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LIFE SCIENCES 15

LIFE: CONCEPTS AND ISSUES



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COURSE DESCRIPTION

Science touches our lives every day. Its increasing relevance is clear in a multitude of areas, including modern genetics & biotechnology, nutrition & health, and brain functioning & behavior. Maybe you've pondered questions such as these:

- * Is eyewitness testimony in courts always accurate?
- * Why are humans among the only species to have friendships?
- * Does sunscreen use reduce skin cancer risk? How do we know that's true?
- * Do vitamin supplements reduce the likelihood of getting sick?
- * What are taste preferences? Why do they exist?
- * What is "blood doping?" How does it improve athletic performance?
- * How does caffeine (and other drugs) work?
- * Why doesn't evolution lead to the production of perfect organisms?
- * What are emotions? Why are they less permanent than they feel?

In Life Science 15, we explore these topics and many others. We'll go beyond the facts as we dissect the process of scientific thinking. We will see that it is an intellectual activity, encompassing observation, experimentation, and explanations of natural phenomena. And, more importantly, it is a practical pathway to discover and better understand our world.

I hope you will find answers to questions you're curious about and will be spurred to ask many more. Above all, as we investigate how we can best use evidence to guide decision-making in our own lives, I hope you'll learn that biology is about you and touches every aspect of your life. It's creative and it's fun.

COURSE REQUIREMENTS

- 150 • **Midterm Exam** (Week 5)
 - 250 • **Final Exam**
 - 121 • **Discussion Section** (Weekly - 75 minutes)
 - Participation - 36 pts
 - Debate - 40 pts
 - Quiz (from Prob. Set; 4 quizzes @ 15 pts each; lowest score dropped = 45 pts)
 - 135 • **Discussion Board Assignments** (30 pts each; due Fridays at 4pm)
 - Weeks 1, 3, 6, and 8*
 - Response to others' posts* (1-3 pts for each response, up to max. of 15 pts)
 - **Extra-credit** —> **Music Video / Movie Trailer-Promo** (0, 10, 20, or 30 pts)
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- 656 • **Total Points Possible**

REQUIRED READINGS / MATERIALS

- *What Is Life? A Guide To Biology, with Physiology, 5th Ed.*, by J. Phelan. 2021. Macmillan - *wil*
(Note: For *What Is Life?* you **must** get the 5th edition; also make sure it is the “with physiology” version)
- *Mean Genes* by T. Burnham and J. Phelan. 2012. Basic Books (1st or 2nd edition is okay) - *mg*

This course is part of the UCLA Inclusive Access program. This means that your textbook, *What Is Life?* will be available to you digitally via the course website. This makes it possible to provide the book at a greatly reduced price. You click on “UCLA Store Course Materials” in the left panel to access it. *Mean Genes* is available via the UCLA store and on Amazon.com.

Everyone enrolled in this course is automatically an Inclusive Access participant to start, and will have access to the online version of the textbook through the 2nd week of class. Those remaining in the program after the 2nd week will be billed for the materials via your BruinBill account and will continue to have access to the course materials. If do not wish to participate in Inclusive Access, you must opt-out by the Friday of 2nd week or you will be charged. If you have questions, contact inclusiveaccess@asucla.ucla.edu. If you do decide to opt out, you can purchase the printed version of the book online.

EXAMS

There are two in-person exams in this class: one midterm and one final. They include multiple choice and short-answer questions. The midterm is from 6-8pm on Thursday of Week 5. It will cover all material from Lectures 1-9 and Problem Sets 1-4. The final is from 3-6pm on Tuesday of Finals Week. It will cover all material, with an emphasis on material covered after the midterm.

Makeup exams and quizzes are not given. If you are unable to take an examination, you must contact the Life Science Core Office before the examination and provide written verification regarding the situation. If you feel that an error was made in the grading of your midterm exam, submit your exam with a detailed explanation to Dr. Phelan.

DISCUSSION BOARD ASSIGNMENTS

During four weeks of the quarter, there will be a Discussion Board Assignment. These will require you to post something (short text responses or photos with text) made to a discussion board on our BruinLearn course website. Specific details of these assignments are posted below. They are due on Fridays (of Weeks 1, 3, 6, and 8) at 4pm. For each day that they are late, 1 point will be subtracted.

RESPONSES TO POST FROM OTHER STUDENTS

Students are encouraged to post thoughtful, constructive, supportive responses to the posts of other students in the class. For these, you can earn 1-3 points for each response, up to a maximum of 15 points for the quarter.

DISCUSSION SECTION AND PROBLEM SETS

Problem Sets: Handed out in class on Thursday of the week prior to when they are discussed.

These include a brief discussion of a topic with short-answer problems. You do not turn in your answers to the Problem Sets, but they will help you prepare for the exams and the quizzes.

