Introduction to Cognitive Science (COG250Y!Y)

Instructor: Dr. Mark Miller
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Location: MS 3153 - Medical Sciences Building 1 King's College Circle
Time: Mondays 2-5pm EST

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1. Contact Information for Course Instructor

- When contacting Dr. Miller (markmillerresearch@gmail.com) please ensure to CC the head TA (Pouria.saffaran@mail.utoronto.ca)
- For any general course-related questions (e.g., clarifications, resources, etc.) please post into our Quercus Discussion forum first. Other students may have the same question as you, & posting in the forum may help you build knowledge together.
- If you have more personal questions/issues, please feel free to contact your respective tutorial TAs

We will make every effort to respond to emails and posts within 72h, and excluding weekends. If you want to speak to us, please email us to arrange appointments on Zoom. We will use Quercus announcements for all course communications.

2. Up-to-date Information on Coronavirus (COVID-19) from University of Toronto:

As the situation may evolve quickly in the context of the COVID-19 pandemic, and the university and the institute may introduce new measures to respond to the situation, it is recommended that you frequently consult their dedicated web pages:

- University of Toronto message on the coronavirus.

UCheck – COVID-19 Self-Assessment

Provincial regulation and public health guidance require that post-secondary institutions implement COVID-19 health screening for anyone coming to campus. In order to comply with these directives, a self-assessment is now required for all members of our community, including faculty members, librarians, staff, and students, each day they visit any one of the three U of T campuses or any other property owned or operated by U of T. Please find more information about UCheck HERE

Absence Declaration on ACORN - If you will be missing class time due to illness or other reasons, and may require consideration for missed academic work, you can formally declare an absence on ACORN. If you would like advising assistance related to your absence, please contact your department or registrar. For more information on how to use ACORN to declare an absence, please see HERE.

3. Course Description

Cognitive Science is the interdisciplinary study of the mind, bridging philosophy, psychology, neuroscience, artificial intelligence, linguistics, and anthropology to understand how minds work. This course introduces the foundational ideas that have shaped the field, beginning with a fundamental question: What does it mean to be a "meat machine"? In other words, how do our physical brains give rise to thoughts, emotions, and experiences?

We'll explore key themes such as the nature of the mind-body problem, the computational theory of mind, and the historical debate between symbolic AI and connectionist models of cognition. Moving beyond traditional views of cognition, we will also explore embodied and dynamical systems approaches, investigating how our bodies and environments shape thought and action. Through case studies ranging from octopus intelligence to predictive brain theories, we will engage with cutting-edge ideas about how the mind emerges through complex interactions between brain, body, and world.

Throughout the course, you'll be exposed to thought-provoking experiments, philosophical debates, and emerging technologies that challenge our understanding of intelligence, consciousness, and selfhood. You will also engage with multimedia content, including lectures, TED Talks, and academic discussions, to help visualize these complex ideas in action.

By the end of the course, you'll have a deeper appreciation of the intricate dynamics that define minds—both human and artificial—and the philosophical, scientific, and practical questions that cognitive science continues to explore.

4. Course Delivery Modes

All course materials (including readings, quizzes and assignments) will be made available on **Quercus**. To access Quercus:

- Go to https://q.utoronto.ca
- Use your UTORid and password to log in
- Once you've logged in, you'll be in your "Dashboard"
- You should see a "Course Card" for each of the courses you are or enrolled in ● Click on a "Course Card" to access the course.
- If you do not see your courses listed, try activating your UTORid and/or verifying your UTORid

Lectures & tutorials are interactive. Your active participation is expected to help enhance class learning. All lectures will be delivered in person at **MS 3153 - Medical Sciences Building 1**

King's College Circle. Please arrive early/on time for classes. Classes will start promptly at 2:10pm EST.

Most tutorial sessions will also happen in person.

5. Learning Outcomes

At the end of this course you will be able to ***do*** cognitive science. In addition to learning basic concepts, you will:

- Train in critical and questioning attitude
- Challenge common-sense assumptions about the mind
- Partake in procedural training through your tutorials

6. Scope and Sequence of Course Topics and/or Content

PART I: COGNITIVE SCIENCE FOUNDATIONS

September 9 - Introduction: On Being a "Meat Machine"?
Essential Material:

- Clark, *Mindware* (Chapter 1, Meat Machines: Mindware as Software)
- [Video] Andy Clark, *What is the Mind-Body Problem?* *https://www.youtube.com/watch?v=klLRzoZsX2A*
- [Video] *They're Made Out of Meat* https://www.youtube.com/watch?v=T6JFTmQCFHg
- [Video] Pete Holmes, *Life Doesn't Make Sense!*

Supporting Material:

- Pfeifer & Bongard, *How the body shapes the way we think* (Chapter 1, Intelligence, Thinking, and Artificial Intelligence)

September 16 - Ghosts in the Machine: From Disembodied to Material Minds
Essential Material:

