

PHIL 694 Special Topics in Contemporary Philosophy

Philosophy of Biology

Spring 2021

Instructor: Dr. Daniel J. Nicholson
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• **When?** Mondays 4:30 pm—7:10 pm. Please note that this is a synchronous online class, so students are expected to be available for online meetings at the set class times.

• **Where?** Zoom via link in Blackboard course site.

• **Online Office Hours** (via Blackboard): Wednesdays 1:15 pm—3:00 pm or by appointment.

• **Where to find information about this course:** all course information, including the syllabus, assignments, and any announcements or changes to the schedule will be posted on Blackboard.

• **Course Description:**

This course considers one of the most exciting and rapidly growing areas of contemporary philosophy: the **philosophy of biology**. Biology is a fertile field of philosophical enquiry, dealing as it does with the very nature of life itself. As practicing biologists have become increasingly specialized in recent decades, big-picture, synthesizing perspectives on how it is all supposed to hang together are needed more than ever. The purpose of this course is to supply tools to help us gain that broader perspective—to think critically about the ways in which biology is done affect the answers it provides, and about how those sit alongside some of our wider views about the world and our place in it.

We will explore a range of fascinating puzzles in the ontology, epistemology, and metaphysics of biology, and we will scrutinize the theoretical role(s) played by key biological concepts such as ‘gene’, ‘organism’, ‘development’, ‘mechanism’, ‘function’, ‘adaptation’, and ‘population’. Some of the questions we will address include: Is biology an autonomous science or is it reducible to physics and chemistry? Does biology have laws? How do biologists explain the phenomena they study? What role do genes play in development? How do organisms adapt to their environments? Is there such a thing as a biological essence? Are organisms very complicated machines or are they something different altogether? And many more. Anyone interested in getting past the textbook answers to think deeply about how biology works and what it tells us about ourselves will enjoy this course.

• **Course Objectives:**

Students who take this course can expect to learn to:

- Engage with classic and contemporary debates in philosophy of biology.
- Apply philosophical reasoning to address unresolved problems in biological theory.
- Draw on insights from the biological sciences to think about traditional philosophical questions.
- Hone their critical thinking and develop their expository and argumentative writing skills.

Students will be evaluated on their ability to articulate and critique arguments from the readings through in-class discussions, written comparative analyses, a presentation, and a research paper.

· Required Readings:

As we will be making use of a very wide range of different texts, ***all the required readings for this course will be provided to you at no cost***. ‘Reading packs’ have been prepared for each class and have been uploaded to Blackboard. You can access and download these as PDF files at your convenience.

If you have the capacity to print off these reading packs, I recommend doing this so that you have paper copies to work with. If you work with the texts electronically, find out how to annotate (mark up) PDF files, e.g. by using Adobe Reader. Make sure that you have the reading packs in front of you during our class sessions as we will be drawing on them heavily in our group discussions.

To avoid copyright issues please note that students remain subject to all the rights and restrictions of the publisher, and students are to honor those. Each student’s copy of the supplied works is to be used solely for purposes of this class; they are not to be distributed, sold, or employed for any other commercial purpose. Each student’s participation in the class will indicate their explicit agreement to be bound by these limitations.

· Course Reading Expectations:

The schedule of readings is given at the end of this syllabus. ***I will expect you to have done the set reading before the relevant class***. This means (a) reading through the reading pack at least once; (b) going back and re-reading the passages that seem especially important, difficult, puzzling, or interesting to you; and (c) writing down your thoughts and questions on the texts. (I recommend keeping a notebook just for your reading notes for this course that you can bring to class, as a reminder of what you want to ask or comment on.)

Do not leave the reading until the last minute. Give yourself enough time to think about the assigned texts so that you can evaluate them critically when you come to class. If you do the reading well in advance, you will get a lot more out of classes, because you will have a lot more to put in. And remember: ***if you don't have questions, you're not reading properly!***

· Questions and Problems:

If you have a question about the course, or a problem with a class or assignment, please feel free to ask it at the start or at the end of one of our online class meetings (often others will have the same question or concern, so doing this will help everyone). Alternatively, you can send me an email. I will respond to emails as soon as I can, though as a rule I do not answer emails during the weekend.

