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# BIO 370: Semi-Intelligent Design: altering the course of evolution

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## BIO370 section A

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### Description

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Warm clothes. Eyeglasses. Antibiotics. Genetically-modified foods. Designer babies. Artificial life. Mankind has been interfering with natural selection pretty much since the moment we appeared on this planet. But with the advent of scientific investigation and our burgeoning understanding of the genetics, biochemistry, and physiology of living things, our ability to interfere with and purposefully channel the course of evolutionary change is exploding. We will be increasingly able to change living things to suit our own whims, but is this a good idea? Can we plan for unplanned consequences? Will these new technologies make life better for all of us, or simply accelerate our inevitable extinction?

In this course we will look at these and related questions from molecular biological, evolutionary, and ethical perspectives and students will present the results of their own research into the literature in both papers and oral presentations. Extensive student participation will be an absolute requirement of the course. This course fulfills the writing intensive requirement for the biology major.

### Classes

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Classes will be held in Room 301, Priscilla Payne Hurd Academic Complex  
Mondays, Wednesdays, and Fridays, 8:55 am to 9:45 am

### Texts

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Only two (new) books are required for this course, and should be available in the bookstore:

*Liberation Biology: The Scientific and Moral Case for the Biotech Revolution* by Ronald Bailey

*Writing Papers in the Biological Sciences* (5th edition) by Victoria E. McMillan

You will also want to have a good style book, such as *The Bedford Handbook* (whatever edition you have from WRIT100 is fine).

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## Course Objectives

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Upon successful completion of this course, students will be able to:

- select and research specific topics in the areas of genetics, evolution, and other areas of biology using both primary and secondary literature sources
- concisely describe a body of research in abstract form
- construct written outlines and drafts based on feedback from peers and the professor
- write research review papers in a proper scientific format
- give concise, well-organized oral presentations to peers
- clearly discuss and answer questions from their peers about their research findings
- offer valuable, constructive criticism on peers' written and oral work

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## Course Policies

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### Attendance

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I expect that you will make every effort to attend each class session. We have very little time together, and much of it will be spent helping each other, so when you miss a class you've denied some of your classmates a chance to learn.

That said, I understand that sometimes things intervene and make absences unavoidable. Over the course of the semester you can miss one draft-editing session and two presentations (not your own, obviously!) without penalty, provided you have a good reason for missing class. Serious illness is pretty much a minimum for "good" here, and any rescheduling of a missed presentation is entirely at my discretion. If you must miss a class, please let me know in advance if at all possible. It's a question of respect, both for me and for your fellow students.

### Grading

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Here is how I will weight the several components of the course:

Literature Review 200 points

Research Proposal 200 points

Article summary 100 points

Abstract exercise 50 points

Peer editing groups 200 points

Presentations 200 points each

Presentation evaluations 150 points

Class participation 100 points

**TOTAL 1400 points**

Here is the grading scale I use in all my classes:

**numeric grade letter grade**

93.3 - 100	A
90.0 - 93.2	A-
86.7 - 89.9	B+
83.3 - 86.6	B
80.0 - 83.2	B-
76.7 - 79.9	C+
73.3 - 76.6	C
70.0 - 73.2	C-
66.7 - 69.9	D+
63.3 - 66.6	D
60.0 - 63.2	D-

Just to review, this is what the Student Handbook has to say about grades:

**A and A-**

These grades are given for achievement of the highest caliber. They reflect independent work, original thinking, and the ability to acquire and effectively use knowledge.

**B+, B, and B-**

These grades are given for higher than average achievement. Evidence of independent work and original thinking is expected.

**C+, C, and C-**

These grades are given when the student has devoted a reasonable amount of time, effort, and attention to the work of the course and has satisfied the following criteria: familiarity with the content of the course, familiarity with the methods of study of the course, and active participation in the work of the class.