- Walmsley, *Mind and Machine* (Chapter 1, Historical and Theoretical Background)
- [Video] Daniel Dennett, *What is the Mind-Body Problem?* https://www.youtube.com/watch?v=zDUVCcknlJY
- [Video] John Searle, *What is the Mind-Body Problem?* https://www.youtube.com/watch?v=ZU8TR8tV-Mc

Supporting Material:

- John Haugeland, *Artificial Intelligence: The Very Idea* (Chapter 1, The Saga of the Modern Mind)

- Andy Clark, *Mindware* (Appendix)
- Ryle, G. (1949). Descartes' myth. *The concept of mind*, 11-24.
- Putnam, H. (1980). Brains and behavior. In *The Language and Thought Series* (pp. 24-36). Harvard University Press.
- Thompson, E., & Cosmelli, D. (2011). Brain in a vat or body in a world? Brainbound versus enactive views of experience. *Philosophical topics*, 163-180.
- Chalmers, D. J. (2016). The Matrix as metaphysics. *Science Fiction and Philosophy: From Time Travel to Superintelligence*, 35-54.

September 23 - The Computational Mind: Brain-Theory, Functionalism & Chinese Rooms

Essential Material:

- Walmsley, *Mind and Machine* (Chapter 2, Classical Cognitive Science and 'Good Old Fashioned AI' & 3, Gödel, the Turing Test and the Chinese Room)
- The Chinese Room - 60-Second Adventures in Thought - https://www.youtube.com/watch?v=TryOC83PH1g
- Mind Matters Podcast - "Why the Brain is Not at all Like a Computer" - https://mindmatters.ai/2019/09/why-the-brain-is-not-at-all-like-a-computer/
- Daniel Dennett on the Mind as Computer - https://www.youtube.com/watch?v=ZiPVpAs-j0

Supporting Material:

- Bermudez, *Cognitive Science An Introduction to the Science of the Mind* (Chapter 4, Physical Symbol Systems and the Language of Thought)
- Clark, *Mindware* (Chapter 2, Symbol Systems)
- Consciousness & the Brain: John Searle at TEDxCERN - https://www.youtube.com/watch?v=j_OPQgPIdKg
- Colin Blakemore - Are Brain and Mind the Same Thing? - https://www.youtube.com/watch?v=yG6OCsB_paU
- *Smart, J. J. (1959). Sensations and brain processes. The Philosophical Review, 68(2), 141-156.*
- Block, 'What is Functionalism?'
- Hutchens, 'How to Pass the Turing Test by Cheating'

September 30 - The Computational Mind: Connectionisms and Neural Networks

Essential Material:

- Walmsley, *Mind and Machine* (Chapter 4, Connectionism & 5, Criticisms and Consequences of the Connectionist Approach)
- Neural Network in 5 Minutes - https://www.youtube.com/watch?v=bfmFfD2RIcg
- Connectionism - Mind & Brain, Philosophy of Mind of Tilburg University - https://www.youtube.com/watch?v=ITwpDxx0UBE

Supporting Material:

- Clark, *Mindware* (Chapter 4, Connectionism)
- Bermudez, *Cognitive Science An Introduction to the Science of the Mind* (Chapter 5, Neural Networks and Distributed Information Processing)
- *Stanford Encyclopedia of Philosophy,* 'Connectionism' - https://plato.stanford.edu/entries/connectionism/
- Jerry A Fodor, "Connectionism and Cognitive Architecture" - https://www.youtube.com/watch?v=vyrn1JWgqFA
- Susan Greenfield - Computational Theory of the Mind - https://www.youtube.com/watch?v=4cElLw86in0

October 7 - Interlude: Other Minds: Cockroaches, Cucumbers and Cephalopods

Essential Material:

- Huebner, Bryce, 'Minimal Minds', in Tom L. Beauchamp, and R. G. Frey (eds), The Oxford Handbook of Animal Ethics, Oxford Handbooks (2011; online edn, Oxford Academic, 1 May 2012), https://doi.org/10.1093/oxfordhb/9780195371963.013.0016
- Godfrey-Smith, *Other minds: The Octopus, the Sea, and the Deep Origins of Consciousness* (Chapter 6, Ours and Others Minds)
- Calvo & Lawrence, *Planta Sapiens: Unmasking Plant Intelligence* (Chapter 5, Do Plants Think?)
- The Octopus, the Sea, and the Deep Origins of Consciousness | Peter Godfrey Smith | Talks at Google - https://www.youtube.com/watch?v=iENXfnOobzw
- The Distributed Mind: Octopus Neurology - https://www.youtube.com/watch?v=W9Gnw7B7oGM

Supporting Material:

