

## **PHIL 415 / 510 – Topics in Philosophy of Biology**

### **‘The Neuroscience of Human Diversity’**

Winter Term 2024

**Tue, Thu 12:30–1:50 pm, [Assiniboia Hall 2-02A](#)**

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### **A. Course overview**

This seminar takes a look at different scientific approaches to the study of human difference and diversity. Given our focus on neuroscientific, psychological, and behavioural research, we address issues at the intersection of nature and nurture. Although research on alleged cognitive differences between different races has fortunately been largely abandoned, research on sex/gender-based neuroscientific and cognitive differences is thriving.

We start out with discussing how feminist and other social values can legitimate function within scientific research. Then we look at the ideas of innateness and genetic information, and contrast evolutionary psychology with evolutionary approaches emphasizing diversity. Biological research on phenotypic plasticity goes beyond the nature-nurture dichotomy, and we will see how the investigation of neuroplasticity and epigenetics provides a way for culture to influence neurophysiology, including in the case of neuropsychiatric conditions.

We critically discuss brain organization theory, which postulates a female brain and a male brain, including what neuroimaging can tell us about cognitive differences. By looking at alternative scientific approaches (e.g., cultural neuroscience), we will discuss how to properly represent cognitive variation and to investigate cultural influences on neurocognition. In the context of how biological sex, sexuality, and gender are related, we will encounter challenges to the gender binary and the sex binary, including intersex conditions. We conclude with a look at the neurodiversity movement about mental disabilities (e.g., autism) and the question of whether normalcy can be defined in evolutionary terms.

### **B. Prerequisites**

The class is organized such that specific background knowledge in philosophy of biology or science is not required, though interests in cognitive science (or the life sciences) are desirable.

Formal prerequisite: To enrol as an undergraduate in a 400 level PHIL course (e.g., PHIL 415), you must have previously completed two philosophy classes (incl. one class at the 200-level or higher), or obtain the instructor’s permission. Feel free to contact me to get permission to enrol.

## C. Required texts

The required readings consist of journal articles and book chapters, and are listed below in Section L. A substantial part of the readings can be accessed online via our course website.

## D. Course requirements

	PHIL 415	PHIL 510
○ Oral presentation	15%	n/a
○ Four brief responses	20%	20%
○ Shorter essay	20%	20%
○ Term paper outline	5%	10%
○ Term paper (final version)	30%	35%
○ Participation	10%	15%

**Oral presentation** (15%, PHIL 415 only): Every student in PHIL 415 has to give one oral presentation. Your task as a presenter is to briefly summarize this meeting's readings (highlighting points that you find particularly relevant) but primarily to start the discussion by having prepared some questions (e.g. about problematic issues in the readings). I ask you to prepare a short handout (including discussion questions) and email me a draft in advance so that I can provide comments. Contact me to sign up for a presentation on a particular class date (it is first come, first serve), where you find the schedule of presentations and still open slots on eClass.

**Four brief critical responses** (5% each): You have to submit four brief critical responses, two before reading week, and two after reading week but no later than April 4. A critical response is about 300 words in length, and should not just summarize the readings. Instead, it should identify an issue that was not fully clarified in the reading and/or your critical response to one point from the reading. With some of the more scientific readings, you may also explain what philosophical issues or other questions it raises. A brief response has to be submitted by the beginning of the class where the reading is assigned, and if several readings are assigned for that date, the brief response can focus on one of them.

**Shorter essay** (20%): You have to write a shorter essay, which is due on Tuesday, February 27 at 11am. The recommended format is that you track down a popular science article relevant to our topics (e.g., something from the popular press) and write an essay on it that summarizes some core points in this article and critically discuss it, for instance how it differs from more reputable science, what problems the popular science presentation raises, or how it relates to the literature we have read in class. Feel free to consult with me about the popular article you want to discuss before starting with the writing of the essay.

Approximate length of the shorter essay paper: 1200–1600 words if you are an undergraduate student (registered in PHIL 415); 2000–2400 words if you are a graduate student (registered in PHIL 510).

