

University of Wisconsin-Madison  
**History of Science/History/MHB 132**

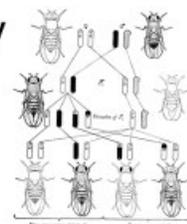
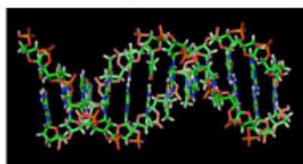
Fall 2020



**BEES, TREES, GERMS, AND GENES**



**A History of Biology**



Prof. Lynn K. Nyhart

**Course description:** How did today's biology emerge out of the diverse traditions that stretch back into the eighteenth century—agriculture and natural history (bees and trees), biomedicine and molecular biology (germs and genes)? And why does it matter to know this history? In this course, we examine classic issues in the history of biology, putting them into broader scientific and social contexts to see how different ways of knowing intertwined, competed, and yielded novel approaches to the study of life. As we will see, although the biology of the past can seem very different from today's cutting-edge work, the underlying ideas laid down in the nineteenth and twentieth centuries—about the diversity and extinction of life, about our own place in nature, and about the consequences of our intervening into nature (or the lack of such consequences)—still profoundly shape today's life sciences, even as the crises of our time require that we rethink these ideas fundamentally. Seizing the moment, the fall 2020 edition of this course emphasizes themes of race and pandemic disease.

**Meeting times and Locations:**

Lecture 001 (Nyhart): online, asynchronous, with synchronous “pivot” Weds. 1:20-2:10 pm

Discussions (TAs): synchronous, whether face-to-face or online:

301: R 7:45-8:35 am, 215 Van Hise Hall  
302: R 8:50-9:40 am, 215 Van Hise Hall  
303: R 12:05pm-12:55 pm, online  
304: R 1:20-2:10 pm, online  
305: R 5:40-6:30 pm, 155 Van Hise Hall  
306: R 6:45-7:35 pm, 155 Van Hise Hall

307: F 12:05pm-12:55 pm, online  
308: F 7:45-8:35 am, 155 Van Hise Hall  
309: F 11:00-11:50 am, online  
310: F 8:50-9:40 am, 155 Van Hise Hall  
311: F 1:20-2:10 pm, online  
312: F 1:20-2:10 pm, online

## Instructional Staff and Contact Information:

Prof. Lynn K. Nyhart  
[lknyhart@wisc.edu](mailto:lknyhart@wisc.edu)

TAs: Jeff Guarneri, [guarneri@wisc.edu](mailto:guarneri@wisc.edu) (308, 310)  
Emily Hutcheson, [hutcheson2@wisc.edu](mailto:hutcheson2@wisc.edu) (304, 312)  
Monica Ledesma, [mledesma@wisc.edu](mailto:mledesma@wisc.edu) (305, 306, 307, 311)  
Sabrina Manero, [smanero@wisc.edu](mailto:smanero@wisc.edu) (301, 302, 303, 309)

Office Hours (online only):

Nyhart: Tu 3-5 p.m.

Ledesma: F 3-5 p.m.

Guarneri: F 1-3 p.m.

Manero: Tu 10 a.m.-noon

Hutcheson: Th, F 2:30-3:30 p.m.

Online meetings outside these hours are also possible by appointment, at instructor's discretion.

## Course Credits, Designations, and Attributes:

Requisites-None

Course Designation: Breadth-Either Humanities or Social Science

Level-Elementary

L&S Credit-Counts as Liberal Arts and Science credit in L&SCanvas

**Canvas Course URL:** <https://canvas.wisc.edu/courses/219683>. All information in this course, including syllabus, readings and lecture materials, quizzes, problem sets, discussion board and writing assignments, study guide questions, and writing tips, will be posted on Canvas. All student assignments are to be posted to Canvas.

**Learning Outcomes:** In successfully completing this course, students will be able to:

- identify key events, people, ideas, practices, and institutions in the history of biology;
- Read a passage of professional or popular scientific writing in biology and connect it to larger historical themes and trends;
- Explain how past ideas about diversity and extinction, scientific and medical intervention, and key concepts such as infection and information have shaped present-day assumptions and attitudes about biology and human nature.