- *Godfrey-Smith, P. (2024). Inferring consciousness in phylogenetically distant organisms. Journal of Cognitive Neuroscience, 1-7.*
- Paco Calvo: Planta Sapiens & Human Impatience: Are we patient enough to learn how smart plants are? - https://www.youtube.com/watch?v=yTbEUEFwkao
- The Insane Biology of: Slime Mold - https://www.youtube.com/watch?v=nPOQQp8CCls&t=116s
- Michael Graziano: Consciousness, Animal Minds, and the Neuroscience of Suffering -
- https://www.youtube.com/watch?v=BionJ56KaVw

October 14 THANKSGIVING

October 21 - TEST 1

October 28 - READING WEEK

PART II: BEYOND THE BRAIN

November 4 - Mind as Dynamical System

Essential Material:

- Walmsley, *Mind and Machine* (Chapter 6, The Dynamical Approach)

Supporting Material:

- Clark, *Mindware* (Chapter 7, Dynamics)
- Bermudez, *Cognitive Science An Introduction to the Science of the Mind* (Chapter 6, Applying Dynamical Systems Theory to Model the Mind)
- Kelso, J. (1995). Dynamic patterns: The self-organization of brain and behavior. The MIT Press.
- Van Gelder, T. (1995). What might cognition be, if not computation?. *The Journal of Philosophy*, *92*(7), 345-381.
- Clark, A. (2006). Vision as dance? Three challenges for sensorimotor contingency theory.
- Resnick, M. (1997). Turtles, termites, and traffic jams: Explorations in massively parallel microworlds. Mit Press.
- Beer, R. D. (2014). Dynamical systems and embedded cognition. The Cambridge handbook of artificial intelligence, 28.
- Hipólito, I. (2022). Cognition without neural representation: dynamics of a complex system. *Frontiers in Psychology*, 12, 643276.
- Eliasmith, C. (1997). Computation and dynamical models of mind. *Minds and Machines*, 7, 531-541.

November 11 - These Brains Were Made for Acting

Essential Material:

- Clark, *Supersizing the Mind* (Chapter 1, The Active Body)
- [Video] How the body shapes the way we think: Rolf Pfeifer at TEDxZurich - https://www.youtube.com/watch?v=mhWwoaoxIyc&t=126s
- [Video] Giada Gerboni TED Talk - "The Incredible Potential of Flexible, Soft Robots" - https://www.youtube.com/watch?v=AI7M-JTC6_w

Supporting Material:

- Clark, *Mindware* (Chapter 5, Perception, Action, and the Brain, Chapter 6: "Robots and Artificial Life")
- Milner and Goodale, *The Visual Brain in Action*.
- [Video] Mel Goodale - ‘Visual Routes to Knowledge and Action: (almost) 25 Years of Two Visual Systems’ - https://www.youtube.com/watch?v=Te4xmwI1Y_k
- [Video] Out of Our Heads | Alva Noë | Talks at Google - https://www.youtube.com/watch?v=af3Vq-C1ck8

November 18 - Embodying Emotions

Essential Material:

- Kiverstein, J., & Miller, M. (2015). The embodied brain: towards a radical embodied cognitive neuroscience. *Frontiers in human neuroscience, 9, 237*
- [Video] Dr. Lisa Feldman Barrett: How to Understand Emotions | Huberman Lab Podcast - https://www.youtube.com/watch?v=FeRgqJVALMQ
- [Video] Luiz Pessoa on the integrative framework, emotions, cognition | Thing in itself w/ Ashar Khan - https://www.youtube.com/watch?v=d3k0Jyac02Y

Supporting Material:

- Luiz Pessoa: "The Entangled Brain: Integration of emotion, motivation, and cognition" - https://www.youtube.com/watch?v=OIyqHvIV3QI

November 25 - Interlude: Where Is Human Memory?

Essential Material:

- Pfeifer & Bongard, *How the Body Shapes the Way we Think* (Chapter 10, Where is Human Memory?)

Supporting Material:

- [Video] How memories form and how we lose them - Catharine Young TED - https://www.youtube.com/watch?v=yOgAbKJGrTA
- [Video] Peter Doolittle TED: How your "working memory" makes sense of the world - https://www.youtube.com/watch?v=UWKvpFZJwcE

December 2 - Wrap-Up & ESSAY 1 DUE

- No additional readings necessary

WINTER BREAK

PART III: EXTENDING COGNITIVE SCIENCE

January 6 - You're a Cyborg Already

Essential Material:

- Clark, *Supersizing the Mind* (Chapter 2, The Negotiable Body)
- [Video] Amber Case TED Talk - "We Are All Cyborgs Now" - https://www.ted.com/talks/amber_case_we_are_all_cyborgs_now?subtitle=en
- [Video] Andy Clark - "Natural-Born Cyborgs? Reflections on Bodies, Minds, and Human Enhancement" - https://vimeo.com/16717229
- [Video] TEDxUChicago 2011 - Susan Goldin-Meadow - What Our Hands Can Tell Us About Our Minds - https://www.youtube.com/watch?v=tPPaJrhluS4

Supporting Material:

