IB 546 - Diversity, Equity, & Inclusion in STEM: The Science Behind Bias seminar

Spring 2021, 1 credit

Course Description: In this seminar course, we will:

- Discuss the historical context of racism, exclusion, and bias in science.
- Read from and discuss the primary literature to understand the science of bias why it is present, and how it has continued to persist across the Science, Technology, Engineering, and Mathematics (STEM) fields
- Identify actions we can each implement as individuals, as well as steps institutions can take, to decrease bias and promote equity and inclusion.

Each week we will assign 2-3 papers from the primary literature or other form of media around a topic. We will come together once a week to discuss the readings or assignment as a group and in smaller breakout rooms. Participants are expected to lead the discussion at least once during the semester, and as a group come up with a list of discussion questions based on the assigned readings/media.

Course Development: This graduate seminar is based on a syllabus developed by Corrie Moreau and offered Fall 2020 at Cornell University.

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Discussion:
Time:
Place: Zoom

READING DISCUSSION TOPICS:

Topics to be discussed (specific readings listed below)
Historical racism in STEM – Origins of the concept of race
Historical racism in STEM – Experimentation on groups
Historical racism in STEM – Eugenics
Data and bias against Women In STEM
Data and bias against LGBTQIA+ in STEM
Data and bias against people of color in STEM
Data and bias against people with disabilities in STEM
Data and bias against first generation and low-income people in STEM
Systemic racism, bias and exclusion in STEM
Progress on reducing racism, bias, and exclusion in STEM
Identify actionable steps to achieve equity and inclusion in STEM

COURSE READING SCHEDULE:

Week	Readings and Media Assignments
1 (Jan 25-29)	Topic 1- Introduction, ground rules, definitions, structure of course
2 (Feb 1-5)	Topic 2 - Historical racism in STEM – Origins of the concept of race 1) Hudson (1996) From "Nation" to "Race": The origin of racial classification in eighteenth-century thought. *Eighteenth-Century Studies* 29(3): 247-264. [link] 2) Govier (1999) The Royal Society, Slavery and the island of Jamaica: 1660-1700. *Notes Rec. R. Soc. Lond*. 53(2): 203-217. [link]
3 (Feb 8-12)	Topic 3 - Historical racism in STEM – Experimentation on groups 1) Sartin (2004) J. Marion Sims, the father of gynecology: hero or villain? *Southern Medical Journal* 97(5): 500-505. [link] 2) Prather et al. (2018) Racism, African American, and their sexual and reproductive health: a review of historical and contemporary evidence and implications of health equity. *Health Equity* 2(1): 249-259. [link]
4 (Feb 15-19)	Topic 4 - Historical racism in STEM – Eugenics 1) video - 10 minute clip of "The Gene – an intimate history" by Ken Burns on PBS): https://tinyurl.com/y8dwjb94 2) Friedmann (2019) Genetic therapies, human genetic enhancement, and … eugenics? *Gene Therapy* 26:351-353. [link] 3) Hill et al. (2019) Genome-wide analysis identifies molecular systems and 149 genetic loci associated with income. *Nature Communications* 10: e5741. [link]
5 (Feb 22-26)	Topic 5 - Data and bias against Women In STEM 1) Holman et al. (2018) The gender gap in science: how long until women are equally represented? *PLOS Biol*. 16(4) e2004956. [link] 2) Leavy (2018) Gender bias in artificial intelligence: the need for diversity and gender theory in machine learning. *2018 ACM/IEEE 1st International Workshop on Gender Equality in Software Engineering* pp. 14-16. [link]
6 (March 1-5)	Topic 6 - Data and bias against LGBTQIA+ in STEM 1) Broockman et al. (2016) Durably reducing transphobia: a field experiment on door-to-door canvassing. *Science* 352: 220-224. [link] 2) Cech and Waldzunas (2021) Systematic inequalities for LGBTQ professionals in STEM. *Science Advances*. [link] 3) Powell et al. (2020) How LGBT+ scientists would like to be included and welcomed in STEM workplaces *Nature.* [link]
7 (March 8-12)	Topic 7 - Data and bias against people of color in STEM 1) Hofstra et al. (2020) The diversity-innovation paradox in science. *PNAS* 117(17): 9284-9291. [link] 2) Hoppe et al. (2019) Topic choice contributes to the lower rate of

