Course Guide

Course Code: Phil 10052/11045

Philosophy of Mathematics
(Honours/MSc)
2017/2018

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1. Course Aims and Objectives

This course is a survey of philosophy of mathematics. Our guiding question throughout the course is, “Why trust mathematics?” We accordingly concentrate on issues related to the epistemology of mathematics. Our aim will be to develop a good acquaintance with a variety of issues of philosophical interest that have arisen over the past 150 years. Each week we take up a different topic: numbers, sets, axioms, proofs, mathematical intuition, etc.

There are two objectives which will be primarily assessed through two essays on topics of the course. By the end of the course, students should aim to possess a well-rounded understanding of a variety of central issues in philosophy of mathematics. Students should also aim to improve their critical skills through in-depth textual analysis and written argumentation.

2. Intended Learning Outcomes

By the end of this course, you will get a well-rounded view of some key topics in contemporary philosophy of mathematics. You will be able to see and make connections among different areas of mathematical inquiry, and reflect critically on the strengths and weaknesses of each approach.

3. Seminar Times and Locations

Fri 14:10 – 16:00, David Hume Tower LG.06

***Note that we will have to reschedule or cancel the third meeting. We will discuss this during the first meeting.

4. Lecture Content

Week 1: Philosophy of Mathematics

Essential Readings:

Useful References:

Week 2: Numbers

Essential Readings:
Useful References:

**Week 3: Sets**
Essential Readings:

Useful References:

**Week 4: Axioms**
Essential Readings:

Useful References:

**Week 5: Incompleteness**
Essential Readings:

Useful References:

**Week 6: Truth and Proof**
Essential Readings:

Useful References:

**Week 7: Applied Mathematics**
Essential Readings:

Useful References:
Week 8: Growth of Mathematical Knowledge
Essential Readings:

Useful References:

Week 9: Sociology of Mathematics
Essential Readings:

Useful References:

Week 10: Geometry and Intuition
Essential Readings:

Useful References:

Week 11: Cognitive Science of Mathematics
Essential Readings:

Useful References:
5. PPLS Undergraduate Student Handbook
The PPLS Undergraduate Student Handbook has more information on Student Support and academic guidance; late coursework and plagiarism; illness and disability adjustments, and useful sources of advice.

The Handbook can be found here:


5. Readings

Complete bibliographical references for primary readings. All readings will be made available online.

6. Assessment Information

Undergraduate students will be assessed by:

- a mid-term essay of 1,500 words (worth 40%)
  due on Thursday 26th October, 2017, by noon;
- an end-of-term essay of 2,000 words (worth 60%)
  due on Thursday 14th December, 2017, by noon.

Masters students will be assessed by an essay of 2,500 words (worth 100%) and due at the end of term (19th December, 2017, noon), on a topic of their own choosing to be agreed upon with the course organizer.

Weekly participation and coursework

Every student should come to class each week having carefully read the assigned texts and written down (a) 1-2 sentences of what they take to be the one or two main claims of the text, and (b) no more than 500 words explaining a possible objection to the argument for that/those claims. Both (a) and (b) are due at the beginning of class. The course organiser will indicate week by week which reading is assigned for seminar discussion for the following week.

Word Count Penalties

Essays must not exceed the word limit, which includes footnotes but excludes bibliography. The precise word count must be written on the coversheet. Overlong essays will be penalised according to the following rule: 5% will be deducted for every 100 words, or part thereof, over the word limit. So, 1-100 words over lose 5%; 101-200 words over lose 10%; 201-300 words over lose 15%; and so on.

Penalties for Late Submission of Essays

Unless an extension has been granted, essays must be submitted by the dates shown in the table of Submission Dates below. Essays submitted late without an extension may not be marked, but, if marked, will incur a penalty (in accordance with section 3.8 of the University Undergraduate Assessment Regulations at: http://www.docs.sasg.ed.ac.uk/AcademicServices/Regulations/UG_AssessmentRegulations.PDF

For each working day that the work is late there will be a reduction of the mark by 5% of the maximum obtainable mark (e.g. a mark of 65% on the common marking scale would be reduced to 60% up to 24 hours later). This penalty applies for up to five working days, after which a mark of zero will be given.

Please note - Regulation 14 Assessment deadlines: Student responsibilities

It is a student’s responsibility to ascertain and meet his or her assessment deadlines, including examination times and locations.

8. Learn

This year the majority of courses will use electronic submissions for Honours coursework. For essay submission instructions please see the instructions on LEARN.
Please note you should not include your name or matriculation number on coursework, only your exam number.