- Clark, *Mindware* (Chapter 8, Cognitive Technology: Beyond the Naked Brain)
- *Barrett, L. (2011). Beyond the brain: How body and environment shape animal and human minds. Princeton University Press.*
- *Hutchins, E. (1995). Cognition in the Wild. MIT press.*
- *Clark, A., & Erickson, M. (2004). Natural-born cyborgs: Minds, technologies, and the future of human intelligence. Canadian Journal of Sociology, 29(3), 471.*

January 13 - Leaning on Language

Essential Material:

- Clark, Supersizing the Mind (Chapter 3, Material Symbols)
- [Video] Is your phone part of your mind? | David Chalmers | TEDxSydney - https://www.youtube.com/watch?v=ksasPjrYFTg

Supporting Material:

- *Clark, Natural Born Cyborgs* (Word Brains, p.69-83)

January 20 - Technologically Extending the Mind

Essential Material:

- Clark, *Supersizing the Mind* (Chapter 4, World, Incorporated)
- [Video] The Extended Mind by Annie Murphy Paul - A Visual Summary - https://www.youtube.com/watch?v=F605JNkn3UE
- [Video] What is Extended Mind? | Episode 1811 | Closer To Truth - https://www.youtube.com/watch?v=rSngHyD44OY
- [Video] Extended You | Professor Andy Clark | TEDxLambeth - https://www.youtube.com/watch?v=hanv8y_wYEQ

Supporting Material:

- Clark, *Mindware* (Chapter 9, Extended Minds?)
- Andy, C., & David, C. (1998). The extended mind. *Analysis*, *58*(1), 7-19.
- Wilson, C. (2009). Wilson, RA, Clark, A."How to Situate Cognition: Letting Nature Take Its Course".
- Wheeler, M. (2018). Talking about more than headsThe embodied, embedded and extended creative mind. In *Creativity and philosophy* (pp. 230-250). Routledge.
- Krueger, J., & Szanto, T. (2016). Extended emotions. *Philosophy Compass*, *11*(12), 863-878.
- Heersmink, R. (2020). Varieties of the extended self. *Consciousness and Cognition*, *85*, 103001.

January 27 - Mind, Rebound?

Essential Material:

- Clark, Supersizing the Mind (Chapter 5, Mind Re-Bound?)
- [Video] Kenneth Aizawa: "Extended Cognition, Trust and Glue and Knowledge" - https://www.youtube.com/watch?v=THr56-VdGPs

Supporting Material:

- Adams, F., & Aizawa, K. (2001). The bounds of cognition. Philosophical psychology, 14(1), 43-64.
- *Sprevak, M. (2019). Extended cognition. The Routledge encyclopedia of philosophy online. New York: Routledge. https://doi. org/10.4324/9780415249126-V049-1*

February 3 - TEST 2

February 10 - Interlude: Online Brains and Bad Borgs

Essential Material:

- Firth, J., Torous, J., Stubbs, B., Firth, J. A., Steiner, G. Z., Smith, L., ... & Sarris, J. (2019). The "online brain": how the Internet may be changing our cognition. *World Psychiatry, 18(2), 119-129.*
- Clark, A. (2003). Natural-born cyborgs: Minds, technologies, and the future of human intelligence (Chapter 7, Bad Borgs)
- [Video] How Social Media Shapes Identity | Ulrike Schultze | TEDxSMU - https://www.youtube.com/watch?v=CSpyZor-Byk

Supporting Material:

- [Collection of papers] Scaffolding Bad: Varieties of Situated Cognitive Harm https://link.springer.com/collections/aadfbjhfec
- Belk, R. W. (2013). Extended self in a digital world. Journal of Consumer Research, 40, 477-500.
- [Video] What your smart devices know (and share) about you | Kashmir Hill and Surya Mattu TED2018 - https://www.ted.com/talks/kashmir_hill_and_surya_mattu_what_your_smart_devices_know_and_share_about_you?subtitle=en

February 17 - HOLIDAY / ESSAY 2 PROPOSAL DUE

PART IV: BAYES, BRAINS AND BEYOND

February 24 - Unboxing Your Prediction Engine

Essential Material:

- Clark, *Surfing Uncertainty* (Chapter 1 Prediction Machines & Chapter 2 Adjusting the Volume)

- [Video] Anil Seth TED Talk: "Your Brain Hallucinates Your Conscious Reality" - https://www.youtube.com/watch?v=lyu7v7nWzfo&t=549s

Supporting Material:

