

**Philosophy 454**  
**Philosophy of Space and Time**  
**MWF 12-12:50**  
**Skinner 1112**  
**Syllabus**

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 OFFICE HOURS: Mo 11-12, We 1-2.

**Course description:**

What is space? Is space a thing, like a star? Is it a ‘container’ in which objects and events live? Or is space nothing but the relative distances we can measure between different objects? What is the geometry of space? How do we come to know it? How has Einstein’s theory of relativity come to influence the answers we give to these questions? Similar questions can be asked about time. But, in other ways, time is unlike space: We can move around in space in any direction we please, but move inexorably forward with the march of time. Does time ‘flow’? What is the difference between past, present, and future? Do past and future exist in the same way as the present or is only the present real? Is time travel possible? In this course we will examine philosophical questions such as these, concerning space and time, and their 20<sup>th</sup> century offspring, spacetime. Our approach will be quasi-historical, with readings ranging from Aristotle and St Augustine, to a debate between Newton and Leibniz, to twentieth century philosophers and physicists.

**Books:**

Required:

- Huggett (ed.), *Space from Zeno to Einstein*. MIT Press (1999). ISBN: 0262581698
- Sklar, Lawrence, *Space, Time, and Spacetime*. U of California Press (1977) ISBN: 0520031741
- Dainton, Barry, *Time and Space*. McGill-Queen’s Press (2001). ISBN: 0773523065

**Background Readings**

*Relativity from A to B*, by Robert Geroch, U of Chicago Press.

Introducing *Time* by Craig Callender, Icon Press, 2001

*Foundations of Spacetime Physics* by Michael Friedman. Advanced.

*World Enough and Spacetime* by John Earman. Advanced, on substantivalism issue.

*Philosophical Problems of Spacetime Theories* by Adolph Grünbaum.

*Introduction to the Philosophy of Science*, edited by Salmon et al., Chapter 5 on spacetime by John Norton.

**Rough Schedule of Readings:**

WEEK 1 (1/24): Introduction, Aristotle

Huggett, chs.4 & 5

WEEK 2 (1/29): Spacetime: The Aristotelian View

Dainton, ch. 9

WEEK 3 (2/5): Relationalism vs. Substantivalism. The Leibniz-Clarke Correspondence Huggett, ch. 8

Dainton, ch.10

Sklar, ch. III, A & B

WEEK 4 (2/12): Relationalism vs. Substantivalism. Newton

Huggett, ch. 7

Sklar, ch. III, C

Dainton, ch.11

WEEK 5 (2/19): Relationalism vs. Substantivalism. Berkeley and Mach

Huggett, ch. 9

Sklar, ch. III, D, 1 & 2

WEEK 6 (2/26): Galilean Relativity

Huggett ch. 10

Dainton, ch. 12

Sklar, ch. III, D, 3

**MIDTERM 3/2**

WEEK 7 (3/5): Kant on Handedness

Huggett, ch. 11

Dainton, ch. 14

Sklar, "Incongruous Counterparts, Intrinsic Features, and the Substantiviality of Space," *Journal of Philosophy* 71 (1974): 277-290

WEEK 8 (3/12): The epistemology of geometry

Huggett, chs. 12&13

Dainton, ch. 13

Sklar, ch. II, A, B, E-H

**SPRING BREAK**

WEEK 9 (3/26): Special Relativity

Huggett, ch. 14

Dainton, ch. 16

Sklar, ch. IV, A-C; also: ch. III, D, 4; ch. II, C, 1

WEEK 10 (4/2): Special Relativity (contd.)

WEEK 11 (4/9): General Relativity

Dainton, ch. 18

Sklar, ch. IV, D; III, E & F; II, C, 2; II, D, 2 & 3

WEEK 12 (4/16): Spacetime Metaphysics

Dainton, ch. 19

WEEK 13 (4/23): Asymmetries in Time

Dainton, ch. 4

Sklar, ch. V

NO CLASS 4/27

WEEK 14 (4/30): Time Travel

Dainton, ch. 8

NO CLASS 5/4

WEEK 15 (5/7)

Review

**Course Requirements:**

Midterm 3/2 in class (20%).

One short paper, 3-4 pages, due 3/16 in class (20%).

Final paper, 5-6 pages, due 5/9 in class (30%).

Final exam, Thursday, May 17<sup>th</sup>, 8-10 a.m (30%)

Handing in all four course-requirements is a condition for passing the class.