Students will also develop broader historical skills that will allow them to:

- identify whether a text is an article, a chapter, a book section, a book, blog post, or online article, and cite it correctly;
- understand and express basic relationships between historical chronology and causation;
- synthesize information from diverse sources into a coherent historical argument;
- empathize with people living in times and cultures different from their own.

**Readings** are mainly *secondary sources* (writings by historians and scientists reflecting on and analyzing what happened in the past), supplemented by *primary sources* (scientific writings by participants).

**Work Expectations:** The credit standard for this 3-credit course is met by an expectation of a total of 135 hours of student engagement with the course learning activities (at least 45 hours per credit), which include regularly scheduled instructor:student meeting times (TA-led discussion one hour per week and

Professor-led Q&A), plus online materials that include recorded learning materials (lectures, podcasts, videos, readings), quizzes, discussion boards, problem sets, and a final project, as described in the syllabus.

### **How This Course Works:**

The weekly rhythm of this course is as follows: after the first two introductory weeks, each week covers two topics (A and B) within a larger umbrella theme of the week. These topics will be presented asynchronously through learning materials made available on Canvas. Learning materials will combine some combination of basic “History to Know” text, powerpoint mini-lectures, podcasts, and readings. Some weeks will have more external readings, others will have more “History to Know” and mini-lectures. I hope to provide all materials for the week by Saturday noon, but because this is the first time I am teaching in this format, what I can guarantee is that all materials associated with Topic A will be available by Saturday noon and all those associated with Topic B will be available by Monday noon. You will need to read/listen/watch/take notes and otherwise process these materials by **Wednesday at 1:30 pm**, when there will be a 10-minute quiz on them. The quiz will close at 1:40 pm. (If you have accommodations for a longer testing time, we will arrange for you to start early). You may take each quiz only once. I will be available in person through Blackboard Collaborate Ultra (BBC-U) to answer questions/discuss the materials for the week until our designated class time ends at 2:10 pm.

The quiz marks a pivot to the second half of the week: comparison/analysis/synthesis. Whereas in the first half of the week, Topics A and B are generally treated separately, the second half of the week brings them together through comparison, analysis, and synthesis. The main place this will happen is in your synchronous discussion section. To prepare yourself for the section, you will post an entry to the discussion board each week (except for Thanksgiving week). For three of these weeks (called “Special Discussion Boards”), you will also respond to someone else’s post, as specified under “Assessment” below.

As you go through the course, you will be building skills toward the final project, which will invite you to present an argument that situates a contemporary issue related to course themes (as raised by a curated set of articles/posts you will have access to near the end of the course) in a longer historical context. All of the graded assessments below will contribute in one way or another to skills you will deploy in this final project. In addition, to help you get there, I will provide weekly study guides. Whereas you are responsible for extracting the major concepts, historical actors, and when key events took place from the learning materials on your own (generally what’s on the quiz), these weekly study guides accompanying the materials will assist in focusing your attention on particular questions in the more complex readings and other materials. They will also help prepare you for discussion boards and discussions. Therefore, **I strongly suggest you print out the study guides and use them to assist you in your note-taking.**

### **Assessment:**

20% **Weekly quizzes**, every Wednesday on Canvas, 1:30-1:40 pm. Quizzes will generally be short (6-10 questions, 10 points). These quizzes are timed and you'll have one attempt at each. At the end of the semester, we'll drop your two lowest scores. The purpose of the quizzes is to make sure you have read/listened to/viewed the learning materials and have retained basic

information about them. While they are technically open-book/open note, if you spend time looking up the information during the quiz, you are less likely to finish it.

**10% Participation in discussion sections (synchronous):** Participation means showing up on time and talking intelligently, demonstrating your active engagement with both learning materials and classmates. After week 2, we will divide each section into groups of approximately six people, who will become your main co-discussants during the rest of the semester. (We may switch groups up about halfway through so that you are interacting closely with more people.) You are expected to attend your discussion section when scheduled, and to interact with your group via BBC Ultra if you are not meeting in person. Your TA may require other specific participation activities, such as using Google Sheets to generate a collective response to a historical question with your group and bring it back to the section as a whole.

