

# BIOL 405: *THE ORIGIN OF SPECIES*

*Spring 2015*

**Class meets: Tu 5:00 – 7:30 PM, 8<sup>th</sup> floor Lounge, Raymond Hall**

<b>INSTRUCTOR:</b>	Gordon Plague, PhD
<b>OFFICE HOURS:</b>	M 2:00 – 4:00 PM, or by appointment
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<b>BOOK:</b>	Darwin C. 1859. <i>The Origin of Species</i> (6 <sup>th</sup> ed.). John Murray, London.  To facilitate discussion, everyone must acquire the same copy of <i>Origin</i> , which is available at the campus bookstore & online (ISBN: 0375751467).

## COURSE DESCRIPTION

About 130,000,000 books have been published since Gutenberg invented the printing press, although few have had a greater influence on the fabric of humanity than Charles Darwin's *The Origin of Species*. *Origin* is widely regarded as the most important Biology book ever published. In it, Darwin not only introduced our modern views of evolution and natural selection, but he also laid the framework for phylogenetics, biogeography, and the concept of sexual selection. *Origin* is a rich and highly readable book, and is great fun to read and discuss with a group – which is what we will do in this seminar course. (Prerequisites: BIOL 300 and BIOL 311.)

## STUDENT LEARNING OUTCOMES

Upon completion of this class, students will: (1) have a deeper knowledge of evolutionary concepts in general, and Darwin's contributions to evolutionary thought specifically, (2) understand & appreciate *Origin* from a historical context, and (3) have gained experience discussing science with a group of other students/scientists.

## COURSE POLICIES

1. **Overall structure:** Each week we will discuss one chapter from *The Origin of Species*. One person will be responsible for leading the discussion each week, and everyone in the class is expected to actively participate in the discussion each week.

2. **Weekly reading:** The value of this class is in gathering together to discuss a book that we all read in common. We cannot have a discussion about the book if people do not read it. Therefore, everyone is required to read each assigned chapter in its entirety.
3. **Attendance:** Again, because the value of this class is in gathering together to discuss a book that we all read in common, attendance is mandatory. Each absence up to 3 absences will reduce your final grade by 10%. If you have more than 3 absences, you will fail the class. (If you have a valid excuse for being absent and want me to consider an exemption to this policy, then you must provide convincing evidence of your absence.)
4. **Leading the discussion:** Discussions often sort of “run themselves”, with very little input or direction needed from the discussion leader. However, when needed, the job of the discussion leader is to facilitate the discussion. This means that it’s their responsibility to keep the discussion moving if and when it lulls, to bring the discussion back on course if it goes too far off topic, and to try to bring people into the discussion so that all voices are represented. Importantly, the discussion leader should not dominate the discussion, and he/she is not the official “Answerer of All Questions”. Please read the paragraph below for some additional thoughts and suggestions for leading our discussion.

Thoughts and suggestions for leading a discussion: Coming prepared with a list of provocative questions is an excellent way to get a discussion going. Keep the discussion moving actively; avoid digressions, and return the discussion to the topic at hand, if necessary. The discussion leader is in charge, and should feel comfortable taking charge, if necessary. Use silence effectively, and resist the temptation to answer your own questions after too little time, which has the effect of taking the discussion away from other participants – who will want to participate themselves, no doubt. Encourage participants to clarify or elaborate on thoughts/opinions/questions if they are ambiguous. Protect the rights and respect of other speakers; otherwise you risk inhibiting their willingness to participate. Focus any dissension on issues rather than participants. Differences of opinion should be encouraged, and can certainly make any discussion more lively and memorable. Use disagreements to encourage critical, independent thinking. Remember that a discussion is just that, and the job of the discussion leader is to invite participation by other members of the group. Unless another member of the group decides to get the discussion rolling for you when it lulls, you will have to do so with your own questions or provocative statements.

5. **Participating in the discussion:** Everyone is expected to participate in the discussion each week. To help facilitate our discussions, everyone that’s not leading the discussion must come each week with 2 questions about the week’s reading. You must email these questions to Gordon **12 hrs** before each discussion. These will be graded with a Check or CheckPlus. This is based on whether you ask a thought-provoking, synthetic question (CheckPlus), or a simple question that is easily answered with Wikipedia or other Internet resources (Check).

*Examples of CheckPlus questions:*

- Why does Darwin spend so much time discussing out-crossing (pg127-33)? Today we certainly know the importance of producing genetically variable offspring, but he doesn’t discuss that at all (I was anticipating/hoping that he would, but maybe this is unfair).
- On pg211, Darwin argues that adaptations always arise due to natural selection. Is this true? Of course Darwin didn’t know about genetic drift, but could drift ever give rise to adaptive traits?

*Examples of Check questions:*

- What is Ornithorhyncus?
- What is a “homopterous insect”?

6. **Reflective essays:** Each week following our discussion, you will write a 1-2 page reflective essay on the week's reading and discussion. In this essay, reflect on how your knowledge, ideas, and understanding of evolution were affected by the reading and discussion, what aspects of the reading and discussion went well, and what aspects could be improved (and what you could do to improve them). You should reflect on each discussion soon after it occurs, so these will be due within 24 hours of each discussion. These will be graded with a Check or CheckPlus. This is based on whether you are truly reflective and introspective about your knowledge, ideas, participation, and personal evolution during each week's reading and discussion (CheckPlus), or whether you offer a simple play-by-play rehashing of the week's reading and discussion (Check).
7. **Your grade:** Is based on discussion participation (44%), discussion questions (22%), reflective essays (22%), and leading the discussion (12%).

Discussion participation (max 10 pts/wk): 5 pts for attendance, 10 pts for active participation

Discussion questions (max 5 pts/wk): 1 pt for Check, 5 pts for CheckPlus

Reflective essays: (max 5 pts/wk): 1 pt for Check, 5 pts for CheckPlus

Leading discussion: this grade will include how well you:

- keep the discussion flowing when it lulls
- bring the discussion back on track if it strays
- draw quiet people into the discussion if needed
- keep from dominating the discussion

Final grades: Will be based on the following percentages:

≥90.00	4.0 = A (Excellent)
≥86.67 and <90.00	3.7
≥83.33 and <86.67	3.3
≥80.00 and <83.33	3.0 = B (Good)
≥76.67 and <80.00	2.7
≥73.33 and <76.67	2.3
≥70.00 and <73.33	2.0 = C (Satisfactory)
≥66.67 and <70.00	1.7
≥63.33 and <66.67	1.3
≥60.00 and <63.33	1.0 = D (Minimum)
<60.00	F

## SCHEDULE

<b>Date</b>	<b><i>Origin</i> chapter</b>
Jan 20	Evolution primer, and History of Charles Darwin and <i>The Origin of Species</i>
27	Ch. 1: Variation under domestication Ch. 2: Variation under nature
Feb 3	Ch. 3: Struggle for existence
10	Ch. 4: Natural selection; or the survival of the fittest
17	Ch. 5: Laws of variation
24	Ch. 6: Difficulties of the theory
Mar 3	<i>No class: Spring Break</i>
10	Ch. 7: Miscellaneous objections to the theory of natural selection
17	Ch. 8: Instinct
24	Ch. 9: Hybridism
31	Ch. 10: On the imperfection of the geological record
Apr 7	<i>No class: April Recess</i>
14	Ch. 11: On the geological succession of organic beings
21	Ch. 12: Geographical distribution
28	Ch. 13: Geographical distribution – <i>continued</i>
May 5	Ch. 14: Mutual affinities of organic beings: morphology: embryology: rudimentary organs
12	Ch. 15: Recapitulation and conclusion