

Natural Science 2

Evolution, Genetics, & Animal Behavior follows the efforts in Western thought to understand the nature of life and living things. The overarching questions of the course are: What is life? Why is there variation among living things? How are they organized? How do they behave and why? How do we know the answers to any of these questions?

Main learning objectives:

1. Summarize the foundational ideas of genetics and evolution.
2. Analyze and explain genetic transmission up to and including a dihybrid cross.
3. Explain the meaning and usage of the word “species,” how a species may be identified, and the meaning of a scientific claim that one species has changed into another.
4. Review and summarize the data supporting evolutionary arguments and critique both the data and the arguments.
5. Describe the basic elements of animal behavior, especially aggression, dominance, and violence, and apply them to human beings.
6. Clarify and attempt to resolve distinctions between biological function, purpose, and teleology.

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Texts:	Aristotle	<i>On the Soul, Parts of Animals, Generation of Animals</i>
	William Paley	<i>Natural Theology</i>
	J. B. Lamarck	<i>Zoological Philosophy</i>
	Georges Cuvier	<i>Revolutionary Upheavals of the Globe</i>
	Charles Darwin	<i>On the Origin of Species, The Descent of Man</i>
	Stephen Jay Gould	<i>Wonderful Life</i>
	Gregor Mendel	<i>Experiments with Hybrids</i>
	Jane Goodall	<i>The Chimps of Gombe</i>
	Konrad Lorenz	<i>On Aggression</i>
	Nicholas Wade	<i>Before the Dawn</i>

Shorter texts by Hardy, Chetverikov, and Mayr are found in the NS2 coursepack.

A college writing handbook is strongly recommended. *The Harbrace College Handbook* is especially recommended. *They Say, I Say*, by Graff and Birkenstein, is very good for improving argumentation. Both are available on the Shimer floor library for extended circulation.

GRADED WORK

Class Participation

Your assignment for every class of the semester is not only to have done the reading *but also to have reflected upon it and come to class prepared to ask or say something about it.*

What you say in class doesn't necessarily have to show mastery of the text. Explaining difficulties that you may be having with a reading can be extremely helpful to both yourself and the group, and an excellent contribution to inquiry.

Participation comprises attendance, preparation, value and frequency of contributions to inquiry, attentiveness to both the texts and the discussion, and civility toward other members of the class (including the authors). All of these aspects of participation affect your grade, and *are required in order to remain in the course.* See "Policy Statements" below for attendance policy details.

Written Work

Papers and exam answers for Evolution, Genetics, & Animal Behavior must be typed double-spaced. Quotations and paraphrases must be followed by parenthetical page references. Ethical use of sources is covered briefly in the instructor's course handout on writing, and at greater length in *Writing With Sources* and in the *Harbrace Handbook* and most other writing handbooks.

1) Examination. A written examination responding to several prompts will be due at the end of the course. The prompts will be distributed long before classes end. You are encouraged not to wait till the end of the semester to write your answers. It will be easier if you answer each prompt as each topic is covered in the course, revising later on if need be.

2) Essay on a course reading or on a topic covered in more than one course reading. But consult with me if you are thinking of writing about more than three authors. 4-6 pp. (950-1500 words). Bibliography required if citing sources not read by the class (bbg page does not count for meeting the length requirement). Formal essay writing is covered in the writing handout and in writing handbooks.

Essay due dates: To avoid all the papers being turned in at the same time in the midst of the semester, the essay will be due on either of two dates (see calendar), depending on the initial letter of your last name. Students in the first group will write on readings or topics covered up to the due date; the second group will write on readings or topics covered between the first and second due dates. If you would like to change your group, see me and I will try to accommodate you.

If a revision of the essay is turned in (see "Revision" under "Policy Statements" below), the revision grade or the average of the two grades, whichever is higher, will count toward the course grade.

3) The student will also complete a genetics worksheet posing several problems in genetics.

Course Grade

The course grade will be calculated as follows:

class participation	50%
essay	20%
exam	20%
worksheet	10%

POLICY STATEMENTS

Attendance

You will be dropped from the course if you are absent from more than four classes, unless due to emergency, in which case we will arrange for make-up work. If you are absent more than five times, you will not pass regardless of circumstances. You are responsible for material covered or assigned during classes that you miss. Persistent lateness affects your participation grade. Students are expected to remain in class during the entire period, and repeated break-taking will also adversely affect your participation grade. In accordance with College academic policy, students who drop or are dropped less than two weeks before the last day of the semester cannot receive a withdrawal grade or a passing grade.

Due Date Extensions

- Barring emergencies, due date extensions for written work must be requested in advance of the deadline.
- In the interest of fairness to other students, there has to be a special circumstance (illness, family emergency, library or computer problems, etc.) for an extension to be granted. Merely wanting to do better work, though commendable, does not allow me to give more time to one student than to others.
- Work submitted late without an extension will be graded down 1 grade step (e.g. B to B-) for each day of lateness. No paper will be graded lower than D due to lateness, unless its grade before lowering is already D.

