



# PHL 232

## Philosophy of Science

S2 External 2015

*Dept of Philosophy*

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#### **Disclaimer**

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## General Information

Unit convenor and teaching staff

Unit Convenor

Rachael Brown

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Credit points

3

Prerequisites

12cp or admission to GDipArts

Corequisites

Co-badged status

Unit description

How does science work? Should scientific method be privileged over other ways of knowing? How do scientific theories change over time? Should the history of science be seen as an unfolding tale of intellectual and technological progress, or as a messier and ambivalent process? This unit introduces central issues in the philosophy of science, including: the nature of observation and experiment; the question of scientific realism; the rationality or irrationality of scientific revolutions; the relation between science and values; and the nature of explanation. This unit presumes no particular background in science – it is suitable for students with a background in arts disciplines as well as for students in the social, behavioural, biological, and physical sciences.

## Important Academic Dates

Information about important academic dates including deadlines for withdrawing from units are available at <https://www.mq.edu.au/study/calendar-of-dates>

## Learning Outcomes

On successful completion of this unit, you will be able to:

A working knowledge of some of the current major issues connecting philosophy and science

The ability to understand and critically evaluate the theories and arguments studied,

identify their strengths and weaknesses, and develop an appreciation of the ways in which these positions have developed in response to identification of problems in other views

An ability to understand and critically evaluate theories and arguments in the philosophy of science.

An ability to express and expound the positions studied clearly and lucidly

Students should start to develop their own philosophically informed views on the issues studied and defend their views, clearly and courteously in response to critical evaluation from others in discussion and in writing

## Assessment Tasks

Name	Weighting	Due
<a href="#"><u>Short persuasive writing task</u></a>	15%	14/08/15
<a href="#"><u>Research Essay Plan</u></a>	5%	16/10/15
<a href="#"><u>Research Essay</u></a>	40%	13/11/15
<a href="#"><u>Weekly blog and reflection</u></a>	20%	02/11/15
<a href="#"><u>Participation</u></a>	20%	Weekly

### Short persuasive writing task

Due: **14/08/15**

Weighting: **15%**

All students will complete a 750 word persuasive writing piece.

Submission: iLearn

Grading: Students will receive a grade out of 100 for the paper.

On successful completion you will be able to:

- A working knowledge of some of the current major issues connecting philosophy and science
- The ability to understand and critically evaluate the theories and arguments studied, identify their strengths and weaknesses, and develop an appreciation of the ways in which these positions have developed in response to identification of problems in other views
- An ability to understand and critically evaluate theories and arguments in the philosophy

of science.

- An ability to express and expound the positions studied clearly and lucidly
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## Research Essay Plan

Due: **16/10/15**

Weighting: **5%**

Students will produce a detailed plan of the research paper for peer review. An planning worksheet will be provided on iLearn.

Submission Instructions for Internal Students: Students will bring their plan to tutorial in week 10 for peer discussion and feedback.

Submission Instructions for External Students: External students will post their essay plans to the external students forum and provide feedback on at least one other plan.

Grading: Pass/Fail.

On successful completion you will be able to:

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- An ability to understand and critically evaluate theories and arguments in the philosophy of science.
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## Research Essay

Due: **13/11/15**

Weighting: **40%**

Students will write a research paper of 2000 words which provides a careful critical examination, based on reasons, argumentation and evidence, of a set topic. A list of topics will be made available on iLearn in week 7, and the research paper must answer one of these set questions.

Submission: Turnitin submission on iLearn

Grading: Students will receive a grade out of 100 for the paper.

On successful completion you will be able to:

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## Weekly blog and reflection

Due: **02/11/15**

Weighting: **20%**

All students are expected to complete a short weekly reflective blog post (100-200 words) on the reading material. These posts should be critical reflections on the reading (rather than summaries). The completion of at least 6 weekly blog posts is a hurdle requirement for this assessment. At the end of semester, students will select three of these posts on which to write a 750 word reflection which will be assessed.

Submission: iLearn

Grading: Those students completing a minimum of 6 weekly blog posts, will receive a grade out of 100 for their reflection.

On successful completion you will be able to:

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- An ability to understand and critically evaluate theories and arguments in the philosophy

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## Participation

Due: **Weekly**

Weighting: **20%**

Internal students are required to attend 70% of all tutorials, prepare for tutorials and to participate in discussion of required readings for each tutorial.