**Term paper** (outline 5%, final version 30% in 415, and outline 10%, final version 35% in 510): You have to write a term paper, the final version of which is due on Monday, April 29 at noon. An outline that at least lists the issues and the literature to be discussed (but may also be a full-length term paper draft) is due on Thursday, April 11 at noon. I will assign a grade to this draft and provide comments relevant for you to write the final version. The term paper should critically discuss an issue from our class, ideally using some of the assigned readings or some of the additional literature that I make available, where of course you are free to find and discuss

further relevant literature. You are encouraged to discuss term paper topics and ideas with me before starting with the writing of the term paper draft.

Approximate length of the final version of the term paper: 1600–2400 words if you are an undergraduate student (registered in PHIL 415); 2800–4000 words if you are a graduate student (registered in PHIL 510).

**Participation** (10% in 415, 15% in 510): Attendance and active participation is important for this class. It is the responsibility of each student to come to class prepared to actively engage in discussion. Each of you will probably have picked up different points from the readings or have questions or objections, so please share them! You can also obtain participation credit by starting topics and replying to posts at the discussion forum on our website (including by briefly reporting on non-assigned literature from the folder with additional literature).

## E. Schedule of classes

<b>Jan 9</b>	Rose et al., ‘Should scientists study race and IQ?’
<b>Jan 11</b>	Chapter 7 of Schiebinger, <i>Has Feminism Changed Science?</i>
<b>Jan 16</b>	Wylie and Hankinson Nelson, ‘Coming to terms with the values of science: insights from feminist science scholarship’
<b>Jan 18</b>	Intemann, ‘Distinguishing between legitimate and illegitimate values in climate modeling’
<b>Jan 23</b>	Pages 49–58 and 68–77 of Kourany, <i>Philosophy of Science after Feminism</i>
<b>Jan 25</b>	Griffiths, ‘What is innateness?’
<b>Jan 30</b>	Buller, ‘Evolutionary psychology: a critique’
<b>Feb 1</b>	Sections 3, 4b and 4c(iv) of Brown et al., ‘Evolutionary accounts of human behavioural diversity’ Smith, ‘Endless forms: human behavioural diversity and evolved universals’
<b>Feb 6</b>	Chapter 3 of Robert, <i>Embryology, Epigenesis, and Evolution: Taking Development Seriously</i>
<b>Feb 8</b>	Section 5 (skip pp. 157–158) and Section 6 of Brigandt, ‘Evo-devo and the limits of philosophical accounts of mechanistic explanation’ Pages 278–290 of Jordan-Young, <i>Brain Storm: The Flaws in the Science of Sex Differences</i>
<b>Feb 13</b>	Masterpasqua, ‘Psychology and epigenetics’ Rutten and Mill, ‘Epigenetic mediation of environmental influences in major psychotic disorders’
<b>Feb 15</b>	Chapter 1 and first two sections (pp. 95–104) of Chapter 8 (also skim Chapter 9) of Baron-Cohen, <i>The Essential Difference: Male And Female Brains ...</i> <b>Last opportunity to submit brief response #2</b>