**10% Discussion boards:** To prepare for high-quality discussion, you are required to post to weekly discussion boards at least 12 hours in advance of your discussion section's meeting time (for weekly posting assignments and prompts, see details on Canvas). Late posts will not be accepted. The two lowest-graded posts will be excluded from this grade.

**10% Special Discussion boards (with responses):** Three times during the course (weeks of Sept. 21, Oct. 17, and Nov. 12), you will be asked to comment on two other students' posts in your section, in addition to supplying your own post. The purpose of these is to give you practice in some particular skills you will need for subsequent assignments, to compare your own ideas with those of others, to offer critical/analytical feedback to your peers, and to receive their critiques. In these cases, your grade will derive from a combination of your own post (1/2 your grade) and your responses to others (1/4 each).

**20% History Problem Sets:** 2 problem sets, 10% each. These will pose a series of questions asking you to analyze different aspects of a historical problem raised in the course.

Problem Set #1: Darwin, Evolution, and Race. Questions open Monday, Sept. 28, due Sunday Oct. 4, 11:59 pm

Problem Set #2: Genetic Engineering and Eugenics. Questions open Tuesday, Nov. 17, due Tues. Nov. 24, 11:59 pm.

**10% Evidence Assignment,** due in Canvas on Monday, Oct. 26, by 11:59 pm.

**20% Final Project:** Connecting past and present, due in Canvas Monday, Dec. 14, by 11:59 pm.

**Grading:** All assignments will receive a numeric score (e.g. 9/10, 29/30); your final composite numerical grade (weighted according to the percentages above) will be converted into a final letter grade using the conversion table below.

Percentage	<60	60-68.9	69-74.9	75-80.9	81-86.9	87-92.9	93 and above
Grade	F	D	C	BC	B	AB	A

#### **Accommodation of Student Needs:**

The 132 teaching team is invested in your success in this course. We aim to ensure that the course is accessible and that students have the support they need. Please discuss any accommodations or accessibility needs with your TA and/or myself as soon as possible. The sooner we can address issues, the more options we have to solve and head off problems. If unforeseen circumstances arise over the semester, please talk with me or your TA about how we can help support your success.

**Resources:**

**McBurney Center for Disability Services:** If you are interested in receiving university services and accommodations for your disability, please contact McBurney by phone at 608-263-2741 or email at [FrontDesk@mcb.wisc.edu](mailto:FrontDesk@mcb.wisc.edu).

**History Lab and Writing Center:** Both the History Lab and Writing Center offer a variety of useful resources, including tutoring sessions, handouts and writing classes. If you find that you need extra writing help for any of our assignments (especially the final assignment), I highly recommend you make appointments early to make sure you have enough time to integrate the feedback you receive. For information, visit <https://history.wisc.edu/undergraduate-program/the-history-lab/> or <http://www.writing.wisc.edu>.

**University Health Services:** If you could use some FREE help managing your time, dealing with stress, managing money, or pretty much anything else, UHS has got you covered: <https://www.uhs.wisc.edu/mental-health/lets-talk>.

**Course Policies:**

*Email:* Due to the size of the course, we are unable to answer questions via email. For short questions (e.g. assignment due dates), please review the syllabus and course summary first. If the answer is not there, you may post on the Q&A forum on the Canvas website, and we will reply there within 24 hours. For longer questions (e.g. advice on how to approach an assignment), or if you have personal concerns you would like to discuss, please arrange to see me or your TA (virtually) during office hours. If you are not able to meet during office hours, you can email us to see if an alternative meeting time is possible.

*Late assignments:* If you are facing circumstances are making it difficult for you to meet assignment deadlines (including personal circumstances such as uncertain housing, lack of food, health issues including but not limited to Covid-19, family crises), I am happy to discuss deadline extensions or other accommodations. (You can also contact the Dean of Students Office for assistance with these issues: <https://doso.students.wisc.edu/student-assistance/>). Please come see me well in advance of the assignment deadline whenever possible. If you do not make prior arrangements with me or your TA, late assignments will lose 3% of the total assignment points per 24 hours late. (The first 3% is docked between 0 and 24 hours.) Assignments will not be accepted more than 120 hours (5 days) after the due date and time. NOTE: LATE FINAL PROJECTS WILL NOT BE ACCEPTED.