· Assignments and Grading:

Attendance & Participation (expected in every class)	10 %
Discussion Facilitation Guide (for two sessions)	30 %
Research Proposal (500 words) & Annotated Bibliography (min. 10 scholarly sources)	10 %
Research Presentation (10 minutes + QAs)	20 %
Final Research Paper (4,000 words, excluding references)	30 %
TOTAL	100 %

- **Attendance & Participation (10%)**: As this is a graduate-level, seminar-based course, your presence and participation are critical to the success of each class. You must come to each session prepared to discuss the set readings and ready to take part in group discussions. You will not be able to do this effectively if you have not read and thought about the texts in advance of each class meeting (see section on ***Course Reading Expectations*** above). Please come to each session with at least ***two questions about each text in the reading pack*** that can be posed to the rest of the class to discuss.

Unjustified absences will negatively impact your final grade. A justified absence requires proper documentation (e.g. a doctor's note or written proof of participation in a University or work-related event). If you are more than 15 minutes late for class, your lateness will be considered $\frac{1}{2}$ an absence. Similarly, you should not expect to do well in this course if you do not take part in group discussions.

- **Discussion Facilitation Guide (2 x 15% = 30%)**: On our first meeting I will ask each student to select two sessions (one in the first half of the semester and another in the second half) for which they will (alone or with a partner) provide a written discussion facilitation guide for the rest of the class. The guide will address ***each*** text in the reading pack assigned for that week. The guide must include: (1) a description of the central theses of each reading; (2) an overview of the key argument(s) made to support the respective theses; (3) a description of the authors' conclusion(s); (4) your critical analyses of the readings and the possible weaknesses in the arguments; and (5) questions for the class to facilitate discussion. You should write at least one page for ***each*** text in the reading pack (i.e., a reading pack with five texts will be at least five pages long). ***Your guide must be posted on the Discussion Board on Blackboard no later than 11:59 pm on the day before the seminar.*** Students are expected to bring to class their own copies of the discussion guide, as well as their own notes on the readings. Please note that the guides are not a replacement for reading the texts. They will serve as the point of departure for our group discussion. At the start of each class, the discussion facilitator for that week will use their guide to introduce the set of readings to the rest of the group.

- **Research Project (10% + 20% + 30% = 60%)**: Each student will choose a topic, problem, or debate in the philosophy of biology to work on over the course of the semester. You can select one of the topics we shall be focusing on in the course (including one of the two topics you will prepare a discussion facilitation guide for), but you are also free to choose a different topic altogether. Please let me know if you need assistance choosing a topic; I can direct you to relevant sources to help you find something that matches your interests. You will carry out your research project in three phases:

1. Once you have decided on the topic, you will write a **Research Proposal & Annotated Bibliography (10%)**. The proposal should be ***500 words in length***, and it must state the thesis or question you wish to explore in your research. What do you hope to accomplish? And how will you go about it? You should explain how you intend to develop a specific argument and not merely summarize the existing literature on the topic. You should also indicate why you think the question you have chosen to investigate is worth pursuing. The annotated bibliography must include ***a minimum of ten scholarly sources*** that you will consult as part of your research. Make sure you format the references appropriately (for examples of the required formatting style, see the reading references in the ***Course Schedule***). Your annotation for each source should be brief (3–4 sentences in paragraph form is sufficient) and it should state what the text is about and how you anticipate it will help you in developing your argument. ***I encourage you to submit your proposal and bibliography as early as possible, and no later than at the start of the class on Week #11 (April 5th)***. I will provide you with written feedback on your proposal and bibliography.

2. You will act on the feedback you receive and continue conducting the research for your project. On the last class of the course (**April 26th**), all students will take turns presenting to the class the main findings of their research in the form of a **15-minute Research Presentation (20%)**. The use of PowerPoint slides, handouts, or other visual aids is strongly encouraged, but not mandatory. The presenter will also answer any questions posed by the rest of the group, who will provide constructive feedback on the content as well as on the delivery of each presentation.
3. The final phase will be to write up the results of your research (again, drawing on the feedback you receive on your presentation from me and your peers) in the form of a **Final Research Paper (30%)**. Your paper should be clearly written, thoughtfully structured, and carefully argued. It can be up to ***4,000 words in length***, excluding the bibliography (which should, again, be appropriately formatted). I will provide you with further guidelines for the research paper later in the semester. Make sure that you plan ahead. As this is the most important assignment in this course it is essential that you allow yourself enough time to do a good job. ***You must submit your final research paper no later than Monday, May 3rd*** (i.e., one week after your research presentation).

