Introduction to History and Philosophy of Science 2

General Information
Course # PHIL 221
Term Winter
Year 2017
Course pre-requisite(s) None
Course co-requisite(s) None
Course schedule MWF 1:35-2:25pm
Number of credits 3
Course location McIntyre Medical Building (MCMED) 1034

Instructor Information
Name Eran Tal
E-mail eran.tal@mcgill.ca
Office hours for students Wednesdays 10:30-12:30
Office location Leacock 933

TA Information
Name Alice Everly Nikolas Hamm
E-mail alice.everly@mail.mcgill.ca nikolas.hamm@mail.mcgill.ca
Office hours TBA TBA

Course Overview
Is there such a thing as a distinctly ‘scientific method’? Can evidence by itself decide between competing theories? How can scientists establish the existence of entities that cannot be observed directly, such as atoms and genes? Can computer simulations replace laboratory experiments? Should ethical and social values be allowed to influence the course of scientific research? This course will explore these and related questions by examining historical and contemporary examples of scientific inquiry from the physical, biological and social sciences.
Learning Outcomes

After taking this course, students will:

- Be familiar with key philosophical problems and positions concerning science and with historical cases exemplifying these problems and positions
- Be able to identify key theses and argument structures in a philosophical text
- Be able to differentiate between philosophical positions and compare their claims and assumptions
- Be able to express their own philosophical thesis in writing and argue for it in a clear and concise manner
- Be able to critically evaluate philosophical arguments, both others’ and their own, and to improve their writing in response to constructive feedback

Instructional Method

Reading and discussion are important components of this course. Students are required to prepare for lectures by reading the week’s mandatory text as listed below. Lectures will provide additional background that locates the readings in a wider context. Conferences will be held weekly starting Week 3 and will be focused on class discussion and on preparing students to write the essays.

Required Course Materials

All required readings have been scanned and are available for download from myCourses. Students are responsible for reading these texts and coming prepared to lectures and conferences. Note that the ‘course week’ starts on Wednesday, hence the week’s reading must be completed before the corresponding Wednesday lecture. See the schedule below for a list of required readings.

Lecture and conference attendance are mandatory, and material covered in lectures and conferences forms part of the required content of this course. Lectures and conferences will present materials that go beyond the week’s reading, as well as important guidelines for writing the essays. Missing a lecture or a conference is not an admissible reason for underperformance at a course assignment. Slides from lectures will be made available on myCourses after each lecture.

Optional Course Materials

In addition to the weekly required readings, optional readings will be assigned from the following two textbooks. While these are not mandatory, they provide clarification and background on the week’s required reading, and are therefore useful resources for writing the essays.


Both books are available at the McGill Bookstore (3544 Ave du Parc, open weekdays 9-5) and on the library course reserves.

Additional optional readings not from these textbooks are available for download from myCourses.
Course Content

This course covers topics in the philosophy of science, using episodes from the history of science as examples. Each week is dedicated to a different problem or topic.

The course is divided into three parts. The first part covers some of the most well-known debates in philosophy of science from the 18th century to the present day. The second part focuses on philosophical problems that concern particular methods of science, such as modeling, measurement and simulation. The third part is dedicated to the intersection of science, society and human values.

Part 1: Foundational debates

<table>
<thead>
<tr>
<th>Wk</th>
<th>Dates</th>
<th>Description</th>
<th>Assignments and/or Readings Due</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Fri Jan 6th</td>
<td></td>
<td>Optional:</td>
</tr>
<tr>
<td></td>
<td>Mon Jan 9th</td>
<td></td>
<td>• B&amp;K Chapter 1: “Science and Philosophy”</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>• STA Chapter 1: “Some problems of induction”</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Fri Jan 13th</td>
<td></td>
<td>Optional:</td>
</tr>
<tr>
<td></td>
<td>Mon Jan 16th</td>
<td></td>
<td>• STA Chapter 3: “Underdetermination”</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>Wed Jan 18th</td>
<td>Logical positivism</td>
<td><em>Conferences start Friday January 20th</em></td>
</tr>
<tr>
<td></td>
<td>Mon Jan 23rd</td>
<td></td>
<td>Optional:</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>• STA Chapter 4: “Logical empiricism and scientific theories”</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Fri Jan 27th</td>
<td></td>
<td>Optional:</td>
</tr>
<tr>
<td></td>
<td>Mon Jan 30th</td>
<td></td>
<td>• STA Chapter 2: “Falsificationism: science without induction?”</td>
</tr>
<tr>
<td>Wk</td>
<td>Dates</td>
<td>Description</td>
<td>Assignments and/or Readings Due</td>
</tr>
<tr>
<td>----</td>
<td>-------</td>
<td>-------------</td>
<td>--------------------------------</td>
</tr>
</tbody>
</table>
| 5  | Wed Feb 1<sup>st</sup>  
Fri Feb 3<sup>rd</sup>  
Mon Feb 6<sup>th</sup> | Kuhn on scientific revolutions | **Short essay due on Monday, February 6<sup>th</sup>**  
Optional:  
- STA Chapter 5: “Kuhn: scientific revolutions as paradigm changes”  
- B&K Chapter 4: “Science, History, and Society” |
| 6  | Wed Feb 8<sup>th</sup>  
Fri Feb 10<sup>th</sup>  
Optional:  
- STA Chapter 10: “Realism and anti-realism” |