**Academic Integrity:**

As stated on the University of Wisconsin-Madison's page on academic integrity (<https://conduct.students.wisc.edu/academic-integrity/>):

“Academic misconduct is governed by state law, UWS Chapter 14 (PDF). Misconduct includes the following, but is not limited to this list:

- Seeks to claim credit for the work or efforts of another without authorization or citation (plagiarism)
- Uses unauthorized materials or fabricated data in any academic exercise (using notes for a closed-book online exam)
- Forges or falsifies academic documents or records (having a friend sign you in for attendance when you're absent)
- Intentionally impedes or damages the academic work of others (tampering with another student's experiment)

- Engages in conduct aimed at making false representation of a student’s academic performance (altering test answers and submitting the test for regrading)
- Assists other students in any of these acts.”

The University of Wisconsin-Madison takes academic misconduct allegations very seriously. If an instructor suspects a student has engaged in academic misconduct, then the instructor will contact the student and ask him/her to explain their work. If the instructor still believes academic misconduct occurred after meeting with the student, he/she will determine the consequences, known as sanctions. One or multiple sanctions may be imposed.

Types of sanctions include an oral reprimand up to expulsion. If the sanction affects any grade, the student will then be notified in writing, typically by email, of the instructor’s decision. The Office of Student Conduct & Community Standards (OSCCS) is also informed and will contact the student about his/her rights and any additional sanctions. Repeated acts of academic misconduct or extreme circumstances may result in more serious actions such as probation, suspension, or expulsion.”

If you have concerns or confusion around academic integrity, please discuss them with me. The Writing Center can also help you with general citation rules.

## Course Schedule

### Unit 0: Setting You Up for Success

Please go through the Unit 0 materials before Wednesday, Sept. 2.

#### *Week 1: Thinking Historically about Biology*

Introductory materials available on Canvas by Monday 8/31.

**Reading:** Riana Betzler, [“Empathy in the Time of Covid-19,”](#) ISHPSSB Newsletter, Summer 2020

**Activities:** Practice Quiz Wed. 9/2, 1:30-1:40 pm.

*Note: You are expected to attend discussion sections this week!*

### Unit 1: Bees and Trees: The Diversity of Life and the Order of Nature

*In this unit we ask, How did naturalists understand how the diversity of life was organized in the 18<sup>th</sup> and early 19<sup>th</sup> centuries? How did the structures of imperialism and slavery help shape those considerations? In what ways were understandings of diversity, hierarchy, and extinction joined in Darwinian evolution?*

**Week 2: Before “Biology”:** *Natural History, Western Imperialism, and Slavery* (Sat. 9/5-Fri. 9/11)

#### **Readings:**

Audrey Smedley and B. D. Smedley, Ch. 9, “The Rise of Science and Scientific Racism,” 213-25. *Race in North America: Origin and Evolution of a Worldview*, 4 ed., 2011. Retrieved from <http://ebookcentral.proquest.com>, 2020-07-11.

Carl Linnaeus, *Systema Naturae*, final edition edited by Gmelin, Leipzig, 1788, translated by W. Turton, London, 1806. Opening pages. Reprinted in T. S. Hall, ed., *A Source Book in Animal Biology*, 31-38.  
Sam Kean, "Science's Debt to the Slave Trade," *Science*, 364, issue 6435 (5 April 2019), 16-20.

**Activities:**

Quiz Wednesday 9/9, 1:30 pm  
Discussion Board

**Week 3: Biology Emerging** (Sat. 9/12-Fri. 9/18)

**Readings:**

Topic A: The Beginnings of "Biology": Joining the Natural History and Natural Philosophy of Life

Georges Cuvier, "Introduction" to *Animal Kingdom* (1833), tr. H. M'Murtrie, Introduction, selections: 12-18 (top); pp. 33-36.  
Jean Baptiste de Lamarck, *Zoological Philosophy* (1809) tr. Hugh Elliot (London, Macmillan and Co., limited, 1914), 205, 210 (on life); 131 (classification), 167-173 (on humans)

Topic B: Historicizing Natural History: Comparison, Extinction, Transformation?

