Course Overview

PHIL3070 - Scientific Knowledge & Scientific Method

Course Outline

Semester          Semester 2 - 2009
Unit Weighting    10
Teaching Methods  Lecture

Brief Course Description
Introduces the nature of scientific method and the grounds of scientific knowledge as expressions of scientific rationality for both science and humanities students.

Contact Hours
Lecture for 2 Hours per Week for the Full Term

Learning Materials/Texts

Course Objectives
(1) to give students a knowledge of the nature and basic principles of rational scientific method and knowledge claims.

(2) to impart to students the skills required for them to be able to engage in critical assessment of scientific
practice and in evaluation of scientific knowledge.

(3) to enable students to effectively communicate their understanding and to interact effectively so as to problem solve with diverse communal groups.

(4) to provide students a critical appreciation of the larger framework of Western science as it has developed in relation to society and within which current science practice operates.

Course Content
The course covers the nature of rationally valid argument and its application to scientific method as prediction/explanation, its inadequacy for theory construction and the consequent problems of rational methodology, including induction and statistical inference. It then places these issues in the larger debate about the nature of observation, the multiple aims of science, and economic and socio-cultural influence on theoretical ideas and procedures, and the various proposals made in the light of these concerning the nature of scientific knowledge and objectivity claims.

Assessment Items
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<tr>
<th>Essays / Written Assignments</th>
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<td>Assessment for PHIL3070 will be by written work which will be individually structured to suit the subject matter. It will normally be by 2 essays, one of 2000 words, 40%, the other of 3000 words, 60%, but this may be varied to include more frequent, smaller case studies, summaries and the like earlier on, to equivalent value, as the subject matter requires. These essays will require the student to explain the central concepts, principles and arguments of the material studied, guided by the assigned readings and seminar discussions, the latter providing continual assessment and feedback on individual student ability to properly engage the subject matter.</td>
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Assumed Knowledge
At least 10 credit points of PHIL course at 1000 level or 40 units of any other courses at any level.

Callaghan Campus Timetable
PHIL3070
SCI KNOWLEDGE & SCI METHOD
Enquiries: School of Humanities and Social Science
Semester 2 - 2009
Lecture Thursday 15:00 - 17:00 [V10]

IMPORTANT UNIVERSITY INFORMATION

ACADEMIC INTEGRITY

Academic integrity, honesty, and a respect for knowledge, truth and ethical practices are fundamental to the business of the University. These principles are at the core of all academic endeavour in teaching, learning and research. Dishonest practices contravene academic values, compromise the integrity of research and devalue the quality of learning. To preserve the quality of learning for the individual and others, the University may impose severe sanctions on activities that undermine academic integrity. There are two major categories of academic dishonesty:

Academic fraud is a form of academic dishonesty that involves making a false representation to gain an unjust advantage. Without limiting the generality of this definition, it can include:

a) falsification of data;

b) using a substitute person to undertake, in full or part, an examination or other assessment item;

c) reusing one's own work, or part thereof, that has been submitted previously and counted towards another course (without permission);

d) making contact or colluding with another person, contrary to instructions, during an examination or other assessment item;
e) bringing material or device(s) into an examination or other assessment item other than such as may be specified for that assessment item; and

f) making use of computer software or other material and device(s) during an examination or other assessment item other than such as may be specified for that assessment item.

g) contract cheating or having another writer compete for tender to produce an essay or assignment and then submitting the work as one's own.

**Plagiarism** is the presentation of the thoughts or works of another as one's own. University policy prohibits students plagiarising any material under any circumstances. Without limiting the generality of this definition, it may include:

a) copying or paraphrasing material from any source without due acknowledgment;

b) using another person's ideas without due acknowledgment;

c) collusion or working with others without permission, and presenting the resulting work as though it were completed independently.

**Turnitin** is an electronic text matching system. During assessing any assessment item the University may -

- Reproduce this assessment item and provide a copy to another member of the University; and/or

- Communicate a copy of this assessment item to a text matching service (which may then retain a copy of the item on its database for the purpose of future checking).