Winter term reading week

<b>Feb 27</b>	Hoffman, ‘What, if anything, can neuroscience tell us about gender differences?’ <b>Shorter essay due at 11am</b>
<b>Feb 29</b>	Jordan-Young and Rumiati, ‘Hardwired for sexism? Approaches to sex gender in neuroscience’ Joel and Fausto-Sterling, ‘Beyond sex differences: new approaches for thinking about variation in brain structure and function’
<b>Mar 5</b>	Kaplan, ‘When socially determined categories make biological realities’ van Anders et al., ‘Biological sex, gender, and public policy’
<b>Mar 7</b>	Hyde et al. ‘The future of sex and gender in psychology: five challenges to the gender binary’ [makes sure to read pages 183–188]
<b>Mar 12</b>	Ainsworth, ‘Sex and gender redefined’ Kessler, ‘The medical construction of gender: case management of intersexed infants’
<b>Mar 14</b>	van Anders, ‘Beyond masculinity: testosterone, gender/sex, and human social behavior in a comparative context’ Fine et al., ‘Sex-linked behavior: evolution, stability, and variability’
<b>Mar 19</b>	Henrich et al., ‘The weirdest people in the world?’
<b>Mar 21</b>	Kim and Sasaki, ‘Cultural neuroscience: biology of the mind in cultural contexts’
<b>Mar 26</b>	Martínez Mateo et al., ‘Essentializing the binary self: individualism and collectivism in cultural neuroscience’ Gatzke-Kopp, ‘Diversity and representation: key issues for psychophysiological science’
<b>Mar 28</b>	Baron-Cohen, ‘The extreme male brain theory of autism’ Ridley, ‘Some difficulties behind the concept of the ‘Extreme male brain’ in autism research. A theoretical review’
<b>Apr 2</b>	Walker, ‘Throw away the master’s tools: liberating ourselves from the pathology paradigm’ Fenton and Krahn, ‘Autism, neurodiversity and equality beyond the ‘normal’
<b>Apr 4</b>	Amundson, ‘Against normal function’ <b>Last opportunity to submit brief response #4</b>
<b>Apr 9</b>	Dussauge and Kaiser, ‘Re-queering the brain’
<b>Apr 11</b>	Concluding discussion <b>Term paper outline due at noon</b>

**Apr 29 Term paper (final version) due at noon**

## **F. Course website**

The course has a website at <https://eclass.srv.ualberta.ca>. A good deal of our assigned readings can be accessed from this site, and I use it to post presentation handouts and additional material. The site also contains a discussion board. Let me know if you audit the class (or upon login at <https://eclass.srv.ualberta.ca> do not see PHIL 415 / 510 under 'My Courses'), so that I can add you to the list of online participants.

## **G. Academic integrity, plagiarism, and AI tools**

The University of Alberta is committed to the highest standards of academic integrity and honesty. Students are expected to be familiar with these standards and to uphold the policies of the university in this respect. Students are urged to familiarize themselves with the [Code of Student Behaviour](#) and avoid any behaviour which could potentially result in suspicions of cheating, plagiarism, misrepresentation of facts and/or participation in an offence. Academic dishonesty is a serious offence and can result in suspension or expulsion from the university.

The Code of Student Behaviour defines plagiarism as follows ([summary](#)):

No Student shall submit the words, ideas, images or data of another person as the Student's own in any academic writing, essay, thesis, project, assignment, presentation or poster in a course or program of study.

Students should consult the information provided by the [Office of the Dean of Students](#) regarding avoiding cheating and plagiarism in particular and academic dishonesty in general. If in doubt about what is permitted in this class, ask the instructor. An instructor or coordinator who is convinced that a student has handed in work that he or she could not possibly reproduce without outside assistance is obliged, out of consideration of fairness to other students, to report the case to the Associate Dean of the Faculty (see the [Academic Discipline Process](#)).

The library also has [information on avoiding plagiarism](#).

In this course, our primary focus is to cultivate an equitable, inclusive, and accessible learning community that emphasizes individual critical thinking and problem-solving skills. To ensure a fair and consistent learning experience for all students, the use of advanced AI tools such as ChatGPT or Dall-E 2 is strictly prohibited for all academic (written/coding/creative/etc.) work, assignments, and assessments in this course. Each student is expected to complete all tasks without substantive assistance from others, including AI tools.

Any use of AI tool in your academic work may result in academic penalties and be considered an act of cheating and a violation as outlined in the relevant sections of the University of Alberta [Code of Student Behaviour](#).

## **H. Sexual Violence Policy**

It is the policy of the University of Alberta that sexual violence committed by any member of the University community is prohibited and constitutes misconduct. Resources and more information can be found at <https://www.ualberta.ca/campus-life/sexual-violence>.

## I. Student Services

The university provides various services, including [Student Accessibility Resources](#) (exam and classroom accommodations for students with a disability, chronic health condition, or anxiety disorders), the [Academic Success Centre](#) (e.g., note-taking and writing skills), the [Centre for Writers](#) (writing support), [Health and Wellness Support](#) (including [Counselling & Clinical Services](#)), the [Sexual Assault Centre](#), and the [First Peoples' House](#)), and the [Office of the Student Ombuds](#) (advice and support to students facing academic, discipline, interpersonal and financial difficulties).

