Calvin and Hobbes by Bill Watterson for January 17, 2015

HST 270-800: Biotechnology and Society

Online in the time of Covid19

Instructor:

Professor Nathan Crowe
crowen@uncw.edu
Office: Technically Morton Hall rm 228 but at home for the pandemic!
Office Hours: T/Th, 3:00-4:00pm (or by appointment). Use the link below to visit my virtual office.
Office Hours Zoom Link: https://uncw.zoom.us/my/crowe.office

Optional Open Discussion Forum Hour: Wednesdays, from 11:00-12:00pm
Open Discussion Forum Zoom Link: https://uncw.zoom.us/j/94266269371

Course Description

Biotechnology pervades our modern world. Today, we can exert significant control over reproduction and food production; we can test our DNA to tell us where we supposedly come from and who we are; we have mastered how to use organisms to produce alcohol, vaccines, and medicines. Biotechnologies are a thriving sector of our economy and are routinely pointed to as the key to our future health and food security. Though they are often brought up in conversations about the future, biotechnologies have histories—histories that are important if we want to understand how they affect our world and their future directions. Issues of race, class, and gender pervade biotechnologies, though the hype around them can often make such issues invisible. This class will examine the social, political, and technological forces that have generated many of our most well-known contemporary biotechnologies and investigate how society has reacted to them. We will spend our time exploring the context in which many biotechnologies emerged and the science that drove them. This means that we will sometimes be discussing complex scientific ideas in order to understand why they were such a radical departure from the past and why they transformed the understanding of the world going forward.

Required Readings and Course Materials

- Alondra Nelson, *The Social Life of DNA: Race, Reparations, and Reconciliation After the Genome* (Beacon Press, 2016)

Student Learning Outcomes

This course is designed to help students:

- Examine biotechnologies within their larger social, political, and cultural contexts.
- Compose arguments that demonstrate that biotechnologies are not neutral things but always imbued with the social and political values.
- Compose written arguments that clearly and effectively articulate the complex historical contexts and debates surrounding the history of biotechnology in the 20th century.
- Critique the ways in which biotechnologies have, or potentially have, disproportional effects in society.

Course Expectations and Policies

Assignments and Grading

Discussion Boards	20%
Content Quizzes	10%
Paper 1	15%
Paper 2	15%
Midterm Exam	15%
Final Exam	15%
Un-paper Assignment	10%

Grade Scale

For all assignments and tests, as well as the final course grade, the grade scale is as follows:

A 100-93	B 86-83	C 76-73	D 66-63
A- 92-90	B- 82-80	C- 72-70	D- 62-60
B+ 89-87	C+ 79-77	D+ 69-60	F 59-0

Plagiarism and Academic Misconduct:

Because this is an online class that requires interaction via written work rather than orally, you may be tempted more than usual to borrow/steal language from a variety of sites. Knowingly presenting another person's language or ideas as your own constitutes plagiarism. **Don't do it**. If you are caught plagiarizing or cheating in any way you will at the very least be failed for the assignment, and depending on the level of the transgression you could receive an "F" for a final grade and be referred to Office of the Dean of Students (ODOS). Plagiarism, the theft of intellectual property, is a serious crime. If you have any questions, talk to me. For additional information: http://uncw.edu/ulc/writing/avoidplagiarism.html

Exam Format

The exams will require you to engage with the material that we've covered in through short answer and essay questions. Study guides will be distributed before each exam.

Papers and "Un-paper" Assignments

You will be required to compose responses to two paper prompts over the course of the semester. Each paper prompt will provide specific guidance as to length and requirements. The un-paper assignment will allow you to create your own medium (video, meme, poem, etc.) by which you engage with the assigned course materials. Guidance as to specific requirements will provided during the semester.

Content Quizzes

Many weeks you will have a content quiz associated with the week's materials. These will be low-stake quizzes that will help reinforce main ideas from the assigned materials. They will be open book/notes and a mix of question formats, such as short answer and true/false. These will be graded exercises, but I will drop the lowest quiz grade at the end of the semester.

Weekly Discussion Boards

20% of your grade is determined by your weekly discussion posts. Most weeks you will be required to post a response to a specific discussion question by Wednesday evening. You will then have to craft two replies to other students (or me) in your discussion group by the following Friday. Discussion post grades are based on both the quality of your initial post and the degree by which you engage with your fellow students in your replies.

These discussion posts are, essentially, representations of your in-person participation and attendance grades. Read/watch/listen to the weekly assignments and write thoughtful, coherent responses to the posted questions, and you will do well. The posts will be graded, and I will drop the lowest grade at the end of the semester. For more specifics on requirements and assessments, see the discussion rubric.