• **Submission of Written Work and Lateness Penalties:**

All graded written work must be drafted and saved in Word and submitted by the designated deadline. Deadlines are non-negotiable. An extension will only be granted due to appropriate extenuating circumstances, and only if these are communicated to me via email in advance of the deadline. If you do not have a good reason for a late submission, ***your assignment will lose one letter grade for each day it is late***, including weekends (i.e., Saturday and Sunday count as two days). These penalties are to ensure fairness in the grading, so that everyone has the same amount of time to work on each assignment.

• **School in the Time of a Pandemic:**

I am here to help you be successful in this course and I am optimistic that, while we cannot be together in person this semester, the seminars will be fun and engaging and thought-provoking.

Nevertheless, given our global and individual circumstances, I want to encourage everyone to:

1. Be patient and kind with yourself and with each other.
2. Do your best, knowing that this will probably look different from other semesters.
3. Communicate openly and clearly about expectations, concerns, and goals. If you encounter unexpected difficulties, tell me what you need, and I will tell you how I can help.
4. Be flexible. This is a strange and anxious time, and circumstances may change over the course of the semester.

• **Course Technology Expectations:**

As this is a Distance Learning Course, you will need regular and reliable access to a computer with an updated operating system (such as Windows 10 or Mac OSX 10.13 or later), a functional camera and microphone, and a stable broadband internet connection. We will be using web-conferencing software (Zoom) from inside our Blackboard site as our primary interface and you should have the capacity to stream both audio and video for our class meetings.

· Best Practice for Learning in an Online Environment:

During our live synchronous class times, please turn phones and other electronic devices to silent—or better still, put them away or switch them off so as not to be distracted by them. Please also close all other programs and web browsers (e.g. email, YouTube, social media platforms, news feeds, etc.) other than what we need for the class itself. Our focus for our synchronous meetings should be our discussions and the texts we are working on together and as much as possible nothing else. ***Finding time for sustained, focused, absorbing work may be difficult as we navigate the multiple adjustments that the pandemic is requiring of us: but doing so is not only good for our studies but good for our mental health and overall being in the world.***

· Commitment to Diversity:

The Philosophy Department seeks to create a learning environment that fosters respect for people across differences. We welcome and value individuals and their differences, including gender expression and identity, race, economic status, sex, sexuality, ethnicity, national origin, first language, religion, age and ability. We encourage everyone to engage with the material personally, but to also be open to exploring and learning from experiences different than their own.

NB: This does not mean not being critical. Respecting others' views means taking them seriously, and taking them seriously means thinking about their strengths and weaknesses, asking questions, and offering constructive criticisms or alternative viewpoints where appropriate. It also means thinking about where the views of others challenge our own, and being open to what they can teach us. Valuing diversity is not just an attitude—it is a matter of developing an active practice. This practice involves:

- learning to listen to other perspectives and to hear criticism of our own views;
- expressing criticisms and differences of opinion in ways that are not personal or hurtful and that leave space for other voices (as well as for the possibility that we are wrong);
- being generous in our interpretation of what others say, forgiving of missteps as moments for learning, and holding ourselves and others accountable for where we can do better;
- having good reasons for one's views, but being willing to change one's mind;
- not rushing to judgment; learning to assess different positions while being unsure where we stand;
- and being willing to accept that there will always be things one cannot see or understand;

Never be afraid to ask a question or to risk saying something that might be wrong – that is how we learn. But equally, never be afraid to listen to the questions and answers of others, and to let their views challenge and change how you think.

· Academic Integrity and the Honor Code:

This course is conducted in accordance with the GMU Honor Code as set out on the University website (<https://oai.gmu.edu/mason-honor-code/>): “*Student members of the George Mason University community pledge not to cheat, plagiarize, steal, or lie in matters related to academic work.*” You are expected to abide by this code; any violation will be reported to the Honor Committee for adjudication.

As members of the academic community, you are expected to be attentive to issues of academic integrity, particularly as they relate to the acknowledgement of sources. The key issue is that you act in ways that respect other people's work. Passive plagiarism (e.g. failing to cite sources) is as bad as active plagiarism (e.g. downloading an essay off the internet). Always cite and reference your sources.