Mark Barrow, "The Problem of Fossils," *Nature's Ghosts*, 23(top) -26.  
Georges Cuvier, "The Megatherium from South America," and introduction to it, in *Georges Cuvier, Fossil Bones, and Geological Catastrophes*, edited and translated by Martin J. S. Rudwick (Chicago: University of Chicago Press, 1997), 25-32  
Jean Baptiste de Lamarck, *Zoological Philosophy* (1809) 124-127 (on the sloth)

**Activities:** Quiz Wed. 1:30-1:40 pm

**Week 4: Darwin** (Sat. Sept. 19 – Fri. Sept. 25)

**Readings:**

Topic A: The History and Geography of Life on Earth (Darwin voyage of the Beagle)

James Secord, "Introduction" to Charles Darwin, *Evolutionary Writings* (Oxford University Press, 2008), x-xx. [Substitutes for lecture; Quiz]  
Darwin Voyage primary source packet

Topic B: The Tree of Life and the *Origin of Species*

James Secord, "Introduction" to Charles Darwin, *Evolutionary Writings* (Oxford University Press, 2008), xx-xxiii  
Charles Darwin, *On the Origin of Species* (London: John Murray, 1859; reprint ed. Harvard University Press, 1964), 1-6, 80-87, 109-111, 126-130, 484-490.

**Activities:**

Quiz Wed. 1:30-1:40 pm  
Special Discussion Board #1

**Week 5: Darwinian Evolution: Problems Solved and Unsolved** (Sat. 9/26-Fri. Oct. 2)

**Readings:**

Topic A: Human Evolution in the late 19thC.

Race science and its repudiation: Mia Bay, *The White Image in the Black Mind* (2000), chapter 2, selections, pp. 40-44, 54-63.

James Secord, "Introduction" to Charles Darwin, *Evolutionary Writings* (Oxford University Press, 2008), xxiv-xxvi

Darwin, *Descent of Man* [selections].

\***Optional** film: "The Life and Times of Sara Baartman." (Baartman was famous as the "Hottentot Venus," brought from South Africa to London and then Paris between 1810 and 1816. Cuvier examined her, alive and dead.) Viewable at: <https://video-alexanderstreet-com.ezproxy.library.wisc.edu/watch/the-life-and-times-of-sara-baartman/transcript?context=channel:the-icarus-films-collection>. The film is over 50 min. long; the part about Baartman's travel to Paris begins at about minute 31. I recommend watching from there to the end. [20 min.]

Topic B: Darwinism: The Great *Gestalt* Shift? (Nyhart Analytical Summary and Review)

No external readings

**Activities:**

Quiz Wed. 1:30-1:40 pm

Discussion Board

Problem Set #1 opens M 9/28; due Sun night 10/4.

**Unit 2: Genes: Intervening to Improve Crops and Citizens**

*In this unit, we consider how new ideas of heredity and population management emerged hand in hand with an ethos of intervention, within the agricultural, academic, and broader social and political contexts in the late 19<sup>th</sup> and early 20<sup>th</sup> centuries.*

**Week 6: Genetics and Eugenics** (Sat. 10/3-Fri. 10/9)

**Readings:**

Topic A: The Problem of Heredity

Edward J. Larson, *Evolution: The Remarkable History of a Scientific Theory* (Modern Library, 2004), "Chapter 7: Genetics Enters the Picture," pp. 151-174.

Topic B: Good Breeding: Genetics, Agriculture, and Eugenics in the early 20<sup>th</sup> Century

Garland E. Allen, "Science misapplied: The eugenics age revisited." *Technology Review*; Aug/Sep 1996; 99 (6): 22-31.

"News and Notes," *American Breeders Magazine* 3 (1912): 69-79.