- Clark, *Mindware* (Chapter 11, Prediction Machines)
- Clark, *Experience Machine* (Chapter 1, Unboxing the Prediction Machine & Appendix)
- Bubic, A., Von Cramon, D. Y., & Schubotz, R. I. (2010). Prediction, cognition and the brain. *Frontiers in human neuroscience*, *4*, 1094.
- Rao, R. (1999). Predictive coding in the visual cortex. *Nature Neuroscience*, *2*(1), 9-10.
- Seth, A. K. (2014). The cybernetic Bayesian brain. In *Open mind*. Open MIND. Frankfurt am Main: MIND Group.
- Clark, A. (2013). Whatever next? Predictive brains, situated agents, and the future of cognitive science. *Behavioral and brain sciences*, *36*(3), 181-204.
- [Video] Andy Clark: "Perceiving as Predicting" (Public Opening Keynote Lecture) - https://www.youtube.com/watch?v=05P41FQlgjI&t=1965s
- [Video] Andy Clark: "Being and Computing: Are You Your Brain, and Is Your Brain a Computer?" - https://www.youtube.com/watch?v=C04taMeCeRw

March 3 - Embodying Predictions

Essential Material:

- Clark, A. (2015). Embodied prediction. In *Open mind*. Open MIND. Frankfurt am Main: MIND Group.
- Nave, K., Deane, G., Miller, M., & Clark, A. (2020). Wilding the Predictive Brain. *Wiley Interdisciplinary Reviews: Cognitive Science*, 11(6), e1542.
- [Video] Karl Friston on Embodied Cognition - https://www.youtube.com/watch?v=HW0JnjgCO3o
- [Video] Andy Clark, Predictive processing and the materially entangled mind - https://www.youtube.com/watch?v=FdhzS8aergo

Supporting Material:

- Hohwy, J. (2014). The self-evidencing brain. *Noûs*. doi: 10.1111/nous.12062. Optional Extra
- *Clark, A. (2015). Embodied prediction. In Open mind. Open MIND. Frankfurt am Main: MIND Group.*

March 10 - Naturalizing "Relevance Realization"

Essential Material:

- Jaeger, J., Riedl, A., Djedovic, A., Vervaeke, J., & Walsh, D. (2024). Naturalizing Relevance Realization: Why Agency and Cognition are Fundamentally Not Computational. *Frontiers in psychology*, 15, 1362658.

Supporting Material:

- Reynolds, J. (2024). Framing the predictive mind: why we should think again about Dreyfus. *Phenomenology and the cognitive sciences*, 1-26.
- Andersen, B. P., Miller, M., & Vervaeke, J. (2022). Predictive processing and relevance realization: exploring convergent solutions to the frame problem. *Phenomenology and the Cognitive Sciences*, 1-22.

March 17 - Predicting Ourselves: Creeping Up on Consciousness

Essential Material:

- Clark, *Surfing Uncertainty (Chapter 7, Expecting Ourselves)*

Supporting Material:

- Seth, A. K., & Bayne, T. (2022). Theories of consciousness. *Nature Reviews Neuroscience*, 23(7), 439-452.
- Solms, M. (2019). The hard problem of consciousness and the free energy principle. *Frontiers in Psychology*, 9, 2714.
- [Video] 'The hard problem of consciousness': A lecture by Professor Mark Solms at the Freud Museum London - https://www.youtube.com/watch?v=JkauuycJUcs
- Dolega, K., & Dewhurst, J. (2019). Bayesian frugality and the representation of attention. *Journal of Consciousness Studies*, 26(3-4), 38-63.

March 24 - Interlude: Caring for Your Prediction Engine: Mushrooms, Meditation and Horror Films

Essential Material:

- Miller, M., White, B., & Scrivner, C. (2024). Surfing uncertainty with screams: predictive processing, error dynamics and horror films. Philosophical *Transactions of the Royal Society B*, 379(1895), 20220425.

Supporting Material:

- Carhart-Harris, R. L., & Friston, K. J. (2019). REBUS and the anarchic brain: toward a unified model of the brain action of psychedelics. Pharmacological reviews, 71(3), 316-344.
- Laukkonen, R. E., & Slagter, H. A. (2021). From many to (n) one: Meditation and the plasticity of the predictive mind. Neuroscience & Biobehavioral Reviews, 128, 199-217.

March 31 - Debug and Debrief / ESSAY 2 DUE

- No additional readings necessary

Final Exam: TBD

Tutorials: sessions will be held by the TAs starting the third week of classes on bi-weekly basis.

Fall	Winter
Sept 20	Jan 17
Oct 4	Jan 31
Oct 18	Feb 14
Nov 1	Feb 28
Nov 15	March 14
Nov 29	March 28

7. Course Assignments

Individuals 'learn best when they are cognitively active and engaged, when learning experiences are meaningful and socially interactive, and when learning is guided by a specific goal' (Hirsh-Pasek et al., 2015, p4).

Assignment	Value %	Due date
Test 1	10	Oct 21
Essay 1	15	Dec 2
Test 2	15	Feb 3
Essay 2 Proposal	5	Feb 17
Essay 2	20	March 31
Final Exam	35	TBD

Term Tests

There will be two term tests. These questions will test your ability to both explain and reflect on course contents.

