**Philosophy 222 The Philosophy of Science**

**American University of Beirut**

**Fall 2019 MW 5:00 PM – 6:15 PM, Fisk 313**

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| Instructor: Dr. Chris Johns  E-Mail: cj08@aub.edu.lb  Phone: Ext. 4259 | Office: 147 Fisk Hall  Office Hours: MW 6:30 – 7:30 pm;  T & Th 1 pm – 2 pm; and by appointment. |

**COURSE DESCRIPTION:**

This course serves as an introduction to the philosophy of science. The course has mainly to do with the development and theoretical grounding of scientific method. We will cover topics such as induction, falsificationism, paradigm shift, scientific realism, and explanation and inference. We will also examine major developments in the history of science. The assigned readings include a text book, a course packet, and Steven Hawking’s *The Grand Design.* Optional readings on the philosophy of physics, biology, and psychology will also be included for interested students. Grades will be based on two papers, Moodle postings, and drop quizzes.

This course mainly emphasizes philosophical thinking, which I take to be the slow, careful, and reflective reading and analysis of texts and concepts. Classes will be discussion-driven, so be prepared by reading the assigned texts ahead of the date of discussion. My goal is not only to introduce this vital philosophical topic, but also to develop the habit of reading and thinking philosophically.

This course satisfies a GE Humanities List I requirement. If you are looking for an easy course, this is not it. If you do not like to read difficult material or you find sustained attention to abstract details tedious and boring, thenyou really should not take this class. But if you want to work hard and sharpen your mind by studying some interesting and fruitful ideas that will enrich your practical and intellectual life, then you are most welcome!

**Program Learning Outcomes**

* The ability to accurately identify the argument(s) (premises and conclusion) which someone is advocating.
* The ability to identify and assess objections to arguments in our readings.
* The ability to develop, explain, and defend your own views.
* To become familiar with the main problems in the philosophy of scienceand to gain an appreciation and philosophical understanding of them.

**Essential**: By taking this class, you agree to read, understand, and comply with this syllabus. By ‘syllabus’ I mean all of the documents found in the **Syllabus Section** on Moodle. If I make any changes to the syllabus, I will inform you. If you have a question about any policy, I am happy to talk about it.

**Required Texts**: The assigned books and Course Packet (CP) are available at the AUB Bookstore. See Course Schedule below for assigned reading schedule.

* Ladyman, James. *Understanding Philosophy of Science.* Routledge, New York, 2002.
* Hawking, Stephen. *The Grand Design.* Bantam, 2010.
* Course Packet (readings complementary to Ladyman)

**Graded Requirements**:

* Moodle Forum, bi-weekly posts (25% of total)
* Midterm Paper: 35%
* Final paper: 35%
* Occasional drop quizzes (5%)

**Moodle Forum Posts:** You will post a brief reaction, every other week, to anything regarding the readings or class discussions. Detailed instructions are on Moodle under the Syllabus Section.

**Paper 1 and Final paper:** Paper 1 runs between 900 – 1200 words and will be based on a question about the assigned readings. The word limits will be strictly adhered to. The final paper will run between 1,500 – 2000 words, based on topics I will give you, but you can modify the topic to suit your interests. Specific instructions for each paper will be posted on Moodle along with the upload link for the assignment. All drafts and papers must be uploaded onto Moodle.

Drafting process: Drafts count for 5% of your paper grade, based on whether you did the draft or not. For the first paper, you will submit a draft and meet with me by appointment to discuss it. I will also give you written comments. For the final paper you will submit an outline of your paper, on which I will give you comments. Formatting: All drafts and papers must be formatted according to the “Papers--formatting, saving, submitting” instructions on Moodle (see Syllabus Section). I will type comments on your paper, grade it, and return it to you electronically. Be sure to read my comments!

Style: These papers are of the “critical” type, meaning that you will take a position (a thesis) and support it with valid reasons. The Grading Criteria for these papers are as follows: 1. **You must be able clearly to state your thesis and its supporting reasons.** 2. You must support your thesis with valid reasons and evidence. 3. You must show that you understand the authors views that you are writing about. 4. You must be able to write in clear, grammatically correct, English. 5. Your main ideas must be logically organized, and your thoughts clear and concise.