Video: "A Dangerous Idea: A History of Eugenics in America," log into UW library: <https://video-alexanderstreet-com.ezproxy.library.wisc.edu/watch/a-dangerous-idea>, 56:40 to 1:13:40 (mostly early 20thC eugenics mvt). 20 min.

Ayah Nuriddin C-SPAN interview on African-American Eugenics at <https://www.c-span.org/video/?439275-13/african-americans-eugenics> (14 min.)

Ayah Nuriddin, "The Black Politics of Eugenics," *Nursing Clio*, June 1, 2017, at <https://nursingclio.org/2017/06/01/the-black-politics-of-eugenics/>

**Activities:**

Quiz Wed. 1:30-1:40

Discussion Board

**Week 7: Population Genetics and Biological Politics, 1910s-1959** (Sat. 10/10-Fri. 10/16)

Readings:

Topic A: From "Mendelism versus Darwinism" to "the Evolutionary Synthesis"

Jan Sapp, *Genesis: The Evolution of Biology* (Oxford/New York: Oxford University Press, 2003), chapter 13 (selection), "Darwinian Renaissance," pp. 143-154.

Topic B: Genetic Politics at Mid-Century

Paul Farber, "Changes in Scientific Opinion on Race Mixing: The Impact of the Modern Synthesis," in *Race and Science: Scientific Challenges to Racism in America*, edited by Paul Farber and Hamilton Cravens (Oregon State University Press, 2009), 130-151.

Theodosius Dobzhansky, "The Race Concept in Biology," *The Scientific Monthly*, Feb. 1941, 52(2): 161-165.

UNESCO, *The Race Concept: Results of an Inquiry* (Paris, UNESCO, 1952), 11-16.

**Activities:**

Quiz Wed. 1:30-1:40 pm

Special Discussion Board #2

### **Unit 3: Germs: Thinking about Epidemic Diseases and How to Fight Them**

*In this unit, we return to the period from the late 18<sup>th</sup> century to the early 20<sup>th</sup> century, to explore how medical scientists thought about the causes of epidemic disease and how to combat them. Why do people get sick at some times and not others? Why do some people not get as sick as other people? How has race factored into both theories and practices of dealing with epidemic disease?*

**Week 8: Disease Causation and Racial Immunity in Antebellum America** (Sat. 10/17-Fri. 10/23)

**Reading:**

Topic A: Epidemics: The Case of Yellow Fever

Dorothy Porter, "Aetiology and Action," in idem, *Health, Civilization and the State* (London: Routledge, 1999), 81-87.

Special Section, "Racial Biases and Health Disparities: 400 Years Since Jamestown," (selections), *American Journal of Public Health*, Oct. 2019, 109 (10): 1336-1341.

Topic B: Immunity and Social Structure in Antebellum America

Kathryn Olivarius, "Immunity, Capital, and Power in Antebellum New Orleans," *American Historical Review*, 124, no. 2 (April 2019): 425-455.

Kathryn Olivarius, "The Dangerous History of Immunoprivilege," *New York Times Op-Ed*, April 12, 2020.

Additionally, you can listen to this interesting podcast:

“Kathryn Olivarius on Her Article ‘Immunity, Capital, and Power in Antebellum New Orleans,’”  
*American Historical Association Podcast*, April 2019: <https://soundcloud.com/aha-historians/kathryn-olivarius-on-her-article-immunity-capital-and-power-in-antebellum-new-orleans?in=aha-historians/sets/ahr-interview> [30 min.]

**Activities:**

Quiz Wed. 1:30-1:40 pm  
Special Discussion Board #2

**Week 9: Microbial Invaders and Heroic Scientists: The Bacteriological Revolution** (Sat. 10/24-Fri.10/30)

**Reading:**

Topic A: Microbial Invaders: The Bacteriological Revolution

Laura Otis, *Membranes: Metaphors of Invasion in Nineteenth-Century Literature, Science, and Politics* (Baltimore: The Johns Hopkins University Press, 1999), 25-36

Optional, just for fun: if you are interested, there is a great melodrama surrounding Koch, Ehrlich, and von Behring, (with special guest appearance by Virchow) called “Charité” available on Netflix (6 episodes, German with subtitles).