Test 1: OCT 21, 10%. Students must do 6 out of 10 short-essay questions. ~200 words per answer. Each question consists of a term or phrase. Students will define the term, explain its

relevance + relevant issues/theories/debates, and make relevant novel connections or criticism. You may have 3h for the test. This may be subject to change. Stay tuned for more info.

Test 2: FEB 3, 15%. There are two sections. Section 1 is as in Test 1, but students will only be required to do 4 out of 9 short answer questions. 200 words per answer. Section 2 is a longer argumentative essay. Students will choose 1 out of 3 questions. 1000 words per answer. To successfully complete section 2, students will:

- State a clear and relevant thesis
- Critically review lecture material and reading material
- Make an *argument,* not a summary
    - ○ integrate reviewed material into their essay in a novel way, such that they effectively defend their thesis

This test will **only cover material in lecture *since* the first test**. You may have 3h for the test. This may be subject to change. Stay tuned for more info.

Essay 1: DEC 2, 15%. The short essay will tackle one of a list of suggested topics pertaining to course material. This is an argumentative essay, meaning it must have a challenging (non-trivial) thesis which it defends. It must be formatted in APA style. It will be approximately 2000 words, not including bibliography and abstract, and must contain at least 10 reputable scholarly sources. In-text citations are mandatory. Essays will be submitted via Quercus in PDF format.

Essay 2 Topic Proposal: FEB 17, 5%. Final essays will be argumentative, research-based essays proposing a novel and challenging thesis on a topic of your choosing. The topic must pertain to course content in some significant way. This assignment is a 300 word, one page proposal (plus sources) for the final paper you intend to write. Please see the "Final Essay" description below for details. Your proposal should contain the following:

1. An introduction to the subject you intend to study relative to cognitive science. You do not yet require a thesis – that is, a plausible answer – but you should have a well-formed topic.
2. An overview analysis of how your essay relates to or addresses course themes, arguments, and materials.
3. A projected explanation of how you will feasibly write your essay inside a 3000-word limit. Argument skeletons encouraged.
4. A provisional initial bibliography of at least five (5) credible, relevant sources, not including course readings.

Some topics, to be announced in class and tutorial, will be excluded from consideration.

Final Essay: MAR 31, 20%. This final essay will be based on the topic approved in the Final Essay Proposal. It must be formatted in APA style. It will be approximately 3000 words, not including bibliography and abstract, and must contain at least ten (10) reputable scholarly sources, not including readings on the syllabus. In-text citations are mandatory. Final essays will be submitted via Quercus, in PDF format.

Final Exam: TBD, 35%. The final exam will test students' knowledge on all course content, with a greater emphasis on material covered in the winter term. The format will be similar to Test 2, which has a Section 1 (respond to 4/9 short answer questions) & Section 2 (respond to 1/3 longer essay question).

8. Resources and Materials

A number of recommended readings will be offered to supplement lecture material. While not required, these suggestions will expand, inform, and enrich your understanding of the material presented in lecture. All will be posted to the course website on Quercus.

Mind and Machine by Joel Walmsley, can be purchased online: https://www.palgrave.com/us/book/9780230302938.

9. Academic Support for Students

Academic Success

- The Student Life centre offers a range of services, including one on one writing, study strategies and group study hubs. For more see: https://studentlife.utoronto.ca/department/academic-success/
- Writing Centre - An outstanding service. Receive one-on-one writing support for assignments and improve your writing through various courses & workshops. See more here: https://writing.utoronto.ca/writing-centres/arts-and-science/
- More than 60 Advice files on all aspects of academic writing are available at http://advice.writing.utoronto.ca
- There is also a series of workshops on different aspects of writing that may be especially helpful for your essays. Check out the dates at: http://writing.utoronto.ca/writing-plus/

Librarians

- Use the Ask Chat service to connect quickly online: https://library.utoronto.ca/ask-librarian
- Connect with your Faculty liaison librarians for research support here: https://onesearch.library.utoronto.ca/liaison-librarians

APA Formatting Resources

- Free online resources from APA (e.g., FAQs, tutorials, etc.): http://www.apa.org/pubs/apastyle/ http://www.apastyle.org/learn/
- Purdue Online Writing Lab (OWL) APA website: https://owl.english.purdue.edu/owl/resource/560/01/

Additional Resources

- English Language Learners (ELL) Program: http://www.artsci.utoronto.ca/current/advising/ell
- Student Life Resources - resources that are relevant to every aspect of "student life," including extracurricular opportunities and family resources http://www.studentlife.utoronto.ca/
- Health & Wellness: http://www.studentlife.utoronto.ca/hwc
- Academic Success: http://www.studentlife.utoronto.ca/asc

10. Procedures & Policies

Please hand in all assignments by their posted due date. We would like to read and mark all submissions ASAP and in a timely fashion, as this is the fairest way to do grading. Relevant accommodations outlined in a Letter of Accommodation or a Letter of Consideration generated by the appropriate Office will be respected.