* Essays that fulfill all of the above criteria in an excellent manner will receive at least 90 points.
* Essays that do so in a “good” manner, or fulfill the criteria partially, will receive at least 80 points.
* Essays that need work in at least two of the above criteria will receive at least 70 points.
* Essays that do not fulfill several of the criteria, or do so in a weak manner, will receive at least 60 points.
* Essays that fail to display much knowledge of the readings, *or* are incomprehensible or thoughtless in expression, will receive 59 points or less.
* Plagiarism will be severely punished. See below.

The best way to prepare for these essays is to read the assigned readings *carefully* and pay attention to how we talk about them in class. Additional instructions, criteria, and writing guides are found on Moodle under the syllabus section.

**Grade Calculation:** I want you to understand how your grades are assigned and calculated, so that you can know better what I expect and so that you can exercise more control over your own progress. See “Grades, Calculating and Estimating” on Moodle. This will show you completely explicitly how all calculations are made, so that you can do them yourself. Here is a brief explanation: All grades are recorded on Moodle’s “Grades” (as well as on the assignments themselves), so you can view them as soon as I have put them up (Moodle🡪Administration🡪Grades).

To estimate your grade at any point in the semester, simply figure your average and multiply it by the “weighted” amount; then sum the weighted amounts. Moodle will also give you an accurate estimate.

Note: on the final grade, before entering on AUBsis, I round up the decimal from .60.

**NOTE**: I am happy to discuss my grading criteria and my reason for your grades. I am happy to help you get the best grade you can. However, do not ask me to raise your grade for any reason. If you do, I will *lower* your course grade by two points. Also, keep in mind that while hard work is important, it does not always result in a good grade. The grade depends on my judgment of your final product. I encourage you to talk to me about how to do better.

**Attendance:** Your performance on the papers and exams will depend heavily on your ability to understand the assigned readings and to think critically about these issues. So, it is in your best interest to attend every class, pay attention, and participate. It is also important to practice forming your thoughts verbally. I will take attendance, but I do not distinguish between “excused” and “unexcused” absences. In other words, you can be absent for any reason you like. However, if you miss **six** classes *for any reason*, you will either be dropped from the course and receive a “W”, or you will receive a failing grade of 50. Five absences result in a 10-point reduction on your final grade. Four absences result in a 5-point reduction. Zero absences will give you two points on your final grade. Two late attendances will count as one absence. *If you think you may have problems meeting these attendance restrictions, then do not take this class.*

**Note**: AUB policy requires that your other courses cannot schedule make-up exams or extra sessions at times conflicting with any other regularly scheduled course (including this one). In case of conflict, you must inform your professors that you must attend your regularly scheduled course and you must be given exam/meeting times that do not conflict with any part of it. If your professor refuses to accommodate you, please refer him/her to me.

**Participation and class conduct**: Participation is strongly encouraged, but not graded (since I do not think there is a sufficiently objective way to measure participation). To participate well, you must do the readings *before* class so we can go over them in class. Ask questions, make comments, and respond (respectfully) to other students. No question or comment is too silly or off base. Everyone has questions, and surely others have the same questions as you. Also be sure to give others a chance to speak. *Be respectful of me and others by listening to what is going on, rather than talking among yourselves.*

Four main rules: 1. Electronic devices of any kind are not allowed (unless you have a special need to use a computer). Cell phones must be put away, out of sight—no exceptions. 2. You may not talk while others are talking. 3. You may not read non-class material during class. 4. Do not leave the room for more than 10 minutes and do not leave early.

Also, as a courtesy to me, *please* *do not make preparations to leave class until I say class is over.* If I seem unaware that class time has expired, kindly alert me, thank you.

NOTE: Repeat offenders of the above rules will be ejected from class (which counts as an absence).

