Philosophy 3520: Philosophy of Science

UNC Charlotte, Fall 2018

Section 001, MWF 10:10–11:00am, Denny 202

Instructor: Trevor Pearce
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Cedar 21B

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Description

What is science, anyway? Is there a scientific method? Why does science progress? Does ethics have a place in science? In this course, an introduction to the philosophy of science, we will deal with these questions and more. We will begin by discussing how science might be distinguished from other forms of human inquiry. After investigating some traditional questions about how scientists model and explain phenomena, we will turn to scientific practice, attempting to determine whether there is any method shared across the various sciences. We will then read much of Thomas Kuhn's *The Structure of Science Revolutions*, which investigates how new scientific theories emerge. Finally, we will finish up by discussing the ethical and political aspects of science, asking what role values should play in scientific research.

Required Texts

Gillian Barker & Philip Kitcher, *Philosophy of Science: A New Introduction* (Oxford UP, 2014)
[ISBN #9780195366198]

Thomas Kuhn, *The Structure of Scientific Revolutions*, 3rd ed. (University of Chicago Press, 1996)
[ISBN #9780226458083]

All other texts are available on the course website at https://canvas.uncc.edu/.

Evaluation

15%	Attendance & Participation	
20%	Summaries	**Beginning August 24**
20%	Take-Home Exam	**September 28–30 (due in class on October 1)**
20%	Presentation	**November 28/30 or December 3/5**
25%	Final Paper (1200 ± 200 words)	**December 9**

Your attendance grade is calculated by dividing attended classes by total classes. I automatically excuse two absences. Requests for additional excused absences due to medical emergencies, personal/family emergencies, military orders, or court orders should be made to the Dean of Students Office (http://goo.gl/1NYBCY) and not to me directly.

'Participation' means making comments and asking questions that reflect your having read and thought about the text under discussion. I will call on individual students following the small-group discussion or the summary write-up. **You must bring a copy of the relevant text to each class**, or you will not be able to effectively participate.

For the summaries, at the beginning of each class you will spend five minutes writing a paragraph that includes (a) the main claim or thesis of the reading for that day and (b) a brief summary of the arguments or evidence the author provides to support this claim or thesis. You may use books and notes. **I will collect and grade these summaries throughout the semester**, though not every class. If you arrive late, you must still hand in your summary at the same time as everyone else. Late summaries will not be accepted. Summaries submitted via e-mail will not be accepted. **Absence from class is not a valid excuse for not turning in a summary** unless your absence is verified by the Dean of Students office (see below). The lowest two summary grades will be dropped.

Topics for the Final Paper will be circulated by e-mail on **November 26**. I am happy to provide feedback on introductions or outlines if you allow me enough time. **The paper must be submitted by 7pm on December 9 at the Canvas site.** Papers that are too long or too short will be penalized a minimum of half a grade point. Late papers will be penalized half a grade point per day.

The take-home exam will consist of short- and long-answer questions. **It will be circulated on September 28 and is due on October 1.**

In the last several weeks of the semester, groups of two students will find a news story relating to science and spend five minutes presenting it to the class. They will spend the next ten minutes leading class discussion of the story in light of what we have learned in the course. These presentations will be on the last four days of the semester, **November 28/30 and December 3/5.**

Class Policies

The standards and requirements set forth in this syllabus may be modified at any time by the course instructor. Notice of such changes will be by announcement in class or by written or e-mail notice.

I will conduct this class in an atmosphere of mutual respect. I encourage your active participation in class discussions. Each of us may have strongly differing opinions on the various topics of class discussions. The conflict of ideas is encouraged and welcome. The orderly questioning of the ideas of others, including mine, is similarly welcome. However, I will exercise my responsibility to manage the discussions so that ideas and argument can proceed in an orderly fashion. You should expect that if your conduct during class discussions seriously disrupts the atmosphere of mutual respect I expect in this class, you will not be permitted to participate further.

All students and the instructor are expected to engage with each other respectfully. Unwelcome conduct directed toward another person based upon that person's actual or perceived race, actual or

perceived gender, color, religion, age, national origin, ethnicity, disability, or veteran status, or for any other reason, may constitute a violation of University Policy 406, the Code of Student Responsibility. Any student suspected of engaging in such conduct will be referred to the Office of Student Conduct.

This course affirms people of all gender expressions and gender identities. If you prefer to be called a different name than what is indicated on the class roster, please let me know. Feel free to correct me on your preferred gender pronoun. If you have any questions or concerns, please do not hesitate to contact me.

The use of cell phones, smart phones, or other mobile communication devices is disruptive, and is therefore prohibited during class except in emergencies. Students are permitted to use tablets and laptops during class for note-taking and other class-related work only.

University Policies

All students are required to read and abide by the Code of Student Academic Integrity. Violations of the Code of Student Academic Integrity, including plagiarism, will result in disciplinary action as provided in the Code. Definitions and examples of plagiarism are set forth in the Code. The Code is available from the Dean of Students Office or at http://legal.uncc.edu/policies/up-407.

As a condition of taking this course, all required papers may be subject to submission for textual similarity review to VeriCite for the detection of plagiarism. All submitted papers will be included as source documents in the VeriCite reference database solely for the purpose of detecting plagiarism of such papers. No student papers will be submitted to VeriCite without a student's written consent and permission. If a student does not provide such written consent and permission, the instructor may: (i) require a short reflection paper on research methodology; (ii) require a draft bibliography prior to submission of the final paper; or (iii) require the cover page and first cited page of each reference source to be photocopied and submitted with the final paper.

Students who miss classes, examinations or other assignments because of a religious practice or belief must provide reasonable notice of the dates of religious observances on which they will be absent by submitting a Request for Religious Accommodation Form (http://goo.gl/I1Ncv0) to the instructor prior to August 31, 2018.