Additionally, **academic integrity** is essential to the pursuit of learning and scholarship in a university, and to ensuring a degree from the University of Toronto is a strong signal of each student's individual academic achievement. As a result, the University of Toronto treats cases of cheating and plagiarism very seriously. The University of Toronto's Code of Behaviour on Academic Matters (www.governingcouncil.utoronto.ca/policies/behavaeac.html) outlines the behaviours that constitute academic dishonesty and the processes for addressing academic offences.

All suspected cases of academic dishonesty will be investigated following procedures outlined in the Code of Behaviour on Academic Matters. If you have questions or concerns about what constitutes appropriate academic behaviour or appropriate research and citation methods, you are expected to seek out additional information on academic integrity from your instructor of from other institutional resources (see www.utoronto.ca/academicintegrity/resourcesforstudents.html). For classroom behaviour, we ask and demand that everyone shows respect and decorum to their fellow classmates. Do not do anything that may disturb them, such as carrying on a conversation, texting, playing games, checking social media, etc.

Final Grade Determination

Final Grade Determination: Assignments are graded in accordance with the evaluation criteria set out by the University – please refer to the University Assessment & Grading Practices Policy

Refined Letter Grade Scale	Grade Point Value	Numerical Scale of Marks
A+	4.0	90 - 100%
A	4.0	85 - 89%
A-	3.7	80 - 84%
B+	3.3	77 - 79%
B	3.0	73 - 76%
B-	2.7	70 - 72%
C+	2.3	67 - 69%
C	2.0	63 - 66%
C-	1.7	60 - 62%
D+	1.3	57 - 59%
D	1.0	53 - 56%
D-	0.7	50 - 52%
F*	0.0	0 - 49%

Late Assignments

There is a lateness penalty of 5% per day up to a maximum of 50% off, including weekends, for late material.

Calculation Errors & Regrades

If you think there is a calculation error in your assignment (i.e., the math on your final grade doesn't add up correctly), please contact the TA that marked your assignment. If there is indeed a calculation error, then the TA can directly remedy this on Quercus. Do this as soon as possible!

Requests for a regrade must be accompanied by a one-page, single-spaced paper detailing why you think you were graded unfairly and sent to Dr. Vervaeke. If Dr. Vervaeke grants you a regrade, he will remark the assignment . Regraded assignments may receive a lower mark. There is no guarantee that grades will rise. Please consider re-grading requests cautiously.

Re-weighting Assignments

- An instructor may change the nature of and the weighting of assignments under exceptional circumstances. This requires a class vote which needs to be scheduled with

one week's notice. A majority (50% of students plus one) is required to change the nature and/or weighting of assignments in the course.

- Please email the instructor & head TA if you anticipate any disruptions to your attendance or completion of assignments.
- The course syllabus is posted online on *Quercus*. Please refer to the syllabus for information about all course assignments and any changes to evaluation if there is an interruption of classes.

Academic Integrity

It is important to familiarise yourself with the University of Toronto's policies and procedures on academic matters. The Code of Behaviour on Academic Matters pertains to all students and faculty at the University of Toronto. This document states that it is an offence for a student knowingly "to represent as one's own any idea or expression of an idea or work of another in academic examination or term test or in connection with any other form of academic work, i.e. to commit plagiarism". It also defines a number of other offences, which the University expects all students to know about and avoid. Please review the complete document online. The University of Toronto also has a website dedicated to Academic Integrity and associated UofT resources, that includes: 1) Definitions of

Academic Offenses HERE, 2) "How Not to Plagiarize" HERE, and 3) "Standard Documentation Formats"

Expectation of professional and collegial behaviours

Timely Submission of Assignments: We expect that all assignments will be submitted by their posted due date. It is expected that arrangements for an extension, if required, will be made directly with your tutorial TA **no later than 2 days** before assignment due date. TAs can provide 1-week extensions. **For longer extensions, please contact Dr. Vervaeke.** Relevant accommodations outlined in a Letter of Accommodation/Consideration by Student Services/Registrar/Accessibility Services will be respected.

Freedom of Information and Protection of Privacy

Students need to regularly check their @utoronto.ca email address for official communication:

- "As of June 10, 2006, all Ontario universities have been covered by the *Freedom of Information and Protection of Privacy Act (FIPPA)*. This Act supports access to University records and protection of privacy, including the protection of personal information about individuals that is held by the University and the provision of access for individuals to their personal information."

Statement on Access & Disability Accommodations

In this course, Access and Accommodation are understood as:

- A right protected by Canadian and international law;
- Services provided to registered recipients by UofT Accessibility Services, and/or by any other service providers;
- A process which requires continuous conversation, learning, work and/or negotiation among all involved, including those who do and those who do not self-identity as disabled or as allies.

Some access practices that we pursue are providing readings in PDF format and posting class slides.