**Part 2: The methods of science**

<table>
<thead>
<tr>
<th>Wk</th>
<th>Dates</th>
<th>Description</th>
<th>Assignments and/or Readings Due</th>
</tr>
</thead>
</table>
| 7  | Wed Feb 15<sup>th</sup>  
Fri Feb 17<sup>th</sup>  
Optional:  
| 8  | Wed Feb 22<sup>nd</sup>  
Fri Feb 24<sup>th</sup>  
(Feb 27<sup>th</sup>-Mar 3<sup>rd</sup> Study Break)  
Optional:  
| 9  | Wed Mar 8<sup>th</sup>  
Fri Mar 10<sup>th</sup>  
Mon Mar 13<sup>th</sup> | Measurement | **Long essay first version due on Monday, March 13<sup>th</sup>**  
Optional:  

Optional:

### Part 3: Science and society

<table>
<thead>
<tr>
<th>Wk</th>
<th>Dates</th>
<th>Description</th>
<th>Assignments and/or Readings Due</th>
</tr>
</thead>
<tbody>
<tr>
<td>13</td>
<td>Wed Apr 5&lt;sup&gt;th&lt;/sup&gt; Fri Apr 7&lt;sup&gt;th&lt;/sup&gt; Mon Apr 10&lt;sup&gt;th&lt;/sup&gt;</td>
<td>Gender and science</td>
<td><strong>Long essay final version due on Monday, April 10&lt;sup&gt;th&lt;/sup&gt;</strong> Okruhlik, K. 1994. Gender and the Biological Sciences. <em>Canadian Journal of Philosophy</em>, supplementary volume 20, pp. 21-42. Optional: B&amp;K Chapter 5: “Critical Voices”</td>
</tr>
</tbody>
</table>
Evaluation
The final mark is composed of the following:

<table>
<thead>
<tr>
<th>Name of Assignment</th>
<th>Due Date</th>
<th>% of final grade</th>
</tr>
</thead>
<tbody>
<tr>
<td>Short essay (800-1000 words)</td>
<td>Monday, February 6th</td>
<td>25%</td>
</tr>
<tr>
<td>Long essay first version (2000-2500 words)</td>
<td>Monday, March 13th</td>
<td>25%</td>
</tr>
<tr>
<td>Long essay final version (2000-2500 words)</td>
<td>Monday, April 10th</td>
<td>40%</td>
</tr>
<tr>
<td>In-class assignments (during tutorial conferences)</td>
<td>Every Friday starting January 20th</td>
<td>10%</td>
</tr>
</tbody>
</table>

**Essays:** one short essay (800-1000 words) and two versions of a long essay (2000-2500 word) are to be submitted to MyCourses by the above due dates. Students will receive comments on the first version of the long essay and will be expected to implement this feedback in the final version. The final version of the long essay should include an additional page summarizing the main changes from the first version. Essay topics and detailed instructions for writing the essays will be given 2 weeks prior to each due date.

**In-class assignments:** during each of the 11 conferences, there will be some in-class activity designed by the TA. Only students who attend their conference will get credit for this activity: 1% each, for a total of 10% points. You can miss one of your conferences without consequences for your final mark. Students who have a medical (or similarly serious) reason for missing their conference will be able to get credit for the activity by submitting equivalent work to their TA.

**Submitting work:** essays are to be submitted online through MyCourses – **not by email.** Submit file in PDF or DOCX format only. In other words: if you are using a word-processor other than Microsoft Word, please use the ‘save as’ or ‘export’ function to save your work as a PDF before uploading it. We may not be able to read files submitted in other formats and you would get no credit for that work.

