

PHIL 438(1): PROBLEMS IN THE **HISTORY**  
& **PHILOSOPHY OF SCIENCE:**  
**ISSUES IN THE LIFE SCIENCES**

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### Course Description

The life sciences are among the most philosophically rich areas of scientific study. Biology has challenged many philosophical assumptions, such as the existence of natural kinds and laws of nature. Studying biology has also helped raise some new philosophical issues, including the extent to which we can know about our biological past or future. This course explores conceptual and methodological issues raised in contemporary biology, including the units of selection, and the structure of evolutionary theory.

### Required Reading

The text for this course is Peter Godfrey-Smith's *Philosophy of Biology*. Other readings will be posted on the course website.

### Prerequisites

Six credits of philosophy, preferably one of Phil 224 - Introduction to Philosophy of Science or Phil 440 - Theory of Knowledge.

### Evaluation

50% Final paper OR Two short papers for 25% each  
10% Weird Creature!  
3% (x10) Argument Reconstruction  
10% Class participation

#### Papers

Papers may be either one 3000-5000 word paper on two 1500-2500 word papers on a topic in the history or philosophy of biology. Papers must make contact with at least one reading from the semester. If choosing the two-paper option, the first paper should be turned in by **October 20**.

#### Argument Reconstruction

At any point throughout the semester, you should choose an assigned article, read it, and reconstruct a major argument of the article in no more than 250 words. Use your own words and try to make the logical structure clear as possible. These must be turned in *before* the class discussion.

#### Weird Creature

Life is full of fun and strange creatures. The object of this assignment is to find the strangest organism on the planet. Students will then give a 5-10 minute presentation on the organism and attempt to tie it into an issue in the philosophy of biology.

#### Informed Class Participation

This is a small class and it is more enjoyable and informative if everyone participates. If you have difficulties speaking up in class, credit will also be given for discussions on the class website.

## Student Learning Outcomes

- Students will be able to state a thesis about a selected problem, historical and/or contemporary, in the philosophy of science, and provide evidence and argument (including replies to counter-arguments) in its defense.
- Students will be able to explain and interpret the ideas associated with positions in the contemporary literature in the history and/or philosophy of science.
- Students will be able to distinguish better and worse reasoning, and recognize conceptual relationships, in texts that raise issues in the history and/or philosophy of science.
- Students will be able to show what is at stake in abstract historical and/or philosophical debate in the sciences, and indicate their broader relevance.
- Students should have a firm grasp of some major issues in the history & philosophy of the life sciences.

## Laptops & Cell Phones

Research shows paper and pen notetaking produces better recall than digital notetaking. If you nevertheless choose to use a laptop to take notes, you must email me your class notes immediately after the end of each class session. Cell phones are not permitted except in emergency situations. Texting is distracting and will cost you participation points.

## Statement on Academic Dishonesty

If you cheat, plagiarize, or otherwise obtain grades under false pretenses, I *will* catch you and burden you with the greatest possible academic penalty. This may include failing the course, referral to the Associate Provost of Academic Planning and Standards, and expulsion. **Ignorance is not an excuse for plagiarism.** Please feel free to contact me or refer to University of Nevada, Reno General Catalog if you are concerned about what constitutes plagiarism.

## Academic Disabilities

If you have or believe you have a disability and would benefit from any accommodations, you may wish to contact me or the Disability Resource Center (Pennington Student Achievement Center Suite 230) as soon as possible to better ensure that such accommodations can be implemented in a timely fashion.

## Tutoring & Writing Center

Your student fees cover usage of the Tutoring Center (784-6801 or [www.unr.edu/tutoring-center](http://www.unr.edu/tutoring-center)) and University Writing Center (784-6030 or <http://www.unr.edu/writing-center>). Evidence of using one or both of these centers for class assignments will count as extra credit in this class.



