Philosophy of Natural and Social Science

Course Instructor:

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COURSE DESCRIPTION AND OBJECTIVES

The course prepares students to engage with work from unfamiliar scientific and social scientific disciplines. In this course, students will learn to go beyond simply accepting a few key points. They will actively engage by placing scientific and social scientific change in historical context, and by philosophically examining presuppositions and method of scientific and social-scientific research. The course fosters this aim by spending unit 1 giving students the skills to use their humanities backgrounds to engage with science. Students will then have the chance to apply those skills in the second half of the course, where they will be introduced to scientific work (quantum mechanics) and social scientific work (development economics).

In Unit 1, students will be introduced to philosophical problem and historical models of scientific theory change. First, students will examine the simple problem: what counts as good evidence for a theory? In Unit 2, students will be introduced to one of the two central theories of modern physics. In Unit 3, we enable students to

assess for themselves the relevance of the history, and the fruitfulness of the current trends. In the first two weeks, economic models are studied alongside reflections of the methodology of economics by Mill and Friedman. These insights are then used to study the case of a recent movement in development economics, prompted by The Lancet medical journal. Students will be equipped to critically analyze whether the use of qualitative and natural scientific experimental techniques in development science is a new fad to be taken with a pinch of salt, or an important and long neglected part of effective development economics.

The assignments in this course are designed not only to evaluate students' understanding of the content, but also to develop transferable skills, like basic research abilities, text interpretation, written and presentation skills, and team-work experience.

LEARNING OUTCOMES

Upon completion of the course, students should be able to:

a. Explain and assess scientific and social scientific texts;
b. Deconstruct the presuppositions of reasoning in science and social science;
c. Introspect on scientific change in historical context;
d. Critique the application of natural scientific techniques to social science;
e. Participate in constructive discussion across disciplinary boundaries;
f. Communicate with a high degree of economy and precision;
g. Generate their own views about the role of science in society.

COURSE REQUIREMENTS

· 20% Group Presentation
· 20% Individual Participation
· 5% Essay on Unit 1 – Draft
· 25% Essay on Unit 1 – Final Version
· 5% Essay on Unit 2 or 3 – Draft
· 25% Essay on Unit 2 or 3 – Final Version

Group Presentation (20%)

Before the Midterm Break
Students will be divided into groups of 3-4. Each week a group is in charge of answering questions other students raise in seminars. Questions will be emailed in advance.

The grade will be the same for the entire group.
Student earned up to 6% for presentation before the midterm break.

After the Midterm Break
Students will be divided into groups of 3-4 to work together on weekly worksheets. The answers should be submitted on Moodle and are due by every **Friday, 11:30PM**, unless otherwise stated.
There will be about 6-7 worksheets. Each is worth up to 3%. Only the highest 5 grades will count towards the grade. Students can earn up to 14%. The grade a student get after the midterm will be added to the grade they earned before the break.

Individual Participation (20%)

Before the Midterm Break
Questions to be emailed in advance for seminars.
Questions will be grade on how much they show engagement with the material. General questions will receive a lower grade; whereas more specific questions will receive a higher grade.

After the Midterm Break
Students will give individual presentations. These are to be done during seminars on Mondays. There will be about 3-4 presentations/seminar.
The topic will be emailed to each student the Thursday before their presentation. Students can earn up to 10%. The grade a student get after the midterm will be added to the grade they earned before the break.

Essay on Unit 1 – Draft (5%)

A draft of **at least 1000 words** to be submitted. Graded on a pass/fail. Feedback given has to be incorporated in the final version.
The paper is on topic cover in Unit 1 (pending instructor's approval).
Due on **Sept 16, Thursday, by 11:59PM, on Moodle**.
Feedback by Sept 30, Thursday, by 11:59PM, on Moodle.

Essay on Unit 1 – Final Version (25%)

An essay of **up to 2500 words** graded on the standard philosophy rubric.
Due on **Oct 5, 11:59PM, on Moodle.**
Grade breakdown:

· 5% response to feedback;
· 20% final version.

Essay on Unit 2 or 3 – Draft (5%)

Before the Midterm Break
Same as "Essay on Unit 1 – Draft".
Due on **Nov 18, Thursday, 11:59PM, on Moodle**.
Feedback by Dec 2, Thursday, 11:59PM, on Moodle.

After the Midterm Break
Draft not required.

Essay on Unit 2 or 3 – Final Version (25%)

Before the Midterm Break
Same as "Essay on Unit 1 – Final Version".
Due on **Dec 7, 11:59PM, on Moodle**.
Grade breakdown: same as "Essay on Unit 1 – Final Version".

