

PH3080
SCIENTIFIC METHODOLOGY
COURSE LEAFLET 2009-2010

Credits: 15

Please note carefully:

The full set of school regulations and procedures is contained in the Undergraduate Student Handbook which is available online at <http://www.abdn.ac.uk/sdhp/ugradstudenthandbook/>. Students are expected to familiarise themselves not only with the contents of this leaflet but also with the contents of the Handbook. Therefore, ignorance of the contents of the Handbook will not excuse the breach of any school regulation or procedure. You must familiarise yourself with this important information at the earliest opportunity.

COURSE CO-ORDINATOR

Dr. Luca Moretti, Old Brewery G07, Tel: 272385, email: l.moretti@abdn.ac.uk
Office hours: Monday 13-15

COURSE DESCRIPTION

This unit aims at uncovering what is constitutive of scientific rationality. The course is divided into two parts. In the first part, some of the most important conceptions of scientific methodology, including Baconian inductivism, Popper's falsificationism, Lakatos' methodology of research programs, and Feyerabend's anarchism, will be analysed. We will test these views on the historical case of the Copernican revolution. The second part focuses on the problem of constructing a *formalized* system of inductive logic. In particular, we will analyse Hempel's conception of confirmation, formulations of Hypothetico-Deductivism and modern Bayesianism. Specific and "technical" topics, including the classical problem of induction, the Duhem-Quine thesis and paradoxes of confirmation will also be surveyed.

TIMETABLE

Lectures: 1 hour per week commencing in Week 1. Tuesdays 11am to 12pm. In Weeks 1-6, lectures will take place in KCG5 (King's). In Weeks 7-8, lectures will take place in KCG10 (King's). In Weeks 9-12, lectures will take place in A36 (Taylor).

Tutorials: 1 hour per fortnight commencing in Week 2. Thursdays from 10am to 11am in S86 (Edward Wright) OR Thursdays from 2pm to 3pm in A30 (Taylor).

SCHEDULE

School of Divinity, History and Philosophy
School Office: KCG11c, Email: philosophy@abdn.ac.uk, Tel: 272366

The following is a *provisional* schedule of topics and essential readings for the course, from which we might want to deviate as the course progresses. Further or different readings for each topic may be indicated before the relevant lecture.

Week Topic

Part I: *Scientific methodology*

Week 1 Lecture: scientific rationality and basic notions

Week 2 Lecture: a case study - Copernican revolution I

Week 3 Lecture: a case study - Copernican revolution II

Week 4 Lecture: Baconian inductivism

Week 5 Lecture: Popper's falsificationism I

Week 6 Lecture: Popper's falsificationism II

Week 7 Lecture: Lakatos' methodology

Week 8 Lecture: Lakatos' methodology and Feyerabend's criticism

Part II: *Inductive logic and confirmation theory*

Week 9 Lecture: the classic problem of induction

Week 10 Lecture: Hempel on the logic of confirmation

Week 11 Lecture: Hypothetico-Deductivism

Week 12 Lecture: Bayesianism

READING LIST (essential)

'*' = in the *Heavy Demand* section of QML + some photocopies will be available at my office door.

Week 1

*J. Ladyman, *Understanding philosophy of science* (Routledge, 2002), pp. 1-18.

*B. Skyrms, *Choice and Chance* (Dickenson Pub. Co., 1966), Ch. 1.

Week 2

*T. Kuhn, *The Copernican revolution* (Harvard Univ. press, 1985), Chs. 1 and 2.

Week 3

*T. Kuhn, *The Copernican revolution*, Chs. 5 and 6.

Week 4

*J. Ladyman, *Understanding philosophy of science*, pp. 18-31 and 52-61.
"Francis Bacon" in the Stanford Encyclopedia of Philosophy
(URL: <http://plato.stanford.edu/entries/francis-bacon/>).

