

## PHILOSOPHY 2030G: Philosophy of Science

**MWF 12:30-1:30pm**

**Talbot College 341**

*Instructor:* Trevor Pearce  
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### *Course Description:*

What *is* science, anyway? Why does it progress? What is the relationship between science and values? In this course, an introduction to the philosophy of science, we will deal with these questions and more. We will begin by discussing different definitions of science, and how these have shaped American legal questions. For the bulk of the course we will read and analyze Thomas Kuhn's influential book *The Structure of Scientific Revolutions*, which examines how science progresses and changes – e.g., the replacement of Newton's physics by Einstein's. In the second half of the course, we will discuss the nature of scientific explanations, the role of modeling in science, and the importance of values to scientific practice. No background in science or philosophy is required or expected.

### *Objectives:*

The main objective of this course is to help students to think critically about science. By the end of the course, students should be able to contribute to and evaluate discussions of the following topics: the demarcation between science and non-science, 'normal' scientific practice, scientific change, progress in science, scientific explanation, the role of modeling in science, and the importance of values in science.

### *Texts:*

Thomas Kuhn. *The Structure of Scientific Revolutions*. Chicago: University of Chicago Press. [All editions – 1962, 1970, 1996 – have the same pagination.]

All other readings are available on WebCT.

*Requirements:*

- 5% – **Participation:** primarily attendance, but also participation in class
- 10% – **Presentation:** in the last weeks of the semester, pairs of 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.
- 20% – **Response papers:** four 2-page papers, each analyzing one of the assigned texts. Each paper must be handed at the start of class on the day we are discussing the analyzed text. The papers must be handed in on or before (1) Jan. 21, (2) Feb. 11, (3) Mar. 11, (4) Apr. 1. The lowest of the four grades will be discarded.
- 25% – **Midterm exam:** in-class exam on March 4, consisting of short essay questions and covering material from the first half of the course. Questions will be circulated on February 28. Students may bring in books and articles, but no handwritten pages.
- 40% – **Term paper:** 2500-word essay due on April 6. The paper should be submitted to <http://turnitin.uwo.ca>, and **also** at WebCT.

The Department of Philosophy policies which govern the conduct, standards, and expectations for student participation in Philosophy courses are available at the Department of Philosophy website. It is your responsibility to understand the policies set out by the Senate and the Department of Philosophy, and thus cannot be used as grounds of appeal.

<http://uwo.ca/philosophy/undergraduate/proceduresappeals.html>

Accommodation policies for medical illness, religious holidays, etc., are detailed in the Academic Calendar: <http://www.westerncalendar.uwo.ca/2010/pg111.html>.

*Schedule:*

Jan        3 – Introduction

**Science versus Non-science**

5 – Ruse, testimony in *McLean v. Arkansas Board of Education*

7 – Popper, “Philosophy of Science...” (1957), pp. 155-166

- 10 – Popper, “Philosophy of Science,” pp. 166-176
- Jan 12 – Popper, “Philosophy of Science,” pp. 176-188
- 14 – Haack, “Six Signs of Scientism” (2009)

### **Scientific Change**

- 17 – Kuhn, *Structure of Scientific Revolutions* (1962), pp. v-9
- 19 – Kuhn, *Structure*, pp. 10-22
- 21 – Kuhn, *Structure*, pp. 23-34 **[response deadline]**
- 24 – Kuhn, *Structure*, pp. 35-42
- 26 – Kuhn, *Structure*, pp. 43-51
- 28 – Polanyi, “Tacit Knowing” (1966)
- 31 – Kuhn, *Structure*, pp. 52-65
- Feb 2 – Kuhn, *Structure*, pp. 66-76
- 4 – Kuhn, *Structure*, pp. 77-91
- 7 – Kuhn, *Structure*, pp. 92-110
- 9 – No reading
- 11 – Kuhn, *Structure*, pp. 111-135 **[response deadline]**
- 14 – Kuhn, *Structure*, pp. 136-143
- 16 – Kuhn, *Structure*, pp. 144-159
- 18 – Kuhn, *Structure*, pp. 160-173

### **SPRING BREAK**

- Feb 28 – Kuhn, “Logic of Discovery or Psychology of Research?” (1970)  
Popper, “Normal Science and its Dangers” (1970)
- Mar 2 – Discussion: Kuhn’s Legacy
- 4 – **MIDTERM**

## **Explanations**

- Mar      7 – Woodward, “Background and Introduction” (2009)  
          9 – Woodward, “The *DN* Model” (2009)  
         11 – Woodward, “The *SR* Model” (2009) **[response deadline]**

## **Modeling**

- 14 – Weisberg, “Who is a Modeler?” (2007)  
         16 – Levins, “The Strategy of Model Building in Population Biology” (1966)  
         18 – Weisberg, “Three Kinds of Idealization” (2007)

## **Values**

- 21 – Longino, “Can There Be a Feminist Science?” (1987)  
         23 – Okruhlik, “Gender and the Biological Sciences” (1994)  
         25 – Douglas, “Rejecting the Ideal of Value-Free Science” (2007)

## **Presentations / Review**

- 28 – Presentations  
         30 – Presentations **[response deadline]**
- Apr      1 – CLASS CANCELLED  
          4 – Presentations  
          6 – Presentations **[term paper due]**