**D+, D, and D-**

These grades are given for unsatisfactory work, below the standard expected by the College. They indicate work which in one or more important aspects falls below the average expected of students for graduation. The work is, however, sufficient to be credited for graduation, if balanced by superior work in other courses.

## Late Assignments

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Late assignments are **very** bad. We're on a tight schedule, and you need to stay on top of the assignments. Anything you hand in late disrupts my schedule as well as the schedules of your classmates. Late assignments will be penalized 10% of the full value for each day (or fraction thereof) that they are late. This also applies to assignments that simply aren't up to snuff: if you hand in two hand-scrawled pages and expect that to count as a draft, you are going to be disappointed!

## Reading

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It is important that you do the reading assigned for any given session (see the [Syllabus](#)) in advance. Discussion of the material is a critical part of the course, and if you haven't read that day's material, you're depriving yourself and your classmates of your most informed and considered opinion.

## Studying Together

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Working together is a Good Thing. I encourage you to talk with friends in and out of this course about what you're doing, how effective your writing is, whether the approach you've chosen to take makes sense, whatever. There is no aspect of this course that can't be improved by working with other students on it.

## Academic Honesty

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I adhere to the [Academic Honesty policy](#) of the College. There is nothing more important to me than personal integrity - not money, not power, not even Science — and I conduct myself and all of my classes in that spirit. If you're not familiar with College policy, you should certainly should be by now!

## Accommodations

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Per Moravian College policy: "Students who wish to request accommodations in this class for a disability should contact Elaine Mara, assistant director of learning services for academic and disability support, at 1307 Main Street or by calling 610-861-1510. Accommodations cannot be provided until authorization is received from the Academic Support Center."

## Access for Disabled Students

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Our classroom is (as far as I'm aware) accessible to students with impaired mobility. I hope that all of you will avail yourselves of the College's Writing Center as well, as part of your process for improving your written work for the course. However, I am legally required to point out to you that "the Writing Center is located in a building that is not accessible to persons with mobility impairments. If you need the services of the Writing Center, please call 610-861-1392." If you have any questions about this, please don't hesitate to ask me.

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## Syllabus

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This syllabus is currently as accurate as I can make it. I don't anticipate there being any changes, but I will let you know as far in advance as I can if that should become necessary.

Meeting number	Date	In-Class	Background Reading
1	Mon., Aug. 27	organizational meeting	
2	Wed., Aug. 29	finding and evaluating sources	<i>Writing Papers</i> chapter 1
3	Fri., Aug. 31	discuss life extension	<i>Liberation Biology</i> chapter 1
	Mon., Sept. 3	No Class (Labor Day)	
4	Wed., Sept. 5	discuss medical advances	<i>Liberation Biology</i> chapter 2
5	Fri., Sept. 7	discuss stem cells	<i>Liberation Biology</i> chapter 3
6	Mon., Sept. 10	discuss human cloning	<i>Liberation Biology</i> chapter 4
7	Wed., Sept. 12	discuss designer babies	<i>Liberation Biology</i> chapter 5
8	Fri., Sept. 14	discuss modification of nature	<i>Liberation Biology</i> chapter 6
9	Mon., Sept. 17	discuss psychopharmacology	<i>Liberation Biology</i> chapter 7
10	Wed., Sept. 19	discuss possible topics	
			Fontana et al. (2010) <i>Science</i>
11	Fri., Sept.	discuss structure of literature	<b>328</b> :321–326



