

Date prepared: 11/16/17
Syllabus
University of New Orleans
Dept. of History and Philosophy

PHIL 4430: Philosophy of the Natural Sciences (3 credits)

SECTIONS 476 & 585: INTERNET

Contact Information

Instructor: Dr. Robert Stufflebeam
Office: LA 385
Office Hours: M-T-W-Th, 11:00 – 1:00 (and by appointment)
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Course Webpage: [Moodle](#) login page

Required Texts

- [1] Klemke, E. D., R. Hollinger, D. W. Rudge, and A. D. Kline (Eds.) (1998): **Introductory Readings in the Philosophy of Science**. 3rd ed. Prometheus. ISBN: 1-57392-240-4 [T]
- [2] Kuhn, T. S. (1996). **The structure of scientific revolutions**. 3rd ed. University of Chicago Press. ISBN 0-226-45808-3 [K]
- [3] Online readings. [O]

Course Description

CATALOG DESCRIPTION: An examination in detail of the outstanding problems, positions, and achievements within contemporary philosophy of science. Attention will be given to issues arising from both the physical and the biological sciences.

COURSE OVERVIEW: This course focuses on several theoretical issues concerning the nature and practice of natural science. The following questions will be explored:

- (1) How should we distinguish genuine science from pseudoscience?
- (2) What is the scientific method?
- (3) What is the ontological status of theoretical entities? (realism vs. antirealism)
- (4) What is the nature of scientific explanations, laws, and theories?
- (5) How should we choose one theory over another?
- (6) What is a scientific revolution? How do they contribute to the growth of scientific knowledge? Is what Kuhn says about paradigms and scientific revolutions to be believed?

We shall explore these questions through the writings of a number influential philosophers of science: Carnap, Hanson, Hempel, Kitcher, Kuhn, Popper, Putnam, Stace, Quine and others. To explore their pieces critically in class, the original face-to-face course from which the lectures were recorded was run like a seminar.

Student Outcomes

Upon successfully completing this course, students will be able to do the following:

- to understand the nature of philosophy and philosophy of science
- to determine whether a statement is true
- to understand what it means for a claim to follow from its evidence
- to understand the three kinds of conditions
- to perform a successful conceptual analysis
- to understand the scientific method
- to understand the problem of demarcation
- to distinguish genuine science from pseudoscience
- to understand the philosophical problems associated with observation
- to understand the realism vs. antirealism debate concerning theoretical entities
- to understand the nature of scientific explanations (especially the “D-N model”)
- to understand the nature of scientific laws
- to understand the nature of scientific theories
- to understand how one theory is chosen over another
- to understand what Kuhn means by ‘paradigm’, ‘scientific revolution’, ‘incommensurability’, etc.
- to understand Kuhn’s historicism and his contribution to philosophy of science
- to present and to defend your own views regarding the issues above
- to read philosophical texts
- to recognize philosophical issues
- to lead philosophical discussions
- to write a philosophical research paper

Grades

Grades will be based on a 100-point scale distributed as follows:

| Requirement | | Final grade | |
|---------------------------------|-----------------|-------------|--------------------|
| Acknowledgment statement | (1%) 1 point | A | 100 – 89.5 points |
| One-minute arguments | (19%) 19 points | B | 89.4 – 79.5 points |
| Exam 1 | (30%) 30 points | C | 79.4 – 69.5 points |
| Exam 2 | (30%) 30 points | D | 69.4 – 59.5 points |
| Essay | (20%) 20 points | F | 59.4 — 0 points |

ACKNOWLEDGEMENT STATEMENT: Each student must acknowledge knowing that each exam must be submitted by 11:55 p.m. CT on the days identified on the Game Plan. Each student must also acknowledge having read UNO's Academic Dishonesty Policy and pledge to abide by it in this course. Completing the acknowledgment statement on Moodle is worth **1%** of your final grade.

ONE-MINUTE ARGUMENTS: Our only means of interacting as a class is through the discussion forums on Moodle. Since interacting with each other and me is important, after almost every lecture there is a discussion question to which you need to post a response. Each student is required to post a response within a few DAYS of when the lecture should be completed. (For each week of the semester, the Game Plan tells you what you need to READ, which lecture to COMPLETE, and to which one minute argument question you need to POST your response.) If you post your response a week after a lecture should have been completed, your response will be late. Consider your responses to be "one-minute arguments." What that means is you will need to make a claim, give some evidence in support of that claim, and it should take me about 1 minute to read it. Hence, you need to write a paragraph as a discussion response, not a single sentence. After posting your discussion response, you may then post a response to someone else's ... continuing the discussion. Your one-minute argument grade will be based on the quality, timeliness, and thoughtfulness of your replies. Overall, it is worth **19%** of your final grade.

