



**PHILOSOPHY 220: PHILOSOPHY AND THE SCIENCES
FALL 2023**

Meeting Time and Location: MWF 11:00-11:50am, Van Hise 579

Prof. Aja Watkins

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Office: 5173 Helen C. White

Office hours: M 12:00-2:00pm or by appt.

COURSE DESCRIPTION

This course provides a broad introduction to the philosophy of science. Students will come to understand major topics and debates in the history of philosophy of science. Additionally, students will get a sense for contemporary philosophy of science, by looking at some interesting, fun, and important papers in philosophy of sciences like biomedicine, climate science, and paleontology. Students should come away from the course able to articulate key positions in philosophy of science and apply these issues to science they encounter in their daily lives.

Credits: 3

Instructional Mode: All face-to-face

How Credit Hours are met by the Course: This class meets for three, 50-minute class periods each week over the fall/spring semester and carries the expectation that students will work on course learning activities for about 2 hours out of the classroom for every class period. The syllabus includes additional information about meeting times and expectations for student work.

Requisites: MATH 96 or placement into MATH 141

Course Designation:

Gen Ed - Quantitative Reasoning Part A

Breadth - Either Humanities or Social Science

Level - Intermediate

L&S Credit - Counts as Liberal Arts and Science credit in L&S

Repeatable for Credit: No

REQUIRED TEXTS

Okasha, S. (2016). *Philosophy of Science: A Very Short Introduction (2nd edition)*. Oxford University Press.

Additional assigned readings will be posted on Canvas.

LEARNING OUTCOMES

1. Ability to think critically about philosophical and scientific arguments.
2. Ability to interpret complex texts accurately and analyze them logically.
3. Ability to communicate precisely and concisely in both writing and speech.
4. Familiarity with central concepts in philosophy of science, such as probability, confirmation, explanation, causality, reductionism, realism, and instrumentalism.

ASSIGNMENTS AND EVALUATION

Grading Scheme

Daily reading quizzes: 10%
Participation and reflection: 10%
Assignments #1-4: 80% (20% each)

Grading Scale

Your quiz/participation grades will be calculated numerically, while you will just receive a letter grade on Assignments #1-4. Letter grades correspond to the following numeric values: A – 95%, AB – 90%, B – 85%, BC – 80%, C – 75%, D – 65%. Your final grade will be converted to a final letter grade according to the following scale:

93-100%	A
88-92.9%	AB
83-87.9%	B
77-82.9%	BC
70-76.9%	C
60-69.9%	D
0-59.9%	F

Grading Procedure

Wherever possible, grading will be done “blind” to avoid any unconscious biases in assessing your work. I will not be employing any grading curves, whether on individual assignments or the final grades. If your final grade is borderline, we will take improvement over the duration of the course into consideration when determining your final grade.

Attendance

Attendance to all course meetings is required and will contribute to your participation grade. The material we cover in this course is difficult, and you will be learning many new skills. Some of these skills, such as discussion, can only be developed with other people. You cannot do well in this course without attending class regularly.

You will get **three unexcused absences** for the term. Because in-class time is expected to be roughly one third of the total learning time for this class, unexcused absences in excess of three may lead to significant reductions of the students' final grade, not limited to a reduction of the "attendance and participation" component of the grading scheme defined above.

You will not be penalized for **excused** absences. Excused absences include sickness and family emergencies and require notification of the instructor. Appropriate accommodations will be made for students with McBurney visas.