**Plagiarism**: is the intentional or careless use of someone else’s writing or ideas as if they were your own, without citing the author of them. It includes, for example, paraphrasing without attribution, paraphrasing by replacing a few words here and there with your own words or using a thesaurus (very popular!), copying the words from a spoken video, using encyclopedia passages without attribution, copy/pasting from various blogs and anonymous sites, submitting parts or wholes of papers purchased online, submitting papers written by other students, friends, or family, or paying someone to write your paper or any part of it; or simply having someone “help” you write your paper (not including the Writing Center, unless they give you ideas and construct sentences for you). I consider plagiarism equivalent to stealing, lying, and cheating, and no amount of it will be tolerated in my class, including in draft work. Plagiarism is wrong for additional reasons: The general objective of college is to become a better writer, thinker, learner, and person. Plagiarizing severely undermines that objective and harms, not only you, but all students, professors, the university, and society in general. If you plagiarize, you fail to learn how to write and think. You represent yourself as having skills and knowledge that you in fact do not have. Also, I take your work and my work seriously. If you plagiarize, then my work becomes a pointless waste of time. I hate wasting time, because I wish to fill my life with meaning and accomplishments. I also hate false relationships. When I read and respond to your work, I consider myself engaged in a mutual relationship of trust, respect, truth, care, and progress. If I am reading your plagiarized work, then I am having a false relationship with you. I despise false relationships because they destroy the substance of life. **If I *suspect* you have plagiarized any amount of work in this class, you will receive a grade of zero for the assignment. It is possible for you to fail the course based on one instance of plagiarism. I will also submit a report to the Academic Affair Committee for judgment. If they judge against you, your offense will go on your academic record and you could be dismissed from the university.** Moreover, if I find you have given your paper to another student to copy, you will be penalized and written up for academic misconduct. Unfortunately, I catch plagiarizers *every semester*. I am an experienced reader and can usually tell, simply by reading, when a student has plagiarized. (This also applies to papers written online by ghostwriters or other students.) I can tell because the writing does not match the assignment, because the text has an “internet feel,” or because it uses awkward wording in an attempt to disguise the source. I also use Google, Turnitin, and other resources. You can, of course, **easily avoid plagiarism simply by *citing your sources properly***. If you are unsure of how to cite sources properly, see “**Documenting Sources: Rules & Mechanics**” posted on Moodle. But *you are responsible for any plagiarism*. If you are struggling with an assignment, or with your English, please come and talk to me. I am here to help.

NOTE: Writing a paper does *not* consist of using a source and changing a few words here and there. Nor does paraphrasing a source consist of changing a few words here and there. To paraphrase means to make a compact summary of the main point of a paragraph, for purposes of clarification for the reader. All paraphrasing must be documented. If not, it is plagiarism.

**Turnitin**. All writing assignments will be submitted to Turnitin automatically when you submit your paper on Moodle. No paper will be graded without a Turnitin report.

Here is how it works: As their website says, “Every paper submitted is returned in the form of a Originality Report. Results are based on searches of billions of pages from current and archived instances of the Internet, millions of student papers submitted to Turnitin, and commercial databases of journal articles and periodicals” (<http://www.plagiarism.org/plag_solutions.html>). NOTE that Turnitin only submits a “similarity” report, not a plagiarism report. The similarity report shows the percentage of your text that is similar or identical to another text, and therefore helps me determine whether you have plagiarized. Some similarity is fine and to be expected. But identical similarity or paraphrased similarity is plagiarism.

More information on Plagiarism is posted on Moodle under the syllabus section.

**The Writing Center:** If you have writing issues that need extra attention, please take advantage of the Writing Center. Their instructors help all students, from first-year to doctoral. Keep in mind that they will *not* proofread or copy-edit your work. Walk in or make an appointment: 9 am - 5 pm, Monday – Friday. West Hall 336; Ext. 3157; E-mail: [writing@aub.edu.lb](mailto:writing@aub.edu.lb)

**Accessible Education services:** AUB strives to make learning experiences as accessible as possible. If you anticipate or experience academic barriers due to a disability (including mental health, chronic or temporary medical conditions), please inform me as soon as possible.  In order to receive reasonable and efficient accommodations, you must register with the Accessible Education Office: [accessibility@aub.edu.lb](mailto:accessibility@aub.edu.lb); +961-1-350000x3246; West Hall, 314.