Note that you can lose points not only for poor quality, but also for problematic or disruptive language that attacks, demeans, or abuses your fellow students. Despite what some say, there are plenty of ways to disagree or debate controversial topics while also keeping our (virtual) spaces welcoming and safe. If you are worried about these issues, please contact me.

Sick Policy (COVID-19 and other)

Obviously, there is no attendance policy for an online course, but the reality is that right now any of us could become seriously ill, likely from the coronavirus, but there are a number of illnesses that could affect our ability to fulfill the course expectations. If you do get sick, I will allow for you to make up work after you recover. Each instance, however, is specific, so please contact me so that we can figure out the best way for you to succeed and regain your health. Depending on the severity of your illness, it may be in your best interest to consider a medical withdrawal or other solutions, but having open communication is the only way we can figure out the best course forward.

I also consider any responsibilities to take care of loved ones who are sick to also fall under this policy. Again, if you are in a situation where you are sick yourself, or you need to be caring for those who are, please let me know so that we can plan accordingly.

Missed and Late Work Policy

There are many deadlines in this course. You have weekly due dates and ones for exams and papers. These deadlines are to keep us all on track and to keep the workload spaced out in the most manageable way possible. Trying your best to meet deadlines will likely result in you doing your best work. In that regard, due dates are here to help us all excel during the semester.

That being said, I understand that there are times in which deadlines become impossible due to a confluence of circumstances (both expected and unexpected). For those times, you can rely on the following policy:

"Life Happens" late-assignment clause: One time during the semester you are allowed to invoke a no-questions asked "life-happens" clause and get an automatic 3-day extension to any paper or the midterm. You do not have to use this policy, but it's there if you need it.

Discussion post and content quiz late policy:
Discussion posts function in a variety of ways for this class, including attendance and participation. Because of that, it's important to post your answers by the deadlines each week. Again, I understand that things happen sometimes, and because of that I will allow two 24-hour grace periods before I begin deducting points of your discussion post grades.

Optional Open Forum Discussions

This course is designated as an asynchronous online course and therefore all the requirements can be completed through the Canvas course page. That being said, I am providing an **optional** synchronous meeting time once a week in which we can engage face-to-virtual-face. These weekly meetings are NOT required, nor will they provide you with any additional credit. They are purely an extra-curricular activity for those who would like to engage with the material in real time with your fellow students and me. You can find information on the time and the zoom link in the syllabus header.

Student Roles and Expectations

I expect that you will treat this class as ***a*** priority in your life, which means that you should make your best effort to fulfill the course expectations. It is also your responsibility to communicate to me any issues you may have concerning disability (see the Office of Disability for more information) and to keep me informed of relevant situations (for instance, getting COVID-19 or needing to care for someone who has it!). Furthermore, I expect that your demeanor in your communication with other students and me will be respectful at all times and that you will uphold the UNCW honor code (www.uncw.edu/odos/honorcode). Other than that, if you approach this class with an open and inquisitive mind, I expect that you will find a great deal of intellectual fulfillment and learn valuable skills from this class.

Instructor Roles and Expectations

You can expect me to be respectful, honest, and open-minded, in our interactions. I will give you the benefit of the doubt unless you give me reasons to assume otherwise. I will also give you critical and timely feedback on all your work and will always make myself available outside of class if you wish to discuss any university or class-related issues. I will be timely in my emails, striving to reply within 24 hours during the work week (Monday-Friday).

Health and Safety Guidelines

Though this is an online class, I think it's worth reminding everyone about UNCW's health and safety guidelines for face-to-face interaction on campus. Following CDC Guidelines, UNC System directives, and out of mutual respect as outlined in the UNCW Seahawk Respect Compact, all faculty, staff, and students will wear face coverings while inside buildings. Students who are unprepared or unwilling to wear protective face coverings will not be permitted to participate in face-to-face sessions and will need to leave the building. Noncompliant students will be referred to the Dean of Students for an Honor Code Violation. Any student who has a medical concern with wearing a face covering should contact the Disability Resource Center at (910) 962-7555.

Proposed Class Schedule

All requirements are due by 11:59pm of the day specified

Unit 1 – Introduction and Early Histories of Biotechnology

[1] Wednesday, August 19th – Sunday, August 23rd

Topic: Basic Definitions – What is Biotechnology?