## J. Attendance, Absences, and Missed Grade Components

Regular attendance is essential for optimal performance in any course. In cases of potentially excusable absences due to illness or domestic affliction, notify your instructor by e-mail within two days. Regarding absences that may be excusable and procedures for addressing course components missed as a result, consult the "[Attendance](#)" and "[Examinations](#)" sections of the Academic Regulations of the University Calendar. Be aware that unexcused absences will result in partial or total loss of the grade for the "attendance and participation" component(s) of a course, as well as for any assignments that are not handed in or completed as a result.

## K. Recording of lectures

Audio or video recording of lectures, labs, seminars, or any other teaching environment by students is allowed only with the prior written consent of the instructor or as a part of an approved accommodation plan. Recorded material is to be used solely for personal study, and is not to be used or distributed for any other purpose without prior written consent from the instructor.

## L. Bibliography of readings

- Ainsworth, Claire (2015) "Sex redefined: The idea of two sexes is simplistic. Biologists now think there is a wider spectrum than that." *Nature* 518(7539): 288-291.
- Amundson, Ron (2000) "Against normal function." *Studies in History and Philosophy of Biological and Biomedical Sciences* 31(1): 33-53.
- Baron-Cohen, Simon (2002) "The extreme male brain theory of autism." *Trends in Cognitive Sciences* 6(6): 248-254.
- Baron-Cohen, Simon (2003) *The Essential Difference: Male And Female Brains And The Truth About Autism*. New York: Basic Books.
- Brigandt, Ingo (2015) "Evolutionary developmental biology and the limits of philosophical accounts of mechanistic explanation." In *Explanation in Biology: An Enquiry into the Diversity of Explanatory Patterns in the Life Sciences*, edited by Pierre-Alain Braillard and Christophe Malaterre, pp. 135-173. Dordrecht: Springer.
- Brown, Gillian R., Dickins, Thomas E., Sear, Rebecca, and Laland, Kevin N. (2011) "Evolutionary accounts of human behavioural diversity." *Philosophical Transactions of the Royal Society B: Biological Sciences* 366(1563): 313-324.

- Buller, David J. (2006) "Evolutionary psychology: a critique." In *Conceptual Issues in Evolutionary Biology* (3<sup>rd</sup> edition), edited by Elliott Sober, pp. 197-214. Cambridge, MA: MIT Press.
- Dussauge, Isabelle, and Kaiser, Anelis (2012) "Re-queering the brain." In *Neurofeminism: Issues at the Intersection of Feminist Theory and Cognitive Science*, edited by Robyn Bluhm, Anne Jaap Jacobson and Heidi Lene Maibom, pp. 121-144. New York: Palgrave Macmillan.
- Fenton, Andrew, and Krahn, Tim "Autism, neurodiversity and equality beyond the 'normal'." *Journal of Ethics in Mental Health* 2(2): 1-6.
- Fine, Cordelia, Dupré, John, and Joel, Daphna (2017) "Sex-linked behavior: evolution, stability, and variability." *Trends in Cognitive Sciences* 21(9): 666-673.
- Gatzke-Kopp, Lisa M. (2016) "Diversity and representation: key issues for psychophysiological science." *Psychophysiology* 53(1): 3-13.
- Griffiths, Paul E. (2002) "What is innateness?" *The Monist* 85: 70-85.
- Henrich, Joseph, Heine, Steven J., and Norenzayan, Ara (2010) "The weirdest people in the world?" *Behavioral and Brain Sciences* 33: 61-83.
- Hoffman, Ginger (2012) "What, if anything, can neuroscience tell us about gender differences?" In *Neurofeminism: Issues at the Intersection of Feminist Theory and Cognitive Science*, edited by Robyn Bluhm, Anne Jaap Jacobson and Heidi Lene Maibom, pp. 30-55. New York: Palgrave Macmillan.
- Hyde, Janet Shibley, Bigler, Rebecca S., Joel, Daphna, Tate, Charlotte Chucky, and van Anders, Sari M. (2019) "The future of sex and gender in psychology: five challenges to the gender binary." *American Psychologist* 74(2): 171-193.
- Intemann, Kristen (2015) "Distinguishing between legitimate and illegitimate values in climate modeling." *European Journal for Philosophy of Science* 5(2): 217-232.
- Jordan-Young, Rebecca M. (2010) *Brain Storm: The Flaws in the Science of Sex Differences*. Cambridge, MA: Harvard University Press.
- Jordan-Young, Rebecca M., and Rumiati, Raffaella I. (2012) "Hardwired for sexism? Approaches to sex/gender in neuroscience." *Neuroethics* 5(3): 305-315.
- Kaplan, Jonathan M. (2010) "When socially determined categories make biological realities." *The Monist* 93(2): 283-299.
- Kessler, Suzanne J. (1990) "The medical construction of gender: case management of intersexed infants." *Signs: Journal of Women in Culture and Society* 16(1): 3-26.
- Kim, Heejung S., and Sasaki, Joni Y. (2014) "Cultural neuroscience: biology of the mind in cultural contexts." *Annual Review of Psychology* 65(1): 487-514.
- Kourany, Janet A. (2010) *Philosophy of Science after Feminism*. Oxford: Oxford University Press.
- Martínez Mateo, Marine, Cabanis, Maurice, Stenmanns, Julian, and Krach, Sören (2013) "Essentializing the binary self: individualism and collectivism in cultural neuroscience." *Frontiers in Human Neuroscience* 7: 289.
- Masterpasqua, Frank (2009) "Psychology and epigenetics." *Review of General Psychology* 13(3): 194-201.
- Ridley, Rosalind (2019) "Some difficulties behind the concept of the 'Extreme male brain' in autism research. A theoretical review." *Research in Autism Spectrum Disorders* 57: 19-27.
- Robert, Jason (2004) *Embryology, Epigenesis, and Evolution: Taking Development Seriously*. Cambridge: Cambridge University Press.

