

TEACHING PORTFOLIO

JULIA R. BURSTEN

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1. TEACHING PHILOSOPHY

I design courses that make philosophy accessible, exciting, and relevant to students' lives outside the classroom. My curricula develop students' abilities to read and reason critically; to analyze arguments; to express their critiques articulately and concisely; and to apply these critiques to situations relevant to a variety of personal, professional, and scholarly situations. This skill-based design allows me to apply my teaching methods to a wide variety of course content and to incorporate new media, such as podcasts and blogs, alongside traditional primary and secondary academic sources.

My courses all use three core teaching tools: weekly written responses to readings, frequent small group discussions, and rubrics for essay grading. These tools foster active engagement with course material. They make learning philosophy less intimidating and more rewarding by encouraging routine practice in critical reasoning and offering regular feedback on students' progress.

- *Weekly responses* are informal 2–3 paragraph reaction papers or short-answer responses to comprehension questions that are submitted online before the reading material is discussed in class. These assignments not only ensure that students have read the material before class, but also that they have practiced critical analysis. I use their responses to check for comprehension problems both in individuals and in the class as a whole, and I give each student feedback on their responses every week. Additionally, I may use individual responses as prompts for in-class discussions, which empowers the students who hear their responses in class and often generates more energetic discussion than teacher-designed prompts.
- *Small group discussions* are carefully designed activities in which groups of 3–6 students respond to a prompt. Groups discuss their prompt for 5–20 minutes and then report back to the class at large on their discussions. Often, different groups are assigned or choose different prompts. Depending on the prompt, small-group discussions teach students to respectfully disagree with one another or to collaboratively problem-solve, all while learning from each other's assessments of a philosophical position. For example, in introductory courses in philosophy of science, some of my liveliest and most productive classes have emerged by splitting students into three groups: one defending realism, one defending antirealism, and one that was unsure which side of the debate to take. The first two groups collected arguments to convince the third group to join their respective sides of the debate, and the third group offered critiques of both sides. In a recent iteration of this small group discussion, I invited MA students interested in philosophy of science to come judge the students' responses. The MA students picked a winning group and gave justifications for their decisions, thereby exposing them to a teaching activity and giving the undergraduates additional examples of critical reasoning.

When a learning environment is structured around small group discussion, students who may not raise their hands to answer questions in front of the class at large will often come alive. Seeing more reserved students engage in live-action philosophical discussion for the first time is one of my greatest rewards as a teacher, and it is a product of cultivating a learning environment in which students feel respected and valued. I strive to create and maintain a culture of friendly respect in my classroom, and I use a variety of pedagogical techniques from both academic teaching and my experience as a yoga teacher to grow and sustain that culture. In the yoga classroom, an instructor's body language is an important form of communication. This is true in the philosophy classroom as well: body language can indicate boredom and disinterest as easily as it can enthusiasm and respect. I look my

students in the eye and address them by name, and in small groups I sit with individual groups and listen to my students talk to each other, rather than standing above them at the front of the room. I find it is hard for students to be apathetic in the face of an instructor's genuine interest in what they have to say.

- I use *rubrics* to grade all of my essay assignments, and I pass out blank rubric forms when I am explaining the assignment prompt. I use examples to explain the grading criteria, and I encourage students to refer to the forms as they self-assess their essays prior to submission. These rubrics make it significantly easier for me to evaluate a student's critical thinking and writing efficiently and objectively, and they leave me more time to provide personalized feedback to students. This grading strategy enhances transparency in the grading process. I have found them especially valuable to students who have not taken many philosophy courses, because they help students see what they need to do to succeed.

Together, regular practice in critical analysis and transparent grading policies make it easier for me to design creative essay assignments that encourage students to do outside research, bring in material from other courses, or experiment with form, such as in the history-podcast assignment I developed for my award-winning Space, Time, and Matter course. This approach empowers students. For instance, I had a student take courses with me for three consecutive semesters, over which time he developed an extended research project on early Islamic theories of the circulation of the blood, and the student ended up majoring in history and philosophy of science as a result of this research. More recently, an MA student has developed research on gender and authority in speech acts as a result of a writing proseminar assignment. This research promises to form the basis of her thesis.

My skill-based approach is the heart of my pedagogy, and I have applied it to new and existing course content in philosophy and history of science. My approach to course content design varies significantly based on the subject matter of the course, though it generally includes primary and secondary academic material as well as non-traditional sources. One of my interests is in aligning content with the engaging, respectful, and approachable learning environments I cultivate. In practice, this means I aim to include diverse perspectives whenever possible. For instance, in my 2010 Myth and Science course I included units on world creation myths and ancient Islamic science, and in my 2014 Space, Time, and Matter course I framed many course topics in terms of socially situated perspectives, such as how socio-commercial demand for improved navigation and calendars led to developments in astronomy and geometry. In all of my classes, I strive to highlight excellent scholarship from academics from underrepresented socioeconomic groups, and I have aided efforts to publicize inclusive syllabi to philosophers of science.

2. TEACHING INTERESTS

I am prepared to teach graduate-level courses in philosophy of chemistry, philosophy of physics, history of science, and topics in general philosophy of science including scientific explanation, models and theories, reduction and emergence, natural kinds, and feminist philosophy of science. I am particularly interested in teaching research seminars on the relation between science and technology from an epistemological point of view, and on modeling in the material sciences. Both of these would focus on multi-scale modeling and the epistemology of design problems.

I am also interested in continuing, and perhaps synthesizing, two existing teaching projects into workshops, short courses, or a proseminar. One of the projects is about research methods in the digital age and the other is about tools for effective collaboration with scientists, I have developed materials for the first project through mentorship of undergraduate and high school research students, and through a research-methods unit for my MA seminar on philosophical writing. I have developed materials for the second project through talks given at the History of Science Society 2014 meeting, the Society for Philosophy of Science in Practice 2015 meeting, and in an interview for an upcoming edition of the Society for Philosophy of Science in Practice newsletter.

I am prepared to teach upper-level undergraduate courses in any of the above areas, as well as courses in logic, analytic philosophy, science and values, and early modern philosophy.

Undergraduate courses that I am prepared to teach include:

- Analytic Philosophy
- Epistemology
- History of Ancient Philosophy
- History of Modern Philosophy/Modern Philosophy
- History of Philosophy of Science
- Introduction to Logic/Intermediate Logic
- Leibniz
- Metaphysics
- Philosophy of Applied Mathematics
- Philosophy of Chemistry
- Philosophy of Language
- Philosophy of Mathematics
- Philosophy of Physics
- Philosophy of Science/Introductory Topics in Philosophy of Science/Topics in Philosophy of Science
- Philosophy of Space and Time
- Practical Reasoning
- Rationalism
- Science, Technology, and Society
- Scientific Explanation
- Scientific Reasoning in the Ancient World
- Space, Time, and Matter

3. COURSES AND WORKSHOPS TAUGHT

3.1. Courses Taught and Assisted.

- 2015 *Philosophy of Science*. Topical survey of issues in general philosophy of science, divided into units on “What Science Says About Reality” (metaphysics) and “Scientific Ways of Knowing” (epistemology).
- 2015 *Seminar in Philosophical Writing*. Masters program proseminar on argument analysis, writing habits, and resource management.
- 2014 *Space, Time and Matter*. Topics in the history of the physical sciences. Emphases on ancient Greek theories of matter, theories of space and time in the Early Modern period, atomism in the Chemical Revolution, and the interplay between theories of space, time, and matter in the early 20th century. This course emphasized historiography and investigated

varieties of historical narrative by drawing not only from primary text sources but also secondary academic sources, popular science books, radio, and video media.

- 2010 *Myth and Science*. Introduction to the birth of western philosophical and scientific reasoning via survey of mythological and naturalistic writings from the pre-Socratics, Plato, Aristotle, Late Antiquity, the Middle Ages and ancient Islam.
- 2010 *Einstein: Modern Science and Surprises*. Survey of the development of modern physics in the late 19th and early 20th century, focusing on the parallel and connected developments of atomic theory, quantum mechanics and the theory of relativity and centering around Einstein's contributions. Teaching assistant to John Norton.
- 2009 *Introduction to the Philosophy of Science*. Survey of foundational topics in philosophy of science, including the problems of induction and causation, classification, explanation, and reduction. Teaching assistant to Michela Massimi.

3.2. Workshops Led.

- 2015 Tutorial on *Enquiry Concerning Human Understanding*. SFSU MA Comprehensive Exam course.
- 2012 'Using Rubrics to Grade Philosophy Essays.' Pitt Philosophy Graduate Teaching Seminar.
- 2012 'Leading Discussion Recitations.' Pitt New Teaching Assistant Fall Orientation.
- 2012 'Getting Started in the Classroom.' Pitt New Teaching Assistant Fall Orientation.
- 2011 'Testing, Assignments and Grading.' Pitt New Teaching Assistant Fall Orientation
- 2011 'Testing, Assignments and Grading.' Pitt New Teaching Assistant Spring Orientation.