	21	reviews	Porteus et al. (2006) <i>PLoS Genetics</i> <b>2</b> (9):e133
12	Mon., Sept. 24	resumés & curriculum vitae	<i>Writing Papers</i> pp. 218–227  stem cell reprogramming slowing bacterial evolution future of human evolution (pick an article that interests you)
13	Wed., Sept. 26	writing for the general public	
14	Fri., Sept. 28	writing and documenting reviews	<i>Writing Papers</i> chapters 5 & 6
15	Mon., Oct. 1	discuss oral presentations	<i>Writing Papers</i> pp. 191–201
16	Wed., Oct. 3	develop rubric for oral presentations <b>article summary due</b>	
17	Fri., Oct. 5	discuss drafting and revising	<i>Writing Papers</i> chapter 7
	Mon., Oct. 8	No Class (Fall Break)	
18	Wed., Oct. 10		
19	Fri., Oct. 12	post draft 1 of the review paper	
20	Mon., Oct. 15	discuss draft 1 of the review paper	
21	Wed., Oct. 17	oral presentations	
		oral presentations	
22	Fri., Oct. 19	post draft 2 of the review paper	
23	Mon., Oct. 22	discuss draft 2 of the review paper	
24	Wed., Oct.	oral presentations	

	24		oral presentations	
25	Fri., Oct. 26		post draft 3 of the review paper	
			oral presentation	
26	Mon., Oct. 29		discuss draft 3 of the review paper	<i>Writing Papers</i> pp. 210–217
			discuss research proposal	
27	Wed., Oct. 31		oral presentations	
28	Fri., Nov. 2		oral presentations	
29	Mon., Nov. 5		discuss preparing final drafts abstracting exercise	<i>Writing Papers</i> chapter 8
			oral presentations	
30	Wed., Nov. 7		<b>final version of the review paper due</b>	
31	Fri., Nov. 9		post draft 1 of the research proposal	
32	Mon., Nov. 12		discuss draft 1 of the research proposal	
33	Wed., Nov. 14		oral presentations	
			oral presentations	
34	Fri., Nov. 16		post draft 2 of the research proposal	
35	Mon., Nov. 19		discuss draft 2 of the research proposal	
	Wed., Nov. 21		No Class (Thanksgiving Break)	
			No Class (Thanksgiving Break)	
	Fri., Nov. 23		post draft 3 of the research	

		proposal
36	Mon., Nov. 26	oral presentation discuss draft 3 of the research proposal
37	Wed., Nov. 28	oral presentations
38	Fri., Nov. 30	oral presentations oral presentations
39	Mon., Dec. 3	<b>final version of the research proposal due</b>
40	Wed., Dec. 5	oral presentations
41	Fri., Dec. 7	oral presentations
	Mon., December 10 1:30 pm	<b>FINAL EXAM PPHAC301</b>

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## Course Components

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### Papers

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I will post your peer editing groups here in the next few weeks.

Each draft you hand in **must** clearly indicate what it is: Who wrote it, when you wrote it, which assignment it is, which draft it is. Be sure to also indicate the word count (see below). All drafts must be typed or word-processed, unless you speak to me first. (And yes, *there's a good reason for that.*)

In accordance with College policy, note that it is your responsibility to keep **all** materials (notes, jottings, index cards, intermediate drafts, etc.) for **all** assignments in this course until you receive a final grade. It is especially important that those of you writing with a word-processor be sure to save intermediate drafts **as separate documents!**

- There will be two major writing assignments in this course:
  1. Review. We'll review (heh.) the structure of a scientific review article on Friday, September 21, but in short they synthesize a number of papers in a particular area into a coherent and fluid whole. The author may choose to extend the content beyond what is known by adding his or her own speculations, but this isn't a requirement.

I want to see a *minimum* of 10 primary sources used for this paper. (The notion of a peer-reviewed journal is **absolutely critical**: *be certain you understand what is meant by this term!*)

2. Research Proposal. Scientific research costs money, and oddly enough, people with money almost always need to be convinced to give some to you. Knowing how to write a solid,

interesting, effective research proposal is a critical skill in modern science. We'll look at this kind of writing later in the semester.