- Submit the assessment item to other forms of plagiarism checking

**RE-MARKS AND MODERATIONS**

Students can access the University's policy at: [http://www.newcastle.edu.au/policylibrary/000769.html](http://www.newcastle.edu.au/policylibrary/000769.html)

**MARKS AND GRADES RELEASED DURING TERM**

All marks and grades released during term are indicative only until formally approved by the Head of School.

**SPECIAL CIRCUMSTANCES AFFECTING ASSESSMENT ITEMS**

*Extension of Time for Assessment Items, Deferred Assessment and Special Consideration for Assessment Items or Formal Written Examinations* items must be submitted by the due date in the Course Outline unless the Course Coordinator approves an extension. Unapproved late submissions will be penalised in line with the University policy.

Requests for **Extensions of Time** must be lodged no later than the due date of the item. This applies to students:

- applying for an extension of time for submission of an assessment item on the basis of medical, compassionate, hardship/trauma or unavoidable commitment; or

- whose attendance at or performance in an assessment item or formal written examination has been or will be affected by medical, compassionate, hardship/trauma or unavoidable commitment.

Students must report the circumstances, with supporting documentation, as outlined in the Special Circumstances Affecting Assessment Items Procedure at: [http://www.newcastle.edu.au/policylibrary/000641.html](http://www.newcastle.edu.au/policylibrary/000641.html)

**Note:** different procedures apply for minor and major assessment tasks.

**Students should be aware of the following important deadlines:**

- Special Consideration Requests must be lodged no later than 3 working days after the due date of submission or examination.

- Rescheduling Exam requests must be received no later than 10 working days prior the first date of
the examination period.

*Late applications may not be accepted.* Students who cannot meet the above deadlines due to extenuating circumstances should speak firstly to their Program Officer or their Program Executive if studying in Singapore.

**STUDENTS WITH A DISABILITY OR CHRONIC ILLNESS**

University is committed to providing a range of support services for students with a disability or chronic illness. If you have a disability or chronic illness which you feel may impact on your studies please feel free to discuss your support needs with your lecturer or course coordinator.

Disability Support may also be provided by the Student Support Service (Disability). Students must be registered to receive this type of support. To register contact the Disability Liaison Officer on 02 4921 5766, email at: student-disability@newcastle.edu.au. As some forms of support can take a few weeks to implement it is extremely important that you discuss your needs with your lecturer, course coordinator or Student Support Service staff at the beginning of each semester. For more information on confidentiality and documentation visit the Student Support Service (Disability) website: www.newcastle.edu.au/services/disability.

**CHANGING YOUR ENROLMENT**

Students enrolled after the census dates listed in the link below are liable for the full cost of their student contribution or fees for that term.

http://www.newcastle.edu.au/study/fees/censusdates.html

Students may withdraw from a course without academic penalty on or before the last day of term. Any withdrawal from a course after the last day of term will result in a fail grade.

**Students cannot enrol in a new course after the second week of term,** except under exceptional circumstances. Any application to add a course after the second week of term must be on the appropriate form, and should be discussed with staff in the Student Hubs or with your Program Executive at PSB if you are a Singapore student.

To check or change your enrolment online go to myHub: https://myhub.newcastle.edu.au

**STUDENT INFORMATION & CONTACTS**

Various services are offered by the Student Support Unit: www.newcastle.edu.au/service/studentsupport/

The Student Hubs are a one-stop shop for the delivery of student related services and are the first point of contact for students studying in Australia. Student Hubs are located at:

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<tr>
<th>Callaghan Campus</th>
<th>Port Macquarie students</th>
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<tr>
<td>Shortland Hub: Level 3, Shortland Building</td>
<td>contact your program officer or <a href="mailto:EnquiryCentre@newcastle.edu.au">EnquiryCentre@newcastle.edu.au</a></td>
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<tr>
<td>Hunter Hub: Level 2, Student Services Centre</td>
<td>Phone 4921 5000</td>
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<td>City Precinct</td>
<td>Singapore students</td>
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<tr>
<td>City Hub &amp; Information Common, University House</td>
<td>contact your PSB Program Executive</td>
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<tr>
<td>Central Coast Campus (Ourimbah)</td>
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<td>Student Hub: Opposite the Main Cafeteria</td>
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**OTHER CONTACT INFORMATION**