4. TEACHING EVALUATIONS

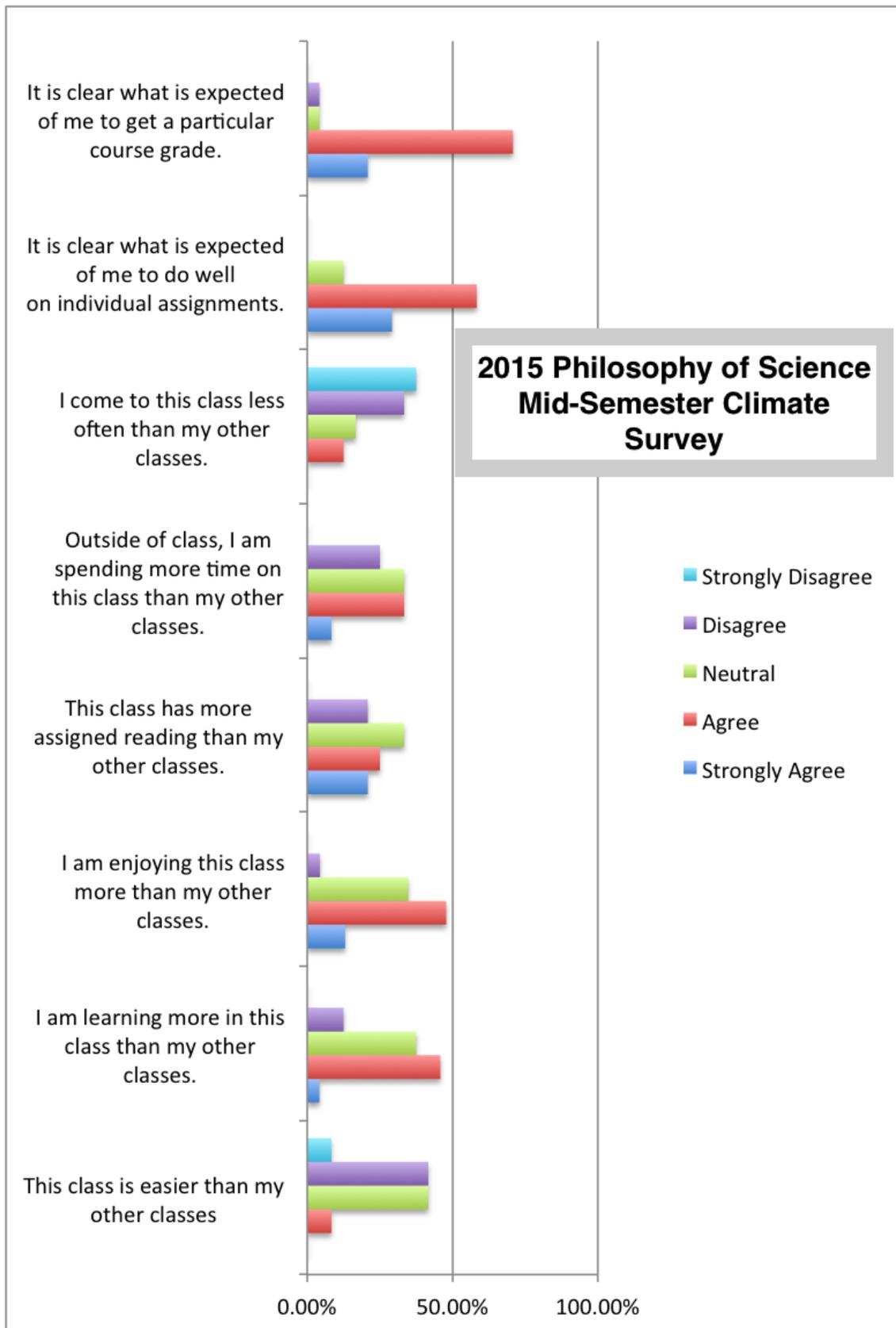
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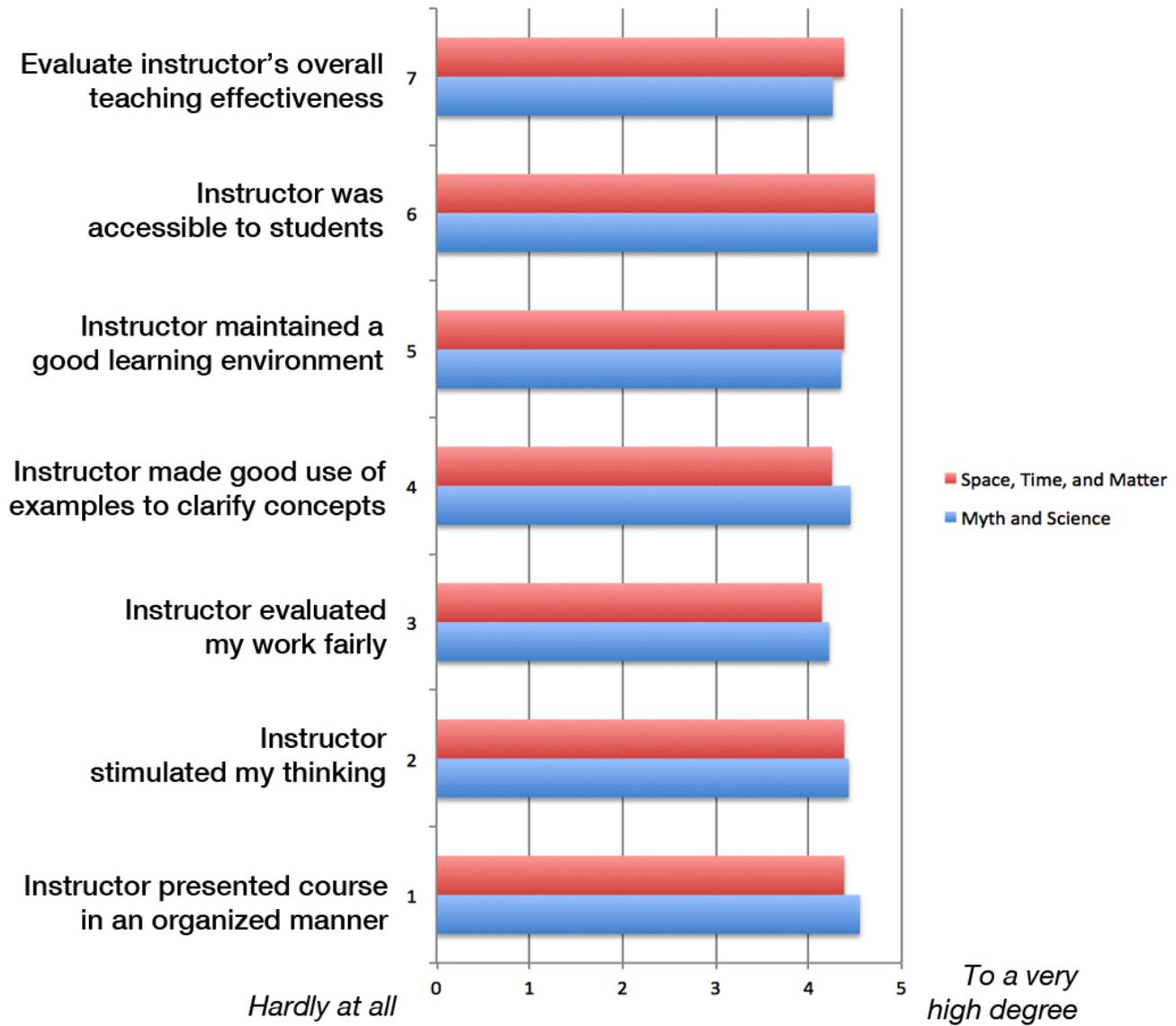
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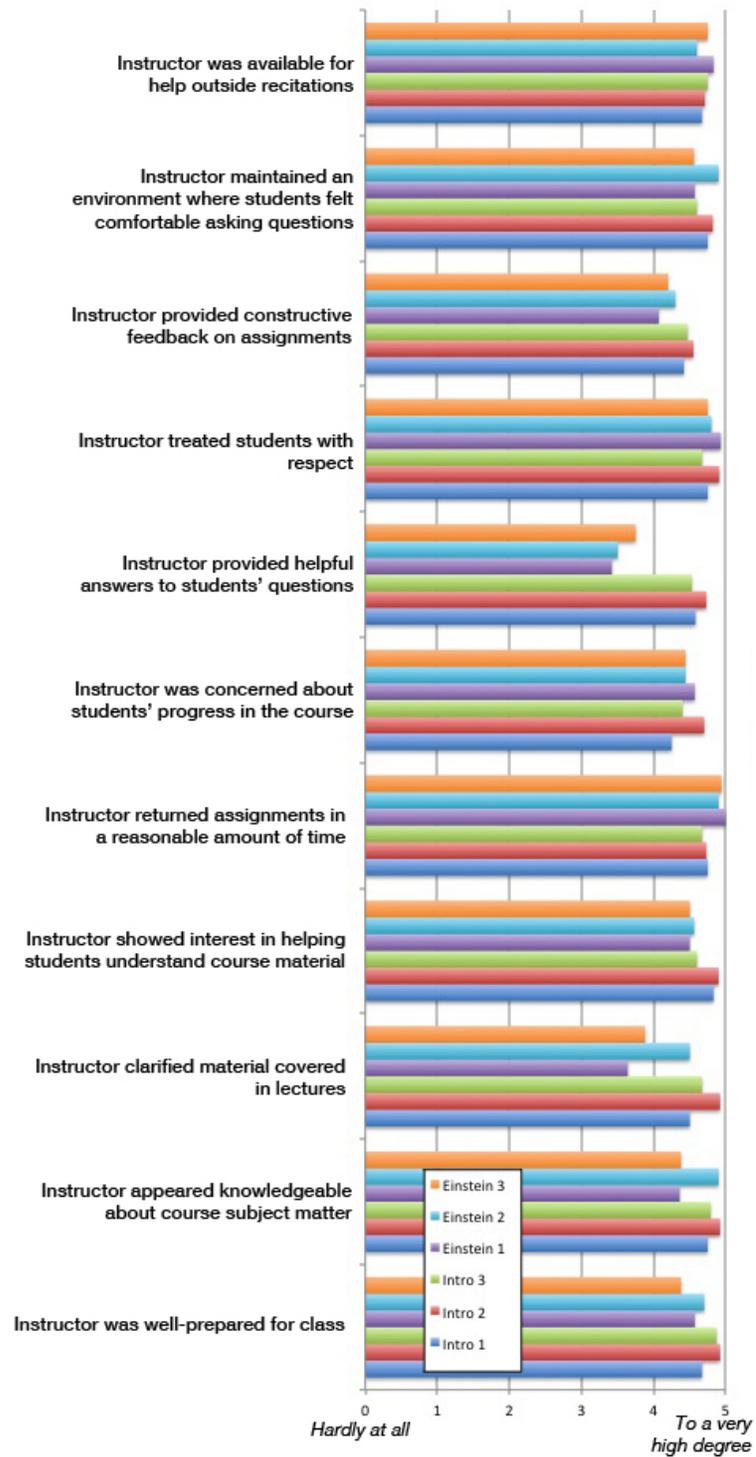
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1. EVALUATIONS

1.1. **Quantitative Feedback.**







1.2. Qualitative Feedback.

1.2.1. *Selected Comments on Introduction to Philosophy of Science (Fall 2009).* **Your lab/recitation instructor would like to know if there is something you believe she/he has done especially well in teaching this lab/recitation section.**

- Always clarify the idea of weekly topics that were taught in lecture. I think it's something much more clear than what I got in the lecture.
- The weekly commentaries, though very arduous, are extremely helpful. The comments you give or explanation are helpful. I found, when I still had trouble grasping a concept that I felt should have been more obvious to me but wasn't I could ask in my commentaries w/out feeling embarrassed.
- Using everyday examples to clarify complex subject matter. Respecting and being patient with students who had difficulty grasping the subject matter. Noticeable passion with the material, which kept the rest of us engaged.
- Julia had done a terrific job explaining difficult philosophical topics to someone who has never taken a philosophy class. She constantly is making sure the students understand. Great TA!
- Very approachable. Explains topics very well, especially if it is considerably difficult or ambiguous. Goes out of her way to make sure you understand the material and are caught up with the class.
- She is very knowledgeable about the material. It is obvious she is very smart and passionate. She's tough though, and can be a bit intimidating. She really wants you to work during recitations, but creates good in-class activities for us.
- Was very excited about teaching and very helpful when answering questions.
- I like her awareness of how the students are doing. She tries to bridge the gap between prof. and students and that is greatly appreciated. Because of that awareness, she was able to structure her recitation around those needs. I also like that recitation was flexible in that there weren't set agendas and we were able to go over what we needed to.
- Taking an interest in students' progress. Being available for help outside recitation.
- Julia made learning the philosophy of science tolerable. She did great at clarifying vague concepts and was very understanding/willing to help students. You guys should probably keep her.
- She has made herself available for help and pays attention to everyone in answering each question as best she can. She kept the recitations interesting by offering stories and new ways of communication.
- Group activities were helpful. Always got class involved in discussion. Passion for material, wanted us to understand it.
- She does a really nice job in clarifying tricky things from lecture. The way recitations are organized keeps me engaged.
- Julia makes herself available to students at all times, which can't be easy to do. I've emailed her with questions frequently and always received prompt responses. She has an extensive knowledge of HPS, and can bring in a wide variety of outside material to talk about and clarify points. She also is clearly very passionate about HPS. One of the best Phil. TAs here.
- She is very knowledgeable on the material and therefore does a good job of explaining things that may not have originally been clear from lecture. She has provided me with helpful feedback to questions.
- The recitation definitely clarified the material for me and also the discussions helped me to make better arguments for just about anything. The class was really valuable.
- This course recitation was probably the first recitation in which I actually felt compelled to participate in discussion. Most recitation instructors have to squeeze even yes/no answers from students. We actually had active debates, discussions, and elaborations of readings.