**Non-Discrimination/harassment**: AUB is committed to facilitating a campus free of all forms of discrimination including sex/gender-based harassment prohibited by Title IX. The University’s non- discrimination policy applies to, and protects, all students, faculty, and staff. If you think you have experienced discrimination or harassment, including sexual misconduct, we encourage you to tell someone promptly. If you speak to a faculty or staff member about an issue such as harassment, sexual violence, or discrimination, the information will be kept as private as possible, however, faculty and designated staff are required to bring it to the attention of the University’s Title IX Coordinator. Faculty can refer you to fully confidential resources, and you can find information and contacts at www.aub.edu.lb/titleix https://www.aub.edu.lb/titleix . To report an incident, contact the University's Title IX Coordinator Trudi Hodges at 01-350000 ext. 2514, or titleix@aub.edu.lb <mailto:titleix@aub.edu.lb> . An anonymous report may be submitted online via EthicsPoint at www.aub.ethicspoint.com https://www.aub.ethicspoint.com/ .

**Moodle**: Here you will find course material such as the syllabus, some course readings, citation mechanics, tips on writing papers, and such. Class notices and announcements will be sent to you by e-mail (via the “News Forum”) so, **check your AUB e-mail** regularly.

**E-mail**: **So that we may better communicate, you must use your AUB e-mail and “authenticate” it so that I can see your name and know who you are.**

---See course schedule, below--

**Course Schedule**: This schedule is subject to change, although any changes will be announced well in advance. To be prepared for class discussions, read the assigned material (estimated 30 pages per week) *prior* to class time. *Always* bring the assigned material to class. *If you do not bring the material to class, I may ask you to leave until you return with it!*

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| **Week.Date** | **Monday** | **Wednesday** |
| **1**. **Sept** 2 & 4 | *Intro to course* | History of Science: From Gods to Atoms  (Rovelli readings in Course Packet (CP) |
| **2.** 9 & 11 | History of Science: Aristotle, Galileo, Bacon  (Handout) | Ladyman Ch. 1: Induction and Inductivism (including Copernican revolution) |
| **3.** 16 & 18 | Ladyman Ch. 2: The problem of Induction | Discussion  Hawking *Grand Design* Ch. 1-3 (60 pp) |
| **4.** 23 & 25 | Ladyman Ch. 3 Falsificationism | Discussion |
| **5.** 30 & 2 | CP: Popper, from *The Logic of Scientific Discovery.* | Discussion  Hawking *Grand Design* Ch. 4-5  Session on writing a philosophy paper |
| **6.** **Oct.**  7 & 9 | Ladyman: Ch. 4 Revolutions and Rationality | Discussion  **Draft of Paper 1 due Thursday 6 pm** |
| **7.** 14 & 16 | Ladyman: Ch. 5 Scientific Realism | Hawking *Grand Design* Ch. 6 |
| **8.** 21 & 23 | CP: Carnap, “Empiricism, Semantics, Ontology.” | Discussion  **Paper 1 due Thursday 6 pm** |
| **9.** 28 & 30 | Ladyman: Ch. 6 Underdetermination | CP: Van Frassen, “To Save the  Phenomena.” |
| **10**. **Nov. 4** & 6 | Ladyman Ch. 7 Explanation and inference | Discussion |
| **11**. 1 1 & 13 | Ladyman Ch. 8 Realism about What? | Hawking *Grand Design* Ch. 7-8 |
| **12.** 18 & 20 | CP: Garfinkel, “Reductionism” | Discussion |
| **13.** 25 & 27 | CP: Keller, “Feminism and Science” | Discussion |
| **14**. **Dec** 2 & 4 | **Last day of class!**  Course summary and Final Paper topics | Reading period begins  No class |
| **15**. 9 - … | **Final exams** | **Final paper drafts due Thurs. 6 PM** |
| 16. … 19 | **Final paper due** TBA | End of Semester Dec. 19 |
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