9. Useful Information

10. Common Marking Scheme

http://www.ed.ac.uk/schools-departments/registry/exams/regulations/common-marking-scheme

<table>
<thead>
<tr>
<th>Grade</th>
<th>Mark Range</th>
<th>Grade Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>A1</td>
<td>90-100</td>
<td>Excellent&lt;br&gt;Outstanding in every respect, the work is well beyond the level expected of a competent student at their level of study.</td>
</tr>
<tr>
<td>A2</td>
<td>80-89</td>
<td>Excellent&lt;br&gt;Outstanding in some respects, the work is often beyond what is expected of a competent student at their level of study.</td>
</tr>
<tr>
<td>A3</td>
<td>70-79</td>
<td>Excellent&lt;br&gt;Very good or excellent in most respects, the work is what might be expected of a very competent student.</td>
</tr>
<tr>
<td>B</td>
<td>60-69</td>
<td>Very Good&lt;br&gt;Good or very good in most respects, the work displays thorough mastery of the relevant learning outcomes.</td>
</tr>
<tr>
<td>C</td>
<td>50-59</td>
<td>Good&lt;br&gt;The work clearly meets requirements for demonstrating the relevant learning outcomes.</td>
</tr>
<tr>
<td>D</td>
<td>40-49</td>
<td>Pass&lt;br&gt;The work meets minimum requirements for demonstrating the relevant learning outcomes.</td>
</tr>
<tr>
<td>E</td>
<td>30-39</td>
<td>Marginal fail&lt;br&gt;The work fails to meet minimum requirements for demonstrating the relevant learning outcomes.</td>
</tr>
<tr>
<td>F</td>
<td>20-29</td>
<td>Clear fail&lt;br&gt;The work is very weak or shows a decided lack of effort.</td>
</tr>
<tr>
<td>G</td>
<td>10-19</td>
<td>Bad fail&lt;br&gt;The work is extremely weak.</td>
</tr>
<tr>
<td>H</td>
<td>0-9</td>
<td>Bad fail&lt;br&gt;The work is of very little consequence, if any, to the area in question.</td>
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Grade-related Marking Guidelines

Explaining the function of these guidelines:
These are only guidelines; marking still requires discretion and judgment.

The guidelines are “bottom up” — each band presupposes that the student has at least satisfied the criteria laid down under the lower bands. So to get a first, it is assumed that you at least satisfy all the criteria for a 2-1, etc.

Each set of guidelines should be understood not as providing necessary and sufficient conditions for a mark in the band specified. Rather, the guidelines under each band provide a kind of “cluster” which defines a paradigm of a piece of work falling within the band in question. A piece of work might deviate from the paradigm in certain respects but still fall within the band. It might help to explain the idea of a paradigm being invoked here. By way of comparison, an ornamental chair (as one might find in a museum, and that is not fit for sitting on) is a less paradigmatic instance of a piece of furniture than an ordinary sofa, but plausibly an ornamental chair still counts as a piece of furniture all the same. This is because it satisfies enough of the criteria in the cluster of concepts associated with being a piece of furniture, though it satisfies fewer of those criteria than an ordinary sofa. Similarly, a piece of work might be a less than fully paradigmatic instance of a 2-1 but still count as a 2-1 all the same.

Although they are written in a way that might naturally suggest a binary reading, the guidelines are generally scalar — satisfying each of them comes in degrees, and is not all or nothing. This is important, and relevant to the “paradigm” point above, in that doing better with respect to one criteria under a given band could offset doing slightly less well with regards to another. Also, precisely where within the band a piece of work is assessed will typically reflect how well the work does in terms of each of these criteria.

The guidelines apply most clearly for essays. In the case of exam questions, part of the exercise will be for the student to work out the extent to which the question calls for something going beyond pure exegesis.

For history of philosophy classes, where the instructor explicitly indicates this is the case, the contrast between exegesis and original argument may be less clear. In these cases, the original argumentation may be an original argument for an interpretation or reading of a text, for example. Individual instructors have some discretion in explaining how the specific details of their course mean these guidelines should be interpreted. As mere guidelines, they provide only a sort of “default setting” rather than a one size fits all set of prescriptions, amenable to only one canonical interpretation.

General Guidelines

- Clarity:
  - Is the writing clear?
  - Is the grammar and spelling correct?
  - Is the language used appropriate?