Your lab/recitation instructor would also like to know what specific things you believe might be done to improve the teaching of this lab/recitation section.

- Group work for me was less beneficial. Lecture style or working w/common questions for the commentaries helped.
- More group exercises so we can see what our peers think.
- I can't think of anything that needs improvement.
- Less group activities, more review of lecture.
- Other than explaining Popper's falsification by interpretive dance, I can think of nothing.
- I think she spends a little too much time in group discussion and not enough time in covering the lecture.
- $i^x = e^{\frac{i\pi x}{2}}$?

- Nothing. She does a great job. Recitation helps a lot.
- Perhaps some more hands on stuff featuring thought experiments in the different areas under study.

1.2.2. *Selected Comments on Einstein: Modern Science and Surprises (Spring 2010).* **Your lab/recitation instructor would like to know if there is something you believe she/he has done especially well in teaching this lab/recitation section.**

- It felt comforting knowing the instructor had a great deal more knowledge than the course work demanded. So I never felt like she didn't know what she was talking about.
- She was very knowledgeable on the content, so she was able to give very clear and insightful explanations. Though the course was designed in such a way that she was not permitted to give answers to questions, she directed the class discussion in such a way that we were able to answer our own questions.
- She encourages everyone to speak up and state their opinions with no biases and provokes thought
- She is very willing to change the way we do things in class so everyone gets involved and understands. She always tries to prepare us well for exams, and is always willing to help us with our problems in the class.
- Got the class to interact well.
- The discovery and questions were a big help. Being able to discuss amongst ourselves the answers to questions we all had since she was not allowed to directly answer them.
- Excellent recitation—I learned a great deal here and had a lot of good thinking sessions during recitation.
- Very receptive to any questions. Allowed group work with challenging questions to stimulate thinking.
- She is very good at promoting discussion in class. She is always available to talk about class material.
- Encouraged us to find out answers by ourselves which ended up being more beneficial than if she just told us.
- Allowing students to interact spawned more critical thinking.
- Facilitated group discussion well. Maintained classroom interaction to a high degree.
- Julia is the most fantastic recitation instructor ever. Answers any question and is funny and enjoyable to talk to.
- Made us think about consequences of physical properties.
- She has done an outstanding job reaching out to everybody, making sure everyone participates.
- Helped clarify things from lecture. The question things we did toward the end of the year really helped. P.S. You were awesome.
- Helping students through the course by actually making them work through it rather than just giving them answers and explanations. She was easily in the top 3 I've had in 4 semesters at Pitt. P.S. You're awesome.

Your lab/recitation instructor would also like to know what specific things you believe might be done to improve the teaching of this lab/recitation section.

- Sometimes when people answered questions there was some silence. In retrospect I know you wanted others to chime in or you wanted the last answer to be recognized as perhaps partially correct and a little more thought would make the answer correct.
- Have the ability to answer questions. Nothing wrong with Julia, just the way the class was.
- Perhaps more test review on the recitation before a test.
- Let us know sooner that you're not allowed to give answers so we don't think you're being mean.
- Try not to hurt our brains as much with your questions.
- I believe it would have been helpful to answer questions more clearly rather than stimulating more discussion.
- Have a longer recitation period. Nothing else.
- A better approach to clarifying student questions is needed. Having other students answer is good for discussions but sometimes I don't understand their answers and no further explanation was given.
- You like having structure, which is good. However I would have liked to review more for exams on the weeks when there was an exam.

1.2.3. *Selected Comments on Myth and Science (Fall 2010).* **What were the instructor's major strengths?**

- Organized. Places emphasis on important points and reviewed major point each week. I learned more in this class than any other I have taken. One of the best teachers I have ever had.
- She was very enthusiastic about the material and conveyed the information very clearly. She was also skilled at leading thought-provoking discussions.
- Julia is very organized and thorough in all of her lectures. She's very good at getting everyone involved and interested. She commands attention because she's a good and intelligent speaker.

- Clarity
- Highly organized, ability to answer questions, strong base of knowledge.
- Knowledge, enthusiasm.
- Great lecturer. Good use of examples and questions.
- Great knowledge of not only the material but other sciences to be able to give good examples. Also helped me to explore any interests I might have in the field.
- Julia was very enthusiastic about the material and made a point to consult “experts” when the topic we were discussing was outside her area of focus. She was positive and fair.
- Getting class involved and participating.
- Very well knowledgeable in subject area. Very passionate about what was being taught. Very good class structure. Had all students’ respect.
- Julia is very organized and it’s clear that she knows a lot about what she teaches on. She also values her students’ input/opinions, and I think this quality is essential for effective teaching.
- Knowledge of course, was able to cram a lot of material in one class. Tried her hardest to keep us interested in class.
- Very enthusiastic and passionate, wants us to learn, explains things clearly.
- Great discussions.
- She planned her lectures well, which allowed her to convey a large quantity of information in 2.5 hours. She also assigned a variety of readings each week, both primary and secondary sources dealing with the subject matter which helped with the elucidation of concepts.

What were the instructor’s major weaknesses?

- Sometimes grading on commentaries didn’t make sense; maybe a point system instead of a good/very etc. rubric. (Not really a weakness, just an observation)
- None
- Tended to rant about Plato and was sometimes pressed for time.
- She was too tough for an introductory course
- Sometimes went off on tangents if she got excited about a certain topic.
- Time management
- Glossed over some subjects, maybe tried to cover too much.
- None, in my honest opinion.
- She seemed at times unable to explain some concepts without deliberately referring to ones explained earlier. The artificiality of this technique, which useful at times as a pedagogical device, is often unnecessary.

What aspects of the course were most beneficial to you?

- Coming to class.
- Effective and engaging lecture style
- The introduction to philosophy, which was something I had never seen before.
- Commentaries, in class discussions
- Everything It gave me tools to bring to other classes. Not only am I able to critically think about readings but able to ask important questions. Always question what I read.
- The discussions
- I learned the most through the lectures.
- Was fun
- Required readings accompanied by commentaries each week made for productive class sessions.
- Facts about the development of science in comparison to modern science.
- The reading guides were very beneficial to me. Small class size also helped.
- Reviews of important material every week, doing commentaries and getting feedback, good amount of reading most weeks. Class and group discussions were also very helpful!

What suggestions do you have to improve the course?

- Make the course have a prerequisite and don’t require so much homework every week.
- Give more assignments. Easier for myself to learn/study when I have something to review from.
- Perfect the way it is.
- It may be beneficial to save group discussion for the second half of class so it does not impede lecture material completion

- Julia ran the class very professionally and gave us all the tools to succeed. Maybe more detailed PP notes, though
- A few weeks may have been a bit too much reading (Aristotle and Plutarch) but it wasn't that bad.

1.2.4. *Selected Comments on Space, Time, and Matter (Spring 2014)*. **What were the instructor's major strengths?**

- Julia was extremely good at stimulating thinking, and my peers definitely looked to her for more information. You can tell she is extremely smart and passionate about her field, and that also makes for a teacher who can provide a stimulating learning environment. Also, she was very confident in her skills, which made it easy to trust and respect her.
- Excellent knowledge about variety of subjects
- Relaxed presentation method
- Group discussions
- She is passionate about teaching what she loves. She gets the class to participate in discussions to make sure we all understand each topic.
- She was good at explaining difficult concepts and making us think about philosophy and science. She graded the papers and assignments fairly. She was very easy to talk to and very accessible to students. She graded assignments in a timely manner and got them back to us promptly.
- Very friendly, and an effective communicator. Very good as stimulating in class discussions.
- telling stories

What were the instructor's major weaknesses?

- Julia sometimes gets off topic easily or went too fast during complicated topics. I think she realizes this though because she addresses the problem in class.
- nothing.

What aspects of the course were most beneficial to you?

- I really enjoyed the commentaries. If I didn't have to write a commentary on the reading, I would honestly just read the article to get it done. Because I was somewhat forced to think deeply about these topics, I learned more along the way and formed some of my own opinions about the world.
- Really expanded my thinking about the "factual" nature of science and made me realize how non-linear the development of science was. Also exposed me to subjects like metaphysics and refreshed my knowledge of the Greek philosophers like Plato and Aristotle.
- The course assignments were relatively easy to complete. The papers had a thorough rubric for them and the assignments were explained to us very well. The weekly commentaries were an easy way to boost up your grade. The extra credit helps as well. The course information was fun to learn too. I don't take many philosophy classes, but I enjoyed this one.

What suggestions do you have to improve the course?

- Keep class discussion or group discussion a major part of the course. This was when I was really able to form an opinion and feed off of my classmates' intelligent comments. I would also suggest that you try to be more clear on some of the more difficult topics. For example, some of the theories can be pretty heavy on Physics, and the explanation can get very confusing for a student who has not taken college Physics yet. Being more clear with the facts used to explain a theory would be very helpful.
- More homework assignments based off of in class discussions and lectures and less weekly readings.

1.3. **New Teaching Assistant Orientation Evaluations.**

NTAO Feedback

Katie Phelps <kmp69@pitt.edu>
To: "Bursten, Julia R" <jrb135@pitt.edu>

Fri, Oct 26, 2012 at 11:34 PM

Dear Julia,

We've (finally) compiled the feedback we received about your workshops at Fall NTAO. My apologies for not getting this to you sooner. The students were asked to rate your performance on a scale of 1-5, with 1 being "very little" and 5 being "very much." The questions the students were asked and the averages of the responses are listed below.

The presenter for this session:

- a) was organized and well-prepared : 4.9 (Getting Started), 4.6 (Leading Discussion Recitation)
- b) was interesting and stimulating : 4.6 (Getting Started), 4.3 (Leading Discussion)
- c) drew on his or her own experiences in the classroom : 4.5 (Getting Started), 4.8 (Leading Discussion)

99% (Getting Started & Leading Discussion Recitations) of the TAs who attended your sessions thought that you should be invited to present again.

I've listed the written comments from the evaluations below. I did not change or alter the comments in any way.

