), "Science as a Vocation" [BB] Exam Due (80 points)
Week 16 12/11-12/15	<u>Final Exam Schedule</u> Reflective Learning Presentations: Tues, Dec. 10, 11-1pm in Irby 307	

IMPORTANT INFORMATION

Please read the following information carefully. The UCA administration requires these notifications to appear on all UCA course syllabi.

◇ Academic Integrity Statement:

The University of Central Arkansas affirms its commitment to academic integrity and expects all members of the university community to accept shared responsibility for maintaining academic integrity. Students in this course are subject to the provisions of the university's Academic Integrity Policy, approved by the Board of Trustees as Board Policy No. 709 on February 10, 2010, and published in the Student Handbook. Penalties for academic misconduct in this course may include a failing grade on an assignment, a failing grade in the course, or any other course-related sanction the instructor determines to be appropriate. Continued enrollment in this course affirms a student's acceptance of this university policy.

◇ Americans with Disabilities Act:

The University of Central Arkansas adheres to the requirements of the Americans with Disabilities Act. If you need an accommodation under this Act due to a disability, please contact the UCA Disability Resource Center, 450-3613.

◇ Building Emergency Plan:

An Emergency Procedures Summary (EPS) for the building in which this class is held will be discussed during the first week of this course. EPS documents for most buildings on campus are available at <http://uca.edu/mysafety/bep/>. Every student should be familiar with emergency procedures for any campus building in which he/she spends time for classes or other purposes.

◇ Title IX Disclosure:

If a student discloses an act of sexual harassment, discrimination, assault, or other sexual misconduct to a faculty member (as it relates to "student-on-student" or "employee-on-student"), the faculty member cannot maintain complete confidentiality and is required to report the act and may be required to reveal the names of the parties involved. Any allegations made by a student may or may not trigger an investigation. Each situation differs, and the obligation to conduct an investigation will depend on the specific set of circumstances. The determination to conduct an investigation will be made by the Title IX Coordinator. For further information, please visit: <https://uca.edu/titleix>. *Disclosure of sexual misconduct by a third party who is not a student and/or employee is also required if the misconduct occurs when the third party is a participant in a university-sponsored program, event, or activity.

◇ Student Handbook:

Students are strongly encouraged to familiarize themselves with all policies in the [Student Handbook](#), especially the Academic Policies and the Sexual Harassment Policy.