University attendance policy: <https://kb.wisc.edu/lis/page.php?id=24628>

University religious observances policy: <https://kb.wisc.edu/lis/page.php?id=21698>

Description of Assignments:

- Daily reading quizzes (10% of your grade): You will be required to read 1-2 articles per class, in advance of the class (see the reading schedule below). In order to check that you have done the reading and to check your comprehension, you'll be asked to answer approximately one multiple choice question on each reading prior to the start of class. These questions should be relatively easy to answer correctly if you have carefully read and understood the reading.
- Participation and reflection (10% of your grade): You will be required to participate by sharing your thoughts on the course material in two ways:
 - Online participation and reflection assignments due every class: Before each class, you will be asked to submit some thoughts about the readings for that class and some reflections on the prior class period. These assignments will be graded for completion only. I will use what you say in your online participation assignment to guide the class discussion.
 - Speaking up in class: Please come prepared to participate verbally in class by raising your hand and speaking up and being a valuable member of in-class exercises or activities. Note that the quality of your contribution counts much more than the quantity of times you speak.
- Assignments #1-4 (each 20% of your grade): Each unit of the course will have a corresponding assignment, to be posted on Canvas. You are allowed to work with a partner (groups of 3+ are not allowed) for any or all of these assignments, but if you choose to work with a partner you

must include in your assignment submission a brief statement summarizing the work that each partner did to complete the assignment.

- Note there will be no final exam for this course.

OTHER POLICIES

Add/Drop

The add/drop deadline with no tuition penalties is September 15, 2023. Please see the registrar's schedule for more information: <https://registrar.wisc.edu/dates>

Lateness Policy and Extensions

All assignments (including quizzes and participation assignments) should be turned in on the due date by the start of class unless otherwise stated. Late reading quizzes and participation/reflection assignments will not be accepted without prior permission from the instructor.

Assignments #1-4, if late, will be penalized by a deduction from the grade for each day it is late. 1/2 grade step per day is the penalty. Hence after 2 days an AB becomes a B and after 4 days it becomes BC. (See the schedule below for assignment due dates.)

Extensions will be granted only to those students with a legitimate excuse, such as sickness. It is the student's responsibility to contact the instructor BEFORE the due date to discuss the possibility of an extension.

Office Hours and E-mail Policy

Philosophy is hard! My office hours are the best resource for help outside of class. I will hold regular office hours, and I encourage you to stop by to chat. You do not need to have a specific question about the course in order to visit office hours. If there is anything that I can do to help you succeed in the course, please let me know!

You are welcome to send me an email if you have a question about the course. If your question requires more than a brief reply, I will ask you to come to our office hours to discuss it. I will check my e-mails daily and try to respond in a timely fashion, but please allow at least 24 hours for a reply. I will not respond to concerns about your grades sent until after 24 hours from when the grades have been returned, to give you time to reflect on whether you really disagree with the grade you received and why.

Academic Integrity

By enrolling in this course, each student assumes the responsibilities of an active participant in UW-Madison's community of scholars in which everyone's academic work and behavior are held to the highest standards of academic integrity. Academic misconduct compromises the integrity of the

university. Cheating, fabrication, plagiarism, unauthorized collaboration, and helping others commit these acts are examples of academic misconduct, which can result in disciplinary action. This includes but is not limited to failure on the assignment/course, disciplinary probation, or suspension. Substantial or repeated cases of misconduct will be forwarded to the Office of Student Conduct & Community Standards for additional review.

For more information, refer to <https://conduct.students.wisc.edu/academic-integrity/>

Note that you need not intend to plagiarize in order to do so. You are guilty of plagiarism if you represent the ideas of others as your own or if you present, as new, ideas derived from an existing source regardless of intending to do so.

Land Acknowledgement

UW Madison occupies ancestral Ho-Chunk land, a place their nation has called Teejop (day-JOPE) since time immemorial. In an 1832 treaty, the Ho-Chunk were forced to cede this territory. Decades of ethnic cleansing followed when both the federal and state government repeatedly, but unsuccessfully, sought to forcibly remove the Ho-Chunk from Wisconsin. We acknowledge the circumstances that led to the forced removal of the Ho-Chunk people, and honor their legacy of resistance and resilience. This history of colonization informs our work and vision for a collaborative future. We recognize and respect the inherent sovereignty of the [Ho-Chunk Nation](#) and the other 11 Native Nations within the boundaries of the state of Wisconsin.