- GS - Clearly thought about all aspects of her presentation.
- GS- Amazing job, fun!
- GS – Very personable, good for the foundational overview of TAing.
- GS – Julia was very well prepared and obviously passionate about college instruction.
- GS – Awesome.
- GS – Very good.
- GS – She was very engaging.
- GS – admitted own issues (i.e.; relevant); good to add technology overview.
- GS – the presenter was good and was engaging.

- LDR - Julia is well-prepared and inspirational. Like the presentation very much!

- LDR - Good at leading a discussion and she showed us how to do that. Lively.
- LDR - Maybe a little less time with audience feedback?
- LDR - In both workshops she randomly called me out several times just because she had decided to memorize my name. Also kept breaking us down into small groups and then discussing broadly which seemed like a waste of time.
- LDR – Did a very good job at conveying info and presenting a dynamic lecture.
- LDR – Nice
- LDR – Very energetic.
- LDR – Still awesome.
- LDR – Very good.
- LDR – engaging, well-mannered, thoughtful, eloquent speaker
- LDR – Excellent at modeling leading discussions.
- LDR – Very engaging!
- LDR – Excellent.
- LDR – Good insights – really confident.

If you have any questions or concerns about your feedback, feel free to contact me. Thanks again for presenting at NTAO!

Best,

Katie Phelps

Ph.D. Candidate, Department of History

Teaching Fellow, TA Services

Center for Instructional Development & Distance Education

University of Pittsburgh

2. TESTIMONIALS

2.1. Edouard Machery

Faculty Observer for Space, Time, and Matter.



University of Pittsburgh

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September 09, 2014

Teaching letter for **Julia Bursten**

I am delighted to write an enthusiastic assessment of Julia Bursten's teaching. As the Director of Graduate Studies of the Department of History and Philosophy of Science, I have followed Julia's teaching performance over the years; I have reviewed her teaching portfolio; and I have observed her teaching. Julia is an extremely talented teacher, she has a passion for helping students think clearly, and she conveys a contagious love for philosophy.

Julia has taught, or assisted the teaching of, many courses at Pitt, including courses in the general philosophy of science (*Introduction to the Philosophy of Science*) and courses in the history and philosophy of physics (e.g., *Einstein: Modern Science and Surprises*). She also has a broader teaching competence, and she is ready and able to teach courses in the history of philosophy (e.g., early modern), in metaphysics, in epistemology, etc. (see her teaching portfolio for a list).

Her teaching evaluations have always been outstanding. They reflect her availability for, and interest in, her students, the detailed feedback she gives them, the clarity of her lectures, and her overall commitment to teaching. Students' comments (see her teaching portfolio) are also remarkable since they are almost all very positive (quite a feat!).

Julia's talent for, and love of, teaching have been widely recognized at Pitt. She has been involved with the CIDDE (Center for Instructional Development and Distance Education) and she has led workshops on how to teach with small-discussion methods and how to use rubrics to grade essays. Recently, she was awarded the 2014 HPS Teaching Excellence Award, which only goes to the best teachers among our students.

On April 03, 2014, I visited Julia's class as an observer. During Spring 2014, Julia was teaching *Space, Time, Matter*. The aim of this course is to teach students the history of physical science in the West from antiquity to the present day. It is not an easy course to teach since the instructor must move swiftly from the history of science to the philosophy of science. Students must get acquainted with the history of scientific and philosophical theories of space, time, and matter, and they must also improve their philosophical understanding of basic issues in the philosophy of science—including the role of mathematics in science—in light of the historical record. Each lecture lasts for 75

minutes. It goes without saying that capturing undergraduates' attention for that long is quite a challenge, but Julia met this challenge brilliantly. I was sitting in the back of the classroom, and I could observe students' behavior during class. Julia allows the use of personal computers, and some used them to take notes. I did not see any student browse the web (check her emails, etc.) to kill time; rather, they were all following the class and getting involved in discussion. I can only wish the same were true when *I* teach.

Instructors in our department are given much freedom to design their syllabus, and Julia took this opportunity in designing her syllabus for *Space, Time, Matter*. This syllabus is excellent, and it brims with interesting articles and topics (e.g., "Here There Be Dragons: The History of Cartography"!). She also brought a few guest speakers to lecture on specialized topics. Students were given a clear sense of her expectations and of the main themes of the course. They were also given several kinds of assignments, including the creation of a podcast. The podcasts produced by the students are fantastic, and you can listen to them there: <http://www.juliabursten.org/student-projects/>. Students also had to write "commentaries" regularly, which were based on the readings. These ensured students kept up with the readings, and they were briefly discussed in class.

I was delighted with Julia's teaching. Her teaching is very dynamic, which is required to keep attention and interest high during a 75-minute long lecture. She changes the format of the class a few times, starting with a summary of the previous lecture, moving to a discussion of several focused issues emerging from the readings, before dividing the class into small discussion groups. The structure of the class is clearly very well thought through.

Julia started her lecture by reviewing the key ideas from the previous lecture. This review was quick, to the point, and involved the students. The topic of the 04/03 lecture and discussion was the discovery of the oxygen, and the discussion involved both historical and philosophical aspects. In particular, the notion of a scientific discovery and the role of social structures in establishing what counts as a scientific discovery were examined in detail.

Julia made an excellent use of powerpoint during the lecture part of this class. The slides were mostly used to introduce topics of lecture and discussion, and were not text heavy. They were tools for structuring the lecture instead of substitutes. Every few minutes, she asked questions related to the readings and lecture. Some questions were comprehension checks, others opinion questions. Students were obviously involved and eager to participate. Julia excelled at elaborating on students' answers to her questions.

Julia knew all the students by name, and she made sure that the students who had raised their hand were all able to speak. The class was not dominated by a few students; rather, most students took part to class discussion, often engaging with one another under Julia's supervision.

After a bit more than half an hour, Julia divided the class in small discussion groups of four students. Each group was asked to discuss how important nomenclatures and,

generally, scientific classifications are for science. Julia visited each group in turn, ensuring that students were focused on the task at hand. When the group activity ended, a representative of each group presented the group's conclusions to the remainder of the class.

Finally, it is worth commenting on a few other aspects of Julia's teaching. She is prompt to grade and give back assignments to students, commenting on these assignments extensively. She provides students with much learning materials, and she repeatedly invites them to meet with her outside the classroom to prepare for the final assignment.

Julia's love for teaching manifests itself in her volunteering to mentor undergraduate students. During Spring 2014, Julia supervised Alexandra Krongel's (a sophomore in HPS at Pitt) independent study project on women and alchemy. Under Julia's supervision, Alexandra Krongel obtained a summer Brackenridge fellowship (www.honorscollege.pitt.edu/summer-brackenridge-fellowships), and is now developing her research project in the history department. This fall, Julia is supervising a high school senior thesis project on the early history of nanoscience (with Pittsburgh Science and Technology Academy). This is simply remarkable.

Julia is a wonderful teacher. She lectures very well. She speaks clearly, she is very engaging, and she is very lively. She is calm and in full control when she is lecturing or running a discussion. She is also enthusiastic about the materials she is teaching, and her students obviously enjoy listening to her and engaging in discussion. She is dedicated to teaching, developing original syllabi and assignments, and providing students with ample feedback. She goes out of her way to be available for discussion and advice outside class, and students are grateful for her help. No wonder her teaching evaluations are systematically off the chart.

Julia is an outstanding teacher, and students obviously enjoy taking classes with her. I enthusiastically recommend her as a teacher.

Sincerely,

A handwritten signature in cursive script that reads "Edouard Machery". The signature is written in black ink and is positioned to the left of the typed name below.

Edouard Machery
Professor
Department of History and Philosophy of Science
University of Pittsburgh

2.2. John Norton**Professor of Einstein: Modern Science and Surprises.**



University of Pittsburgh

Center for Philosophy of Science

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Julia Bursten
Report on Observation of Teaching
HPS 0410 Einstein for Everyone
March 29, 2010

Julia Bursten was one of my teaching assistants for this course in the Spring 2010. The course material is an introduction to modern physics with a strong emphasis on Einstein's contribution. It is designed for students who have little background in physics but want some understanding of all the fuss associated with Einstein. It is a good course to teach since the students who take it are motivated primarily by interest. The challenge of the course, however, is that the material is conceptually difficult for many students with less science. A special problem is that the course attracts students with very different backgrounds, from English majors to engineering students. Somehow we need to have them all interact profitably.

The course is structured traditionally. There are lectures that I give and recitations lead by the teaching assistants. I provide a moderate amount of structure for the recitations. Students are to complete and submit written assignments for each recitation; and there is a list of discussion topics specified for each recitation. Otherwise, I leave the running of the recitation to the teaching assistant.

My expectation is that the teaching assistant will first moderate a discussion of the assignment questions. Then, if that material is exhausted, the TA will move onto the discussion questions. I stress that the teaching assistant's job is not to lecture. It is to promote active discussion by students. For active discussion produces a quite different and, I believe, better understanding of the material.

The problem is that students find this active discussion hard. They prefer to sit silently and have an instructor feed them answer that they dutifully jot down in preparation for the test. As term proceeds and students get overworked and tired, their reluctance to discuss can become more acute.

On March 29, I visited Julia's recitation as an observer, trying as much as possible to be an invisible fly on the wall. I was very pleased with Julia's teaching. By this stage of the term, Julia had recognized slippage in student preparation. They were doing less ahead of the recitation and

were less prepared for the discussion. To remedy this, she had asked them all to prepare two things in advance. First, they had to email questions to her on the readings. That is a simple way to ensure that they had read something. Second, they were to report “discoveries” to her. These are ideas that they found interesting or intriguing in the assigned reading. That, I thought, is a very good idea. It encourages a different sort of reading. Students now look for interesting and rewarding ideas, as opposed to anticipations of test questions.

When the recitation started, Julia quickly divided the class in small discussion groups of four students. Each group was to discuss the material. While they did this, Julia moved from group to group, to ensure that things were proceeding smoothly in each. About half way through the recitation, the group activity ended and the recitation returned to a single forum. The discussion questions were written on the blackboard and they became the focus of discussion. A representative of each group presented the group’s conclusions to the recitation.

The introduction of this structure into the recitation was Julia’s idea. It is a very effective way to ensure that the recitations are filled with students talking and discussing. The structure resulted from attention to what was happening in the recitations and careful thought over what it would take to keep the recitations as discussion meetings. It shows that she has a good understanding of the realities of classroom dynamics and the ways in which it can be profitably directed.

It is clear to me from this his experience and others during the term in which she was my teaching assistant that Julia is excellent teacher.

Sincerely



Director, Center for Philosophy of Science
Professor, Department of History and Philosophy of Science
University of Pittsburgh

2.3. James Lennox
Faculty Adviser to Graduate Teaching.



University of Pittsburgh

Kenneth P. Dietrich School of Arts and Sciences
Department of History and Philosophy of Science

October 27, 2013

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To whom it may concern:

I am writing to provide an enthusiastic endorsement of **Julia Bursten** as an uncommonly fine teacher. From the evaluations she has received from students you can see that they agree, but I write from the perspective of someone who has been teaching undergraduates for 36 years and who has for some years taught our Teaching Practicum seminar in which all of our second year students are required to participate.