	<b>Schedule</b>	<b>Date</b>	<b>Reading/Assignment</b>	
<b>EVOLUTION</b>	<b>Introduction</b>	Aug. 29		
	<b>Key Concepts</b>	Aug. 31	PGS Ch. 1 "Philosophy & Biology" p. 1-10	
	<b>Pre-Darwinian Biology</b>	Sept. 2	"Evolutionary Theories Before Darwin"	
		Sept. 5	<i>Labor Day, No Class</i>	
	<b>Darwinian Evolution</b>	Sept. 7	Charles Darwin, <i>On the Origin of Species</i> , ch. 4	
	<b>The Modern Synthesis</b>	Sept. 9	PGS Ch. 3 "Evolution & Natural Selection" p. 28-50	
	<b>Extended Synthesis</b>	Sept. 12	Kevin Laland, Gregory A. Wray, Hopi E. Hoekstra, et al. "Does Evolution..."	
	<b>The Evolutionary Toolbox</b>	Sept. 14	Austin Booth, Carlos Mariscal, & W. Ford Doolittle, "The Modern Synthesis..."	
	<b>Intelligent Design</b>	Sept. 16	Anya Plutysnki, "Should intelligent design be taught in public school..."	
	<b>Function I</b>	Sept. 19	PGS Ch. 4 "Adaptation, Construction, Function" p. 51-65	
	<b>Function II</b>	Sept. 21	Karen Neander, "The Teleological Notion of Function"	
		Sept. 23	<i>No Class</i>	
		Sept. 26	<i>No Class</i>	
	<b>Adaptation</b>	Sept. 28	Mary Jane West-Eberhard, "Adaptation: Current Uses"	
	<b>Adaptationism</b>	Sept. 30	Sara Green, "A Philosophical Evaluation of Adaptationism..."	
	<b>Units of Selection I</b>	Oct. 3	Elisabeth Lloyd, "Units and Levels of Selection"	
	<b>Units of Selection II</b>	Oct. 5	Sandra Mitchell, "Competing Units of Selection? A Case of Symbiosis"	
	<b>Biological Individuality I</b>	Oct. 7	PGS Ch. 5 "Individuals" p. 66-80	
	<b>Biological Individuality II</b>	Oct. 10	Ellen Clarke, "The Problem of Biological Individuality"	
	<b>Microbes I</b>	Oct. 12	Maureen O'Malley & Yan Boucher "Paradigm change in evolutionary..."	
	<b>Microbes II</b>	Oct. 14	Laura Franklin-Hall, "Bacteria, Sex, and Systematics"	
	<b>Tree of Life I</b>	Oct. 17	PGS Ch. 7 "Species and the Tree of Life" p. 100-119	
	<b>Tree of Life II</b>	Oct. 19	Maureen O'Malley & Eugene V. Koonin "How stands the Tree of Life...?"	
			<b>Paper 1 Due if choosing two-paper option.</b>	
	<b>LIFE</b>	<b>Model Organisms I</b>	Oct. 21	Rachel Ankeny & Sabina Leonelli, "What's so special about model organisms?"
		<b>Model Organisms II</b>	Oct. 24	Jessica Bolker, "Model organisms: There's more to life than rats and flies"
<b>Models I</b>		Oct. 26	PGS Ch. 2 "Laws, Mechanisms, & Models" p. 11-27	
		Oct. 28	<i>Nevada Day, No Class</i>	
		Oct. 31	<i>Halloween, No Class</i>	
<b>Life I</b>		Nov. 2	Carol Cleland & Shelley Copley, "The possibility of alternative microbial life..."	
		Nov. 4	<i>No Class</i>	
<b>Life II</b>		Nov. 7	Emily Parke, "What could arsenic bacteria teach us about life?"	
<b>Life III</b>		Nov. 9	Carlos Mariscal & W. Ford Doolittle, "Life & Life Alone"	
		Nov. 11	<i>Remembrance Day, No Class</i>	
		Nov. 14	Carol Cleland, "Is a general theory of life possible?"	
<b>THE BIG QUESTIONS</b>		<b>Universal Biology II</b>	Nov. 16	Carlos Mariscal, "Regarding Biology as a Universal Science"
	<b>Universal Biology III</b>	Nov. 18	Carlos Mariscal & Leonore Fleming, "Why Study Universal Biology?"	
	<b>Origins of Life I</b>	Nov. 21	Iris Fry, "Are the different hypotheses on the emergence of life as different..."	
	<b>Origins of Life II</b>	Nov. 23	Carlos Mariscal et al., "LUCA comes of age"	
		Nov. 25	<i>Thanksgiving, No Class</i>	
	<b>Contingency</b>	Nov. 28	John Beatty, "The Evolutionary Contingency Thesis"	
	<b>Convergence</b>	Nov. 30	Russell Powell & Carlos Mariscal, "Convergence as Natural Experiment..."	
	<b>Evolution/Social Behavior</b>	Dec. 2	PGS Ch. 8 "Evolution and Social Behavior" p. 120-143	
	<b>Non-Genetic Evolution</b>	Dec. 5	Eva Jablonka and Marion Lamb, "Précis of Evolution in Four Dimensions"	
	<b>Cultural Learning</b>	Dec. 7	Cecilia Heyes, "Grist and mills: On the cultural origins of cultural learning"	
	<b>Biological Race I</b>	Dec. 9	Lisa Gannett, "The biological reification of race"	
	<b>Biological Race II</b>	Dec. 12	Robin O. Andreasen, "A new perspective on the race debate"	
		Dec. 14	<i>Prep Day, No Class</i>	
	<b>Biological Race III</b>	Dec. 16	Roberta Millstein, "Thinking about Populations and Races in Time"	
	<b>Presentations</b>	Dec. 19	"Weird Creature!"	
<b>Wrap Up</b>	Dec. 21			