Topic B: Manufacturing Immunity: Vaccines, Antitoxins, Immunology, Virology

John M. Barry, *The Great Influenza: The Story of the Deadliest Pandemic in History* (New York: Viking Penguin, 2004), pp. 67-71.

W. F. Bynum, *Science and the Practice of Medicine in the Nineteenth Century* (Cambridge, UK: Cambridge University Press, 1994), “Immunology,” 158-164

**Activities:**

Evidence assignment due Monday 10/26 by 11:59 pm

Quiz Wed. 1:30-1:40 pm  
Discussion Board

**Week 10 (11/2-11/6): Pandemic 1918** (Sat. 10/31-Fri. 11/6)

**Reading:**

Topic A: Experiencing the Spanish Flu

Nancy Bristow, *American Pandemic: The Lost Worlds of the 1918 Influenza Epidemic* (Cary: Oxford University Press USA), 43-45, 71-74, 131-139.

Steven Burg, “Wisconsin and the Great Spanish Flu Epidemic of 1918,” *Wisconsin Magazine of History*, Autumn 2000, pp. 37-56.

Bruno Strasser and Thomas Schlich, “The Art of Medicine: A History of the Medical Mask and the Rise of Throwaway Culture,” *The Lancet*, May 22, 2020. [https://doi.org/10.1016/S0140-6736\(20\)31207-1](https://doi.org/10.1016/S0140-6736(20)31207-1)

Topic B: Pandemic and Post-Pandemic Puzzles: Influenza, Pneumonia,

John Barry, *The Great Influenza*, 288-291, 294-296; 411-418

**Activities:**

Quiz  
Discussion Board

## Unit 4: Genes to Genomes: Information and Intervention

*In this unit we examine how molecular biology developed around the master metaphor of “information,” and how molecular biology transformed biological theory and practice—indeed, the very image of biology—from the 1930s to the 1990s. At the same time, the specter of eugenics has remained.*

### **Week 11: The Emergence of Molecular Biology** (Sat. 11/7-Fri. 11/13)

#### Reading:

##### Topic A: Molecularizing the Gene

John M. Barry, *The Great Influenza*, 419-427

Jan Sapp, “Chapter 16: Conceiving a Master Molecule,” in idem, *Genesis: The Evolution of Biology* (Oxford; New York: Oxford University Press, 2003), 187-194 **only**, plus notes (319-322).

James D. Watson and Francis Crick, “Molecular Structure of Nucleic Acids: A Structure for Deoxyribose Nucleic Acid,” *Nature* (25 April 1953): 737-8.

##### Topic B: The Master Molecule: Genes, Codes, and Regulation

Matthew Cobb, “60 Years Ago, Francis Crick Changed the Logic of Biology,” *PLoS Biology* 15(9): e2003243. <https://doi.org/10.1371/journal.pbio.1003243>. September 18, 2017

Sapp, *Genesis* (see above), 194-200, 319-32 (notes)

Nathaniel Comfort, *The Science of Human Perfection*, 214-219 (to asterisks)

### **Week 12: Intervening at the Molecular Level** (Sat. 11/14-Fri. 11/20)

#### Reading:

##### Topic A: The Promise and Threat of Genetic Engineering

Comfort, *Science of Human Perfection*, 219-225 (to asterisks)

Bob Park and Scott Thacher, “Dealing with Experts: The Recombinant DNA Debate,” *Science for the People* 9, no. 5 (Sept-Oct. 1977): 28-35

##### Topic B: “Biotech”: The Industrial and Commercial Transformation of Biotechnology

Paul Rabinow, Chapter One, “Toward Biotechnology,” in *Making PCR: A Story of Biotechnology* (Chicago: University of Chicago Press, 1996), 19-45, 178-9.

