

PHIL 371: Philosophy of Natural Sciences
George Mason University
Fall 2021

Instructor: Wesley Buckwalter

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Virtual class times: Tuesdays and Thursdays 3:00 - 4:15 PM via Zoom

Virtual office hours: Email to set up a private appointment

Where, When, and How the Course Meets

This course is taught online. It is taught in the synchronous conference format. All class periods will be held through Zoom meetings distributed via the course Blackboard site. Although the course will be held online by video conference, many things about it will resemble what you might typically expect from an in-person course (e.g. **the class will meet on Tuesdays and Thursdays from 3:00 to 4:15 PM, and you will be expected to logon to Zoom at those same times every week**).

Course Description

This course is an introduction to the philosophy of natural science. The goals of the course are:

- 1) To acquaint students with some of the important positions and arguments on several central questions in contemporary philosophy of science. Those questions include:
 - What characteristics make an activity scientific? What is the difference between science and pseudo-science?
 - Given its diversity of tools and methods, are the natural sciences a unified domain of human knowledge?
 - What assumptions govern scientific activity that are not themselves subjects of scientific research or proof?
 - What is the nature of scientific explanation and reasoning? Does it give us genuine knowledge?
 - What constitutes genuine progress in science? Can science ever regress? Why or why not?
 - Should we believe in the entities postulated by our best scientific theories, or are they merely useful fictions?
 - To what degree does scientific knowledge reflect the contingent interests of certain social groups?
 - What should we do with real or apparent conflict between science and religion, ethics, or politics?
 - Does scientific knowledge help us with disciplines outside of the domain of science? Why or why not?

- 2) To improve students' skills in analyzing and criticizing arguments both verbally and in writing.
- 3) To improve students' skills in explaining and defending their own philosophical views, both verbally and in writing.
- 4) To inspire interdisciplinary thinking between philosophy, the sciences, and the humanities to improve inquiry.

Learning Outcomes

- Knowledge of the basic questions philosophy of science asks and answers.
- Skill in thinking systematically through a complex subject matter.
- Growth in philosophical skills relating to critical reading, perspicuous writing, and quality argument.
- Growth in virtues relating to authenticity, discipline, humility, empathy, insight, and love for truth.

Attendance Policy

Students are expected to **attend regularly and participate in class discussion**. You are encouraged to participate with your video turned on during class time. You are also encouraged to use group chat during class.

Communication Policy

The best way to contact me is by email. I will respond to emails **within two working days**, and often much faster than that. Please do not hesitate to contact me with questions about the course that you cannot find the answers to on the syllabus or course Blackboard site, suggestions for improvement, or to request a one on one meeting with me over Zoom. Remember, **students must use their MasonLive email account** to receive important University information, including communications related to this class. I am unable to respond to messages sent from or send messages to a non-Mason email address.

Required Texts

Theory and Reality: An Introduction to the Philosophy of Science, 2nd ed., Peter Godfrey-Smith (Chicago, 2021)

The Structure of Scientific Revolutions, 50th Anniversary Edition, Thomas Kuhn and Ian Hacking (Chicago, 2012)

Where the Conflict Really Lies: Science, Religion, and Naturalism, Alvin Plantinga (Oxford, 2011)

Grading

Your grade for the course will be determined by your grade on the following components of the course:

1. **Attendance and Participation (10% of your course grade)**

You are expected to attend class regularly and to contribute to class discussion through audio, chat, and any discussion board posts should they be used in Blackboard.

2. **Reading Journal (30% of your course grade)**

You are required to keep a reading journal and to make an entry in it by midnight the night before each class period on the reading assigned for that period.

Journal entries are to be made using the Reading Journal tool in the course Blackboard site. You should aim for entries to be between 100 to 200 words long. The entries should contain two parts: (i) briefly summarize the main point of the reading, and (ii) offer your take in the form of a critical reaction. For example, you might identify a point you agree with or disagree with and say why. Or you might relate the reading to a personal experience you had once, a meme or film it reminds you of, or to ask a question you wish to raise in class. Journals can engage with any of the assigned reading, optional reading, or audio/visual components scheduled for the relevant class period. Journals are private and will only be viewed by student and instructor.

The first entry is due on Monday night September 27 at 11:59 PM. The remaining 17 entries are due at midnight the day before each class period. Entries will be graded as either "1" or "0". All late entries will be "0".

3. **One short paper (25% of your course grade)**

You will write one short paper that should be no longer than 1,000 words (roughly 4 double-spaced pages). Papers must be uploaded through the course Blackboard site to be accepted. They are due by 11:59 PM on the day they are due. A list of topics and instructions will be given for the paper. Grading criteria, citation guidelines, and writing tips will be shared through the course Blackboard site. **The short paper will be due on November 2.**

The date of your paper submission will be taken from the date you upload your paper to the course Blackboard site. Papers that are handed in late with a documented legitimate excuse will be accepted without penalty. Without a legitimate excuse, short papers will be penalized 5% each day late. Anonymous grading is currently turned on for this assignment in Blackboard. To remain anonymous, do not include your name or other identifying information in your assignment submission. Submissions will be automatically screened using SafeAssign.