Discussion section - Discussion section meets each week for 1 hour 15 minutes. For your participation during the 8 section meetings, you will receive up to 36 points.

Quizzes - At the beginning of four of the sections (in Weeks 2, 3, 4, and 9), there will be a quiz, worth 15 points. This quiz will be based on a problem from the Problem Set for that week. You must attend the entire section to get credit for your quiz. Your lowest quiz score will be dropped (to accommodate students who join the class late, miss section due to illness, or have an excused absence).

Debate - In four of the section meetings there will be a debate (Weeks 4, 5, 7, and 8). You will take part directly in one debate. Six students will participate in each debate, three on each side of the issue. The debate will take approximately 30 minutes and will include:

Opening arguments (*5 minutes for each side*)

Break for teams to think about their rebuttal (*3 minutes*)

Response to other side (*4 minutes for each side*)

Questions from TA/class (*8 minutes total*)

* Each student on a team gets the same score (*40 points possible*), based on preparation (*12 pts*), presentation (*12 pts*), persuasiveness and rebuttal relevance (*12 pts*), and responses to questions (*4 pts*).

* Students not taking part in the debate should come with a prepared question for the debaters. This task will factor into your section participation grade.

* Debate topics:

Topic 1: Genetic screening for all known diseases should be mandatory.

Topic 2: Humans have transcended evolution.

Topic 3: Technology has been more of a detriment than a benefit to society

Topic 4: Cultural, not genetic, causes are the basis of human conflict.

EXTRA-CREDIT OPPORTUNITY - MUSIC VIDEO / MOVIE TRAILER / ETC.

Assignment - Make a music video or mock/parody movie trailer about one or more of the life science concepts we cover explicitly in the class. The lyrics/content should include (mostly) technical, scientific, and accurate information about ideas that we have investigated. Also, be sure to mention “UCLA” and “LS15” in your video (either verbally or in writing).

- * Your video can be completely original or a parody of one of your favorite songs or movies.
- * The length should be between two and three minutes (no more than four minutes).
- * You may work by yourself or in teams of up to 4 people.
- * Each person on a given team will receive an identical score.
- * You must post the video to YouTube by the deadline. Include the lyrics as captions within your video or within the description below it.

To turn in your assignment, send an active YouTube link for your video to jay@ucla.edu. In this email, include the full names and UCLA ID#s for all teammates. It is due by noon on Sunday at the end of Week 9.

Videos will be graded by the teaching staff. The top 5 will receive 30 points. The others will receive a score of 0, 10, or 20 points, evaluated based on incorporation of biology and scientific ideas, creativity, entertainment, and overall quality. Surprise us. Make us laugh. Make us cry.

Here are some examples of great videos from previous quarters:

- * <https://www.youtube.com/watch?v=gGQPGOrYRC0>
- * <https://www.youtube.com/watch?v=JsMm5PYiB2o&fbclid=>
- * <https://www.youtube.com/watch?v=G3qwa4Q7jO0>
- * <https://youtu.be/WxX5hWhJgv0>
- * https://www.youtube.com/watch?v=sbWY4QrD_0E
- * <https://youtu.be/nQawz0qxspY>
- * <https://www.youtube.com/watch?v=fqOjnCzzCZU>

GRADING

Final course grades will be based on a straight scale using the following thresholds for grade cut-offs: A range: from 90-100%, B range: from 80-89.9%, C range: from 70-79.9%, D range: from 60-69.9%, and F: for 59.9% or lower. A “minus” will be assigned to the bottom three percentage points and, within the B, C, and D grade ranges, a “plus” will be assigned to the top three percentage points (i.e., 80-82.9% is a B-, 87-89.9% is a B+).

If the class mean is lower than 80% at the end of the course, the scale will be adjusted upward to compensate (e.g., 89% may become an A-). Under no circumstances will grades be adjusted down. I’d recommend that you keep track of your own points so that at any time during the quarter you know your minimum standing in the class.

THE LIFE SCIENCES CORE OFFICE

For administrative or scheduling problems relating to this course, please contact the Life Science Core Office: lscore@lifesci.ucla.edu, 825-6614, Life Sciences Building, room 2317.

DELIVERABLES

All of the items and due dates below are described elsewhere in the syllabus. I’ve provided this additional week-by-week breakdown just to give you an alternative way to view your deadlines.

Week	Discussion Sec	Problem Set	Quiz	Debate	Discussion Board Assignment
1	<i>doesn't meet</i>				Self-reflection 1
2	Sci. Thinking	PS1: Sci. Thinking	yes		
3	Evolution	PS2: Evolution	yes		PhotoPost 1
4	Genetics	PS3: Genetics	yes	(yes)	
5	Altruism	PS4: Altruism		(yes)	
6	<i>doesn't meet</i>				ShortSciSummary
7	Nutrition & Health			(yes)	
8	Exp. Behavior	PS5: Exp. Behavior		(yes)	PhotoPost 2
9	Nervous System	PS6: Nervous System	yes		
10	Industrial Societies				

Note: Each student participates in only one debate.

