

BIO 425/525
Foundations of DevoEvo
Spring 2020
TuTh 2:00-3:20, Cooke 127A

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Course Description: This course examines the historical and conceptual foundations of Developmental Evolution (DevoEvo) through readings and group discussions of historical and philosophical literature on origins of and reception to evolutionary and developmental biology, in particular the role developmental phenomena played in the formulation of evolutionary ideas.

Learning Objectives: The primary aims of this course are to familiarize and prepare ourselves to critically and intelligently discuss the historical, philosophical, and intellectual origins of evolutionary theories, in particular the alternatives to Darwin's Natural selection that were popular around the time of the Origin, and the role developmental biology played in evolutionary thinking. We will accomplish this through familiarizing ourselves with the central figures, events, and alternative evolutionary theories (Theistic evolutionism, Lamarckism, Orthogenesis, Mutation theory, and Natural Selection) in early biological thought. We will accomplish this through assigned readings, engaging in class discussion and small projects, and completing assignments that allow students to interpret and engage with primary and secondary source material.

Required and optional texts: In order of class discussion (copies, likely cheaper than the bookstore, can be ordered from Amazon.com, Bookfinder.com, or other online retailers.):

Optional texts:

Required texts:

The Darwinian Revolution, M. Ruse (1979)

The Eclipse of Darwinism, P. J. Bowler (1992)

The Changing Role of the Embryo in Evolutionary Thought, R. Amundson (2005)

Assessment: Group discussion: 25%
Reading reflections: 10%
Participation: 25%
Small project(s) 15%
Final project: 20% (essay/unessay), 5% (consultation)

Grades:

94 – 100: A

90 – 93: A-

87 – 89: B+

83 – 86: B

80 – 82: B-
67 – 69: D+

77 – 79: C+
65-66: D

73 – 76: C
0 – 64: F

70 – 72: C-
FX

Group discussion (25%): Each student will lead at least one group discussion of the reading material (usually ~2 book chapters or one paper). The goal of this discussion is not to simply present the material to class, rather it is to reflect upon the materials presented in the reading and discuss with the class the strengths and weaknesses of the arguments presented, to critically assess whether the arguments and conclusions are well founded or whether alternative explanations of the data are more likely, and to put the foundational concepts of the material into a larger historical context. Contextualizing the material will require more than reiterating the content of each book chapter, and will include researching additional background. Finally, each presentation should end with a brief discussion of how the material covered in each chapter is related to contemporary research questions.

Reading reflections (10%): Reading reflections are low-stakes writing assignments without specific guidelines, the format is open to allow you reflect upon the readings with respect to goals of the course and its learning objectives, your prior experiences, and your research interests. The goal of each reflection is to contextualize the weekly readings in a way that makes them meaningful for your course goals. Each reflection must be accompanied by three discussion points/questions to guide your participation in group discussions and should be turned in before class.

Participation/Daily class preparation (25%): Voluntary and consistent participation is necessary for success; this participation includes and depends upon consistent preparation outside of class. You must bring your text, notes, and any other required supplementary materials (handouts, reading packets, etc.) to class every day. *Regular attendance is required in this course.* Active attendance, unexcused absences, and tardiness will be taken into account when calculating this portion of the final grade.

Small projects (15% total/5% each): Students will explore current events topics of interest and engage with the concepts covered in the required texts by preparing three small projects, which will be a summary of and commentary on the reading materials given current research topics in biology. The form of the project is open and can take the style of, for example, a short blog piece, a critical letter to the editor, a short essay, or an infographic. Student will pick one topic for each required text. See course schedule for due dates

Final Project (25%):

Respond to the following prompt, following the guidelines in option A or option B:

Select a central theme that you think is particularly significant to the history and philosophy of evolutionary and developmental biology before the New Synthesis. Choose three persons, places, and/or events, and make a case why those people, places, and/or events are significant to that theme, presenting a clear argument and evidence.

You are required to meet with me and have your theme and the people, places, and/or events approved. This is to ensure that your project is both feasible and fulfills the assignment's requirements. Option A and option B will be graded on similar criteria. Each is expected to present an argument with supporting evidence. Your essay or unessay should be well written (or painted or otherwise presented) and its argument clear. It should connect the three individuals, places, and/or events to one another and to the argument you are advancing, and it should make a claim about the role of development on evolutionary thought.