COURSE SCHEDULE

(subject to change)

Week # (& Date)	<u>SEMINAR TOPIC</u>
Week #1 (Mon, January 25 th)	<p><u>INTRODUCTION / THE NATURE OF LIFE AND BIOLOGY</u></p> <ul style="list-style-type: none">• Required Readings:<ul style="list-style-type: none">- Mayr, E. (1997). <i>This is Biology: The Science of the Living World</i>. Harvard: Harvard University Press, Chapter 1.- Oparin, A.I. (1961). <i>Life: Its Nature, Origin, and Development</i> (A. Synge, trans.). London: Oliver & Boyd, Chapter 1.- Mayr, E. (1961). Cause and Effect in Biology. <i>Science</i> 134: 1501–1506.
Week #2 (Mon, February 1 st)	<p><u>IS BIOLOGY AN AUTONOMOUS SCIENCE?</u></p> <ul style="list-style-type: none">• Required Readings:<ul style="list-style-type: none">- Rosenberg, A. (1985). <i>The Structure of Biological Science</i>. Cambridge: Cambridge University Press, Chapter 2.- Mayr, E. (1996). The Autonomy of Biology: The Position of Biology Among the Sciences. <i>The Quarterly Review of Biology</i> 71: 97–106.- Shapere, D. (1969). Biology and the Unity of Science. <i>Journal of the History of Biology</i> 2: 3–18.- Munson R. (1975). Is Biology a Provincial Science? <i>Philosophy of Science</i> 42: 428–447.• Discussion Facilitator: Jay McMullen
Week #3 (Mon, February 8 th)	<p><u>ARE THERE LAWS IN BIOLOGY?</u></p> <ul style="list-style-type: none">• Required Readings:<ul style="list-style-type: none">- Smart, J.J.C. (1959). Can Biology Be an Exact Science? <i>Synthese</i> 11: 359–368.- Beatty, J. (1995). The Evolutionary Contingency Thesis. In G. Wolters & J. Lennox (eds.), <i>Theories and Rationality in the Biological Sciences</i> (Pittsburgh: University of Pittsburgh Press), pp. 45–81.- Carrier, M. (1995). Evolutionary Change and Lawlikeness: Beatty on Biological Generalizations. In G. Wolters & J. Lennox (eds.), <i>Theories and Rationality in the Biological Sciences</i> (Pittsburgh: University of Pittsburgh Press), pp. 82–97.- Mitchell, S.D. (1997). Pragmatic Laws. <i>Philosophy of Science</i> 64: S428–S447.- Waters, C.K. (1998). Causal Regularities in the Contingent World of Biological Distributions. <i>Biology and Philosophy</i> 13: 5–36.• Discussion Facilitator: Matt Zavitz

Week #4 (Mon, February 15 th)	<p><u>REDUCTIONISM AND ITS DISCONTENTS</u></p> <ul style="list-style-type: none"> • Required Readings: - Brigandt, I., & Love, A. (2017). Reductionism in Biology. <i>The Stanford Encyclopedia of Philosophy</i> (E.W. Zalta, ed.). - Kaiser, M.I. (2011). The Limits of Reductionism in the Life Sciences. <i>History and Philosophy of the Life Sciences</i> 33: 453–476. - Hull, D.L (2002). Varieties of Reductionism: Derivation and Gene Selection. In M.H.V. Van Regenmortel & D.L. Hull (eds.), <i>Promises and Limits of Reductionism in the Biomedical Sciences</i> (Chichester: John Wiley & Sons), pp. 161–177. - Dupré, J. (2010). It Is Not Possible to Reduce Biological Explanations to Explanations in Chemistry and/or Physics. In J. Dupré (ed.), <i>Processes of Life</i> (Oxford: Oxford University Press), pp. 128–142. <ul style="list-style-type: none"> • Discussion Facilitator: Will Jensen
Week #5 (Mon, February 22 nd)	<p><u>THE MECHANISMS DEBATE</u></p> <ul style="list-style-type: none"> • Required Readings: - Machamer, P., Darden, L., & Craver, C.F. (2000). Thinking About Mechanisms. <i>Philosophy of Science</i> 67: 1–25. - Darden, L. (2008). Thinking Again About Biological Mechanisms. <i>Philosophy of Science</i> 75: 958–969. - Craver, C.F. & Bechtel, W. (2006). Mechanism. In S. Sarkar & J. Pfeifer (eds.), <i>The Philosophy of Science: An Encyclopedia</i> (London: Routledge), pp. 469–478. - Nicholson, D.J. (2012). The Concept of Mechanism in Biology. <i>Studies in History and Philosophy of Biological and Biomedical Sciences</i> 43: 152–163. - Moss, L. (2012). Is the Philosophy of Mechanism Philosophy Enough? <i>Studies in History and Philosophy of Biological and Biomedical Sciences</i> 43: 164–172. <ul style="list-style-type: none"> • Discussion Facilitator: Jay McMullen
Week #6 (Mon, March 1 st)	<p><u>THE FUNCTIONS DEBATE</u></p> <ul style="list-style-type: none"> • Required Readings: - Wouters, A.G. (2005). The Function Debate in Philosophy. <i>Acta Biotheoretica</i> 53: 123–151. - Wouters, A.G. (2003). Four Notions of Biological Function. <i>Studies in History and Philosophy of Biology and Biomedical Sciences</i> 34: 633–668. - Mossio, M., Saborido, C. & Moreno, A. (2009). An Organizational Account of Biological Functions. <i>British Journal for the Philosophy of Science</i> 60: 813–841. <ul style="list-style-type: none"> • Discussion Facilitator: Wali Siddiq

