BIOS 232: Introduction to Genetics, Ethics, and Society

Syllabus Spring 2022

Primary Instructors: Roshni Patel (rpatel7) and Rachel Ungar (raungar) @stanford.edu
Secondary Instructors: Tim MacKenzie, Daphne Martschenko, Emily Greenwald, Pagé Goddard, Daniel Cotter, Alanna Pyke, Meena Chakraborty, Malika Freund
Faculty Sponsor: Julie Baker

Class meetings: Tuesdays/Thursdays 4:30-6:30 pm, from May 17th to June 2nd
Office hours: please email Roshni or Rachel to schedule

Syllabus Contents

Course Information

Course Overview

This mini-course will introduce concepts at the intersection of genetics, ethics, and society. This course will be composed of six sessions spread out over three weeks. Before each session, you can expect to spend approximately 30 minutes completing pre-class readings or other minor assignments. Each session will consist of short in-class lectures paired with both small-group and large-group discussions.

Motivation

We are witnessing an astonishingly rapid development of technologies to measure, model, and manipulate our biological selves and environment, many of which are minimally regulated. We see a corresponding rise in powerful actors seeking to misuse genetic research to embolden racist, sexist, transphobic, and ableist ideology. Without formal training, students lack knowledge about the historical context and ethical frameworks of genetics research, both of which are key to enabling geneticists to interrogate their own biases, and responsibly conduct and communicate their research.

Learning Goals

We hope this course will enable students to evaluate the ethical implications of scientific research and innovate just and equitable solutions . Specifically, by the end of this class, you will be able to:

1. Connect the historical context of genetics research to its modern-day practice
2. Evaluate the social and ethical implications of genetics research
3. Analyze how societal norms and structures, along with personal identities, biases, and responsibility, impact the conduct of scientific research

Course Materials

All course readings and content will be posted to Canvas; no materials will need to be purchased.

Grading

Our intention behind grades in this course is to encourage you to attend each session. This course is offered on a credit/no-credit basis, and 40 points are required to pass. Each of the 6

sessions will be worth 10 points. This grading allows for flexibility for you as a student in cases of emergency, but we expect that students will attend all classes.

Expectations

What you can expect from us

- We will welcome questions, concerns, and general feedback
- We will be responsive via email in a timely manner to students
- We will provide additional (optional) readings and other resources if you wish to continue thinking and learning about these topics
- We understand that you come from a variety of diverse backgrounds and commitments outside of class, and may have unforeseen circumstances that require you to miss class
- We will guide class in a manner that promotes compassionate, respectful, and open-minded discussion
- We commit to ensuring an inclusive space and positive classroom environment

What we expect from you

- Pre-class assignments - We will provide readings, and on occasion, exercises, to complete prior to each session. You will not be graded on completion, but the readings and exercises are crucial for participating in discussions and making the most of this course!
- Attendance - We ask that you attend every session, given how short this course is. In the event you are unable to attend a session due to unforeseen circumstances, please contact Rachel or Roshni.
- In-class participation - A significant portion of your learning will come from small group discussions. We expect everyone to participate in a manner that is consistent with the classroom norms we collectively establish in our first session.
- Honor code - We expect you to follow the Stanford Honor Code. For more information please see here.

Schedule

A list of our schedule is below. This is subject to potential changes prior to the course.

Session 1: Introduction to Bioethics and Society

Tuesday May 17, 2022
Facilitated by Tim Mackenzie

- Describe personal identities and use this to co-create ground norms for discussions throughout the course
- Evaluate different ethical frameworks by applying the four principles of bioethics to case studies.
- Identify the ways in which societal structures and norms impact science.

Session 2: History of Heredity

Thursday May 19, 2022
Facilitated by Daniel Cotter, Emily Greenwald
Guest lecture by Dr. Jazlyn Mooney

Learning objectives

- Recall how the study of heredity and genetics has developed over time.
- Understand how societal biases intersected with knowledge of heredity/genetics to justify early scientific thought and 19th/20th century eugenics movements.
- Analyze how historical context impacts modern-day science through the specific examples of eugenics and genome editing.

Session 3: Introduction to Human Genetic Data

Tuesday May 24, 2022
Facilitated by Pagé Goddard, Alanna Pyke, Meena Chakraborty

Learning objectives

- Identify limitations and concerns around the collection, use, and analysis of human genetic data
- Develop an understanding of the current landscape of genomic data stewardship
- Identify key stakeholders and conflicts of stakeholdership in the collection, use, and analysis of human genetic data

Session 4: Race, Ancestry, Identity, and Genetics

Thursday May 26, 2022
Facilitated by Daphne Martschenko, Alanna Pyke, Daniel Cotter
Guest lecture by Dr. Alice Popejoy

Learning objectives

- Examine how and why genetic ancestry and race are used in current genetic studies

- Evaluate inconsistencies and uncertainties in how race, ethnicity, and ancestry are defined and used in genetics over time and between cultures
- Assess the risks and benefits of using genetic ancestry and race in current genetic studies and identify how to mitigate risks
- Evaluate the relationship between identity and genetic ancestry.