What to do if you have an access and/or accommodation issue that you wish to address? The University of Toronto recommends that students register at Accessibility Services well in advance of classes to allow for timely arrangements. Located on the 4th Floor at 455 Spadina Avenue, 416-978-8060, accessibility.services@utoronto.ca.

Learn about your options by consulting the University's accommodation information for faculty and staff: http://www.studentlife.utoronto.ca/as/faculty-and-staff#node-2090

11. Continuity Planning in Case of Disruption to Classes and/or Field

In the event of an interruption of classes, we may have to switch to (a)synchronous class and modify assignments. If a student is unable to attend classes or complete academic requirements due to the onset of an illness or other disruption, we will make all reasonable attempts to ensure they receive course credit (e.g., re-weight completed assignments).

12. Coursework Extension

A coursework extension may be appropriate if academic (e.g., unexpected problems of research in a course) or non-academic (e.g., illness) reasons make it impossible for you to complete course requirements on time.

Please do not delay if you need an extension. Extensions within 48h of assignment deadlines may not be considered unless in unprecedented conditions which have relevant documentation. More info on extensions can be found here: https://sidneysmithcommons.artsci.utoronto.ca/how-do-i-request-an-extension/

13. Equity, Diversity and Inclusion

At the University of Toronto, we strive to be an equitable and inclusive community, rich with diversity, protecting the human rights of all persons, and based upon understanding and mutual respect for the dignity and worth of every person. We seek to ensure to the greatest extent possible that all students and employees enjoy the opportunity to participate as they see fit in the full range of activities that the University offers, and to achieve their full potential as members of the University community.

Our support for equity is grounded in an institution-wide commitment to achieving a working, teaching, and learning environment that is free of discrimination and harassment as defined in the Ontario Human Rights Code. In striving to become an equitable community, we will also work to eliminate, reduce or mitigate the adverse effects of any barriers to full participation in University life that we find, including physical, environmental, attitudinal, communication or technological.

Equity Policy
Anti-Racism and Cultural Diversity Office

Equity, Diversity, and Inclusion Reminder

As outlined in the Student Code of Conduct, the University of Toronto does not condone discrimination or harassment against any persons or communities especially when based on grounds protected under the Ontario Human Rights Code. The University of Toronto recognizes its commitment to human rights, equity and inclusion and acknowledges the disproportionate impact COVID-19 has on various parts of our community. COVID-19 is not isolated to people of any particular ethnic origin, place of origin or race. Equity, diversity and respect must remain integral as we continue to transition during these challenging times. The institution will monitor and address discriminatory comments or behaviour including on U of T's online platforms and classrooms. In accordance with the Ontario Human Rights Code, no person shall engage in a course of vexatious conduct that is directed at one or more specific individuals, and that is based on the race, ancestry, place of origin, colour, ethnic origin, citizenship, sexual orientation, gender identity, gender expression, age marital status, family status or disability. This includes:

- Racial slurs or "jokes"
- Insults due to racial identity
- Online posts of cartoons or pictures, in a workplace or school that degrade persons of a particular racial group
- Name-calling due to race, colour, citizenship, place of origin, ancestry, ethnic background or creed
- Pseudonyms or handles that are inappropriate about ancestry, colour, citizenship, ethnicity, place of origin, race, or religion
- For more prohibited grounds for discrimination please visit: http://www.ohrc.on.ca/en/ontario-human-rights-code

14. Accommodation of Religious Observances

It is the policy of the University of Toronto to arrange reasonable accommodation of the needs of students who observe religious holy days other than those already accommodated by ordinary scheduling and statutory holidays. Students have a responsibility to alert members of the

teaching staff in a timely fashion to upcoming religious observances and anticipated absences. Instructors will make every reasonable effort to avoid scheduling tests, examinations, or other compulsory activities at these times. If compulsory activities are unavoidable, every reasonable opportunity should be given to these students to make up work that they miss, particularly in courses involving laboratory work. When the scheduling of tests or examinations cannot be avoided, students should be informed of the procedure to be followed to arrange to write at an alternate time. It is most important that no student be seriously disadvantaged because of their religious observances. However, in the scheduling of academic and other activities, it is also important to ensure that the accommodation of one group does not seriously disadvantage other groups within the University community. Please see these guidelines for more information.

15. Copyright

University of Toronto faculty, staff and students are both creators and users of material subject to the protections of the Copyright Act. Accordingly, all have both rights and obligations that arise from copyright law as it has been interpreted and applied by the courts. For guidance on whether or not fair dealing applies to the material you would like to use in your scholarly work, please consult the University of Toronto's Copyright Fair Dealing Guidelines.

You are encouraged to contact your Liaison Librarian (https://onesearch.library.utoronto.ca/liaison-librarians) or Scholarly Communications and Copyright Office (copyright@library.utoronto.ca) for assistance with any copyright issues.

16. Safety and Security

Please see UofT's Safety & Support webpage here:
https://future.utoronto.ca/current-students/safety-support/