Week #7 (Mon, March 8 th)	<p><u>THE GENE CONCEPT</u></p> <p>• Required Readings:</p> <ul style="list-style-type: none"> - Griffiths, P.E & Stotz, K. (2007). Gene. In D.L. Hull & M. Ruse (eds.), <i>The Cambridge Companion to the Philosophy of Biology</i>, (Cambridge: Cambridge University Press), pp. 85–102. - Sarkar, S: (2006). From Genes as Determinants to DNA as Resource: Historical Notes on Development and Genetics. In E.M. Neumann-Held & C. Rehmann-Sutter (eds.), <i>Genes in Development: Re-Reading the Molecular Paradigm</i> (Durham: Duke University Press), pp. 77–95. - Stotz, K. Griffiths, P.E., & Knight, R: (2004). How Biologists Conceptualize Genes: An Empirical Study. <i>Studies in History and Philosophy of Biological and Biomedical Sciences</i> 35: 647–673. - Dupré, J. (2005). Are There genes? In A. O'Hear (ed.), <i>Philosophy, Biology and Life</i> (Cambridge: Cambridge University Press), pp. 193–210. <p>• Discussion Facilitator: Sam Martin</p>
Week #8 (Mon, March 15 th)	<p><u>EXPLAINING DEVELOPMENT</u></p> <p>• Required Readings:</p> <ul style="list-style-type: none"> - Lewontin, R.C. (2000). <i>The Triple Helix: Gene, Organism, and Environment</i>. Cambridge, MA: Harvard University Press, Chapter 1. - Keller, E.F. (2002). <i>Making Sense of Life: Explaining Biological Development with Models, Metaphors, and Machines</i>. Cambridge, MA: Harvard University Press, Chapter 4. - Keller, E.F. (2000). Decoding the Genetic Program: Or, Some Circular Logic in the Logic of Circularity. In P. J. Beurton, R. Falk, & H.-J. Rheinberger (eds.), <i>The Concept of the Gene in Development and Evolution: Historical and Epistemological Perspectives</i> (Cambridge: Cambridge University Press), pp. 159–177. - Oyama, S., Griffiths, P.E., & Gray, R.D. (2001). Introduction: What is Developmental Systems Theory? In S. Oyama, P.E. Griffiths, & R.D. Gray (eds.), <i>Cycles of Contingency: Developmental Systems and Evolution</i> (Cambridge, MA: The MIT Press), pp. 1–11. <p>• Discussion Facilitator: Benjamin Tellis</p>