4. **One long paper (35% of your course grade)**

You will write one long paper that should be no longer than 2,00 words (roughly 6 to 8 double-spaced pages). Papers must be uploaded through the course Blackboard site to be accepted. A list of topics and instructions will be given for the paper. You may also propose your own topic on anything we have talked about in this course, but you must clear it with me first. Grading criteria, citation guidelines, and writing tips will be shared through the course Blackboard site

The long paper will be due on December 9 at 11:59 PM. The long paper will be marked as “0” if it is not received by 11:59 PM on December 9, unless you have requested a grade of IN. Anonymous grading is currently turned on for this assignment in Blackboard. To remain anonymous, do not include your name or other identifying information in your assignment submission. Submissions will be automatically screened using SafeAssign.

Incompletes Policy

University policy specifies that instructors are to assign an IN incomplete grade only if the student has completed a significant portion of the assessment and there is a non-academic reason that prevents them from completing the work within the semester. Incomplete grades will only be assigned in the case of exceptional, unforeseen circumstances that occur within the last six weeks of the semester.

Flexible Syllabus Policy

Except for changes that substantially affect implementation of the grading statement, this syllabus is a guide for the course and is subject to change with advance notice. For example, readings may be adapted to match our progress.

Basic Course Technology Requirements

Activities and assignments in this course will regularly use the Blackboard learning system, available at <https://mymason.gmu.edu>. Students are required to have regular, reliable access to a computer with an updated operating system (recommended: Windows 10 or Mac OSX 10.13 or higher) and a stable broadband Internet connection (cable modem, DSL, satellite broadband, etc., with a consistent 1.5 Mbps [megabits per second] download speed or higher). Activities and assignments in this course will regularly use web-conferencing software (Blackboard/Zoom). In addition to the requirements above, students are required to have a device with a functional camera and microphone. In an emergency, students can connect through a telephone call, but video capability is the expected norm.

Course Materials and Student Privacy

Portions of our synchronous meetings in this class may be recorded to provide necessary information for students in this class. Recordings will be stored on Blackboard and will only be accessible to students taking this course during this semester. **All course materials posted to Blackboard or other course site are private to this class;** and by federal law, any materials that identify specific students (via their name, voice, or image) must not be shared with anyone not enrolled in this class.

Academic Integrity

The integrity of the University community is affected by the individual choices made by each of us. Mason has an Honor Code with clear guidelines regarding academic integrity. Three fundamental and rather simple principles to follow at all times are that: (1) all work submitted be your own; (2) when using the work or ideas of others, including fellow students, give full credit through accurate citations; and (3) if you are uncertain about the ground rules on a particular assignment, ask for clarification. No grade is important enough to justify academic misconduct. Plagiarism means using the exact words, opinions, or factual information from another person without giving the person credit. Writers give credit through accepted documentation styles, such as parenthetical citation, footnotes, or endnotes. Paraphrased material must also be cited, using the appropriate format for this class. A simple listing of books or articles is not sufficient. Plagiarism is the equivalent of intellectual robbery and cannot be tolerated in the academic setting. If you have any doubts about what constitutes plagiarism, please see me or review the Honor Code: <https://oai.gmu.edu/mason-honor-code/>.

Disability Accommodations

Disability Services at George Mason University is committed to upholding the letter and spirit of the laws that ensure equal treatment of people with disabilities. Under the administration of University Life, Disability Services implements and coordinates reasonable accommodations and disability-related services that afford equal access to university programs and activities. Students can begin the registration process with

Disability Services at any time during their enrollment at George Mason University. If you are seeking accommodations, please visit <http://ds.gmu.edu/> for detailed information about the Disability Services registration process. Disability Services is in Student Union Building I (SUB I), Suite 2500; ods@gmu.edu; (703) 993-2474.

Sexual Harassment, Sexual Misconduct, and Interpersonal Violence

George Mason University is committed to providing a learning, living and working environment that is free from discrimination and a campus that is free of sexual misconduct and other acts of interpersonal violence in order to promote community well-being and student success. We encourage students and employees who believe that they have been sexually harassed, sexually assaulted or subjected to sexual or interpersonal misconduct to seek assistance and support. University Policy 1202: Sexual Harassment and Misconduct speaks to the specifics of Mason’s process, the resources, and the options available to students and employees. <https://universitypolicy.gmu.edu/policies/sexual-harassment-policy/>

Notice of mandatory reporting of sexual or interpersonal misconduct: As a faculty member, I am designated as a “Non-Confidential Employee,” and must report all disclosures of sexual assault, sexual harassment, interpersonal violence, stalking, sexual exploitation, complicity, and retaliation to Mason’s Title IX Coordinator per University Policy 1202. If you wish to speak with someone confidentially, please contact one of Mason’s confidential resources, such as Student Support and Advocacy Center (SSAC) at 703-993-3686 or Counseling and Psychological Services (CAPS) at 703-993-2380. You may also seek assistance or support measures from Mason’s Title IX Coordinator by calling 703-993-8730, or emailing titleix@gmu.edu.