Session 5: Ethical Issues in Reproductive Genetics; Positionality

Tuesday May 31, 2022
Facilitated by Meena Chakraborty and Malika Freund
Guest lecture by Emily Higgs

Learning objectives

Ethical Issues in Reproductive Genetics

- Understand the role of eugenics in the development of the prenatal genetic testing field
- Summarize the current landscape of prenatal genetic testing, carrier screening, and embryo selection
- Extrapolate the future implications of the currently available technologies
- Evaluate how principle-based ethics can help guide society towards ethical application of these technologies

Positionality

- Evaluate your own positionality and its relationship to your work as a scientist

Session 6: Genetics and Criminal Justice; Action and Ideation

Thursday June 2, 2022
Facilitated by Emily Greenwald and Daphne Martschenko

Learning objectives

Genetics and Criminal Justice

- Identify the role of genetics in the criminal justice system via forensic applications and genetic databases
- Design potential safeguards of current and future uses of genetics in the criminal justice system
- Evaluate scientists' role and responsibilities regarding applications of genetics in the criminal justice system

- Ideate ways to make existing academic structures more equitable, inclusive, and just, and will create actionable goals to do so

Respect for Diversity and Commitment to Inclusion

Academic Accommodations

Stanford is committed to providing equal educational opportunities for disabled students. Disabled students are a valued and essential part of the Stanford community. We welcome you to our class, and we are committed to supporting your learning. If you experience disability, please register with the Office of Accessible Education (OAE). Professional staff will evaluate your needs, support appropriate and reasonable accommodations, and prepare an Academic Accommodation Letter for faculty. To get started, or to re-initiate services, please visit oae.stanford.edu.

If you already have an Academic Accommodation Letter, we invite you to share your letter with us. Academic Accommodation Letters should be shared at the earliest possible opportunity so we may partner with you and OAE to identify any barriers to access and inclusion that might be encountered in your experience of this course.

Content Considerations

As an ethics course, we will be discussing content that can be emotionally difficult. These topics can include, but are not limited to: race, class, and gender issues; genocide; eugenics; criminal justice; policing; prenatal testing; pregnancy termination; and forced sterilization. Being able to learn about and discuss uncomfortable topics is an important part of learning in this course, but if engaging with specific content is so traumatic you cannot learn or be present, please let us know beforehand for accomodations. Likewise, if you become so distressed you need to leave a class, reach out to us afterwards for accommodations. We emphasize the importance of taking care of yourself and support you leaving a lesson that causes serious distress. Please reach out afterwards to let us know that you left class and so that we can check in on your well-being. In addition, we welcome feedback on how to better present this material or provide content warnings for students that may struggle in the future.

Name and Pronouns

If your name is different than on Canvas, feel free to reach out to us beforehand to notify us. We are committed to referring to you with the correct name and pronoun, and please feel free to correct us if we make a mistake or mispronounce your names. We promise during the first class to have everyone share their names and pronouns.

Additional Resources

These resources, primarily compiled by the Biosciences Department, are intended to show you further avenues of support. If you have any questions, or want help with further resources, please reach out to us, The Graduate Life Office (GLO: 650-723-7288), or the Biosciences Office of Graduate Education (OGE: oge-helpme@stanford.edu)

Diversity Resources

- Diversity Resources and Organizations: https://biosciences.stanford.edu/current-students/diversity/diversity-resources-and-partnerships/

Wellness Resources

- Health and wellness resources: https://biosciences.stanford.edu/current-students/resources/health-and-wellness-resources/
- Counseling & Psychological Services (CAPS) for urgent and non-urgent support: https://vaden.stanford.edu/caps (650-723-3785)
- National Suicide Prevention Lifeline: 1-800-273-8255 (24/7)
- The Trevor Project: 866-488-7386 (24/7)
- Crisis Text Line: Text SUPPORT to 741-741
- National Alliance on Mental Illness: 1-800-950-6264
- Native American Suicide Prevention Helpline operated by SAMHSA (800-273-8255)

Academic Resources

- Academic Resources and Assistance: https://biosciences.stanford.edu/current-students/resources/academic-resources-and-assistance

Financial Resources

- Students should not have any financial costs associated with this class. If you notice there are any financial costs that arise related to this course, please reach out to a primary instructor (Roshni or Rachel).
- Financial Resources and Assistance: https://biosciences.stanford.edu/current-students/resources/financial/