EXAMS: There will be **2** take-home essay exams, each covering about half of the course material. You may use your text and notes but ***you may NOT collaborate***. As in the paper, **you must properly cite sources of all work that is not your own**. Consult me for advice in case of uncertainty. The exams are worth **60%** of your final grade.

ESSAY: Each student will be required to write **1** philosophical research paper. I'm not asking for just any paper. I'm requiring a specific type of essay organized and written in a specific type of way. Hence, you will be required to do more than merely survey/explain a specific problem/issue; you will also be required to make your own claim and to defend it. The **10-12 page** paper must be based on a topic listed on Moodle or approved by me, written in accordance with the guidelines on Moodle, and submitted via Moodle. **You may NOT use sources available only online**. Your essay is worth **20%** of your final grade.

What follows are my class policies. If for any reason you are unable to abide by these policies, you should withdraw from my course.

- ACADEMIC DISHONESTY:** Academic honesty is fundamental to the process of learning and to evaluating academic performance. Academic dishonesty will not be tolerated. Academic dishonesty includes, but is not limited to, the following: cheating, plagiarism, tampering with academic records and examinations, disseminating any part of an exam, falsifying identity, and being an accessory to acts of academic dishonesty. Refer to the Student Code of Conduct for further information. The Code is available on Moodle and online at <http://www.studentaffairs.uno.edu>. Each student is required to pledge that all completed work will be submitting according to the principles of academic integrity as defined in the statement on Academic Dishonesty in the UNO Student Code of Conduct
- AUDITS:** Whether an audit is successful will depend only on your one minute argument performance.
- CONDUCT:** Feel free to say anything to me or to your peers, but tailor your remarks so as not to be uncivil, abusive, or inappropriate. I will not tolerate ANY abusive behavior in the one minute argument discussions, so do not engage in any personal attacks or name calling. (See my 'warning' below.)
- DISABILITIES:** It is University policy to provide, on a flexible and individualized basis, reasonable accommodations to students who have disabilities that may affect their ability to participate in course activities or to meet course requirements. Students with disabilities should contact the Office of Disability Services as well as their instructors to discuss their individual needs for accommodations. For more information, please go to <http://www.ods.uno.edu>.
- INCOMPLETES:** Incompletes are STRONGLY discouraged. Should you need to take an incomplete, arrangements must be made with me well BEFORE Exam 3.
- LANGUAGE:** Feel free to say anything to me or to your peers, but tailor your remarks so as not to be uncivil, abusive, or inappropriate. I will not tolerate ANY abusive behavior, so do not engage in any personal attacks or name calling. (See my 'warning' below.)
- LATE-STARTS:** There are no special dispensations for late-start students.
- LATE WORK:** A one minute argument response will be penalized a letter grade for each week it is late. Hence, if you post a reply to a question 5 weeks late, you the highest you could receive is a 50. Waiting until the end of the semester to post your replies is utterly self-defeating.
- MAKE-UPS:** Both exams are take-home essay exams. Hence, no make up exams will be given.
- PARTICIPATION:** Since this is an internet course, your participation will be limited to the one minute arguments. Your responses should be posted each week, NOT weeks later. You need to have read the material and completed the lecture prior to posting your discussion response.
- PROCTORING:** To ensure academic integrity, all students enrolled in distance learning courses at the University of New Orleans may be required to participate in additional student identification procedures. At the discretion of the faculty member teaching the course, these measures may include on-campus proctored examinations, off-site or online proctored examinations, or other reasonable measures to ensure student identity. Authentication measures for this course may include Proctor U and any fees associated are the responsibility of the student. University of New Orleans partners with Proctor U, a live, online proctoring service that allows students to complete exams from any location using a computer, webcam, and reliable internet connection.
- WITHDRAWALS:** You may withdraw from this course for any reason. Withdrawal is strictly up to you and none of my business. Look in the course listings for the last day to withdraw without a penalty — a 'W' appearing on your transcript.