Watch:

- Intro video

Read:

- Stevens, Chapter 1 (~15 pgs)

Complete:

- Introduction survey by Friday, August 21st
- Syllabus and Content Quiz by Saturday, August 21st

[2] Monday, August 24th – Sunday, August 30th

Topic: Biotechnology in the Vat: Beer, Vitamins, Steroids, and Antibiotics before 1950

Watch:

- Week 2 Lecture
- *The Science of Brewing Beer* (~3 mins)

Read:

- Sengoopta, "'Dr. Steinach coming to make old Young!' sex glands, vasectomy and the quest for rejuvenation in the roaring twenties" (5pgs)
- Peter Neushul, "Science, Government, and the Mass Production of Penicillin." (25pgs)
- Rima Apple, "Vitamins Win the War: Nutrition, Commerce, and Patriotism in the United States during the Second World War." (12pgs)

Listen:

- Dig Podcast: *Witches Brew: How the Patriarchy Ruins Everything for Women, Even Beer* (~51mins)

Complete:

- Content Quiz: Week 2, by Wednesday, August 26th
- Discussion board first post by Wednesday, August 26th
- Discussion board responses by Friday, August 28th

Unit 2: Important Contexts for Understanding Biotechnology

[3] Monday, August 31st – Sunday, September 6th

Topic: DNA as master molecule

Watch:

- Week 3 Lecture
- *Decoding Watson* (84 mins)

Read:

- Nicolas Rasmussen, "Chp 1: Biology, Industry and the Cold War" (30 pgs)
- Hallam Stevens, "Chp 3: Inventing Genetic Engineering," (15 pgs)

Complete:

- Content Quiz: Week 3 by Wednesday, September 2nd

- Discussion post by Wednesday, September 2nd
- Discussion board responses by Friday, September 4th

[4] Monday, September 7th – Sunday, September 13th

Topic: Eugenics

Watch:

- Week 4 lecture

Read:

- Gar Allen, "Eugenics Record Office at Cold Spring Harbor," (40 pgs)
- Wendy Kline, Chapter 1 and 2 of *Building A Better Race* (60 pgs)

Complete:

- Content Quiz: Week 4 by Wednesday, September 9th
- Discussion board first post by Wednesday, September 9th
- Discussion board responses by Friday, September 11th

[5] Monday, September 14th – Sunday, September 20th

Topic: Eugenics

Watch:

- Week 5 lecture
- The State of Eugenics (55mins)

Read:

- Various perspectives on eugenics from *Beyond Bioethics* (~40pgs)
  - Michael B. Katz "The Biological Inferiority of the Undeserving Poor"; Alexandra Minna Stern, "Making Better Babies: Public Health and Race Betterment in Indiana, 1920-1935"; Edwin Black, "Eugenics and the Nazis: The California Connection"; James Q. Whitman, "Why the Nazis Studied American Race Laws for Inspiration.
- Primary sources

Complete:

- Discussion board first post by Wednesday, September 16th
- Discussion board responses by Friday, September 18th
- Paper 1 by Sunday, September 20th

Unit 3: The Anticipation and Creation of Genetic Engineering

[6] Monday, September 21st – Sunday, September 27th

Topic: Biotech and Society in the 1960s and 1970s

Watch:

- Lecture, Week 6

Read:

- Jon Turney, *Frankenstein's Footsteps*, chp 6 and 7 (~40 pgs)
- Rebecca Skloot, "The Miracle Woman" (~5pgs)
- Primary sources

Complete:

- Discussion board first post by Wednesday, September 23rd
- Discussion board responses by Friday, September 25th

[7] Monday, September 28th – Sunday, October 4th

Topic: Recombinant DNA, Asilomar, and the reality of genetic engineering

Watch:

- Week 7 lecture
- "Hypothetical Risk: Cambridge City Council's Hearings on Recombinant DNA research," 1976. (~30 mins)
- CRISPR Ted Talk – Jennifer Doudna, 2015 (~15 mins)

Read:

- Stevens, "Chp 4: The Recombinant DNA Debates" (~15 pgs)
- Hogan, "From Precaution to Peril" (5pgs)
- Comfort, "Can we cure genetic diseases without Slipping into Eugenics?" (11pgs)

Complete:

- Content Quiz: Week 7 by Wednesday, September 30th
- Discussion board first post by Wednesday, September 30th
- Discussion board responses by Friday, October 2nd

Midterm

[8] Monday, October 5th – Sunday, October 11th

Topic: Midterm

Complete: Midterm by Sunday, October 11th

Unit 4: The Birth of "Biotech" and its Consequences

[9] Monday, October 12th – Sunday, October 18th

Topic: Patents, Biotech, and Big Business

Watch:

- Lecture, Week 9

Read:

- Stevens, "Chp 5: Biotechnology and Business" and "Chp 6: Patenting Life" (~30pgs)
- Osagie Obasogie "Your body, their property" (~3pgs)
- Primary Sources

Listen:

- Distillations podcast "The Mouse that Changed Science" (41mins)

Complete:

- Content Quiz: Week 9 by Wednesday, October 14th
- Discussion board first post by Wednesday, October 14th
- Discussion board responses by Friday, October 16th