- Structure:
- Is a clear thesis or position stated?
- Is an argument, or arguments, offered in support of the thesis?
- Does each part of the essay/exam have a clearly indicated purpose?

- **Understanding:**
  - Is a sound understanding of relevant issues demonstrated?
  - Is the exposition of others’ views accurate?
  - Are technical terms adequately defined?

- **Originality:**
  - Is there evidence of independent thought?
  - Is there critical engagement with the material?

- **Argument:**
  - Is the argument convincing?
  - Are the inferences valid?
  - Are obvious objections anticipated?

**Grade Bands**

**Fail (less than 40)**

**Third Class (40–49):**

- Writing is generally unclear. Frequent spelling or grammar mistakes, incorrect language, and/or excessively convoluted sentence structure.
- Neglects clearly to state a thesis or position and/or fails to support this with arguments. Contains irrelevant material, or material whose relevance is not adequately explained.
- Demonstrates a barely adequate understanding of central issues. Contains several errors in exposition or in explanation of concepts.
- No evidence of independent thought or critical engagement. Merely rehashes arguments from readings or lectures.
- Where arguments are given, these are weak, depend on invalid inferences or implausible premises. Fails to anticipate obvious objections.

**Lower Second Class (50–59):**

- Writing is generally clear, but there are occasional spelling/grammar infelicities and/or poorly constructed sentences.
- A thesis/position is indicated but not clearly defined. Some arguments given, but their structure often unclear.
- Demonstrates a basic grasp of key concepts, but occasional inaccuracies in exposition/explanation.
- Little evidence of independent thought. Some suggestion of original ideas, but these are under-developed and/or expressed unclearly.
- Arguments generally weak or un convincing.

**Upper Second Class (60–69):**

- Writing is generally clear, marred only by the rare spelling/grammar infelicity or poorly constructed sentence.
• A thesis/position is indicated and clearly defined. Arguments are given with relatively clear structure. It is generally clear what is going on in each section, why one section follows on from the previous one, and how the essay as a whole hangs together.
• Demonstrates a solid understanding of the key concepts, and the exposition is generally accurate and thorough.
• Substantial evidence of original thought – either an original argument of some kind for a familiar position or an original argument for a novel position. In either case, the argument should be reasonably well developed.
• The author’s original arguments are interesting and promising, but fairly central or glaring problems with the argument are not discussed or addressed in any way, or are given only a highly cursory treatment.

Low First Class (70–79):

• Writing is very clear and engaging throughout. Where examples are used they are both relevant and memorable. The writing will also be concise.
• The essay’s structure is not only clear and well defined; it also provides a satisfying narrative arc.
• Demonstrates a deep understanding of the key concepts. Explains other philosopher’s ideas in the author’s own terms, clearly presenting those ideas in a way that indicates that the author has “made them his/her own.” Where technical terms are used they are always carefully defined.
• Highly original thought, with well developed arguments. The exegesis will generally be sufficiently concise as to allow the author to develop his or her own arguments in considerable detail.
• The author very carefully considers the most central and obvious problems with his/her original argument(s) and has interesting things to say about them.

Mid-First Class (80–89):

• Writing is crystal clear and highly engaging throughout. Memorable examples are used to underscore key points. The writing is concise without coming across as terse or stilted.
• The essay’s structure is clear and well defined, with a highly satisfying narrative arc.
• Demonstrates a deep understanding of key concepts. Not only explains the ideas of other philosophers in a way that shows he/she has “made them his/her own,” but that actually casts new light on how we might charitably understand the ideas of those philosophers.
• Very original thought, above and beyond what we would normally expect from an undergraduate. These original ideas will be developed in great detail.
• The author very carefully considers the most central and obvious problems with his/her original argument(s) and has prima facie convincing rejoinders. Author may also consider more subtle objections to his/her argument(s)/view(s).

High First Class (90–100):
• Writing is extremely clear, concise, and engaging — of a publishable quality.
• The essay’s structure is extremely clear and well-defined, with a highly satisfying narrative arc.
• Demonstrates a deep understanding of key concepts. Not only explains the ideas of other philosophers in a way that shows he/she has “made them his/her own,” but that actually casts new light on how we might charitably understand the ideas of those philosophers.
• A highly original and well developed line of argument and/or novel view, such that the essay is publishable, at least in an undergraduate or postgraduate journal, perhaps bordering on being publishable in a mainstream professional journal.
• The author considers the most important objections to his/her arguments/views. The replies are generally convincing and subtle. If space allows, less obvious objections may also be discussed in interesting ways.