WARNING! *Philosophy of Science is part of philosophy. Doing philosophy requires a willingness to think critically. Critical thinking does not consist in merely making claims. Rather, it requires offering reasons/evidence in support of your claims. It also requires your willingness to entertain criticism from others who do not share your assumptions. You will be required to do philosophy in this class. Doing philosophy can be hazardous to your cherished beliefs. Consequently, if you are unwilling to participate, to subject your views to critical analysis, to explore issues that cannot be resolved empirically, or to use computers, then my course is not for you.*

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PHIL 4430 Game Plan

(Subject to slight revision.)

| WEEK | TOPIC/READING | LECTURE | ONE MIN. ARG |
|---|---|---------|--------------|
| (1) 08/16 – 08/18 | Syllabus | 1 | 1 |
| (2) 08/21 – 08/25 | What is philosophy of science? [T] Klemke et al.: What is philosophy of science? (pp. 19-26) | 2 | 2 |
| | Groundwork [O] Stufflebeam: Ch. 2 - Statements and truth | 3 | 3 |
| (3) 08/28 – 09/01 | [O] Stufflebeam: Ch. 2 - Conditions and conceptual analysis | 4 | 4 |
| | [O] Stufflebeam: Chs. 3 & 4 - Arguments | 5 | 5 |
| (4) 09/04 – 09/08 | [O] Stufflebeam: The scientific method (The Mind Project) | 6 | 6 |
| | Science vs. pseudoscience [T] Klemke et al.: Introduction (pp. 29-37) | 7 | 7 |
| | [T] Popper: Science: conjectures and refutations (pp. 38-47) | | |
| (5) 09/11 – 09/15 | [T] Feyerabend: How to defend society against science (pp. 54-65) | 8 | 8 |
| | [T] Thagard: Why astrology is a pseudoscience (pp. 66-75) | 9 | 9 |
| (6) 09/18 – 09/22 | [T] Kitcher: Believing where we cannot prove (pp. 76-98) | 10 | 10 |
| | Natural science vs. Social science [T] Klemke et al.: Introduction (pp. 105-109) | 11 | 11 |
| | [T] Taylor: Interpretation and the sciences of man (pp. 110-127) | | |
| (7) 09/25 – 09/29 | Explanation and law [T] Klemke et al.: Introduction (pp. 197-205) | 12 | 12 |
| | [T] Hempel: Studies in the logic of explanation (pp. 206-224) | 13 | 13 |
| | [T] Lambert & Britten: Laws and conditional statements (pp. 225-231) | | |
| (8) 10/02 – 10/06 | [T] Cartwright: The truth doesn't explain much (pp. 233-240) | 14 | 14 |
| | Friday, 6 Oct.: Exam 1 due by 11:55 p.m. CT | | |
| (9) 10/09 – 10/11 <i>FALL BREAK</i> | Neil deGrasse Tyson on Philosophy and Science [O] Nerdist podcast #489 with Neil deGrasse Tyson [O] Neil deGrasse Tyson: Anti-Science and Anti-Intellectual [O] Why Neil deGrasse Tyson is a philistine [O] An open letter to Neil DeGrasse Tyson [O] Neil deGrasse Tyson and the value of philosophy | 15 | 15 |
| (10) 10/16 – 10/20 | Theories [T] Klemke et al.: Introduction (pp. 309-315) | 16 | 16 |
| | [T] Carnap: The nature of theories (pp. 316-332) | | |
| (11) 10/23 – 10/27 | [T] Putnam: What theories are not (pp. 333-338) | 17 | 17 |
| | Realism vs. Antirealism [O] Stufflebeam: Perception: An introduction | 18 | 18 |
| | [T] Hanson: Observation (pp. 339-351) | | |
| (12) 10/30 – 11/03 | [T] Stace: Science and the physical world (pp. 352-357) | 19 | 19 |
| | [T] Toulmin: Do sub-microscopic entities exist? (pp. 358-362) | | |

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| (13) 11/06 – 11/10 | Confirmation and Acceptance [T] Klemke et al.: Introduction (pp. 397-403) [T] Quine & Ullian: Hypothesis (pp. 404-414) | 20 | 20 |
| (14) 11/13 – 11/17 | [T] Giere: Justifying scientific theories (pp. 415-434) | 21 | 21 |
| | [T] Kuhn: Objectivity, value judgment, and theory choice (pp. 435-450) | 22 | 22 |
| (15) 11/20 – 11/21 | Kuhn: SSR [K] Kuhn: Chapters 1-5 (pp. 1-51) | 23 | 23 |
| (16) 11/27 – 12/01 | [K] Kuhn: Chapters 6-12 (pp. 52-160) | 24 | 24 |
| Dec. 07 | Exam 2 and Essay are both due by 11:55 p.m. | | |