Week 5

*K. Popper, "Science: conjectures and refutations" in M. Curd and J. A. Cover (eds.), *Philosophy of science: the central issues* (W.W. Norton & Co, 1998), pp. 3-10.
*J. Ladyman, *Understanding philosophy of science*, pp. 62-81.

Week 6

*J. Ladyman, *Understanding philosophy of science*, pp. 81-92.
*I. Lakatos, "The methodology of scientific research programmes" in I. Lakatos, *Philosophical Papers* Vol. 1. (Cambridge Univ. Press, 1978), pp. 8-31 (up to Sect 2(c) excluded).
Lakatos' paper is included also in *I. Lakatos and A. Musgrave (eds.), *Criticism and Growth of Knowledge* (Cambridge, Univ. Press, 1970).

Week 7

*I. Lakatos, "The methodology of scientific research programmes" in his *Philosophical Papers*, Vol 1, pp. 31-52 (i.e. from Sect 2(c) to Sect 3(b) all included), pp. 68-73 (i.e. Sect 3(d)), and pp. 86-90 (i.e. Sect 3(d.4)).

Week 8

*I. Lakatos, "Why did Copernicus research programme supersede Ptolemy's?" in his *Philosophical Papers*, Vol. 1, pp. 168-189.
*P. Feyerabend, *Against Method* (Verso, 2003), Chs. 8-10.
*P. Feyerabend, "Consolations for the specialist" in his *Philosophical Papers* Vol. 2 (Cambridge Univ. Press, 1981), Sect. 9.

Week 9

*J. Ladyman, *Understanding philosophy of science*, pp. 32-1.
*M. H. Salmon (et al.), *Introduction to philosophy of science*, (Hackett, 1999), pp. 55-66.

Week 10

*M. H. Salmon (et al.), *Introduction to philosophy of science*, pp. 42-44 and 49-52.
*C. Hempel, "Studies in the Logic of Confirmation", in his *Aspects of Scientific Explanation: and Other Essays in the Philosophy of Science* (Free Press, 1965), pp. 3-39.

Week 11

*M. H. Salmon (et al.), *Introduction to philosophy of science*, pp. 44-49.
T. Grimes. "Truth, Content, and the Hypothetico-Deductive Method", *Philosophy of Science* 57 (1990), pp. 514-22. (Download it from [jstor](http://www.jstor.org))

Week 12

*"Commentary: Bayes for beginners", in M. Curd and J. A. Cover (eds.), *Philosophy of science: the central issues*, pp. 627-638.
*M. H. Salmon (et al.), *Introduction to philosophy of science*, pp. 66-99.

ESSAY

Due Date: Friday, 11 December 2009

2500-3000 words (2 copies). Essays should be in 12 point font with line spacing of at least 1½.

You are encouraged to choose your own topics. Please consult with the course-co-ordinator.

One paper copy of your essay, with signed coversheet, should be submitted to KCG11c by the due date. The other must be submitted by Turnitin (see appendix). Essays will not be accepted until you have submitted both copies.

Turnitin ID: 133854

Turnitin password (**case-sensitive**): PH3080

ASSESSMENT

50% examination (2 hours), 50% essay.

PLAGIARISM

'Plagiarism is the use, without adequate acknowledgement, of the intellectual work of another person in work submitted for assessment. A student cannot be found to have committed plagiarism where it can be shown that the student has taken all reasonable care to avoid representing the work of others as his/her own.'

Plagiarism is a serious offence everywhere, both within and outwith the academic community. All cases of suspected plagiarism will be reported to the Head of School in the first instance and cannot be discussed with or determined by a Tutor or Course Co-ordinator.

Please note that students **MUST** refer to the School's Undergraduate Student Handbook for more detailed information on what constitutes plagiarism, how to avoid it, and what the University's procedure is should plagiarism be suspected.

AIMS

1. To introduce students to scientific methodology and inductive reasoning.
2. To give students insight into the central problems of scientific rationality and methodology.
3. To test methodological views on concrete scientific cases.
4. To explore connections between scientific methodology and other disciplines such as epistemology and formal epistemology.