The course Ms. Bursten was teaching was a version of one I designed many years ago entitled *Myth and Science*, which is cross-listed with Classics. The aim of the course is to introduce students to the origins of European science and philosophy in Classical Greece, and to have them reflect on the similarities and differences between the achievements of Greek medicine, mathematics, astronomy and natural philosophy and the myths of near Eastern cultures and those embedded in the work of Homer and Hesiod. Its catalogue description is general enough that it gives our advanced graduate students a great deal of flexibility to decide how they wish to focus the course and approach the material. Thus the syllabus you see in Ms. Bursten's teaching portfolio is entirely of her own design, though likely influenced by looking at previous iterations.

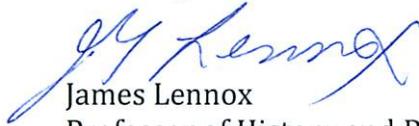
Because of a conflict in our schedules, I could not observe Julia teaching live, and so I observed videos of her teaching. She also consulted with me when designing the course. The version of the class she taught meets only once a week for 2.5 hours in the evening. This is a challenge in three respects: the length of time of each class, the hour of the day (when many of the students will be tired, some from working all day) and the length of time *between* classes, plenty of time to forget what was previously covered. The better instructors, such as Julia, will design the assignments and structure the classes to overcome these problems. Bursten's classes began with a very clever way of reviewing the previous week's material—she handed back commentaries that the students had done on that material, but each student got someone else's commentary. Based on what they read, they then had to summarize some aspect of the previous week's material—in this case, a number of Greek myths. She also kept changing the format of the class—from these summaries, to lecture, to small group discussion in which she would participate, to presentations—which helped overcome possible fatigue due to the hour and broke up the 2.5 hour class period into manageable chunks. So much for the intelligent design of the course structure.

Julia Bursten is also a natural teacher. The students were clearly comfortable with her and felt at ease asking questions, probing things she was saying, and presenting

their own ideas. She is among the very best of our graduate students in being able to involve virtually every student in the discussion of whatever topic was on the table. She kept a record of students' responses and questions on the board while using power point to keep the class on track. She was respectful of their responses to her questions, and to their questions, without being condescending. Julia would occasionally challenge the students to clarify their questions and answers, but had built up such a rapport with them that they were comfortable with her doing so. The bottom line is that there was genuine learning taking place in her classroom.

In short, in Julia Bursten you are not only getting an outstanding scholar but an outstanding teacher.

Sincerely,



James Lennox
Professor of History and Philosophy of Science
Director, Classics, Philosophy and Ancient Science Program

2.4. Casey Lally

Student in Space, Time, and Matter. Julia,

I meant to send this message earlier, but I wanted to thank you for a great Space, Time, Matter class last semester! I learned so much about topics that I had little exposure to before. Not only that, but you and the other graduate students that came to speak to us have inspired me to push my own limits as a woman in the scientific realm. So thank you very much, and I wish you the best of luck wherever your studies take you!

Sincerely,
Casey Lally

2.5. Sameer Rahman

Student in Intro to Philosophy of Science, Einstein: Modern Science and Surprises, and Myth and Science. To Whom It May Concern:

My name is Sameer Rahman, and I am a recent graduate from the University of Pittsburgh. I completed my undergraduate studies in History and Philosophy of Science. When it comes to describing my experience at the University of Pittsburgh in the History and Philosophy of Science major, one individual comes to mind, and that is Julia Bursten. I have been associated with Julia Bursten since my first HPS course at PITT. Throughout my experience as an HPS student, Julia has been an integral part to my success.

In my many years of education be it high school or undergraduate studies, I can say Julia Bursten is very dedicated to her field of study in HPS. Julia presents a professional standard in her lectures and Teacher's Assistant duties. As a TA, I noticed that Julia went out of her way to accommodate students during her office hours. She took the initiative to meet outside of office hours to better accommodate students as well. Often she would send e-mails to the course list and reiterate solutions to misunderstandings in the material. Julia also took the time to read drafts for essays and respond with comments to enhance student's papers. Although she was just a TA, she always put fourth the utmost effort to help her students in whatever was necessary.

In the fall of 2010, I had the pleasure of participating in Julia's course Myth and Science at PITT. Her semesters spent as a Teacher's Assistant transitioned perfectly into being a professor. She presented a very interesting course that stimulated students' thoughts week in and out. Julia was effective in persuading students to interact in groups often to bounce ideas off of one another. She was always punctual and professional. Her class was always organized and just a joy to be a part of. Julia always presented thought provoking arguments and thoroughly explained the course material every week. She also presented her insight and extra material to enable students to better understand the material.

My experience with Julia Bursten could be presented for vast amounts of time because it has always been a joy and helpful. Julia Bursten in my opinion has been a great TA and professor. She exemplifies what it takes to be an effective educator and student. She possesses the traits to succeed because of her willingness to help others, her work ethic, and her overall great disposition at all times. Julia Bursten has made my experience as an HPS major all the better at the University of Pittsburgh.

2.6. Jonathan LaTourelle

Student in Einstein: Modern Science and Surprises

Current Graduate Student in History and Philosophy of Science, Arizona State University. To Whom It May Concern:

It is my sincere pleasure to recommend Julia Bursten to you. I had the good fortune of being taught by Julia, in the early part of 2010, as part of a class on the philosophy of 20th century physics following Einstein and his thinking. Julia's wide breadth of knowledge was obvious to me immediately, but it was her love of Leibniz that first caught my attention. I remember quite clearly the brilliance in her eyes as she told our class about The Principle of Sufficient Reason and its function in the context of modern scientific explanation.

At that time philosophy and science had been my passion for some time, I had transferred from a City College in Santa Barbara only a semester before to study at the University of Pittsburgh because of their famously respected program; it was Julia's welcoming example and instruction, and willingness to participate as an interlocutor, that created a productive space for me to explore the history of scientific ideas in real depth for the first time upon my arrival at the university.

Over my time at Pittsburgh Julia has consistently volunteered herself as an academic resource: she has helped me to explore ideas as diverse of the history of thermodynamics and statistical mechanics to the nonexistence of a philosophy of geology to the nature of the handedness of chemical reactions (the last of which was a all during a serendipitous discussion upon a chance meeting on an early morning bus-ride!). My only regret is that I've not had an opportunity to spend more time learning about the history and philosophy of chemistry from her, which I understand is the field of her technical work and passion.

Her strength as a teacher comes from many, and various, directions: good humor, good story telling, good looking; but of primary importance to me was her ability to engage me in critical argumentation that I was unfamiliar with and in so doing help me realize my own nascent, hardly cogent, thoughts in mature and coherent essays and arguments. I am deeply indebted to, and thankful for, Julia's influence on my thinking and writing; even more so, I am grateful for her continual encouragement to continue with my own academic work. She is, in my opinion, a highly accomplished teacher and philosopher of science.

2.7. Joshua Maskrey

Student in Myth and Science. I have been asked to write a letter of recommendation that attests to Julia Bursten's abilities as an instructor. My past experiences in Julia's classroom make this an easy task. Last fall, I decided to enroll in Julia's Myth and Science class. As a chemical engineer, I was taking this class as one of my electives. I was interested in the material to be covered in the course, but, quite honestly, I didn't expect it to be exciting like my technical classes. However, Julia's teaching methods quickly made Myth and Science the class I looked forward to every week last semester.

First and foremost, Julia is a highly organized, enthusiastic and accessible instructor. The first day of class, she distributed a syllabus containing the topic of every class along with the required work for the semester, and she stuck to it. She always came to class completely prepared with powerpoint slides, handouts, and ideas for the evening's lecture. She encouraged students to come to her office hours or contact her by e-mail if they struggled with the weekly readings. Many great instructors have these traits. Julia, however, used these traits to create a unique classroom environment that allowed students to learn a massive amount of material and have a lot of fun learning it. Every class with Julia was an adventure. Her classes were interactive; there was never a Myth and Science class where you just listened to her talk all night. We would often break into groups to analyze a passage from a reading, or prepare an argument in support of or against an ancient philosopher's viewpoint. During these group exercises, she would move from group to group to listen in and provide feedback; often saying something that would make the group think about an idea that wasn't previously considered. If a group was struggling, she always knew exactly what

5. SAMPLE SYLLABI

Space, Time, Matter

Spring 2014

Tues/Thurs 11–12:15
CL 204

Julia R. Bursten
E-mail: jrb135@pitt.edu

Office Hours: M 1–2, W 11–12, & by appt
Office: CL 901J

1 Course Description

Ever since the ancients first looked up at the sky, people have asked themselves questions: What are the stars made of? Does time have a beginning or an end? Is the universe infinite? Throughout history, humanity has theorized about the nature of space, time, and matter, and these theories became the basis of both ancient and modern physical science.

This course is an introduction to the history of physical science in the West from antiquity to the present day. We will investigate how theories of space, time, matter and motion evolved from ancient Greece and antiquity, through the Scientific Revolution of the 17th century and the birth of modern physics and chemistry in the early 20th century, and into today.

This course is suitable for both science and non-science majors.

2 Format

This course is organized into three units: space, time, and matter. Rather than developing comprehensive chronologies for scientific thought about each of these subjects, each unit is comprised of a selection of historical episodes, some of which overlap between units. This episodic approach allows the course to develop two main themes:

- First, these episodes all highlight the use of mathematics in the development of ideas in the physical sciences. We will explore the connection between mathematical reasoning and scientific reasoning throughout history and consider why these modes of inquiry have been paired so often and so successfully in the development of theories in the physical sciences.
- Second, we will treat our historical survey as a subject of discussion in itself. History is a discipline of stories, and stories come in many formats. We will engage with a variety of narrative formats throughout the course, including primary texts, academic scholarship, popular science, radio programs, and science fiction. This variety is intended to cultivate reflective discussion about the impact a story's form on its ability to communicate a message to its audience. Students will develop historical narratives in multiple formats throughout the course, including both short essays and audio recordings (podcasts).

3 Evaluation

Students will be evaluated in the following 5 areas:

1. **Commentaries (30%)**: Students must complete 10 commentaries over the course of the semester. Each commentary is worth 3% of the final grade. Commentaries may be informal, but they should reflect knowledge of the reading and a command of written Standard English. Commentaries are due by e-mail to *spacetimematter2014@gmail.com* by *Monday at midnight every week* and should be between 300–500 words. Students who submit more than 10 commentaries will receive credit for their 10 highest-scoring papers.
2. **Essay (15%)**: All students will be required to submit one essay of approximately 1200 words (4–5 pp.) in the style of an academic history paper. This essay is due *Monday, Feb. 17*.
3. **Podcast (15%)**: All students will be required to produce and record one historical audio narrative (podcast) between 5–10 minutes long. This podcast is due *Monday, March 17*.
4. **Final Project (25%)**: For the final assignment, students will choose to either write a longer essay of at least 2000 words (8–10 pp.) or produce and record a longer podcast at least 15 minutes long. This project is due *Tuesday, April 22*. Students are encouraged to explore either novel narrative forms, content not discussed in class, or both.
5. **In-Class Assignments (15%)**: Students will complete various in-class activities and assessments throughout the semester. These will include both individual and group exercises in discussion and writing. Short quizzes may be given in class. In-class assignments may not be announced ahead of time.