Course Schedule

| <u>Date</u> | <u>Topic</u> | <u>Required reading done before class starts</u> | <u>Optional A/V activity</u> | <u>Reminders</u> |
|--------------------------|---|--|---|------------------------|
| Tuesday, September 21st | (Re)introduction to Course, Empiricism and Logical Positivism | <i>Theory and Reality</i> , Chapters 1 and 2 | The Vienna Circle and Logical Positivism https://www.youtube.com/watch?v=8e1gdGluXI8 | |
| Thursday, September 23rd | The Old Problem of Induction | <i>Theory and Reality</i> , Chapter 3.1-3.2 (up to but not | | Reading Journals Begin |

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| | | including section "3.3. Ravens Problem") On Induction (Blackboard) | | Before Next Class *First Entry due Sept 27 by Midnight in Blackboard |
| Tuesday, September 28th | Paradoxes of Confirmation and the New Problem of Induction | <i>Theory and Reality</i> , Chapter 3.3-3.5 (the rest of chapter 3) | | |
| Thursday, September 30th | Popper's Falsificationism | <i>Theory and Reality</i> , Chapter 4 | | |
| Tuesday, October 5th | Kuhn's Revolution | <i>Theory and Reality</i> , Chapter 5 <i>The Structure of Scientific Revolutions</i> , Chapters 2 and 3 | | |
| Thursday, October 7th | Lakatos, Laudan, and Feyerabend | <i>Theory and Reality</i> , Chapter 6 <i>The Structure of Scientific Revolutions</i> , Chapters 8 and 9 | | |
| Tuesday, October 12th | NO CLASS | | | |
| Thursday, October 14th | The Sociology of Science | <i>Theory and Reality</i> , Chapter 7 | | |
| Tuesday, October 19th | The Replication Crisis: Causes | False-Positive Psychology https://journals.sagepub.com/doi/pdf/10.1177/0956797611417632 | Radiolab Episode on "Stereotype Threat" https://www.wnycstudios.org/podcasts/radiolab/articles/stereothreat | |

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| Thursday, October 21st | The Replication Crisis: An Opportunity? | Philosophy of Science and The Replicability Crisis https://onlinelibrary.wiley.com/doi/epdf/10.1111/phc3.12633 A Manifesto for Reproducible Science https://www.nature.com/articles/s41562-016-0021.pdf | | |
| Tuesday, October 26th | Feminist Philosophy of Science | <i>Theory and Reality</i> , Chapter 8.1-8.4 (up to but not including section 8.5 Science Wars") | Journal Entries Podcast with Ashton and McKenna https://journalentries.fireside.fm/ashton-and-mckenna | |
| Thursday, October 28th | Science Wars | Theory and Reality, Chapter 8.5 "Science Wars" Bait and Switch https://www.chronicle.com/article/bait-and-switch/ 'Sokal Squared' https://www.chronicle.com/article/sokal-squared-is-huge-publishing-hoax-hilarious-and-delightful-or-an-ugly-example-of-dishonesty-and-bad-faith/ | | |
| Tuesday, November 2nd | Values in Science | <i>Theory and Reality</i> , Chapter 8.6 "Values in Science" Inductive Risk and Values in Science https://libkey.io/libraries/2 | | *Short Paper Due by Midnight in Blackboard |

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| | | 20/articles/57678107/full-text-file | | |
| Thursday, November 4th | Expertise and Trust in Science | The Noble Lies of COVID-19 https://slate.com/technology/2021/07/noble-lies-covid-fauci-cdc-masks.html Democracy, Public Policy, and Lay Assessments of Scientific Testimony https://libkey.io/libraries/20/articles/41380638/full-text-file?utm_source=api_1365 | | |
| Tuesday, November 9th | Truth and Modeling | True Enough https://libkey.io/libraries/20/articles/31032989/full-text-file | | |
| Thursday, November 11th | Naturalistic Philosophy | <i>Theory and Reality</i> , Chapter 9 | | |
| Tuesday, November 16th | Realism | <i>Theory and Reality</i> , Chapter 10 | | |
| Thursday, November 18th | Explanation | <i>Theory and Reality</i> , Chapter 11 | | |
| Tuesday, November 23rd | Scientism | The Problem with Scientism https://blog.apaonline.org/2018/01/25/the-problem-with-scientism/ | Richard Dawkins: 'Scientism' is a dirty word https://www.youtube.com/watch?v=hWlsyjKXdAM | |
| Thursday, November 25th | NO CLASS | | | |
| Tuesday, November 30th | Theism and Science | <i>Where the Conflict Lies</i> , Preface, Chapter 1, Chapter 9 | Plantinga himself explaining the basic idea | |

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| | | | https://www.youtube.com/watch?v=h8k6PDXr-7k | |
| Thursday, December 2nd | Evolution and Naturalism | <i>Where the Conflict Lies</i> , Chapter 10 Optional: As much Plantinga as you like | | |
| *Long Paper Due December 9 by Midnight in Blackboard* | | | | |