Revision

The essay, if it has been turned in by its due date, may be revised and resubmitted for a new grade with my approval, which will depend on whether you can persuade me that there will be substantial and successful revision--not mere correction. *The original version, with my comments, must be turned in with the revised version.*

Incompletes

- The grade of "Incomplete" may be given under the same conditions as for due date extensions, and must also be approved by the Dean.
- Unless an "incomplete" or a due date extension has been granted, writing submitted more than 5 days after the last meeting of the course will not be accepted.

POLICY STATEMENTS (contn'd)

Academic Dishonesty

--The ethical use of sources in writing is explained in course materials, in *Writing with Sources* (distributed to every Shimer student), in most writing handbooks, and in conference as the need arises. In addition, you are encouraged to ask me, in class or in conference, for clarification or advice whenever you have doubts about honest use of sources.

--Written work that, in my judgment, contains improperly used source material will not be accepted. This applies whether the plagiarism is intentional or unintentional.

--I reserve the right to investigate cases of suspected plagiarism. Investigation may consist of any or all of the following: retaining the paper and comparing it with the work of other writers, published or unpublished; requiring the student to submit drafts, notes, or other materials, including books, used in preparing the paper; giving the student an unannounced quiz on what is presumably his or her own work; and use of plagiarism detection software.

--If after investigation I am satisfied that plagiarism has been knowingly committed, the student will fail the course and be reported to the Dean of the College.

--Redress: The student has a right to demand formal proceedings by the Academic Standing Committee. The instructor will comply with the decision of the Committee.

CALENDAR

© = coursepack

- Thu 8/25 Course introduction.
Aristotle: *On the Soul*. Book 1, chs. 1-4; Book 2, chs. 1-4 ©
- Mon 8/29 Book 3: chs. 3 (begins pg. 679), 8-12
Parts of Animals. Book 1; Book 2, ch.1 ©
- Wed 8/31 *Generation of Animals*. Book 1 ©
- Thu 9/1 Lab: Classification
- Mon 9/5 *Labor Day*

EVOLUTION

- Wed 9/7 **Paley:** *Natural Theology*. Chs. 1-3, 26-27 ©
- Thu 9/8 **Lamarck:** *Zoological Philosophy*. Pp. 1-40
Lab: Specimens
- Mon 9/12 Pp. 41-54, 77-95, 133-41
Lab: Specimens
- Wed 9/14 **Cuvier:** "Revolutionary Upheavals" ©
Lab: Skulls & skeletons
- Thu 9/15 **Darwin:** *The Origin of Species*. Introduction, chs. 1-2
- Mon 9/19 Chs. 3-4
- Wed 9/21 Chs. 5-6
- Thu 9/22 Chs. 11-12
- Mon 9/26 Ch. 13
- Wed 9/28 **Gould:** From *Wonderful Life*. Pp. 98-136 (to be distributed)
- Thu 9/29 Pp. 207-39

GENETICS

- Mon 10/3 **Mendel:** *Experiments with Hybrids*. Pp. 1-20
Wed 10/5 Pp. 20-41
Dean's Break
Mon 10/10 **Hardy:** "Mendelian Proportions" ©
Chetverikov: "Evolution from the Standpoint of Genetics." Pp. 3-21 ©
Essay due for students with last names from A to M
Wed 10/12 Pp. 21-41
Thu 10/13 **Mayr:** From *On Speciation*. ©
Mon 10/17 Lab: Genetics
Wed 10/19 Genetics worksheet due

ANIMAL BEHAVIOR & HUMAN EVOLUTION

- Darwin:** *The Descent of Man*. Ch.2
Thu 10/20 Ch. 3
Mon 10/24 **Goodall:** *The Chimpanzees of Gombe*. Ch.2
Wed 10/26 Ch. 6
Thu 10/27 Lab: Animal behavior
Mon 10/31 *The Chimpanzees of Gombe*. Ch. 13
Wed 11/2 Ch. 15
Thu 11/3 Ch. 17
Mon 11/7 **Lorenz:** *On Aggression*. Chs. 1-3
Wed 11/9 Chs. 4-6
Thu 11/10 Chs. 7-9
Mon 11/14 Chs. 10-11
Wed 11/16 Chs. 12-14
Thu 11/17 **Wade:** *Before the Dawn*. Chs. 1-3
Mon 11/21 Chs. 4-6
Essay due for students with last names from N to Z
Thanksgiving Break
Mon 11/28 *Before the Dawn*. Chs. 7-8
Wed 11/30 Chs. 9-10
Thu 12/1 Chs. 11-12
Examination due