**Tips for writing a paper:**

- 1) It is important that you proofread each of your papers and check it for typos, spelling mistakes and grammatical errors. I will grade your paper down, if it contains a large number of such errors. It is part of the criteria for an A paper that the paper contain hardly any spelling mistakes or grammatical errors.
- 2) Use the active voice and try to avoid the passive voice. For example: 'Hume argues' instead of 'it is argued by Hume.'
- 3) Write in complete sentences! Reading what you have written out aloud can help you identify sentence fragments.
- 4) Write in a straightforward, clear style. Use only words whose meaning you yourself understand. If you need to use a 'technical term' whose meaning is not widely understood, explain how you are using it.
- 5) Your paper needs to begin with a short and focused introductory paragraph. In your introduction you should briefly introduce the question or problem you will be addressing and state your thesis. Also you should provide an outline of the strategy you will use to discuss the problem. It is best, if you use the first person voice in introducing what you will write about.
- 6) The point of a philosophy paper is to present an argument. One strategy for writing a paper is to present a position you disagree with, discuss the reasons one might offer in support of that position and then raise objections to these reasons.
- 7) Start writing your paper early enough to allow yourself time for revisions. Often it is helpful after you complete a draft of your paper to wait a couple of days before you return to it. By gaining a little distance you will be able to assess your own work more critically. You might also consider giving your paper someone else to read. (If you feel like you have trouble writing papers, you might take it to the Writing Center here on Campus.) Someone who is not familiar with the course material will be able to tell you if your paper is sufficiently clear and self-contained.

**A note about the reading philosophy:**

Even though the number of pages we will read for each class is going to be relatively small, you should budget enough time for the reading to be able to read each piece at least three times. Don't expect to be able to 'breeze through' the texts and you can avoid a lot of frustration. Hume is a pleasure to read, but he is often making difficult and subtle arguments and obviously is not writing in modern American English. For all the readings you should have a pen and paper ready to take notes as you read. Hume's text, like all philosophical writing, is concerned with advancing and defending arguments. Your task will be to try to reconstruct the arguments and to critically evaluate them.

The first reading of the text should be fairly quick. Your goal here should be to get a first, rough sense of the general argument Hume is advancing and the rough structure of the text. What is his main thesis? (write this down!) Where in the text is he arguing for it? Where does he address objections? Where does he discuss qualifications? Where does he motivate the argument? Don't worry, if during the first reading you don't yet understand how precisely Hume is arguing for a thesis.

The second reading should be devoted to giving a reconstruction of the argument that is as sympathetic as possible. Now you should spend a lot of time on trying to understand how the author supports the main thesis, and how s/he might address potential objections. Here it is usually useful to try to jot down the following: What are the premises of the argument? How are the premises themselves supported? For example Hume might appeal to shared intuitions or might claim that the premises are self-evident. (e.g., “Obviously all our beliefs are ultimately based on observation...”) What are the steps which are meant to get the author from the premises to the conclusion? (Here words like ‘because’ and ‘therefore’ can provide a clue.) You might think of yourself as engaging in a dialogue with the text here. Ask critical questions of the text, such as “You say that all simple ideas are copies of impressions. Why should I be compelled to accept this?” Then search the text for answers. At this stage your aim should not yet be to try to discover flaws or problems in the argument. Aim to make the argument as strong as possible.

Finally it is time to be critical. During a third reading you ought to try to see if you can uncover weaknesses in the arguments. If someone would want to disagree with a conclusion, there are two general ways in which one might attack the author’s arguments. One, you can disagree with one or more of the premises. That is you might accept that *if we grant the premises, then the conclusion follows*, but you might disagree with one or more of the premises. (But then you should ask yourself how you would respond to the attempt to motivate the premises.) Or, two, you might disagree with one or more of the steps in the argument. That is, you might be willing to accept the premises, but you might deny that this commits you to the conclusion as well. If you have an objection of the latter kind you should try to explain why it is possible to accept the author’s premises and yet deny his or her conclusions. (Of course you also might have objections of both kinds.)

A careful reading of a difficult text takes time. Learn to read patiently and slowly, and before you get frustrated, remember that even professional philosophers struggle with some of the texts you are reading. One of the most wonderful aspects of reading philosophy is that it allows you to engage in conversations with some of the deepest and most original thinkers of all times. Enjoy the challenge!

#### ACADEMIC INTEGRITY:

As you know, the university has a student-administered Honor Code and Honor Pledge which commits you neither to give nor receive any unauthorized assistance on any of your assignments. Unauthorized assistance includes plagiarizing papers. Whenever you quote from an author directly you must identify the quote and add a reference to the source. The same goes for very close paraphrases of someone else’s ideas.

#### ACCOMODATIONS FOR STUDENTS WITH DISABILITIES:

If you need special accommodations please let me know at the beginning of term so that we can work out appropriate arrangements.

#### RELIGIOUS OBSERVANCES:

If you will need to miss class for religious observances, please let me know within the first couple of weeks of class.