

# IDH2930 APPLIED BIOLOGY: FROM ATOMS TO SOCIETY

Fall 2023

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**Instructors:** Sydney Edwards and Dr. Peter Kima  
**Email:** [sedwards2@ufl.edu](mailto:sedwards2@ufl.edu)

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**Time:** M 1:55 – 2:45pm  
**Place:** 0119 Little Hall

## Course Page:

<https://serenappliedbiology.github.io/>

**Office Hours:** After class or by appointment.

## Main References:

- Robert M. Sapolsky, *Behave: The Biology of Humans at Our Best and Worst*, Penguin Books, 2017.
- Siddhartha Mukherjee, *The Emperor of All Maladies: A Biography of Cancer*, Scribner, 2011.

**Objectives:** This course is designed to introduce undergraduate students to the foundational concepts underpinning biology. At the course's conclusion, students are expected to accomplish the following:

- Understand current debates and new advances within their discipline.
- Develop a better intuition for how good science is conducted.
- Understand basic concepts within genetics, neuroscience, and evolutionary biology.
- Be able to articulate future research directions for their field of interest.

**Prerequisites:** A high school-level understanding of biology, chemistry, and calculus is helpful though not required.

## Grading Breakdown

Class participation	(40%)
Initial course survey	(10%)
Final project proposal	(10%)
Final project draft	(10%)
Peer review	(5%)
Final project	(15%)
Final project reflection	(10%)
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Total	(100%)

## Grading Scale

A	[90% - 100%]
A-	[87% - 90%]
B+	[85% - 87%]
B	[80% - 85%]
B-	[77% - 80%]
C+	[75% - 77%]
C	[70% - 75%]
D	[60% - 70%]
E	[0% - 60%]

## Grading Policy:

A minimum grade of B is required to earn Academic points towards your Honors Completion Requirements. (Exception: Honors Quest I and II sections require a C). Once you have earned your final grade in this course, please upload the course information and final grade from your Unofficial Transcript into your Honors Canvas Cohort: Honors Completion module to earn Honors Completion credit.

**Important Dates:**

Final Project Proposal .....	October 16 <sup>th</sup> , 2023
Final Project Draft .....	November 20 <sup>th</sup> , 2023
Final Project .....	December 8 <sup>th</sup> , 2023
Final Project Reflection .....	December 11 <sup>th</sup> , 2023

**Final Project Overview:**

This course is graded primarily on attendance and participation. The final project is designed to help you synthesize the topics from this course and can be any topic of your choosing. Additionally, you have free reign in how you present your final project. Some ideas are to interview a professor whose work you're interested in using a podcast-style format, a short video documentary (a few minutes) describing a facet of biology or medicine that you are passionate about, a formal research paper, a popular science-style blog, or an at-home independent research project. This list is not exhaustive and other project ideas are encouraged! Feel free to be as creative as you like.

**Class Policy:**

- Regular attendance is essential and expected.
- While doing the readings, take notes and think of any questions, ideas, or concepts you would like to discuss during the class session. This will only make our class sessions more interesting and useful to you as a student!
- If you are not able to attend a class session for any reason, please let me know in advance. I do not want this course to become a burden. If there is anything going on that makes completing this course difficult, reach out to me and we can develop a plan to help you successfully complete the course.

**Accommodations for Students with Disabilities:** Students requesting classroom accommodation must first register with the Dean of Students Office. The Dean of Students Office will provide documentation to the student who must then provide this documentation to the instructor when requesting accommodation

**UF Honor Code:**

The UF Student Honor Code (see [dso.ufl.edu](https://dso.ufl.edu) for details): We, the members of the University of Florida community, pledge to hold ourselves and our peers to the highest standards of honesty and integrity. On all work submitted for credit by students at the University of Florida, the following pledge is either required or implied: "On my honor, I have neither given nor received unauthorized aid in doing this assignment."

Honor Code violations include copying on an exam (or helping another student to copy) and/or turning in an exam for regrading that has been changed since it was graded by the instructor. Any student found responsible for an academic honesty violation in this course will forfeit any applicable exam drop policy and be recommended sanctions consistent with the offense.