Option A: The Essay

Write a 1500-2000 word essay responding to the prompt. Include an introduction, clear thesis statement, and evidence. Consult and cite both secondary and primary sources. Papers should include a brief heading (student's name, class section number, and due date should suffice) and title, and should be doubled-spaced, 12-pt. standard font, with 1-inch margins. All source citations should be footnotes following the rules of the Chicago Manual of Style.

Option B: The Unessay

Respond to the prompt any way you want. Be as creative as you want. You might submit a work of art in a chosen medium or compose original song lyrics or a poem. It can be a BuzzFeed-style listicle (complete with a click bait headline) or quiz, a short story, the script to a Broadway play, or a National Inquirer cover or story. It can be presented in any medium: video, audio, sculpture, watercolor, HTML, etc. These suggestions are intended only to illustrate the possibilities. You are encouraged to think beyond those ideas. Regardless of the specific form of the unessay, it should be accompanied by a brief, 1 page description explaining the logic similar to descriptions that accompany works of art at museums.

Additional Resources:

Office of Accessibility Resources: If you require accommodations to enable you to successfully participate in this course, please contact the Office of Accessibility Resources (60 Capen Hall, 645-2608) and notify your Instructor. <https://www.buffalo.edu/studentlife/who-we-are/departments/accessibility.html> or email at stu-accessibility@buffalo.edu

Counseling Services: 716-645-2720 or 716-829-5800 for confidential mental health care.

Food Support: Information on Blue Pantry (a virtual food pantry service for UB students) and UPC Food Pantry (located near South Campus) can be found [here](#).

UB is committed to providing a safe learning environment free of all forms of discrimination and sexual harassment, including sexual assault, domestic and dating violence and stalking. If you have experienced gender-based violence (intimate partner violence, attempted or completed sexual assault, harassment, coercion, stalking, etc.), UB has resources to help. This includes academic accommodations, health and counseling services, housing accommodations, helping with legal protective orders, and assistance with reporting the incident to police or other UB officials if you so choose. Please contact UB's Title IX Coordinator at 716-645-2266 for more information. For confidential assistance, you may also contact a Crisis Services Campus Advocate at 716-796-4399.

Academic Integrity Guidelines: Originality and insight are the twin hallmarks of good academic work. Moreover, the value and credibility of that work rest in the certainty that it was carried out entirely and only by the one whose name is on the paper. Students are called upon to be honest about the work they submit, from daily or weekly exercises to finished term papers. This includes short essays, exams, or casual reaction papers as well. University policies on academic integrity are [published in the Undergraduate Catalogue](#) and are hereby incorporated by reference into this syllabus.

Class schedule

Week	Course Topic(s)	Reading
Week 1		
28 Jan	Course Introduction	
30 Jan	A short introduction to DevoEvo/EvoDevo	
Week 2		

4 Feb	Introduction to developmental biology I	
6 Feb	Introduction to developmental biology II	
Week 3		
11 Feb	Introduction to developmental biology III	
13 Feb	Introduction to evolutionary biology I	
Week 4		
18 Feb	Introduction to evolutionary biology II	
20 Feb	Introduction to evolutionary biology II	
Week 5		
25 Feb	Before the Origin I	Ruse: 1-3, reflections due
27 Feb	Before the Origin II	Ruse: 4-5, reflections due
Week 6		
3 March	On the eve of the Origin	Ruse: 6, reflections due
5 March	During / After the Origin	Ruse: 7-8, reflections due
Week 7		
10 March	After the Origin	Ruse: 9-10, reflections due, short projects due
12 March	The Eclipse	Bowler: 1-3, reflections due
Week 8		
17 March	<i>No class</i>	
19 March	<i>No class</i>	
Week 9		
24 March	Lamarckism	Bowler: 4, reflections due
26 March	Lamarckism in France and America	Bowler: 5-6, reflections due
Week 10		
31 March	Orthogenesis	Bowler: 7, reflections due
2 April	Mutation Theory	Bowler: 8, reflections due, short projects due
Week 11		
7 April	The rise of DevoEvo	Amundson: 1-2, reflections due
9 April	Form, Archetypes, and ancestors	Amundson: 3-4, reflections due
Week 12		
14 April	The first "evolutionists"	Amundson: 5-6, reflections due
16 April	NeoDarwinism	Amundson: 7-8, reflections due
Week 13		
21 April	The Structuralist response	Amundson: 9-10, reflections due, short projects due
23 April	Overview/Reflection/Analyses of Ruse, Bowler, and Amundson	
Week 14		
28 April	What is the promise of DevoEvo?	Wagner I-III
30 April	???????	
Week 15		
5 May	Unessay presentations	

7 May	Unessay presentations	