Accommodations

McBurney Disability Resource Center syllabus statement: “The University of Wisconsin-Madison supports the right of all enrolled students to a full and equal educational opportunity. The Americans with Disabilities Act (ADA), Wisconsin State Statute (36.12), and UW-Madison policy (Faculty Document 1071) require that students with disabilities be reasonably accommodated in instruction and campus life. Reasonable accommodations for students with disabilities is a shared faculty and student responsibility. Students are expected to inform faculty [me] of their need for instructional accommodations by the end of the third week of the semester, or as soon as possible after a disability has been incurred or recognized. Faculty [I], will work either directly with the student [you] or in coordination with the McBurney Center to identify and provide reasonable instructional accommodations. Disability information, including instructional accommodations as part of a student's educational record, is confidential and protected under FERPA.”
<http://mcburney.wisc.edu/facstaffother/faculty/syllabus.php>

I am committed to meeting and even exceeding the accommodations required by the university. I hope that you will feel comfortable letting me know if there's anything I can do to make your experience in this course go more smoothly or for the course environment to be more welcoming.

Diversity & Inclusion

Institutional statement on diversity: “Diversity is a source of strength, creativity, and innovation for UW-Madison. We value the contributions of each person and respect the profound ways their identity, culture, background, experience, status, abilities, and opinion enrich the university community. We commit ourselves to the pursuit of excellence in teaching, research, outreach, and diversity as inextricably linked goals. The University of Wisconsin-Madison fulfills its public mission by creating a welcoming and inclusive community for people from every background – people who as students, faculty, and staff serve Wisconsin and the world.” <https://diversity.wisc.edu/>

Discrimination on the basis of race, sex/gender, sexual orientation, disability status, religion, ethnicity, nationality, age, socioeconomic background, etc. will not be tolerated in this class. Please bring any inappropriate behaviors to my attention in whatever way you feel the most comfortable. If you are not comfortable speaking to me, the appropriate person to speak to is the Philosophy Department chair, [Emily Fletcher](#).

Title IX

In any cases of sexual harassment or misconduct, you are welcome to speak with me. However, I am a Title IX Mandatory Reporter, which means that I am obligated by law to report the incident to the UW Title IX Coordinator. Here is more information on Title IX: <https://compliance.wisc.edu/titleix>

COVID

I am committed to maintaining a classroom that is safe with respect to COVID-19. This might require that I change classroom policies mid-semester. See UW COVID updates here: <https://covidresponse.wisc.edu/>

Rules, Rights & Responsibilities

You are all expected to follow the classroom norms that we establish together. It is imperative that we treat one another with respect, even in the face of strong disagreement. It is our shared responsibility to create a classroom environment that is welcoming and supports the learning of all students.

Technology Policy

Turn off and put away cell phones before the start of class. Laptop and I-Pad use is permitted for note-taking purposes only. I reserve the right to establish a stricter technology policy if I find that students are regularly distracted by their devices.

Additional resources

If you are looking for additional support, the following on-campus resources might be useful:

- Academic Coaching and Tutoring Services (ACTS): <https://actsddea.wisc.edu/>
- Writing Center: <https://writing.wisc.edu/>

I would also encourage you to reach out to one another for help if you have questions on the readings or the assignments.

SCHEDULE OF TOPICS AND READINGS

(Subject to change)