After the Midterm Break
Due on **Dec 7, 11:59PM, on Moodle**.
Grade breakdown: 30% final version.

NOTE: Things change – the Fates are fickle. Consequently, information found on this syllabus is subject to revision as we progress through the quarter: Readings and content may be added (or cut) depending on our rate of progress, and it may be necessary to amend the due date of the assignments. Revisions will be announced in lecture and posted online. It is each student's responsibility to keep informed of any changes.

If you are facing a major medical or another major difficulty that is keeping you from doing well in the class, contact me as soon as you can. I am happy to work with you to find the best course of action and, if possible, to help you complete the course successfully. But I can't help if you don't let me know about your circumstances as soon as they arise.

Please, don't wait until after the last week of classes to let me know about your circumstances. At that point there is virtually nothing I can do to accommodate you.

MATERIALS
· All course materials, information, assignments, etc. will be available on Moodle.

· All communications will be made through your university email ID or announcements on Moodle. Please make sure you check your inbox and Moodle frequently. It is each student's responsibility to keep informed of any changes.

GRADING

The following grading scale will apply: 0-29% U, 30-39% E, 40-49% D, 50-59% C, 60-69% B, 70-79% A-, 80-89% A, 90-100% O

Paper and exams will be graded based on the evaluation criteria you find in "Philosophy Rubrics" here https://julianaflima.github.io/current. You'll also find link to videos of Kit Patrick marking an O and a C paper. Scan the QR Code below to get access to these resources.

COURSE SCHEDULE & READINGS

Unit 1: Philosophy of science (6 weeks)

Week 1	Aug 23	**1.1 Induction and Confirmation** *Reading:* Godfrey-Smith,P. *Theory and Reality*, Ch. 3.
Week 2	Aug 30	**1.2 Hypothetico-Deductivism** *Reading:* Hempel,C.G. *Philosophy of natural science*, Chs. 2 & 3.
Week 3	Sep 6	**1.3 Varieties of Underdetermination** *Reading:* Gillies,D. "The Duhem Thesis and the Quine Thesis". Van Fraassen,B.C. "To Save the Phenomena".
Week 4	Sep 13	**1.4 Inference to the Best Explanation** *Reading:* Lipton,P. *Inference to the best explanation*, Chs. 2 & 4.
Week 5	Sep 20	**1.4 Inference to the Best Explanation (cont'ed)** *Reading:* Lipton,P. *Inference to the best explanation*, Chs. 2 & 4.

Week 6   Sep 27   **1.5 Bayesianism**
Reading: Strevens, "Notes on Bayesian Confirmation Theory", Chs. 1–5.

Week 7   Oct 4   **1.5 Bayesianism (cont'ed)**
Reading: Strevens, "Notes on Bayesian Confirmation Theory", Chs. 1–5.

Midterm Break

Unit 2: Philosophy of Quantum Mechanics (4 weeks)

Week 8   Oct 18   **2.1 The Experimental Basis for Quantum Mechanics**
Reading: Maudlin, *Philosophy of Physics: Quantum Theory*, Ch. 1.

Week 9   Oct 25   **2.2 The Mathematics of Quantum Mechanics**
Reading: Albert,D. *Quantum Mechanics and Experience*, Ch. 2.

Week 10   Nov 1   **2.3 The Measurement Problem and Collapse Theories**
Readings: Albert,D. *Quantum Mechanics and Experience*, Chs. 4 & 5

Week 11   Nov 8   **2.4. Everettian and Bohmian Theories**
Readings: Albert,D. *Quantum Mechanics and Experience*, Chs. 6 & 7.

Unit 3: Philosophy of development economics (3 Weeks)

Week 12   Nov 15   **3.1 Models and Idealization**
Reading: 3.1 Reiss,J. *Philosophy of Economics: A Contemporary Introduction*, Chapt 7.

Week 13   Nov 22   **3.2 The F twist and behavioural economics**
Readings: Friedman,M. *The methodology of positive economics*.
Lester,R.A. "Shortcomings of marginal analysis for wage-employment problems", *The American Economic Review*, 36(1), 63-82.

Week 14   Nov 29   **3.3 Randomised controlled trials**
Deaton,A. "Instruments, randomization, and learning about development", *Journal of economic literature*, 48(2), 424-455.

Week 15   Dec 6   Catch up!

Week 16   *Reading Week*

The End!