	NIH awards to African-American/Black scientists. *Science Advances* 5: eaaw7238. [link] *3)* Why Asian Americans are not the Model Minority - Alice Li – TEDx Talks (10:35 minutes): https://youtu.be/87QkjfUEbz4
8 (March 15-19)	Topic 8 - Data and bias against first generation and low-income people and people with disabilities in STEM 1) Douglass & Thomson (2008) The poor and the rich: a look at economic stratification and academic performance among undergraduate students in the United States. *CSHE Research & Occasional Paper Series* 15(8): 1-20. [link] 2) Lee (2011) A comparison of postsecondary science, technology, engineering, and mathematics (STEM) enrollment for students with and without disabilities. *Career Development for Exceptional Individuals* 34(2): 72-82. [link]
9 (March 22-26)	Topic 9 - Systematic racism, bias and exclusion in STEM 1) Miller & Roksa (2020) Balancing research and service in academia: gender, race, and laboratory tasks. *Gender & Society* 34(1): 131-152. [link] 2) Ma et al. (2019) Women who win prizes get less money and prestige. *Nature* 565: 287-288. [link]
10 (Mar. 29-Apr. 2)	Topic 10 - Progress on reducing racism, bias, and exclusion in STEM 1) Bentley et al. (2017) Diversity and inclusion in genomic research: why the uneven progress? *Journal of Community Genetics* 8: 255-266. [link] 2) Jimenez et al. (2019) Underrepresented faculty play a disproportionate role in advancing diversity and inclusion. *Nature Ecology & Evolution* 3: 1030-1033. [link]
11 (April 5-9)	Topic 11 - Identify actionable steps to achieve equity and inclusion in STEM part 1 1) Cooper et al. (2020) Fourteen recommendations to create a more inclusive environment for LGBTQ+ individuals in academic biology. *CBE – Life Sciences Education* 19(es6): 1-18. [link] *2)* Schell et al. (2020). Recreating Wakanda by promoting Black excellence in ecology and evolution. *Nature Ecology & Evolution* pp. 1-3. [link]
12 (April 12-16)	Topic 12 - Identify actionable steps to achieve equity and inclusion in STEM part 2 1) Chapman (2019) "Rendering the invisible visible: student success in exclusive excellence in STEM environments" Ch. 2 in *Diversifying STEM: Multidisciplinary Perspectives on Race and Gender* pp. 36-52. [link] 2) Smith et al. (2015) Seven actionable strategies for advancing women in science, engineering, and medicine. *Cell Stem Cell* 16: 221-224. [link]
13 (April 19-23)	Topic 13 - Synthesis and review. No readings.

INCLUSIVITY STATEMENT

We understand that our members represent a rich variety of backgrounds and perspectives. The School of Integrative Biology is committed to providing an atmosphere for learning that respects diversity. While working together to build this community we ask all members to:

- Share their unique experiences, values, and beliefs.
- Be open to the views of others.
- Honor the uniqueness of their colleagues.
- Appreciate the opportunity that we have to learn from each other in this community.
- Value each other's opinions and communicate in a respectful manner.
- Keep confidential discussions that the community has of a personal (or professional) nature.
- Stories stay, lessons leave
- Use "I" statements
- Take Space, Make Space
- Accept that things may remain unresolved
- Embrace discomfort, but take a moment if you need it
- If you feel yourself getting angry or defensive, ask yourself why.
- You will make mistakes and apologize if you do (it is not about your intent it is about your impact)
- Take ownership of your words and actions. This is a good way to act with more intention and consideration of others in the classroom.
- Use this opportunity together to discuss ways in which we can create an inclusive environment in this course and across the community.