Class participation marking criteria:

- **Outstanding contributor:** Contributions in class reflect extensive preparation. Ideas offered are usually substantive; provide major insights and direction for class discussion. Challenges are substantiated and persuasive. Makes an important contribution to class discussion overall.
- **Good contributor:** Contributions in class reflect thorough preparation. Ideas offered are often substantive; provide useful insights and some direction for class discussion. Challenges are substantiated and often persuasive. Makes a significant contribution to class discussion overall.
- **Adequate contributor:** Contributions in class reflect adequate preparation. Ideas offered are sometimes substantive; provide some insight but rarely offer direction for class discussion. Challenges are sometimes presented, substantiated and persuasive. Makes a contribution to class discussion overall.
- **Unsatisfactory contributor:** Contributions in class reflect inadequate preparation. Ideas offered are rarely substantive; rarely provide insight but do not offer useful direction for class discussion. Contributions may be distractions rather than constructive. Does not make a positive contribution to class discussion overall.
- **Non-participant:** This person says little or nothing in class. There is not an adequate basis for evaluation. Makes no contribution to discussion.

(Adapted from Tyler, J. (2004) Class Participation Assessment Guide. Department of Education, Brown University).

External students should provide courteous and relevant feedback on the blog posts of at least two other students in 7 weeks of the semester. The marking criteria are the same as for internal students.

Submission: Weekly in-class (internal students), Weekly on iLearn (external students)

Grading: Students will receive a grade out of 10 for participation (an interim report on participation will be provided to all students at mid-semester)

On successful completion you will be able to:

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- An ability to understand and critically evaluate theories and arguments in the philosophy of science.
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## Delivery and Resources

**Lectures:** Wednesdays, 10am-12noon (E6B Rm 117)

**Tutorials:** Fridays, 1-2pm (W5C 302) and 3-4pm (W5C 311)

**Prescribed Texts (all students are expected to have access to a copy of these texts)**

- Gillian Barker & Philip Kitcher (2014) *Philosophy of Science: A New Introduction*, Oxford University Press
- Samir Okasha (2002) *Philosophy of Science: A Very Short Introduction*, Oxford University Press.

**All other course materials will be provided through iLearn and the e-Reserve.**

**The unit website is available through iLearn (<http://ilearn.mq.edu.au>). It contains essential resources for the unit, and you are expected to log in on a regular basis.**

## Unit Schedule

Week		Key Dates
1	Introduction: What has philosophy got to do with science?	NO TUTORIALS THIS WEEK

	<b>WHAT IS SCIENCE? CONCEPTIONS OF SCIENCE AND SCIENTIFIC PROGRESS</b>	
2	What is Science? Science Vs. Pseudoscience	
3	Naive Inductivism	<b>NO TUTORIALS THIS WEEK</b> Short writing task due (14/08)
4	Popper: Falsificationism	
5	Kuhn: Scientific Revolutions	
6	Case Study: Is "Intelligent Design" science?	
	<b>THE METHODS OF SCIENCE: HOW DOES SCIENCE TELL US ABOUT THE WORLD?</b>	
7	Why trust science? Scientific Realism and Anti-realism	
	Mid-Semester Break	
8	Are there really laws of nature?	
9	The Historical Sciences: Prediction, Retrodiction and the Deep Past	
10	Learning About the World Indirectly: Models and Modelling in Contemporary Science	Essay Planning Exercise in Tutorials (plans due 16/10)
	<b>SCIENCE &amp; VALUES: THE INFLUENCE OF SOCIETY ON SCIENCE</b>	
11	The Perpetuation of Convenient Myths: The Role of Sexuality in Scientific "Discovery"	
12	Science is Big Business: Is Science Autonomous?	
13	No lectures or tutorials: Essay planning Meetings	Weekly blog and reflection due (02/11)
		Research essay due (13/11)

## Policies and Procedures

Macquarie University policies and procedures are accessible from [Policy Central](#). Students should be aware of the following policies in particular with regard to Learning and Teaching:

Academic Honesty Policy [http://mq.edu.au/policy/docs/academic\\_honesty/policy.html](http://mq.edu.au/policy/docs/academic_honesty/policy.html)

Assessment Policy <http://mq.edu.au/policy/docs/assessment/policy.html>

Grading Policy <http://mq.edu.au/policy/docs/grading/policy.html>

Grade Appeal Policy <http://mq.edu.au/policy/docs/gradeappeal/policy.html>



Grievance Management Policy [http://mq.edu.au/policy/docs/grievance\\_management/policy.html](http://mq.edu.au/policy/docs/grievance_management/policy.html)

Disruption to Studies Policy [http://www.mq.edu.au/policy/docs/disruption\\_studies/policy.html](http://www.mq.edu.au/policy/docs/disruption_studies/policy.html) *The Disruption to Studies Policy is effective from March 3 2014 and replaces the Special Consideration Policy.*

In addition, a number of other policies can be found in the [Learning and Teaching Category](#) of Policy Central.

## Student Code of Conduct

Macquarie University students have a responsibility to be familiar with the Student Code of Conduct: [https://students.mq.edu.au/support/student\\_conduct/](https://students.mq.edu.au/support/student_conduct/)

## Results

Results shown in *iLearn*, or released directly by your Unit Convenor, are not confirmed as they are subject to final approval by the University. Once approved, final results will be sent to your student email address and will be made available in [eStudent](#). For more information visit [ask.mq.edu.au](http://ask.mq.edu.au).