There are no scheduled exams for this course.

4 Policies and Resources

4.1 Classroom Community

This course involves active student participation in discussions of potentially contentious issues. For these discussions to be a success, all students must engage with the readings and with their peers. Weekly commentary assignments have been designed to encourage engagement with readings, and group discussion activities will involve students in debates with each other.

By entering any classroom, students agree to participate in an intellectual community. This community encourages respectful disagreements that foster new knowledge through the tools of critical thinking. This community does not tolerate disrespectful disagreements that aim to attack a person's ethnicity, religious beliefs, politics, gender, or other aspects of personal identity.

4.2 Laptops, Tablets, Phones, Devices

Because this course encourages students to think of historical narratives in multi-media terms, electronic devices are welcome in the classroom so long as they are being used to enhance students' classroom experience (e.g. for reading references, note-taking, etc.). The use of electronic devices in the classroom is a privilege, and students who abuse this privilege will revoke it.

4.3 Writing Center

A strong command of written English is necessary for any college education and is expected in this class. If you do not presently possess the skills required to compose clear, organized, and thoughtful essays, then you must be prepared to acquire them. I encourage you to speak with me during office hours if you are concerned about your performance in this area, and to make use of the University of Pittsburgh Writing Center. Further information on the Writing Center can be found online at <http://www.english.pitt.edu/writingcenter/>

4.4 Accommodations

If you have a disability for which you are or may be requesting an accommodation, you are encouraged to contact both your instructor and Disability Resources and Services (DRS), 216 William Pitt Union, (412-648-7890) as early as possible in the term. DRS will verify your disability and determine reasonable accommodations for this course.

4.5 Academic Integrity

Students and faculty are expected to familiarize themselves with the published rules and regulations governing academic integrity, a term meaning the ethical standards of integrity by which each student and faculty member is expected to operate. As members of a community of learners, all students and instructors are expected to adhere to these behavioral, academic, and ethical standards of the University community and of their field of study. The Academic Integrity Code sets the standards for protocol regarding issues such as how to handle cheating or plagiarizing. It can be found at www.provost.pitt.edu/info/ai1.html

5 Schedule of Topics

Week 1: Why History of Science?

- Jan 7: History as Stories
- Jan 9: Mathematics and the Shape of the Physical Sciences

Part 1: Space

Week 2: Ancient Cosmology

- Jan 14: Ancient Theories of the Natural World
- Jan 16: Geometric Cosmology

Week 3: Looking Up

- Jan 21: The Scientific Revolution
- Jan 23: Galileo's Telescope

Week 4: Mapping the Earth

- Jan 28: Here There Be Dragons: The History of Cartography
- Jan 30: Projection and Distortion

Part 2: Time

Week 5: Carving Up Time

- Feb 4: Simultaneity and Duration: Measuring Hours, Days, Weeks, and Years
- Feb 6: The French Republican Calendar

Week 5: Space, Time and Light

- Feb 11: Background to Special Relativity
- Feb 13: The Relativity of Simultaneity and The Light Hypothesis

Week 7: The Philosophy of Time

- Feb 18: What is Time?
- Feb 20: The Arrow of Time

Week 8: Time, Space and Calculus

- Feb 25: Leibniz, Clarke, and Newton
- Feb 27: Time and Infinity

Week 9: Time Travel

Readings:

- March 4: The Grandfather Paradox
- March 6: Time Travel in Literature

Spring Break

Part 3: Matter

Week 10: Ancient Matter Theories

- March 18: How Many Elements?
- March 20: Matter and Change

Week 11: Telling Chemical Stories

- March 25: How Materials Define Societies
- March 27: Kinds of Historical Narrative

Week 12: The Birth of Chemistry

- April 1: Phlogiston and Oxygen
- April 3: Dalton's Atoms

Week 13: Atoms, Molecules, and Bonds

- April 8: Quantum Mechanics
- April 10: What are Chemical Bonds?

Week 14: Space, Time, and Matter in the 21st Century

- April 15: Space and Time: Black Holes and Quantum Fields
- April 17: Matter: Density Functionals and Nanoscience

Reading Schedule

WK	TOPIC	DT	READING	NOTES
1	Why History of Science?	1/7	N/A	
		1/9	Bowler and Morus, "Science, Society and History" Wigner, "Unreasonable Effectiveness" (Berlin, "History and Theory")	
Space				
2	Ancient Cosmology	1/14	Radiolab, "Space" Pannekoek, "World Structures" (Wheelwright, "The Philosopher-Scientists of Miletus")	
		1/16	Plato, <i>Timaeus</i> , 28b–34d Aristotle, <i>De Caelo</i> Book II, 1-4 http://classics.mit.edu/Aristotle/heavens.2.ii.html (*Kepler, <i>Mysterium Cosmographicum</i>)	Add/Drop Ends 1/17
3	Looking Up	1/21	Shapin, "What Was Known?" Pannekoek, "Astronomical Computation"	
		1/23	Radiolab, "The Distance of the Moon" Galileo, <i>The Sidereal Messenger</i> http://www.thisamericanlife.org/radio-archives/episode/475/send-a-message?act=0#play	
4	Mapping the Earth	1/28	Denny, "Mapmaking" (Denny, "The Electronic Age")	
		1/30	Mandelbrot, "How Long is the Coast of Britain?"	
5	Carving Up Time	2/4	Holford-Strevens, "Prehistory and History of the Modern Calendar" and "Weeks and Seasons" Pannekoek, "Reform of the Calendar"	Essay Assignment Handed out
		2/6	Richards, "Calendars of the World" and "French Republican Calendar"	
Time				
6	Space, Time & Light	2/11	http://www.pitt.edu/~jdnorton/teaching/HPS_0410/chapters/origins/ http://www.pitt.edu/~jdnorton/teaching/HPS_0410/chapters/origins_pathway/index.html (http://www.youtube.com/watch?v=BG2sDVjL1wg)	
		2/13	*Einstein, "On the Electrodynamics of Moving Bodies"	
7	The Philosophy of Time	2/18	Radiolab, "Time"	Essay Assignment Due 2/17
		2/20	http://plato.stanford.edu/entries/time/ (Broad, Braithwaite, and MacMurray, "Symposium: Time and Change")	
8	Time, Space, and Calculus	2/25	Alexander, Introduction to Leibniz-Clarke Correspondence Leibniz-Clarke Correspondence, 4 th letter and Reply	
		2/27	Bardi, "Flaws of Motion"	
9	Time Travel	3/4	Your Favorite Time Travel Stories	Podcast Assignment Handed Out
		3/6		
Spring Break 3/9–3/16				

Matter				
10	Ancient Matter Theories	3/18	Plato, <i>Timaeus</i> 52d–61d Aristotle, excerpts from <i>Generation and Corruption</i> and <i>Meteorology</i> <i>Optional: Lloyd, “Hot and Cold, Wet and Dry”</i>	Podcast Assignment Due 3/19
11	Telling Chemical Stories	3/25	CHOOSE 1 FOR COMMENTARY: Kean, <i>Disappearing Spoon</i> , Chs. 4–6 (Cosmology, Chemical Warfare) Blum, <i>Poisoner’s Handbook</i> , Prologue and Ch. 1 (Forensics, Toxicology) <i>Optional: Radiolab, “Desperately Seeking Symmetry” (Symmetry)</i>	Final Assignment Handed Out 3/27
12	The Birth of Chemistry	4/1	Bowler and Morus, “The Chemical Revolution” <i>Optional: Nye, “Dalton’s Atom and Two Paths for the Study of Matter”</i> <i>Optional: Chang, “The Hidden History of Phlogiston”</i>	Final Assignment Proposal Due 4/3
13	Atoms, Molecules and Bonds	4/8	Nye, “A New Chemistry, A New Physics: Radiations, Particles, and Wave Mechanics after 1895” <i>Optional: Kaiser, excerpts from How the Hippies Saved Physics</i> <i>Optional: Lewis, “The Atom and the Molecule”</i>	
14	Space, Time, & Matter in the 21st Century	4/15	Read and discuss one science news article about cosmology, physics, or chemistry from 2000 or later	Final Assignment Due 4/22
Final Exam Period 4/21–4/26				

Book Sources:

- Alexander, *The Leibniz-Clarke Correspondence, Together with Extracts from Newton’s Principia and Opticks*. Manchester: Manchester University Press, 1998.
- Aristotle, *Complete Works*, v. 1. Ed. Barnes. Princeton: Princeton University Press, 1984.
- Bardi, *The Calculus Wars*. New York: Basic Books, 2007.
- Blum, *The Poisoner’s Handbook*. New York: Penguin Press, 2010.
- Bowler and Morus, *Making Modern Science: A Historical Survey*. Chicago: University of Chicago Press, 2005.
- Denny, *The Science of Navigation*. Baltimore: Johns Hopkins University Press, 2012.
- Holford-Strevens, *The History of Time: A Very Short Introduction*. Oxford: Oxford University Press, 2005.
- Kaiser, *How the Hippies Saved Physics*. New York: Norton, 2011.
- Kean, *The Disappearing Spoon*. New York: Little, Brown, and Co. 2010.
- Nye, *Before Big Science: The Pursuit of Modern Chemistry and Physics 1800-1945*. London: Prentice Hall, 1996.
- Pannekoek, *History of Astronomy*. Sydney: Allen & Unwin, 1961.
- Plato, *Timaeus*. Ed. Zeyl. Indianapolis: Hackett, 2000.
- Richards, *Mapping Time: The Calendar and its History*. Oxford: Oxford University Press, 2000.
- Shapin, *The Scientific Revolution*. Chicago: University of Chicago Press, 1996.
- Wheelwright, *The Presocratics*. Upper Saddle River, NJ: Pearson, 1966.

PHIL 715: Seminar in Philosophical Writing

Dr. Julia R. Bursten
burstenj@sfsu.edu

Fall 2015
Mondays, 7–9:45 p.m., HUMA 381

Office Hours: Tues. 10–11, Weds. 3:15–4:30 Office: 443 HUMA

1 Course Description

The goal of this course is for students to become **good writers of philosophy**. As such, the course is divided into three themes: (1) Good Philosophy, (2) Writing Philosophy, and (3) Good Writing. The primary goal of Theme 1 is to identify and analyze patterns of argument in philosophical writing and evaluate arguments for validity, soundness, and other criteria of philosophical merit. Theme 2 aims to employ argument analysis to read, interpret, and write philosophical essays. Theme 3 aims to construct productive research and writing habits, including but not limited to managing references and developing effective writing schedules. These themes will run concurrently through each seminar meeting, where you will practice identifying and interpreting arguments, critically engaging with philosophical papers, and synthesizing these analytic skills into your own papers. These papers, and the writing processes that produce them, will serve as stylistic templates for your M.A. theses.

