

**Lingnan University**  
**Department of Philosophy**

<b>Course Title</b>	: Scientific Realism
<b>Course Code</b>	: PHI4399K
<b>Recommended Study Year</b>	: 2-4 Years
<b>No. of Credits/Term</b>	: 3
<b>Mode of Tuition</b>	: Sectional
<b>Class Contact Hours</b>	: 3 hours/week
<b>Category in Major Programme</b>	: Programme Elective – Special Topics
<b>Prerequisite(s)</b>	: N/A
<b>Co-requisite(s)</b>	: N/A
<b>Exclusion(s)</b>	: N/A
<b>Exemption Requirement(s)</b>	: N/A

### **Brief Course Description**

What can science achieve, and how should we regard its theories? Can it discover how things really are in the microscopic, unobservable, realm? And should we take its theories at face value? These are the key questions that we will explore in this course.

We will focus attention on scientific realism – roughly, the position that scientific theories should be taken literally, even in their claims about unobservable things, and that most contemporary theories are approximately true – and on arguments for and against it. In examining these arguments, we will cover related topics in scientific method, e.g. Duhem's thesis that a hypothesis cannot be tested in isolation.

We will also explore key alternatives to scientific realism, including instrumentalism, constructive empiricism, entity realism, and structural realism.

### **Aims**

1. To expose students to the literature on, and problems concerning, scientific realism.
2. To introduce and examine related problems in scientific method.
3. To improve students' understanding of the history of natural science.
4. To enable students to take their own view on what science can achieve, and how we should regard its theories.

### **Learning Outcomes**

1. Students should be familiar with scientific realism and the key alternatives, namely instrumentalism, constructive empiricism, entity realism, and structural realism.
2. Students should be conversant with arguments for and against these positions, especially scientific realism, and related episodes in the history of natural science.
3. Students should understand relevant topics in scientific method, and how they feature in the aforementioned arguments and episodes.
4. Students should be able to articulate and defend their own view (e.g. selected from the key alternatives) on what science can achieve, and how we should regard its theories.

### **Indicative Content**

1. Scientific Realism
2. Relevant Issues in Scientific Method
  - a. Duhem's Thesis and Underdetermination
  - b. Theory-Ladenness of Observation

- c. Induction
- d. Inference to the Best Explanation
- 3. Instrumentalism
- 4. Constructive Empiricism
- 5. Entity Realism
- 6. Structural Realism

### **Teaching Method**

The course will be taught in a seminar format, involving interactive lecturing, presentations, and group discussion.

### **Measurement of Learning Outcomes**

Progress will be measured by:

1. Participation in discussion and performance in quizzes (LO1, LO2, LO3, and LO4).
2. Quality of presentations (LO1 and LO2).
3. Performance in mid-term essay (LO2 and LO4).
4. Performance in final exam (LO1, LO2, LO3, and LO4).

### **Assessment**

15% class participation.

15% presentation

30% mid-term essay

40% final exam.

### **Required Readings**

A course reader, along with appropriate links to on-line resources, will be provided for the course.

Notes from seminars will also be posted online.

### **Supplementary Readings**

Psillos, S. *Scientific Realism: How Science Tracks Truth*. London: Routledge.

Van Fraassen, B. C. *The Scientific Image*. Oxford: Clarendon Press.

### **Important Notes**

- (1) Students are expected to spend a total of 9 hours (i.e. 3 hours of class contact and 6 hours of personal study) per week to achieve the course learning outcomes.
- (2) Students shall be aware of the University regulations about dishonest practice in course work, tests and examinations, and the possible consequences as stipulated in the Regulations Governing University Examinations. In particular, plagiarism, being a kind of dishonest practice, is “the presentation of another person’s work without proper acknowledgement of the source, including exact phrases, or summarised ideas, or even footnotes/citations, whether protected by copyright or not, as the student’s own work”. Students are required to strictly follow university regulations governing academic integrity and honesty.
- (3) Students are required to submit writing assignment(s) using Turnitin.
- (4) To enhance students’ understanding of plagiarism, a mini-course “Online Tutorial on Plagiarism Awareness” is available on <https://pla.ln.edu.hk/>