Week #9 (Mon, March 22 nd)	<p><u>ADAPTATIONISM</u></p> <ul style="list-style-type: none"> • Required Readings: <ul style="list-style-type: none"> - Levins, R. & Lewontin, R.C. (1985). <i>The Dialectical Biologist</i>. Cambridge, MA: Harvard University Press, Chapter 2. - Gould, S.J. & Lewontin, R.C. (1979). The Spandrels of San Marco and the Panglossian Paradigm: A Critique of the Adaptationist Programme. <i>Proceedings of the Royal Society of London B</i> 205: 581–598. - Dennett, D.C. (1995). <i>Darwin's Dangerous Idea: Evolution and the Meanings of Life</i>. London: Penguin, Chapter 9. - Sober, E. (1998). Six Sayings About Adaptationism. In D.L. Hull & M. Ruse (eds.), <i>The Philosophy of Biology</i> (Oxford: Oxford University Press), pp. 72–86. - Walsh, D.M. (2012). Situated Adaptationism. In W.P. Kabasenche, M. O'Rourke, & M.H. Slater. (eds.), <i>The Environment: Philosophy, Science, and Ethics</i> (Cambridge, MA: The MIT Press), pp. 89–116. <ul style="list-style-type: none"> • Discussion Facilitator: Matt Zavitt
Week #10 (Mon, March 29 th)	<p><u>POPULATION THINKING</u></p> <ul style="list-style-type: none"> • Required Readings: <ul style="list-style-type: none"> - Mayr, E. (2006). Typological versus Population Thinking. In E. Sober (ed.), <i>Conceptual Issues in Evolutionary Biology</i> (3rd ed.) (Cambridge, MA: The MIT Press), pp. 325–328. - Sober, E. (2006). Evolution, Population Thinking, and Essentialism. In E. Sober (ed.), <i>Conceptual Issues in Evolutionary Biology</i> (3rd ed.) (Cambridge, MA: The MIT Press), pp. 329–359. - Ariew, A. (2010). Population Thinking. In M. Ruse (ed.), <i>The Oxford Handbook of Philosophy of Biology</i> (Oxford: Oxford University Press), pp. 64–86. - Walsh, D.M. (2019). The Paradox of Population Thinking: First Order Causes and Higher Order Effects. In T. Uller & K.N. Laland (eds.), <i>Evolutionary Causation: Biological and Philosophical Reflections</i> (Cambridge, MA: The MIT Press), pp. 227–246. <ul style="list-style-type: none"> • Discussion Facilitator: Benjamin Tellis

Week #11 (Mon, April 5 th) <u>RESEARCH PROPOSAL & ANNOTATED BIBLIOGRAPHY DUE</u>	<p><u>THE NATURE OF THE ORGANISM</u></p> <ul style="list-style-type: none"> • Required Readings: <ul style="list-style-type: none"> - Nicholson, D.J. 2014. The Return of the Organism as a Fundamental Explanatory Concept in Biology. <i>Philosophy Compass</i> 9: 347–359. - Weber, A., & Varela, F.J. (2002). Life After Kant: Natural Purposes and the Autopoietic Foundations of Biological Individuality. <i>Phenomenology and the Cognitive Sciences</i> 1: 97–125. - Thompson, E. (2007). Mind in Life: Biology, Phenomenology, and the Sciences of the Mind. Cambridge, MA: The MIT Press, Chapter 6. • Discussion Facilitator: Sam Martin
Week #12 (Mon, April 12 th)	<p><u>ORGANISMS VS. MACHINES</u></p> <ul style="list-style-type: none"> • Required Readings: <ul style="list-style-type: none"> - Nicholson, D.J. (2013). Organisms ≠ Machines. <i>Studies in History and Philosophy of Biological and Biomedical Sciences</i> 44: 669–678. - Nicholson, D.J. (2014). The Machine Conception of the Organism in Development and Evolution: A Critical Analysis. <i>Studies in History and Philosophy of Biological and Biomedical Sciences</i> 48: 162–174. - Nicholson, D.J. (2018). Reconceptualizing the Organism: From Complex Machine to Flowing Stream. In D.J. Nicholson & J. Dupré (eds.), <i>Everything Flows: Towards a Processual Philosophy of Biology</i> (Oxford: Oxford University Press), pp. 139–166. • Discussion Facilitator: Wali Siddiq
Week #13 (Mon, April 19 th)	<p><u>METAPHYSICS AND BIOLOGY</u></p> <ul style="list-style-type: none"> • Required Readings: <ul style="list-style-type: none"> - Waters, K.C. (2017). No General Structure. In M.H. Slater & Z. Yudell (eds.), <i>Metaphysics and the Philosophy of Science: New Essays</i> (Oxford: Oxford University Press), pp. 81–107. - Dupré, J. & Nicholson, D.J. (2018). A Manifesto for a Processual Philosophy of Biology. In D.J. Nicholson & J. Dupré (eds.), <i>Everything Flows: Towards a Processual Philosophy of Biology</i> (Oxford: Oxford University Press), pp. 3–45. • Discussion Facilitator: Will Jensen
Week #14 (Mon, April 26 th)	<p><u>RESEARCH PRESENTATIONS</u></p>

RESEARCH PAPER DUE ON MONDAY, MAY 3rd