## Student Support

Macquarie University provides a range of support services for students. For details, visit <http://students.mq.edu.au/support/>

## Learning Skills

Learning Skills ([mq.edu.au/learningskills](http://mq.edu.au/learningskills)) provides academic writing resources and study strategies to improve your marks and take control of your study.

- [Workshops](#)
- [StudyWise](#)
- [Academic Integrity Module for Students](#)
- [Ask a Learning Adviser](#)

Macquarie University provides a range of Student Support Services. Details of these services can be accessed at:

<http://www.deanofstudents.mq.edu.au/>

Or

<http://www.campuslife.mq.edu.au/campuswellbeing>

Another useful support service is provided by the Learning Skills unit which you can find at: <http://www.mq.edu.au/learningskills/>.

## Student Services and Support

Students with a disability are encouraged to contact the [Disability Service](#) who can provide

appropriate help with any issues that arise during their studies.

Extensions and special consideration

Requests for extensions must be submitted in writing to the convenor at least 3 days prior to the final submission date accompanied by supporting documentation. Note, other study commitments will not be considered as an acceptable reason for requesting an extension. Email requests should include the unit code in the subject heading.

Where no extension has been granted, up to 5% of the total mark for that assessment may be deducted for each day the assignment is late, including weekends and public holidays.

## Special Consideration Policy

[http://www.mq.edu.au/policy/docs/special\\_consideration/policy.html](http://www.mq.edu.au/policy/docs/special_consideration/policy.html)

## Applying for Special Consideration

Students applying for Special Consideration circumstances of three (3) consecutive days duration, within a study period, and/or prevent completion of a formal examination must submit an on-line application with the Faculty of Arts. For an application to be valid, it must include a completed Application for Special Consideration form and all supporting documentation.

The online Special Consideration application is found at: [http://www.arts.mq.edu.au/current\\_students/undergraduate/admin\\_central/special\\_consideration](http://www.arts.mq.edu.au/current_students/undergraduate/admin_central/special_consideration).

## Student Enquiries

For all student enquiries, visit Student Connect at [ask.mq.edu.au](http://ask.mq.edu.au)

## IT Help

For help with University computer systems and technology, visit <http://informatics.mq.edu.au/help/>.

When using the University's IT, you must adhere to the [Acceptable Use Policy](#). The policy applies to all who connect to the MQ network including students.

## Graduate Capabilities

### Creative and Innovative

Our graduates will also be capable of creative thinking and of creating knowledge. They will be imaginative and open to experience and capable of innovation at work and in the community. We want them to be engaged in applying their critical, creative thinking.

This graduate capability is supported by:

## Learning outcomes

- The ability to understand and critically evaluate the theories and arguments studied, identify their strengths and weaknesses, and develop an appreciation of the ways in which these positions have developed in response to identification of problems in other views
- An ability to express and expound the positions studied clearly and lucidly
- Students should start to develop their own philosophically informed views on the issues studied and defend their views, clearly and courteously in response to critical evaluation from others in discussion and in writing

## Assessment tasks

- Short persuasive writing task
- Research Essay Plan
- Research Essay
- Weekly blog and reflection
- Participation

## Capable of Professional and Personal Judgement and Initiative

We want our graduates to have emotional intelligence and sound interpersonal skills and to demonstrate discernment and common sense in their professional and personal judgement. They will exercise initiative as needed. They will be capable of risk assessment, and be able to handle ambiguity and complexity, enabling them to be adaptable in diverse and changing environments.

This graduate capability is supported by:

## Learning outcome

- An ability to express and expound the positions studied clearly and lucidly

## Assessment tasks

- Research Essay
- Participation

## Commitment to Continuous Learning

Our graduates will have enquiring minds and a literate curiosity which will lead them to pursue knowledge for its own sake. They will continue to pursue learning in their careers and as they participate in the world. They will be capable of reflecting on their experiences and relationships with others and the environment, learning from them, and growing - personally, professionally and socially.

This graduate capability is supported by:

## Learning outcome

- The ability to understand and critically evaluate the theories and arguments studied, identify their strengths and weaknesses, and develop an appreciation of the ways in which these positions have developed in response to identification of problems in other views

## Discipline Specific Knowledge and Skills

Our graduates will take with them the intellectual development, depth and breadth of knowledge, scholarly understanding, and specific subject content in their chosen fields to make them competent and confident in their subject or profession. They will be able to demonstrate, where relevant, professional technical competence and meet professional standards. They will be able to articulate the structure of knowledge of their discipline, be able to adapt discipline-specific knowledge to novel situations, and be able to contribute from their discipline to inter-disciplinary solutions to problems.