2 Evaluation

You will be evaluated in the following 5 areas:

1. **Argument Analysis (30%)**: You will complete 6 assignments to practice various stages of analyzing and interpreting philosophical arguments.
 - (a) Thesis, Summary, Outline of “Eating Meat and Eating People” or “A Defense of Abortion,” due Aug. 31
 - (b) Thesis, Summary, Outline of “The Natural Ontological Attitude,” due Sept. 14
 - (c) Argument Reconstructions of Wax, Billiard, and Twin Earth arguments, due Sept. 21
 - (d) Outline and Reconstruction of “Real Patterns,” due Sept. 28
 - (e) Reconstruction and Analysis of *Timaeus* selection, due Oct. 5
 - (f) Annotated bibliography of 4 articles of your choice from your paper bibliography, due Oct. 26
2. **Seminar Paper (30%)**: You will develop a 10–12 page philosophical paper on a topic of your choosing, in four stages:

- (a) *Proposal (5%), due Oct. 12*: Identify a philosophical problem, formulate a thesis, and collect a list of references
 - (b) *Draft 1 (5%), due Saturday, Oct. 24*: Prepare a preliminary essay draft for peer review.
 - (c) *Draft 2 (0%, but class presentation will not be permitted without it), due Saturdays Oct. 31–Dec. 5*: Revise your paper in response to critical feedback. This will be the draft used for your class presentation.
 - (d) *Draft 3 (20%), due Dec. 10*: Prepare a final revision in response to presentation. This will be the draft used for your model thesis proposal.
3. **Work in Progress Workshop (15%), Oct. 26**: This is a peer review workshop, which will be conducted in class or during another, mutually agreeable time during that week. Draft 1 of your paper must be emailed to your WIP group. WIP guidelines will be distributed in class.
 4. **Class Presentation (15%), Nov. 2–Dec. 7**: During the final four weeks of the semester, you will present Draft 2 to the class for further feedback. These will be formal presentations where you will present for 15 minutes and respond to questions and comments for 15 minutes.
 5. **Model Thesis Proposal (10%), due Dec. 16**: In order to practice developing a seminar paper into a thesis proposal, you will submit a model thesis proposal drawn from Draft 3 to iLearn. Guidelines will be discussed in class.

There is no final exam for this course.

Grade Scale

A+ 98–100%	B+ 87–90%	C+ 77–79%	D 60–69%
A 94–97%	B 83–86%	C 73–76%	
A- 91–93%	B- 80–82%	C- 70–72%	F <60%

3 Policies and Resources

Classroom Community

This course involves active participation in discussions of potentially contentious issues. For these discussions to be a success, all students must engage critically with the readings and with their colleagues.

By entering any classroom and especially this one, you agree to participate in an intellectual community. This community encourages respectful disagreements that foster new knowledge through the tools of critical thinking. This community does not tolerate disrespectful disagreements that aim to attack a person’s character, ethnicity, religious beliefs, politics, gender, or other aspects of personal identity.

Writing Center

A strong command of written English is necessary for graduate education and is expected in this class. If you do not presently possess the composition skills required to write clear, organized, and thoughtful essays in English, please see me during office hours. Further resources are available at the SFSU Learning Assistance Center, <https://www.sfsu.edu/~lac/index.html>.

Accessibility

Students with disabilities who need reasonable accommodations are encouraged to contact me. The Disability Programs and Resource Center (DPRC) is available to facilitate the reasonable accommodations process. The DPRC is located in the Student Service Building and can be reached by telephone (voice/TTY) at 415-338-2472 or by email at dprc@sfsu.edu.

Academic Integrity

You're graduate students. You shouldn't have to be told that plagiarism is a waste of my time and your money. Information about the College of Liberal & Creative Arts policy and procedures regarding plagiarism can be found at <http://lca.sfsu.edu/faculty/plagiarism-resources>

Extensions

As graduate students, you should also be prepared to manage your time so that you can get assignments in before the deadline. You will learn strategies for doing so even more effectively over the course of the semester. Extensions will be granted on a case-by-case basis for personal health and family emergencies only. All other assignments will be graded down 50% for late submission.

Personal Disclosure

SF State fosters a campus free of sexual violence including sexual harassment, domestic violence, dating violence, stalking, and/or any form of sex or gender discrimination. If you disclose a personal experience as an SF State student, the course instructor is required to notify the Dean of Students. To disclose any such violence confidentially, contact: The SAFE Place – (415) 338-2208; http://www.sfsu.edu/~safe_plc/ or Counseling and Psychological Services Center – (415) 338-2208; <http://psyservs.sfsu.edu/>. For more information on your rights and available resources: <http://titleix.sfsu.edu>

4 Schedule of Lectures and Readings

The textbook for this course is *The Practice of Philosophy*, by Jay Rosenberg (POP). You are expected to acquire this text on your own. All other readings will be provided via iLearn. Readings are listed in the suggested order of reading. Parenthetical items are *optional* further readings.

Additional background resources include Strunk and White's *Elements of Style* and the *Stanford Encyclopedia of Philosophy*, available at <http://plato.stanford.edu>.

Aug. 24: Introduction

- POP, Prospect and Ch. 13

Part I: Good Philosophy

Aug. 31

- POP Ch. 1–5
- Cora Diamond, “Eating Meat and Eating People” OR Judith Jarvis Thomson, “A Defense of Abortion”

Sept. 7: NO CLASS (Labor Day)

Sept 14

- POP, Ch. 7
- Arthur Fine, “The Natural Ontological Attitude”

Sept. 21

- POP Ch. 8
- Rene Descartes, wax argument
- David Hume, billiard ball argument
- Hilary Putnam, “The Meaning of ‘Meaning’ ”

Sept. 28

- POP Ch. 6 and 9
- Daniel Dennett, “Real Patterns”
- Bransford et al., “How Experts Differ from Novices”

Oct. 5

- POP Ch. 10–12
- Plato, *Timaeus*, Sections 53c–59a

Part II: Writing Philosophy

Oct. 12

- Nancy Sommers, “Revision Strategies of Student Writers and Experienced Adult Writers”
- Edmund Gettier, “Is Justified True Belief Knowledge?”

Oct. 19

- Joan Bolker, selections from *Writing Your Dissertation in Fifteen Minutes a Day*
- Alan Henry, “Productivity 101: A Primer to the Pomodoro Technique”
- Laura Vanderkam, “What You Need to Know to Create an Accountability Group that Works”

Part III: Good Writing

Oct. 26

- Works In Progress Workshop

Nov. 2

- Presentations

Nov. 9

- Presentations

Nov. 16

- Presentations

Nov. 23: NO CLASS (Fall Break)

Nov. 30

- Presentations

Dec. 7

- Presentations

PHIL 715 Reading/Assignment Schedule–Updated 9/30

WK	TOPIC	DT	READING	NOTES
1	Introduction	8/24	POP, Prospect and Ch. 13	
Part I: Good Philosophy				
2	Engaging Arguments	8/31	POP Ch. 1–5 Diamond, “Eating Meat and Eating People” OR Thompson, “A Defense of Abortion”	Summary 1 Due Withdraw Deadline 9/4
NO CLASS 9/7: Labor Day				
3	Argument Patterns I: Critical Modes	9/14	POP, Ch. 7 Fine, “The Natural Ontological Attitude”	Summary 2 Due
4	Argument Patterns II: Supplementary Tools	9/21	POP Ch. 8 Descartes, wax argument Hume, billiard ball argument Putnam, “The Meaning of ‘Meaning’”	Reconstruction 1 Due
5	Arguments to Articles I	9/28	POP Ch. 6 and 9 Dennett, “Real Patterns” Bransford et al., “How Experts Differ from Novices”	Reconstruction 2 Due
6	Arguments to Articles II	10/5	POP Ch. 10–12 Plato, <i>Timaues</i> 53c–59a	Recons./Analysis Due
Part II: Writing Philosophy				
7	Revision & Writing Habits	10/12	Sommers, “Revision Strategies of Student Writers and Experienced Adult Writers” Gettier, “Is Justified True Belief Knowledge?”	Paper Proposal Due
8	Time & Resource Management	10/19	Bolker, selections from <i>Writing Your Dissertation in Fifteen Minutes a Day</i> Henry, “Productivity 101: A Primer to the Pomodoro Technique” Vanderkam, “What You Need to Know to Create an Accountability Group that Works”	Annotated Bibliography (4 entries) Due
Part III: Good Writing				
9	Work in Progress Workshop	10/26	Group Paper Reading	Draft 1 Due 10/24
10	Presentations	11/2	Presentations	Draft 2 Due 10/31–12/5
11	Presentations	11/9	Presentations	
12	Presentations	11/16	Presentations	HSS Conference 11/16–11/19: Extra Credit Opportunity
NO CLASS 11/23–11/27: Fall Recess				
13	Presentations	11/30	Presentations	
14	Presentations	12/7	Presentations	Draft 3 Due 12/10 Model Thesis Proposal 12/16
Final Exam Period 12/12–12/18				

6. SAMPLE TEACHING MATERIALS

Naturalism: The Gathering

Study Cards for PHIL 350: Philosophy of Science

Realism

Science gives us an approximately true description of reality

Philosophical View—Realism & Anti-Realism

- **Tools:** Convergence, no miracles, beliefs of scientists
- **Power:** Explains the success of science
- **Weaknesses:** Failed past theories, unobservables, skepticism

Anti-Realism

No reason to expect that science gives us an approximately true description of reality

Philosophical View—Realism & Anti-Realism

- **Tools:** Pessimistic meta-induction, instrumentalism, scientific revolutions
- **Power:** Explains the success of science
- **Weaknesses:** Increased predictive success, success-truth link, common sense

Unification

Explanations are instances of a common pattern

Philosophical View—Explanation

- **Tools:** Schematic sentences, filling instructions, classification
- **Power:** Works with anti-realism
- **Weaknesses:** Spurious unification, over-unifying

The D-N Model

Explanations are deductions from true natural laws

Philosophical View—Explanation

- **Tools:** Natural laws, determining conditions, *explanans*, *explanandum*
- **Power:** Makes explanation logically valid
- **Weaknesses:** anti-realism, explanations that don't rely on laws

Reductivism

All the laws of nature can be reduced to laws of one science (physics)

Philosophical View—Laws of Nature

- **Tools:** Bridge laws, grand unified theories
- **Power:** Explains why things can happen across multiple scientific domains
- **Weaknesses:** Fodor (disjunctiveness), Cartwright (falseness)

Pluralism

Different sciences need different laws (or no laws at all)

Philosophical View—Laws of Nature

- **Tools:** Domain-specificity, multiple definitions of law
- **Power:** Explains why there are more sciences than physics, answers law problems in biology
- **Weaknesses:** Unity of science (Nagel), exceptions

Essay 1 Prompts and Requirements

PHIL 350

Essay 1 is due at 11:59 p.m. on October 9 on iLearn. It will be checked for originality by Turnitin. Papers should be around 1500 words (4–7 pp.). *Please use the essay writing guide and the rubrics as you write!*

1 Prompts

1. **Confirmation** Here is a famous paradox from philosophy of science: In *Hypothetico-Deductive* confirmation, every positive instance of evidence confirms a hypothesis. According to most understandings of logic, the same can be said for sentences that are *logically equivalent* to a hypothesis. For instance, every time you see a black raven, it *confirms* the hypothesis that “All ravens are black.” BUT every time you see something that is NOT black and NOT a raven (like a white dove, or a red apple), that ALSO confirms the hypothesis, “All ravens are black.”