- The two papers must be on separate topics, unless you have double the minimum number of references. I intend the two presentations to be keyed to these papers, so if you *do* use the same topic for both papers, you're going to have to choose a different topic for one of the talks.
- I expect a certain minimum length for each draft:

### **Draft Minimum length**

First 2000 words

Second 2400 words

Third 2700 words

Final 3000 words

And don't forget to schedule time with the staff at the Writing Center — getting a real outsider's perspective (by which I mean a non-scientist, or one who isn't very familiar with your subject) can be an invaluable asset to your writing.

## P r e s e n t a t i o n s

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Each of you will give two oral presentations over the course of the semester. You will also be responsible for evaluating the presentations of your classmates. We'll discuss and develop criteria for evaluating these presentations late in September, but here are a few ground rules:

- Your presentation should take between 15 and 20 minutes, to allow time for questions
- You must provide me an abstract (200 words or more) **one week before** your presentation; I will post this abstract on the website.
- For at least one presentation you must use a software presentation program such as [gak!] PowerPoint.
- In each presentation you must present experimental results (from one of the papers, of course — I don't expect you to create them!) in reasonable

detail.

## Participation

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Beyond your written and oral presentations, I also expect you all to participate in editing your classmates' written drafts and evaluating their presentations. You can see by the [point distribution](#) I use for grading that I take these aspects of the course very seriously.

When editing, keep in mind the purpose and audience of the piece. We'll discuss our goals and criteria further in class, but as is so often the case, the golden rule is a pretty good guide.

In addition, I expect you to give me evaluations of each talk. We'll discuss the format later in the semester.

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## Course Resources

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These are a few years old, but here are clips from the world's most reliable news source detailing new developments in [bioengineering plants](#) and [humans](#).

Of the numerous books I considered adopting for this course, there are two which are particularly good, and which you might want to look at. *Radical Evolution* by Joel Garreau opens with the sentence "This book can't begin with the tale of the telekinetic monkey." Enough said. The other is Gregory Stock's *Redesigning Humans*. Stock focuses on the biological, while Garreau ranges more widely in what he discusses, but both are very well written and excellent resources for further reading.

Here is an essay from Prof. Ruth Schwarz Cowan's recent book, *Heredity and Hope: The Case for Genetic Screening*; the essay is entitled "[Medical Genetics Is Not Eugenics](#)."

You may be interested in "a paper written as a background for discussion" by Schichor et al. entitled "[Should We Allow Genetic Engineering? A Public Policy Analysis of Germline Enhancement](#)." It presents a number of arguments against genetic engineering and points to a number of other resources.

Anita Allen examines some of the arguments in favor of genetic enhancement in an article entitled [Genetic, and Moral, Enhancement](#) and finds them wanting.

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## Prof. Jones

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If you ever have questions that you can't answer yourself using the textbooks, the Web, or even (gasp!) *thinking*, realize that there are a lot of additional resources available to you: your classmates and me. Don't be shy about asking for help. This is part of my job, and one which I don't shirk. Depending on what the problem is, the most reliable method to contact me is probably email (I sometimes don't realize I have voicemail for a day or two). My email address is cjones [at] moravian [dot] edu and my office (and lab) phone number is 610-861-1614.

If you need to speak with me sometime when I'm not on campus (a rare event!), call me at home any time between 9 am and 9 pm. Students often tell me they don't feel comfortable calling me at home because they think I mind. Consider the logic here: there's nothing that says I have to give you my home phone number, yet I have done so in class. So **why** would I give you that number if I didn't want you to use it? Note that "use" is not the same thing as "abuse": don't call me at 3 am the day before an assignment is due and expect much sympathy (or pleasant conversation)!

Here's a copy of [my current class schedule](#). My official office hours are from 1:15 pm to 2:15 pm Mondays. If I'm not in my office (Room 310, Collier Hall of Science), try my lab (Room 233, Collier Hall of Science — between the elevator and the loading dock on the main floor). That said, feel free to get hold of me any time; if I can't spare the time to talk then, I'll tell you so, and we can set up an appointment at our mutual convenience.