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<tr>
<th>Faculty Websites</th>
<th>General enquiries</th>
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<tr>
<td><a href="http://www.newcastle.edu.au/faculty/business-law/">www.newcastle.edu.au/faculty/business-law/</a></td>
<td>Callaghan, City and Port Macquarie</td>
</tr>
<tr>
<td><a href="http://www.newcastle.edu.au/faculty/education-arts/">www.newcastle.edu.au/faculty/education-arts/</a></td>
<td>Phone: 02 4921 5000</td>
</tr>
<tr>
<td><a href="http://www.newcastle.edu.au/faculty/engineering/">www.newcastle.edu.au/faculty/engineering/</a></td>
<td>Email: <a href="mailto:EnquiryCentre@newcastle.edu.au">EnquiryCentre@newcastle.edu.au</a></td>
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</tbody>
</table>
This course outline will not be altered after the second week of the term except under extenuating circumstances with Head of School approval. Students will be notified in advance of the change.

**Studentmail and Blackboard:** Refer - [www.blackboard.newcastle.edu.au/](http://www.blackboard.newcastle.edu.au/)

This course uses Blackboard and studentmail to contact students, so you are advised to keep your email accounts within the quota to ensure you receive essential messages. To receive an expedited response to queries, post questions on the Blackboard discussion forum if there is one, or if emailing staff directly use the course code in the subject line of your email. Students are advised to check their studentmail and the course Blackboard site on a weekly basis.

**Important Additional Information**

Details about the following topics are available on your course Blackboard site (where relevant). Refer - [www.blackboard.newcastle.edu.au/](http://www.blackboard.newcastle.edu.au/)

- Written Assignment Presentation and Submission Details
- Special Circumstances
- Re-marks & Moderations
- Return of Assignments
- Preferred Referencing Style
- Student Communication
- Essential Online Information for Students

**SCHEDULE OF LECTURES**

**WEEK ONE:**
- What is philosophy of science?
- Why study philosophy of science?
- Methodology
  - *Inductivism*
  - *The inductive-empiricist view of science.*
- Hume’s Argument against induction.

**WEEK TWO:**
- Hume’s Argument Against induction - continued.
- Attempts to reply to Hume.
  *Reichenbach, uniformity of nature, inductive justification of induction, Clendinnen, BonJour and others. The appeal to probability.

WEEK THREE:
- Further analysis of attempts to reply to Hume.
  *The linguistic justification of induction, Strawson, Moore and others.
  Inductive scepticism and its consequences. Russell.

WEEK FOUR:
- More problems for inductivism.
  *The priority of theory to observation.

WEEK FIVE:
- The Philosophy of Science of Karl Popper.
  *The concept of falsifiability.
  *Popper’s conception of science as falsifiable conjectures.

WEEK SIX:
- Popper’s Philosophy of Science - continued.
  *Degrees of falsifiability
  *Falsifiability and content.
  *Popper’s argument for claim that Probability of laws is zero.

WEEK SEVEN:
- Truth, Verisimilitude and Corroboration.

WEEK EIGHT:
- The concept of falsifiability
  *Problems with falsifiability
  *Holism
  *Popper on the asymmetry of verification and falsification.

WEEK NINE:
- The Popper/Kuhn Controversy
  *Kuhn’s criticisms of Popper. Popper’s replies.
  *The relation between the History of Science and the Philosophy of Science.

WEEK TEN:
- T. S Kuhn’s Philosophy of Science.
  *Normal science and revolutionary science. Scientific revolutions.
  *Paradigms
  *Theory comparison. Kuhn on “incommensurability”.

School of Humanities and Social Science
• Criticisms of Kuhn.

WEEK ELEVEN:
• Imre Lakatos’s View of Science.
  *Lakatos on the History of Science versus the Philosophy of Science.
  *The methodology of scientific research programmes.
  *The hard core and the auxiliary belt.
  *Progressive and degenerating problem shifts.
  *Lakatos on Newton’s theory of the solar system.

  Paul Feyerabend’s scepticism about methodology
  *Feyerabend’s sceptical arguments.
  *Feyerabend’s “anarchism”.

WEEK TWELVE:
• Scientific Realism.
  *Realism versus Instrumentalism
  *Maxwell on Realism
  *The concept of novel predictive success
  *Fine on Realism
  *Structural Realism
  *Recent developments