Many philosophers have grappled with this paradox. Now it’s your turn. Write an essay where you (1) state whether you think non-black non-ravens confirm the hypothesis, “All ravens are black,” (2) *argue* for why you’ve chosen your answer, and (3) discuss the implications of your answer for one other philosophical idea we have discussed in class, such as the idea that confirmation is an improvement on falsification or the idea that laws are about causes and effects.

2. **Laws** (1) State whether, in your determination, there are laws in biology or not. (2) *Argue* for your answer and (3) briefly summarize the problem of reductivism and discuss the implications of your answer for reductivism.
3. **Realism** (1) Summarize the no-miracles argument and the pessimistic meta-induction. (2) State which argument is more convincing and (3) *argue* for your answer. (4) Raise one problem for your answer (an objection) and discuss how to solve the problem.

Prompt: Confirmation (See prompt sheet for full directions)

A+ Satisfies all of the requirements for an 'A' grade (see below), with additional originality, sophistication, effort, or skill going beyond what is expected.

A Superior

- Concisely states whether non-black non-ravens confirm the hypothesis, "All ravens are black." (Fulfills (1) in prompt)
- Argues critically and clearly for whichever position is being defended. (Fulfills (2) in prompt)
- Accurately summarizes another idea from class and discusses implications of answer (1) for that idea. (Fulfills (3) in prompt)
- Goes beyond the material covered in lectures and demonstrates exceptional critical ability and/or innovative reasoning.
- Uses technical terminology from philosophy (e.g. "demarcation," "falsification," "hypothesis") accurately and appropriately.
- Contains few or no factual errors or logical flaws in reasoning.
- Has a clear and concise introduction, thesis, and conclusion.
- Writing in the essay is clear and contains few or no grammatical errors.
- Citations and bibliography are accurate and consistently formatted.

A- Satisfies most of the requirements for an 'A' grade, but only comes to 'B' standard in some other respects.

B+ Satisfies all of the requirements for a 'B' grade (see below), and meets the 'A' standard in a few respects.

B Meritorious

- States whether non-black non-ravens confirm the hypothesis, "All ravens are black." (Addresses (1) in prompt)
- Argues clearly for whichever position is being defended. (Addresses (2) in prompt)
- Summarizes another idea from class and discusses implications of answer (1) for that idea. (Addresses (3) in prompt)
- Goes beyond the material covered in lectures or demonstrates exceptional critical ability.
- Uses technical terminology from philosophy (e.g. "demarcation," "falsification," "hypothesis").
- Contains few factual errors or logical flaws in reasoning.
- Has an introduction, thesis, and conclusion.
- Writing in the essay contains few grammatical errors.
- Citations and bibliography are mostly accurate and consistently formatted.

B- Satisfies most of the requirements for an 'B' grade, but only comes to 'C' standard in some other respects.

C+ Satisfies all of the requirements for a 'C' grade (see below), and meets the 'B' standard or above in a few respects.

C Satisfactory

- States whether non-black non-ravens confirm the hypothesis, "All ravens are black." (Addresses (1) in prompt) **BUT**
 - Argument for the position being defended is unclear, obviously invalid, or difficult to follow. (Misses (2) in prompt) **OR**
 - Misrepresents another idea from class or fails to discuss implications of answer (1) for that idea. (Misses (3) in prompt)
- Does not go beyond material covered in lectures.
- Misuses technical terminology from philosophy (e.g. "demarcation," "falsification," "hypothesis").
- Contains factual errors or logical flaws in reasoning.
- Lacks an introduction, thesis, or conclusion.
- Writing in the essay contains some grammatical errors.
- Citations and bibliography are incomplete, not accurate, or inconsistently formatted.

C- Satisfies most of the requirements for an 'C' grade, but only comes to 'D' standard in some other respects.

D+ Satisfies all of the requirements for a 'D' grade (see below), and meets the 'C' standard or above in a few respects.

D Minimal

- Author's ruling on whether non-black non-ravens confirm the hypothesis, "All ravens are black" is unclear or missing. (Misses (1) in prompt) **OR**
 - Argument for the position being defended is unclear, obviously invalid, or difficult to follow. (Misses (2) in prompt) **AND**
 - Misrepresents another idea from class or fails to discuss implications of answer (1) for that idea. (Misses (3) in prompt)
- Does not go beyond material covered in lectures.
- Does not use technical terminology from philosophy (e.g. "demarcation," "falsification," "hypothesis").
- Contains significant factual errors or logical flaws in reasoning.
- Lacks an introduction, thesis, and conclusion.
- Writing in the essay contains significant grammatical errors.
- Citations or bibliography are absent.

D- This is the minimum passing mark. Barely sufficient evidence to avoid failure, with only a rudimentary knowledge of the subject; contains irrelevant material or significant errors and misconceptions.

Failure. Inadequate in conception, substance or follow-through, or fails to address essay prompt.

Final Assignment

Space, Time, and Matter 2014

Due Date: Tuesday, April 22, Midnight

Your final task for this class is to develop a narrative in the history of science that is personally compelling to you and explain why this narrative is important for understanding some aspect of contemporary science's relationship to human life. You may either extend one of the narratives you have already developed for either the first essay or the podcast, or you may choose a new narrative.

The historical narrative must come from the natural sciences—either the physical sciences (physics, astronomy, cosmology, mathematics, chemistry) or the life sciences (biology, neuroscience, zoology, cognitive science)—and it may *not* be a narrative that we have discussed in class. The narrative can be from any period in history, from ancient Babylonian calendars to last week's discovery of gravitational radiation.

The explanation of this narrative's importance should answer at least one of the following questions:

1. How does this narrative help scientists to understand contemporary scientific research?
2. How does this narrative help philosophers to answer questions about the nature of scientific inquiry?
3. How does this narrative help historians to explain the progress of scientific ideas or technologies over time?
4. How would everyday life today be different if the events in the narrative had not taken place?

As you answer one or more of these questions, keep in mind the relationships between science and technology, between science and society at large, and between science and philosophy. Your goal is to explain why the story you have chosen to tell is an important one, and you need to accomplish this goal by making connections between the discoveries and methods of science and other human endeavors, which can range from getting to class on time to answering the question, "Why are we here at all?"

Note: While it is alright to add an explanation why this narrative is personally interesting to you, doing this is not fulfilling the assignment and you cannot do this *instead of* answering the questions above.

Requirements

Proposal

10% of your grade on this project will come from your project proposal, which is a one-page summary of what you plan to do and how you plan to do it. A worksheet is attached on the next page to help you develop your proposal. Proposals are due **Friday, April 4 at midnight**. Proposals turned in after the due date but before April 7 at midnight will be given half credit. Proposals turned in after April 7 at midnight will be given no credit. *If you do not submit a proposal, your assignment grade will be reduced by 2 letter grades.*

Essay Option

Write an 8–10 page essay in the style of an academic history paper, which develops your narrative and explains its significance. The essay may address the same narrative as your first essay, but you may not simply add on to the beginning or end of your first essay. You will need to go into more detail on both your historical narrative and your explanation of why it is important. Unless you specifically propose to do otherwise in your project proposal, your essay must be written as a history paper rather than a personal essay, short story, playscript, or pop-science article.

Podcast Option

Record and produce a 12–20 minute audio podcast that develops your narrative and explains its significance. The podcast may address the same narrative as your first podcast, but you may not simply add on to the beginning or end of your first podcast. You will need to go into more detail on both your historical narrative and your explanation of why it is important. Unless you specifically propose to do otherwise in your project proposal, this podcast must include at least two voices—either as co-narrators or as an interviewee.

Choose-Your-Own-Adventure Option

If you have an alternative project in mind, anything from a video to a puppet show to a “Team Leibniz” viral campaign around campus, you will need to meet with me individually by **Thursday, April 3rd** to review your idea. Even after meeting with me you must submit a written proposal.

Group Projects

You may collaborate with up to two other members of the class to produce a podcast or develop a choose-your-own-adventure project. If you choose to work in a group, you must meet with me as a group by **Thursday, April 3rd** to review your idea, and you must each submit individual written proposals.

Assessment

Grading standards will be similar to previous assignments. Complete rubrics will be distributed in class on Tuesday, April 8.

Essay

10% Proposal

- Submitted a proposal on time

35% Accurate narrative of an episode in the history of science

- Are the facts straight?
- Do you use historical anchorpoints (time, place, name, context)?
- Did you tell a story?
- Is the story about an event?
- Is that event in the history of science?

25% Convincing argument why this narrative is significant

- Did you answer at least one of the four questions:
 - How does this narrative help scientists to understand contemporary scientific research?
 - How does this narrative help philosophers to answer questions about the nature of scientific inquiry?
 - How does this narrative help historians to explain the progress of scientific ideas or technologies over time?
 - How would everyday life today be different if the events in the narrative had not taken place?
- Do you support your answer with convincing arguments?
 - Use of facts from story

15% Does your essay have: introduction, thesis, conclusion, citations, and bibliography?

15% Writing Voice/Quality

- Is your story compelling?
- Grammar, punctuation, spelling
- Writing is clear and easy to follow

Ways to Mess Up

- One letter grade deducted if essay is not on proposal topic
- One letter grade deducted for essays shorter than 7.5 pages or longer than 12 pages
- One letter grade deducted for every 24-hour period the assignment is late

Podcast

10% Proposal

- Submitted a proposal on time

35% Accurate narrative of an episode in the history of science

- Are the facts straight?
- Do you use historical anchorpoints (time, place, name, context)?
- Did you tell a story?
- Is the story about an event?
- Is that event in the history of science?

25% Convincing argument why this narrative is significant

- Did you answer at least one of the four questions:
 - How does this narrative help scientists to understand contemporary scientific research?
 - How does this narrative help philosophers to answer questions about the nature of scientific inquiry?
 - How does this narrative help historians to explain the progress of scientific ideas or technologies over time?
 - How would everyday life today be different if the events in the narrative had not taken place?
- Do you support your answer with convincing arguments?
 - Use of facts from story

10% Creativity/Narrative Voice

- Is your story compelling?
- Do you use the format of the podcast to get across your point?
 - Tone of voice
 - Timing of delivery
 - Sound effects (optional)

10% Included a second voice on the podcast

10% Recording Quality and Polish

- Are there any problems opening the file?
- Is the podcast easy to hear?
- Are there other problems with the recordings (echo-y, glitch-y)?

Ways to Mess Up

- One letter grade deducted if podcast is not on proposal topic
- One letter grade deducted for every minute under 10 minutes or every minute over 25 minutes
- One letter grade deducted for every 24-hour period the assignment is late