

PHIL 341- Philosophy of Science 1
(Winter 2018)

CRN: 14161

Schedule: TR 4:05-5:25

Location: ENGTR 2100

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Office: LEA 935

Office Hours: Thursday 1:30-3:00 or by appointment.

Course Description:

This course is a discussion of the philosophical problems surrounding and underpinning the issue of scientific explanation. We will be looking at historical and contemporary attempts to characterize the extent to which and the manner of how scientific investigation provides *understanding* of the phenomena that it explores. Topics include but are not limited to the role of causation in explanation, the relationship between different fields and subfields of the sciences, our epistemic goals pertaining to the sciences, the relationship between general laws and particular situations, and the relationship between observation, prediction, and understanding.

The course will consist of four basic sections:

- i) Scientific Explanation: A brief survey of historical and contemporary accounts of scientific explanation. Here we will explore attempts to characterize the structure of explanation in the sciences as well as arguments about the limitations on (or even impossibility of) such an approach. This is the first, the largest, and the most general of the topics that will be covered.
- ii) Explanation in the Physical Sciences: An overview of some of the issues specific to providing explanations in sciences such as physics, chemistry, geology, *et cetera*, including but not limited to discussion of reduction and emergence in physics and chemistry.
- iii) Explanation in the Life Sciences: A discussion of scientific explanation as it applies to problems in life sciences such as biology and medicine. Problems such as how we are to understand and evaluate theoretical claims in the context of complex systems (such as an ecosystem, or in the immune system of an individual) and in the differences in methodological approach and standards of explanatory acceptability necessitated in studying living systems.
- iv) Explanation in the Social Sciences: We will look into some of the issues unique to explaining the behavior of human systems, such as how historical explanations work, as well as explanations and models of human social structures (such as issues arising in economic or political theorizing, as well as those faced by psychologists, sociologists, anthropologists, and ethnographers).

In this course, students should develop a basic understanding of some of the classical issues in the philosophy of science as well as becoming familiar with issues particular to scientific explanation in the physical, life, and social sciences. The expectation is that a student will have a basic familiarity with a variety of the material discussed in the course while choosing a few distinct areas of the subject matter to engage with at a deeper level.

Course Materials: All materials are available via the McGill library and/or myCourses.

Evaluation:

*4 short papers (20% total, 5% each)

Provide a short discussion note (400-600 words) on one paper from each of the four sections of the class. This paper may be on any of the readings covered in that section and must be handed in no later than the class following the completion of that section (students are, of course, encouraged to turn in their discussion notes in advance of this date). These papers are meant to be relatively low-stakes writing assignments; their main purpose is to encourage students to engage with some of the readings in greater detail

*2 handouts (20% total, 10% each)

Provide a handout that elaborates on some *part* of the reading for that week and be ready to briefly (~5 minutes) present the content of that handout to the class.

*Term Paper (60%)

A 2000 word research paper on any subject related to the topic of scientific explanation, the final version of which is due on the last day of classes. It is broken into the following components (more detail on each component will be provided as the relevant deadlines approach):

Paper proposal (5%)- submitting a 150-300 word abstract of the topic that you intend to write upon (this both encourages students to start thinking about their papers early and allows for topics to be approved by the instructor).

Short draft and peer review (15%)- submitting a draft of 1000-1500 words for (doubly anonymous) peer review and providing peer review on two other student papers.

Final version (40%)

Late assignment penalty: Late papers are penalized 5% per day. If, for whatever reason, a handout cannot be completed in time for the appropriate class, a handout can be done on an alternate day for *half credit* (i.e. if you miss the day you were supposed to be providing a handout, you can volunteer for a different day, but you will only receive half marks for the replacement handout).

McGill Policy Statements:

“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. This does not apply to courses in which acquiring proficiency in a language is one of the objectives.” (Approved by Senate on 21 January 2009 - see also the section in this document on Assignments and Evaluation.)

« 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). »

“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). (Approved by Senate on 29 January 2003)

« 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/).»