SCHEDULE OF TOPICS FOR LS15

WEEK	READINGS	TOPIC
1	T Th <i>wil:</i> 1	1. The age of science 2. Scientific thinking and decision-making <i>* No Discussion Section meeting</i>
2	T Th <i>mg:</i> 1; <i>wil:</i> 10	3. Darwin's dangerous idea 4. Nurturing nature: the power of culture <i>* Discussion Section topic: Science as a way of figuring things out</i>
3	Th T <i>wil:</i> 8,9	5. What did Mendel discover? 6. Genes and inheritance <i>* Discussion Section topic: Evolution and natural selection</i>
4	T Th <i>mg:</i> 10,11	7. Kindness to our kin 8. Friend and foe are fluid categories <i>* Discussion Section topic: Genetics</i>
5	T Th <i>wil:</i> 11	9. Unexpected conflict, unexpected cooperation 10. Exam: 6-8pm (covers material from Topics 1-9; PSets 1-4) <i>* Discussion Section topic: Altruism</i>
6	T Th <i>wil:</i> 6,7 <i>mg:</i> 2,3; <i>wil:</i> 2,3	11. Modern genetics and biotechnology: DNA fingerprinting 12. Proteins, carbs, and fats: the macromolecules of life <i>* No Discussion Section meeting</i>
7	T Th <i>wil:</i> 23 <i>wil:</i> 25; <i>mg:</i> 7	13. Nutrition and health 14. The trouble with testosterone: hormones, physiology & behavior <i>* Discussion Section topic: Nutrition and health</i>
8	T Th <i>mg:</i> 8,9; <i>wil:</i> 11,26	15. Reproduction: eggs are big, sperm are small, and that matters 16. Neurons, brains, and our connection to the external world <i>* Discussion Section topic: Experimental approaches to behavior</i>
9	T Th <i>wil:</i> 24; <i>mg:</i> 4	17. What gives drugs their power? Caffeine, Prozac, Botox, & more 18. Neurotransmitters and complex behavior <i>* Discussion Section topic: Nervous system functioning</i>
10	T Th <i>mg:</i> 5,6 <i>mg:</i> 12	19. Flourishing in our alien, industrial environment 20. Evolution and emotions: finding (and creating) happiness <i>* Discussion topic: Industrial societies: Life in an alien environment</i>

Discussion Board Posts

Week 1

Self-reflection 1

Choose one of the following options and post your response to the discussion board on the course website. Your response should be 100-300 words in length.

It is due by Friday of Week 1 at 4pm.

- * “I’m not a science person.” Why might you (or someone you know) have ever said that? Using examples, explain a) why this is not actually an accurate assertion, and b) why this is potentially a harmful thing to say.
or
 - * An important feature of scientific thinking is that it can tell us when we should change a belief we hold about the natural world. Describe an instance of scientific thinking causing you to change your mind. What was your belief and why did you change it?
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Week 3

Photo Post 1

Choose one of the following options and post your response to the discussion board. In addition to the posted photo(s), your response should be 50 to 250 words in length.

It is due by Friday of Week 3, at 4pm.

- * Often, there are multiple evolutionary solutions to the same set of selective pressures. Post a pair of photos (taken by you) showing two different evolutionary solutions for the same problem. Include a description and explanation for your photos.
or
 - * Post a photo of (or advertisement for) a product or service that makes a health claim. Describe what would constitute reasonable evidence for the claim. Investigate and report on the actual evidence for the claim.
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Week 6

Short Science Summary

Select and read one of the peer-reviewed research articles posted on the course website. (To find the articles: Click on “Modules” in BruinLearn, then scroll down to the bottom.) Write a brief summary for a 15-year-old. In your summary, describe:

- 1) the main point or finding,*
- 2) the coolest methods or result,*
- 3) why they might care, and*
- 4) a possible avenue of further study related to the topic*

Your response should be 100 to 300 words in length.

No more than six students may select each of the posted articles. Sign up via the spreadsheet on the course website.

It is due by Friday of Week 6 at 4pm.

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Week 8

Photo Post 2

Choose one of the following options and post your response to the discussion board on the course website. In addition to the posted photo(s), your response should be 50 to 250 words in length.

It is due by Friday of Week 8 at 4pm.

- * Post a photo of an interesting graph you encounter in your everyday life. Describe where it comes from and what it is saying. How could it be made more effective?
- or*
- * Post photos of nutritional labels from three different foods having the same number of calories per serving but coming from different combinations of macromolecules. Explain how they differ and the health implications.
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