OBJECTIVES

By the end of the course, students will be able to:

1. demonstrate, in spoken and written form, a detailed knowledge of the nature and content of key elements in contemporary discussions of philosophy of science, scientific methodology and inductive logic.

2. present and critically discuss/assess key problems and arguments in these fields.
3. demonstrate, in spoken and written form, an enhanced understanding of key issues in the philosophy of science (esp. methodology) and formal methods in philosophy.
4. demonstrate, in spoken and written form, improved abilities in philosophical analysis and enhanced capacity to make up their own minds about key problems in all these fields.

Appendix - TurnitinUK

Information for Students

What is Turnitin® UK (A JISC Service)?

The service helps academic staff address a number of common but difficult to identify issues related to citation and collaboration in coursework assessments. It enables tutors to identify the original source of material included within student work by searching a database of several billion pages of reference material gathered from professional publications, student essay websites and other student works. It is used by academics as a tool to help them provide better information and feedback to students about the work they have submitted. The tool does not make decisions about the intention of unoriginal work, nor does it determine if unoriginal content is incorrectly cited or indeed plagiarised. It simply highlights sections of text that have been found in other sources to help academic staff members make these decisions. In many cases this will lead the academic member of staff to provide feedback to students on how to improve their coursework submissions and citations. All assessment decisions will continue to be made by the course tutor who will review the entire work.

What is the benefit of using the service?

Your institution wishes to encourage students to behave with honesty and integrity at all times. The correct citation of work and the authenticity of submitted work is a cornerstone, not just of our education system, but of the trust and value held in each of our education institutions by employers and the public at large. The use of this service along with other methods of maintaining the integrity of the academic process will help your institution maintain academic standards and assessment fairness.

How will my data be used?

In order for this service to work you will be required to submit your assignments to the service where they will be stored together with your name, email address, course details and institution. You may also opt to enter your address and phone number but this is *not* compulsory. Once your material has been uploaded it will be stored electronically in a database and compared against work submitted from this or any other department(s) within this institution or from other UK institutions using the service.

Your tutor will receive an Originality Report from the service. In most cases this feedback will be used by the tutor to instruct you about the process of citation and the importance of maintaining academic standards. In some cases, dependent on extent, level and context, the institution *may* decide to undertake further investigation which could ultimately lead to disciplinary actions, should instances of plagiarism be detected. Such decisions are entirely at the discretion of your institution and in no way involve HEFCE (the Higher Education Funding Council for England) nor the service. In this circumstance it is possible that your personal data may need to be disclosed to academic staff within the other institution(s) from where matching content has been submitted.

HEFCE has overall responsibility for the processing of personal data carried out by Turnitin® UK (A JISC Service). HEFCE and each institution signing up to use the service will together act as Joint Data Controllers for the personal data submitted with students' work.

In order for your institution to make use of the service it will be necessary for personal data relating to you to be transferred to countries not governed by EU Data Protection legislation. However, it should be noted that *iParadigms*, the company processing your data are bound by terms of contract to at all times abide by the Data Protection Act 1998.

How long will the service keep my work?

The service will seek to retain content submitted to it and associated personal data until the termination of this service or its successor, thus helping to accumulate as large a corpus of knowledge as possible against which to compare submitted content.

Who owns the copyright to the work I have submitted?

HEFCE has no interest in acquiring the intellectual property rights for the content submitted by you. The copyright for such content will continue to reside with either yourself or your institution; whichever is currently the case.

The service will help to protect your work from future plagiarism and thereby help maintain the integrity of any qualification you receive.

What are my rights under the Data Protection Act?

As the data subject you do have the right to see what personal information is held about you in relation to this or any other service that stores your personal information and have limited rights to object to your data being used. Please refer to the Plagiarism Advisory Service web site (www.jiscpas.ac.uk) for further information regarding these rights.