Comfort, *Science of Human Perfection*, 235 (top) – 239

#### Activities:

Quiz Wed. 1:30-1:40 pm

Special Discussion Board #3

## Unit 5: Bringing History to Bear on the Present

*In this final unit, we draw mainly on recent and current science journalists’ accounts to consider some ways in which the themes of this course have come together in twenty-first century biology. How have the assumptions of the past become the issues of today? How can the past inform our understanding of the present and help guide our future?*

### **Week 13: CRISPR and Genome Editing** (Sat. 11/21-Wed. 11/25)

#### Readings and other media:

Topic A: Information + Intervention: CRISPR, Genome Editing, Gene Drives.

Radiolab Podcast Update: CRISPR (March 24, 2017)

<https://www.youtube.com/watch?v=9evyeRivZwk> (48 min.)

Dylan Matthews, “A Genetically Modified Organism Could End Malaria...” Vox, May 31, 2018, updated Sept. 26, 2018: <https://www.vox.com/science-and-health/2018/5/31/17344406/crispr-mosquito-malaria-gene-drive-editing-target-africa-regulation-gmo>

Michael Irving, “Malaria-resistant mosquitoes engineered using CRISPR,” New Atlas (March 9, 2018): <https://newatlas.com/malaria-resistant-mosquitoes-crispr/53739/>

J. Benjamin Hurlbut, “Limits of Responsibility: Genome Editing, Asilomar, and the Politics of Deliberation,” *Hastings Center Report* (Sept-Oct. 2015): 11-14

**Optional:**

Last Week Tonight with John Oliver, July 1, 2018 (sensitivity alert for crude if hilarious language): <https://www.youtube.com/watch?v=AJm8PeWkiEU>

Topic B: Pandemic Pivot 1: CRISPR and COVID-19

Carey Goldberg, “CRISPR Comes To COVID: A Pandemic Pivot And The Push For A Simple Coronavirus Test” <https://www.wbur.org/commonhealth/2020/07/10/crispr-coronavirus-covid-19-testing>

<https://www.forbes.com/sites/johncumbers/2020/07/01/a-new-20-minute-covid-19-test-will-use-crispr-gene-editing-technology-to-deliver-results-at-the-doctors-office-supermarket-or-workplace/#4621edfb7a55>

**Activities:**

Problem Set #2 due Tuesday 11/24 by 11:59 pm

No Quiz, No Discussion Board, No Discussion (Thanksgiving!)

**Week 14: COVID-19 and the Political Economy of Vaccine R&D** (Sat. 11/28-Fri.12/4)

**Readings:**

Topic A: Pandemic Pivot 2: Vaccine Research

Eric Hamilton, “UW–Madison, FluGen, Bharat Biotech to develop CoroFlu, a coronavirus vaccine” (Press release, 2 April 2020)

Browse: <http://flugen.com/influenza/> , <https://www.bharatbiotech.com/>

Kaushik Sunder Rajan, “Experimental Values: Indian Clinical Trials and Surplus Health,” *New Left Review* 45 (May/June 2007): 67-76 (excerpt).

Topic B: Private Enterprise and Public Health: COVID-19 and the Political Economy of Vaccine Testing

Laura Stark, “The Hidden Racism of Vaccine Testing,” *The New Republic* “Critical Mass,” at <https://newrepublic.com/article/158308/hidden-racism-vaccine-testing-a...>

Alexander Zaitchik, “No Vaccine in Sight,” *The New Republic* (June 2020): 22-29

Reread Riana Betzler: “Empathy in the time of Covid-19”: <https://www.ishpssb.org/blog/204-empathy-in-the-time-of-covid-19>

Optional: Kenneth Bailey and Lori Lobenstine, “Social Justice in a time of Social Distancing,” from ds4si: Design Studio for Social Intervention (PDF)

**Activities:**

Quiz Wed. 1:30-1:40 pm

Discussion Board

***Week 15: Final Project*** (Sat. 12/5-Wed. 12/9)

Course Review/Overview; Final Project Preparation

**Reading:**

Review Final Project Library

W 12/9: Last Class Day: Final Project Q&A (synchronous)

NO QUIZ, NO DISCUSSION BOARDS, NO DISCUSSIONS!

**MONDAY December 14: Final take-home essay due in Canvas Dropbox by 5 pm.**