**Policy for Late Work:** Extensions to deadlines set will be granted only in **exceptional** circumstances, usually only for medical reasons and with a medical note or other, similar emergencies, appropriately documented. Essays will be penalized at the rate of 5 percentage points per day overdue. For example, an essay submitted three days late and graded 80 will have a final mark of 65. Essays submitted more than seven days late will receive a mark of 0. In-class assignments cannot be submitted late (with the exception of medical reasons as stated above).

**Email:** before emailing your TA or instructor, check the syllabus and the announcements on myCourses to see if you can find the answer to your query there. Requests to explain course material cannot be handled by email – please bring up your question at conference or attend our office hours. In all matters pertaining to the grading of your assignments, please contact your TA and meet them during their office hours. Requests for regrading will only be considered after the student has discussed the issue with the TA who graded their assignment. We endeavor to respond to emails within two business days (i.e. not on weekends).

**Use of electronic devices:** Mobile computing and communications devices are permitted in class **only for note taking and for consulting online resources,** and only insofar as their use does not disrupt the teaching and learning process. Mobile computing and communications devices must be switched to silent mode and may not be used for voice communication at any time during class. Users of such devices must respect the right of fellow students and the instructor not to be distracted. No audio or video recording of any kind is allowed in
class without the explicit permission of the instructor or TA. These rules apply both to lectures and conferences.

McGill Policy Statements

Language of Submission:
In accord with McGill University’s Charter of Students’ Rights, students in this course have the right to submit in English or in French any written work that is to be graded.

Conformément à la Charte des droits de l’étudiant de l’Université McGill, chaque étudiant a le droit de soumettre en français ou en anglais tout travail écrit devant être noté (sauf dans le cas des cours dont l’un des objets est la maîtrise d’une langue).

Academic Integrity:
McGill University values academic integrity. Therefore, all students must understand the meaning and consequences of cheating, plagiarism and other academic offences under the Code of Student Conduct and Disciplinary Procedures (see www.mcgill.ca/students/srr/honest/ for more information).

L’Université McGill attache une haute importance à l’honnêteté académique. Il incombe par conséquent à tous les étudiants de comprendre ce que l’on entend par tricherie, plagiat et autres infractions académiques, ainsi que les conséquences que peuvent avoir de telles actions, selon le Code de conduite de l’étudiant et des procédures disciplinaires (pour de plus amples renseignements, veuillez consulter le site www.mcgill.ca/students/srr/honest/).

Plagiarism:
“Plagiarism” means the representation of another’s work, published or unpublished, as one’s own or assisting another in representing another’s work, published or unpublished, as his or her own.

(a) No student shall represent another person’s work, published or unpublished, as his or her own in any academic writing, such as an essay, thesis, research report, project or assignment submitted in a course or a program of study, or represent as his or her own the work of another, whether the material so represented constitutes a part or the entirety of the work submitted.

(b) No student shall contribute any work to another student with the knowledge that the latter may submit the work in part or whole as his or her own. Receipt of payment or other forms of compensation for work contributed shall be cause for presumption that the student had such knowledge.

Additional Statements
• The University Student Assessment Policy exists to ensure fair and equitable academic assessment for all students and to protect students from excessive workloads. All students are encouraged to review this Policy, which addresses multiple aspects and methods of student assessment, e.g. the timing of evaluation due dates and weighting of final examinations.

• © Instructor-generated course materials (e.g., handouts, notes, summaries, exam questions, etc.) are protected by law and may not be copied or distributed in any form or in any medium without explicit permission of the instructor. Note that infringements of copyright can be subject to follow up by the University under the Code of Student Conduct and Disciplinary Procedures.

• As the instructor of this course I endeavor to provide an inclusive learning environment. However, if
you experience barriers to learning in this course, do not hesitate to discuss them with me and the Office for Students with Disabilities, 514-398-6009.

- **End-of-course evaluations** are one of the ways that McGill works towards maintaining and improving the quality of courses and the student’s learning experience. You will be notified by e-mail when the evaluations are available. Please note that a minimum number of responses must be received for results to be available to students.

- Additional policies governing academic issues which affect students can be found in the McGill Charter of Students' Rights (see the Handbook on Student Rights and Responsibilities).

- McGill has policies on sustainability, paper use and other initiatives to promote a culture of sustainability at McGill. (See the Office of Sustainability.)