**Campus Resources:**

Honors Program, 201 Walker Hall, 352-392-1519

Quick questions for an Honors advisor? Email [advisor@honors.ufl.edu](mailto:advisor@honors.ufl.edu)

Need an Honors advising appointment? Schedule via Microsoft Bookings: [ufhonorsadvising](https://ufhonorsadvising)

The Counseling & Wellness Center

Provides confidential counseling services at no cost for currently enrolled students. Resources are available on campus for students having personal problems or lacking clear career or academic goals, which interfere with their academic performance. [www.counseling.ufl.edu/cwc/](https://www.counseling.ufl.edu/cwc/)

Course Outline		
Date	Topic	Materials
August 28 <sup>th</sup>	Course Introduction	<ul style="list-style-type: none"> <li>• Read over syllabus</li> </ul>
September 4 <sup>th</sup>	Holiday	<ul style="list-style-type: none"> <li>• No class</li> </ul>
September 11 <sup>th</sup>	Genetics	<ul style="list-style-type: none"> <li>• Sean Carroll's Mindscape Podcast, <i>Lea Goentoro on Regrowing Limbs</i></li> <li>• Siddhartha Mukherjee, <i>The Gene</i>, pgs. 64-85</li> <li>• Robert Sapolsky, <i>Behave</i>, pgs. 711-717</li> </ul>
September 18 <sup>th</sup>	Evolutionary Biology	<ul style="list-style-type: none"> <li>• Nick Lane, <i>Power, Sex, Suicide: Mitochondria and the Meaning of Life</i>, pgs. 278-293</li> <li>• Robert Sapolsky, <i>Behave</i>, pgs. 328-353</li> </ul>
September 25 <sup>th</sup>	Neuroscience	<ul style="list-style-type: none"> <li>• Antonio Damasio, <i>Descartes' Error</i>, pgs. 245-252</li> <li>• Robert Sapolsky, <i>The Biology of Humans at Our Best and Worst</i></li> <li>• The Decision Lab, <i>The Somatic Marker Hypothesis</i></li> </ul>
October 2 <sup>nd</sup>	Moral Psychology	<ul style="list-style-type: none"> <li>• Joshua Greene, <i>Moral Tribes</i>, pgs. 105-143</li> </ul>
October 9 <sup>th</sup>	Cancer Biology	<ul style="list-style-type: none"> <li>• Michael Levin, <i>How bioelectricity could regrow limbs and organs</i></li> <li>• Siddhartha Mukherjee, <i>The Emperor of All Maladies</i>, pgs. 193-201</li> <li>• Siddhartha Mukherjee, <i>Cancer's Invasion Equation</i></li> </ul>
October 16 <sup>th</sup>	Research Panel	<ul style="list-style-type: none"> <li>• No readings this week</li> </ul>
October 23 <sup>rd</sup>	Microbiology	<ul style="list-style-type: none"> <li>• Jenny Rohn, <i>Bacteria and Antibiotics: Revenge of the Microbes</i></li> <li>• Yasemin Saplakoglu, <i>Mobile Genes From the Mother Shape the Baby's Microbiome</i></li> </ul>
October 30 <sup>th</sup>	Immunology	<ul style="list-style-type: none"> <li>• Erica Sonnenburg, <i>Diet as a Lever to Improve Your Microbiome and Health</i></li> <li>• Sheena Cruickshank, <i>Harnessing the Power of Immunology to Heal Ourselves</i></li> </ul>

Course Outline (cont.)		
Date	Topic	Materials
November 6 <sup>th</sup>	Scientific Ethics	<ul style="list-style-type: none"> <li>• Brian Christian, <i>The Alignment Problem</i>, pgs. 82-90</li> <li>• Arlene Balkansky, <i>Radium Girls: Living Dead Women</i></li> <li>• Abhijit Banerjee and Esther Duflo, <i>Poor Economics</i>, pgs. 41-70 (fine to skim this)</li> </ul>
November 13 <sup>th</sup>	Philosophy of Science	<ul style="list-style-type: none"> <li>• Stanford Encyclopedia of Philosophy, <i>David Hume</i>, Part 5: Causation</li> <li>• Eric Winsberg, <i>Causal Inference in Complex Non-linear Systems: A Cautionary Tale</i></li> <li>• Rafal Bogacz, <i>Dopamine role in learning and action inference</i>, eLife Digest</li> <li>• David Hume on Causation</li> </ul>
November 20 <sup>th</sup>	Peer Review	<ul style="list-style-type: none"> <li>• Work on peer reviews during class time</li> </ul>
December 4 <sup>th</sup>	Final Project	<ul style="list-style-type: none"> <li>• Present Final Project</li> </ul>