This graduate capability is supported by:

## Learning outcomes

- A working knowledge of some of the current major issues connecting philosophy and science
- The ability to understand and critically evaluate the theories and arguments studied, identify their strengths and weaknesses, and develop an appreciation of the ways in which these positions have developed in response to identification of problems in other views
- An ability to understand and critically evaluate theories and arguments in the philosophy of science.
- Students should start to develop their own philosophically informed views on the issues studied and defend their views, clearly and courteously in response to critical evaluation from others in discussion and in writing

## Assessment tasks

- Short persuasive writing task
- Research Essay Plan
- Research Essay
- Weekly blog and reflection
- Participation

## Critical, Analytical and Integrative Thinking

We want our graduates to be capable of reasoning, questioning and analysing, and to integrate and synthesise learning and knowledge from a range of sources and environments; to be able to critique constraints, assumptions and limitations; to be able to think independently and systemically in relation to scholarly activity, in the workplace, and in the world. We want them to have a level of scientific and information technology literacy.

This graduate capability is supported by:

### Learning outcomes

- A working knowledge of some of the current major issues connecting philosophy and science
- The ability to understand and critically evaluate the theories and arguments studied, identify their strengths and weaknesses, and develop an appreciation of the ways in which these positions have developed in response to identification of problems in other views
- An ability to understand and critically evaluate theories and arguments in the philosophy of science.
- An ability to express and expound the positions studied clearly and lucidly
- Students should start to develop their own philosophically informed views on the issues studied and defend their views, clearly and courteously in response to critical evaluation from others in discussion and in writing

### Assessment tasks

- Short persuasive writing task
- Research Essay Plan
- Research Essay
- Weekly blog and reflection
- Participation

## Problem Solving and Research Capability

Our graduates should be capable of researching; of analysing, and interpreting and assessing data and information in various forms; of drawing connections across fields of knowledge; and they should be able to relate their knowledge to complex situations at work or in the world, in order to diagnose and solve problems. We want them to have the confidence to take the initiative in doing so, within an awareness of their own limitations.

This graduate capability is supported by:

## Learning outcomes

- A working knowledge of some of the current major issues connecting philosophy and science
- The ability to understand and critically evaluate the theories and arguments studied, identify their strengths and weaknesses, and develop an appreciation of the ways in which these positions have developed in response to identification of problems in other views
- An ability to understand and critically evaluate theories and arguments in the philosophy of science.
- An ability to express and expound the positions studied clearly and lucidly
- Students should start to develop their own philosophically informed views on the issues studied and defend their views, clearly and courteously in response to critical evaluation from others in discussion and in writing

## Assessment tasks

- Research Essay Plan
- Research Essay
- Weekly blog and reflection

## Effective Communication

We want to develop in our students the ability to communicate and convey their views in forms effective with different audiences. We want our graduates to take with them the capability to read, listen, question, gather and evaluate information resources in a variety of formats, assess, write clearly, speak effectively, and to use visual communication and communication technologies as appropriate.

This graduate capability is supported by:

## Learning outcomes

- A working knowledge of some of the current major issues connecting philosophy and science
- The ability to understand and critically evaluate the theories and arguments studied, identify their strengths and weaknesses, and develop an appreciation of the ways in which these positions have developed in response to identification of problems in other views
- An ability to understand and critically evaluate theories and arguments in the philosophy of science.
- An ability to express and expound the positions studied clearly and lucidly

- Students should start to develop their own philosophically informed views on the issues studied and defend their views, clearly and courteously in response to critical evaluation from others in discussion and in writing

### Assessment tasks

- Short persuasive writing task
- Research Essay Plan
- Research Essay
- Weekly blog and reflection
- Participation

## Engaged and Ethical Local and Global citizens

As local citizens our graduates will be aware of indigenous perspectives and of the nation's historical context. They will be engaged with the challenges of contemporary society and with knowledge and ideas. We want our graduates to have respect for diversity, to be open-minded, sensitive to others and inclusive, and to be open to other cultures and perspectives: they should have a level of cultural literacy. Our graduates should be aware of disadvantage and social justice, and be willing to participate to help create a wiser and better society.

This graduate capability is supported by:

### Learning outcome

- Students should start to develop their own philosophically informed views on the issues studied and defend their views, clearly and courteously in response to critical evaluation from others in discussion and in writing

### Assessment tasks

- Research Essay
- Participation

## Socially and Environmentally Active and Responsible

We want our graduates to be aware of and have respect for self and others; to be able to work with others as a leader and a team player; to have a sense of connectedness with others and country; and to have a sense of mutual obligation. Our graduates should be informed and active participants in moving society towards sustainability.

This graduate capability is supported by:

### Learning outcome

- An ability to understand and critically evaluate theories and arguments in the philosophy of science.

## Assessment task

- Participation