[10] Monday, October 19th – Sunday, October 25th

Topic: The Human Genome Project

Watch:

- Lecture, Week 10
- *GATTACA* (1997) (121 mins)

Read:

- Stevens, "Chp 12: The Human Genome Project" and "Chp 20: Personal Genomics" (~30 pgs)
- Readings from *Beyond Bioethics* (~15pgs)
  - Dobbs, "What is your DNA Worth?"; Reardon, "Should Patients Understand that they are research subjects?"; Cussins, "Direct-to-consumer Genetic Tests Should Come with a Health Warning"; Duster, "Welcome, Freshmen: DNA Swabs, Please"

Complete:

- Content Quiz: Week 10 by Wednesday, October 21st
- Discussion board first post by Wednesday, October 21st
- Discussion board responses by Friday, October 23rd

[11] Monday, October 26th – Sunday, November 1st

Topic: Reproductive technologies: Genetic Testing, IVF, and Designer Babies

Watch:

- Lecture, Week 11

Read:

- Stevens, "Chp 15: From the Pill to IVF," and "Chp 13: Genetic testing, Disability, and Discrimination" (~30pgs)
- Readings from *Beyond Bioethics* (~30pgs)
  - Dickenson "Me Medicine"; Bayer and Galea, "Public Health in the Precision-Medicine Era"; "Adrienne Asch, "Disability Equality and Prenatal Testing"; Darnovsky and Stern, "The Bleak New World of Prenatal Genetics"; Daley, Have New Prenatal Tests Been Dangerously Oversold?;" Miriam Zoll, "Generation I.V.F."; Lisa Ikemoto, "Reproductive Tourism"; Douglas Pet, "Make me a baby as fast as you can"
- Begin reading: Nelson, *The Social Life of DNA*

Listen:

- Babies on Demand: Reproduction in a Technological Age (~40mins)

Complete:

- Content Quiz: Week 11 by Wednesday, October 28th
- Discussion board first post by Wednesday, October 28th
- Discussion board responses by Friday, October 30th

Unit 5: Biotechnology, Race, and Disability

[12] Monday, November 2nd – Sunday, November 8th

Topic: The Human Genome Project and its consequences, Race and Ancestry

Watch:

- Lecture, Week 12

Read:

- Continue Reading Nelson, *The Social Life of DNA*
- Joan Donovan, et. al, "Cracking Open the Black Box of Genetic Ancestry Testing" (10pgs)
- Jenny Reardon and Kim Tallbear, "'Your DNA is Our History" (13pgs)
- Amy Harmon, "Why White Supremacists are Chugging Milk (and why geneticists are alarmed) (7pgs)
- UC Davis Population and Evolutionary Genetics blog post "Polygenetic Scores and Tea Drinking," 2018 (7pgs)

Complete:

- Content Quiz: Week 12 by Wednesday, November 4th
- Discussion board first post by Wednesday, November 4th
- Discussion board responses by Friday, November 6th

[13] Monday, November 9th – Sunday, November 15th

Topic: Race and Ancestry; Disability and Biotechnology

Watch:

- Lecture, Week 13
- Fixed: the Science/Fiction of Human Enhancement (~60 mins)

Listen (or read the transcript):

- Disability Visability Project: Ep. 66 Cyborgs (~35 mins)

Read:

- Finish Nelson, *The Social Life of DNA*

Complete:

- Discussion board first posts by Wednesday, November 11th
  - Note that there will be two different discussion posts due this week
- Discussion board responses by Friday, November 13th
- Paper on Race and Biotechnology by Sunday, November 15th

[14] Monday, November 16th – Sunday, November 22nd

Topic: Applying what we've learned – GMOs, Ancient DNA, and Synthetic Biology

Watch:

- Lecture, Week 14
- *Svante Paabo, DNA Clues to our Inner Neanderthal* TED Talk (~16mins)
- *Stewart Brand, The Dawn of de-extinction* (~18 mins)
- *Dan Gibson, How to build synthetic DNA and send it across the internet* (~15 mins)

Read:

- Whatever you want! See GMO/Synth Bio assignment instructions.

Complete:

- Discussion board first post, due Wednesday, November 18th
- Discussion board responses due by Friday, November 20th
- Un-paper project initial due date Wednesday, November 18th

Unit 6: Application and Review

[15] Monday, November 23rd – Tuesday, November 24th

Topic: Review and Reflection

- Last day of classes is Tuesday, November 24th and Reading day is November 25th

[16] Monday, November 30th – Saturday, December 5th

Topic: Final exam and un-paper project

Complete:

- Final exam by Friday, December 4th
- All outstanding assignments by Thursday, December 3rd