Students in this course seeking accommodations to disabilities must first consult with the Office of Disability Services (http://ds.uncc.edu/) and follow the instructions of that office for obtaining accommodations.

Reading Schedule

Aug 22 – Introduction
Gillian Barker & Philip Kitcher, *Philosophy of Science* (2014), pp. 1-10

PART 1: THE ANALYTIC PROJECT

Aug 24 – Demarcation
Gillian Barker & Philip Kitcher, *Philosophy of Science* (2014), pp. 12-24

Aug 27 – Falsification
Karl Popper, "Philosophy of Science: A Personal Report" (1957), pp. 155-163 [first two sections]

Aug 29 – Scientism
Susan Haack, "Six Signs of Scientism" (2012)

Aug 31 – Confirmation & Theories
Gillian Barker & Philip Kitcher, *Philosophy of Science*, pp. 24-37

Sep 3 – NO CLASS [Labor Day]

Sep 5 – Testing
Pierre Duhem, *The Aim and Structure of Physical Theory* (1906), pp. 180-190

Sep 7 – Models
Michael Weisberg, *Simulation and Similarity* (2013), chap. 3

Sep 10 – Explanation
Gillian Barker & Philip Kitcher, *Philosophy of Science* (2014), pp. 38-47 [NO CLASS SESSION]

Sep 12 – Causal Laws
Nancy Cartwright, "Causal Laws and Effective Strategies" (1979), pp. 419-426 [first two sections]

Sep 14 – Causal Patterns
Angela Potochnik, "Causal Patterns and Adequate Explanations" (2015)

Sep 17 – Fictions
Alisa Bokulich, "Distinguishing Explanatory from Nonexplanatory Fictions" (2012)

PART 2: THE VIEW FROM THE SCIENCES

Sep 19 – Unity
Gillian Barker & Philip Kitcher, *Philosophy of Science* (2014), pp. 50-61 [NO CLASS SESSION]

Sep 21 – Pluralism
Helen Longino, "Foregrounding the Background" (2016)

Sep 24 – Reductionism
Eric Turkheimer, "Heritability and Biological Explanation" (1998)

Sep 26 – Race
Quayshawn Spencer, "A Radical Solution to the Race Problem" (2014)

Sep 28 – Data
Sabina Leonelli & Rachel Ankeny, "Re-Thinking Organisms: The Impact of Databases . . ." (2012)

Oct 1 – Simulations
Emily Parke, "Experiments, Simulations, and Epistemic Privilege" (2014)

Oct 3 – Historical Science
Carol Cleland, ". . . Historical Science and Experimental Science" (2002)

Oct 5 – Comparative Method
Adrian Currie, "Ethnographic Analogy . . . and Archaeological Special Pleading" (2016)

Oct 8 – NO CLASS [Student Recess]

Oct 10 – Naturalism
Gillian Barker & Philip Kitcher, *Philosophy of Science* (2014), pp. 61-76

PART 3: SCIENCE, HISTORY, AND SOCIETY

Oct 12 – Normal Science
Thomas Kuhn, *Structure of Scientific Revolutions* (1962), chap. 2

Oct 15 – Puzzle Solving
Thomas Kuhn, *Structure of Scientific Revolutions* (1962), chap. 4

Oct 17 – Frameworks
Gillian Barker & Philip Kitcher, *Philosophy of Science* (2014), pp. 78-89 [NO CLASS SESSION]

Oct 19 – Relativism
Gillian Barker & Philip Kitcher, *Philosophy of Science* (2014), pp. 89-103 [NO CLASS SESSION]

Oct 22 – Crisis
Thomas Kuhn, *Structure of Scientific Revolutions* (1962), chap. 8

Oct 24 – Revolutions
Thomas Kuhn, *Structure of Scientific Revolutions* (1962), chap. 9

Oct 26 – Textbooks
Thomas Kuhn, *Structure of Scientific Revolutions* (1962), chap. 11

Oct 29 – Resolution
Thomas Kuhn, *Structure of Scientific Revolutions* (1962), chap. 12

Oct 31 – Progress
Thomas Kuhn, *Structure of Scientific Revolutions* (1962), chap. 13

PART 4: SCIENCE, VALUES, & POLITICS

Nov 2 – Critical Voices
Gillian Barker & Philip Kitcher, *Philosophy of Science* (2014), pp. 106-135 [NO CLASS SESSION]

Nov 5 – Gender
Emily Martin, "The Egg and the Sperm" (1991)

Nov 7 – Sex
Sarah Richardson, "Sexes, Species, and Genomes" (2010)

Nov 9 – Colonialism
Jenny Reardon & Kim TallBear, "'Your DNA is Our History': Genomics, Anthropology . . ." (2012)

Nov 12 – Responsibility
Heather Douglas, *Science, Policy, and the Value-Free Ideal* (2009), chap. 4

Nov 14 – Values
Heather Douglas, *Science, Policy, and the Value-Free Ideal* (2009), chap. 5

Nov 16 – Ethics
Inmaculada de Melo-Martín & Kristen Intemann, "Can Ethical Reasoning Contribute . . . ?" (2007)

Nov 19 – Controversy
Dan Hicks, "Epistemological Depth in a GM Crops Controversy" (2015)

Nov 21 & 23 – NO CLASS [Thanksgiving Break]

Nov 26 – Well-Being
Anna Alexandrova, "Can the Science of Well-Being Be Objective?" (2016)

PART 5: PRESENTATIONS

Nov 28 – Student Presentations

Nov 30 – Student Presentations

Dec 3 – Student Presentations

Dec 5 – Student Presentations