If your personal data has been integrated into the service via your institution's student information system your request may require the institution to withdraw your personal information from student information system as well. Your institution will be able to inform you of the implications of exercising this right under these conditions.

Please note: your tutor can submit your work to the service without the use of personal data should you decide to exercise this right. The right to objection relates to the storage of your personal data and does not extend as a right to object to your tutor making use of technology aimed at improving academic standards when assessing your work

Student Instructions for TurnitinUK

TurnitinUK is an online service which compares student assignments with online sources including web pages, databases of reference material, and content previously submitted by other users across the UK.

*The software makes no decision as to whether plagiarism has occurred; it is simply a tool which highlights sections of text that have been found in other sources. The assignment which has been submitted to TurnitinUK and an **Originality Report**¹ (the report which identifies the text matches found) are displayed for the member of staff to view. The member of staff can see whether resources have been appropriately referenced and hence whether plagiarism has occurred. You will be able to view your own Originality Report **only** if the member of staff enables this.*

The following instructions will enable you to register to use Turnitin, enrol in a class and to submit an assignment. A comprehensive Student User Guide can be found at https://submit.ac.uk/usage_jisc/tiuk_student_guide.pdf.

If you are a new user please begin at Step 1. If you have already used TurnitinUK, please go straight to Step 2.

¹ For further information about the Originality Report see Section 2 of the Student User Guide https://submit.ac.uk/usage_jisc/tiuk_student_guide.pdf.

Step 1: Create a User Profile

First, set up a unique user profile which consists of an email address, user password, personal user information and user preferences. *You will need a class id and enrolment password to enable you to create a user profile. If you do not have this information, please contact your tutor.*

- Go to http://submit.ac.uk/newuser_type.asp (Note: underscore _ between 'newuser' and 'type')
- Follow the on-screen instructions to create your user profile. Use your University email address and choose your own password (Note: choose one you will remember)
- Click **end wizard and login**. This takes you to Step 4 on this sheet. The next time you log in to TurnitinUK start from Step 2.

Step 2: Login to TurnitinUK (once you have created a User Profile)

- Go to www.submit.ac.uk - click on **user login**
- At the login page enter email address (*your University of Aberdeen one as before*) and user password (*which you chose yourself at Step 1*)
- Click **login** to open your TurnitinUK homepage

Step 3: Enrol in a Class

Note: You will have enrolled in one class when you created your User Profile. When you need to enrol in another, follow these instructions:

- Starting from your TurnitinUK homepage, click **enrol in a class**
- Enter the **class id number** which you will be given by the relevant tutor
- Enter **enrolment password** – which again you will be given by the relevant tutor
- Click **submit** to enrol in a class and add it to your homepage

Step 4: Submit Coursework

- Click on the **class name** on your homepage
- Click the **submit button** next to assignment name in your class
- Select **file upload** from the pull-down menu entitled 'Submit a paper by' (at the top of the submission box)
- Enter the **submission title** (title of assignment)
- Click the **browse** button and locate the file for submission
- Click **submit** (top right-hand corner)
- Click **yes, submit** (Note: *you can only submit a piece of work once unless you are submitting a Revision Assignment – see below*)
- You will receive a **digital receipt** which will also be emailed to you

Revision Assignments

*Your Tutor or Course Co-ordinator may have made the **Revision Assignment** facility available to you. If this is the case you will be allowed to submit a draft copy of your paper and have the opportunity to see your Originality Report and revise your work before submitting it for assessment. Your Course Co-ordinator or tutor has access to all Revision Assignments and can see how these have been changed or "fine-tuned" before submission. You need to submit your final paper to the main*

assignment when you are satisfied with your work - it is not automatically forwarded from the Revision Assignment to the actual assignment.

Submitting a revision assignment

- *See Step 4: Submit Coursework*

If you have any problems using TurnitinUK that your tutor can't help with please contact philosophy@abdn.ac.uk