Date	Topic	Readings
September 6	Syllabus and expectations	
September 8	Demarcation problem	Okasha chapter 1 Lakatos (1973), "Science and Pseudoscience"
September 11	Explanation	Okasha chapter 2-3
September 13	Underdetermination	Duhem (1906), "Physical theory and experiment"
September 15	Values in science	Rudner (1953), "The scientist qua scientist makes value judgments" Douglas (2000), "Inductive risk and values in science"
September 18	Objectivity	Longino (1990), <i>Science as Social Knowledge</i> , chapter 4 Harding (1995), "Strong Objectivity"
September 20	Trust in science	Oreskes (2021), "If you say science is right, you're wrong"
September 22	Realism	Okasha chapter 4
September 25	Anti-realism	van Fraassen (1980), "Arguments concerning scientific realism" Chang (2022), <i>Realism for Realistic People</i> , chapter 2
September 27		Cartwright (1980), "The truth doesn't explain much" Elgin (2004), "True enough"
September 29	Scientific revolutions	Okasha chapter 5 Kuhn (1962), <i>The structure of scientific revolutions</i> , chapter 9
October 2	Pessimistic meta-induction	Laudan (1981), "A confutation of convergent realism"
October 4	Unity	Oppenheim and Putnam (1958), "Unity of science as a working hypothesis"
October 6	Disunity/pluralism	Fodor (1974), "Special sciences (Or: the disunity of science as a working hypothesis)" Wylie (1999), "Rethinking Unity as a 'Working Hypothesis' for Philosophy of Science"

October 9-11	What is philosophy of science (and what should it be)?	Laplaine et al. (2019), “Why science needs philosophy” Fehr & Plaisance (2010), “Socially relevant philosophy of science: an introduction”
October 13	Review and recap	Oreskes (2019), <i>Why trust science?</i> , chapter 1 and coda
October 16	Models	Wimsatt (1987), “False models as a means to truer theories” ASSIGNMENT #1 DUE
October 18		Potochnik (2017), <i>Idealization and the Aims of Science</i> , chapter 1
October 20		Parker (2010), “Scientific Models and Adequacy-for-Purpose.”
October 23	Models in climate science	Frigg, R., Thompson, E., & Werndl, C. (2015). “Philosophy of Climate Science Part II: Modelling Climate Change.”
October 25		Oreskes (2018), “The scientific consensus on climate change: how do we know we're not wrong?”
October 27		Intemann (2017), “Who needs consensus anyway? Addressing manufactured doubt and increasing public trust in climate science”
October 30		Winsberg (2018), “Communicating uncertainty to policymakers: The ineliminable role of values” Pulkkinen et al. (2022), “The value of values in climate science”
November 1		Jebeile and Roussos (2023), “Usability of climate information: Toward a new scientific framework”
November 3		No readings – work on Assignment #2 in class
November 6	Measurement	Chang and Cartwright (2008), “Measurement” ASSIGNMENT #2 DUE
November 8		Tal (2013), “Old and new problems in philosophy of measurement”
November 10	Measurement in the social and biomedical sciences	Hoffmann and Tarzian (2001), “The girl who cried pain: a bias against women in the treatment of pain”
November 13		Boulicault (MS), “Gender and the measurement of fertility: a case study in critical metrology”
November 15		Williams (2023). “The ethics of using body mass index in in-vitro fertilization risk assessment.”
November 17		Lujan and Dicarolo (2018), “Science reflects history as society influences science: brief history of 'race,' 'race correction,' and the spirometer”
November 20		Runhardt (2023), “Legitimate reactivity in measuring social phenomena: Race and the census”
November 22		Chellappoo (2021), “Constrasting narratives of race and fatness in Covid-19”

November 24		Thanksgiving break
November 27		Jackson (2021), “The uncertain method of drops: how a non-uniform unit survived the century of standardization” ASSIGNMENT #3 DUE
November 29	Data	Leonelli (2015), “What counts as scientific data? A relational framework”
December 1		D'Ignazio and Klein (2020), <i>Data Feminism</i> , intro
December 4	Data in paleontology	Monarrez et al. (2021), “Our past creates our present: a brief overview of racism and colonialism in Western paleontology”
December 6		Rieppel (2019), “How American tycoons created the dinosaur”
December 8		Wylie (2019), “Overcoming the underdetermination of specimens”
December 11		Bokulich (2018), “Using models to correct data: paleodiversity and the fossil record”
December 13	Wrap up	ASSIGNMENT #4 DUE