- Rose, Steven, Ceci, Stephen, and Williams, Wendy M. (2009) "Should scientists study race and IQ?" *Nature* 457(February 12): 786-789.
- Rutten, Bart P. F., and Mill, Jonathan (2009) "Epigenetic mediation of environmental influences in major psychotic disorders." *Schizophrenia Bulletin* 35(6): 1045-1056.
- Schiebinger, Londa (1999) *Has Feminism Changed Science?* Cambridge, MA: Harvard University Press.
- Smith, Eric Alden (2011) "Endless forms: human behavioural diversity and evolved universals." *Philosophical Transactions of the Royal Society B: Biological Sciences* 366(1563): 325-332.
- van Anders, Sari M. (2013) "Beyond masculinity: testosterone, gender/sex, and human social behavior in a comparative context." *Frontiers in Neuroendocrinology* 34(3): 198-210.
- van Anders, Sari M., Schudson, Zach C., Abed, Emma C., Beischel, William J., Dibble, Emily R., Gunther, Olivia D., Kutchko, Val J., and Silver, Elisabeth R. (2017) "Biological sex, gender, and public policy." *Policy Insights from the Behavioral and Brain Sciences* 4(2): 194-201.
- Walker, Nick (2021) "Throw away the master's tools: liberating ourselves from the pathology paradigm" Reprinted in *Neuroqueer Heresies: Notes on the Neurodiversity Paradigm, Autistic Empowerment, and Postnormal Possibilities* by Nick Walker, pp. 16-28. Fort Worth: Autonomous Press.
- Wylie, Alison, and Hankinson Nelson, Lynn (2007) "Coming to terms with the values of science: insights from feminist science scholarship." In *Value-Free Science? Ideals and Illusions*, edited by Harold Kincaid, John Dupré and Alison Wylie, pp. 58-86. Oxford: Oxford University Press.

*The University of Alberta acknowledges that we are located on Treaty 6 territory, and respects the histories, languages, and cultures of the First Nations, Métis, Inuit, and all First Peoples of Canada, whose presence continues to enrich our vibrant community.*

Policy about course outlines can be found in [Course Requirements, Evaluation Procedures and Grading](#) of the University Calendar.