

**COG 342 H1S: Issues in Concepts, Theories of Mind, Cognitive Evolution**  
*Top-Down and Bottom-Up Approaches to Cognition*

**Meeting Time:** Friday, 10 am - 1 pm

**Location:** UC 179

**Instructor:** Alex Djedovic

**Contact:** [alex.djedovic@mail.utoronto.ca](mailto:alex.djedovic@mail.utoronto.ca)

**Office Hours:** Mondays at UC F306 11-1, or by appointment.

**Teaching Assistants:** Filip Miscevic ([fillip.miscevic@mail.utoronto.ca](mailto:fillip.miscevic@mail.utoronto.ca)), Jessica Hughes ([jessica.hughes@socialneuro.psych.utoronto.ca](mailto:jessica.hughes@socialneuro.psych.utoronto.ca)).

*Email policy:* Emails must be sent from your University of Toronto (utoronto) account, with “COG 342” in the subject line. Emails will be answered within 48 hours (not counting weekends). If you do not receive an answer within 48 hours, please send the email again. Emails should only concern procedural questions about the course. Course content will be discussed in lecture, in tutorials and in office hours. Since the run-ups to deadlines are always stressful for everyone, please ask me any questions you have at least two days before an assignment is due. Do not rely on a response in the final 24 hours.

**Course Description:**

This course is an in-depth exploration of philosophical and empirical issues surrounding *the criterion of the cognitive*. To that end, this course offers an overview of theoretical frameworks for the study of cognition, focusing on contrasting “top-down” and “bottom-up” frameworks, as well as the interplay between the two. We will aim to develop critical philosophical engagement aimed at evaluating the advantages and shortcomings of each.

We will focus on the leading theories of cognition, their conceptual frameworks, and their potential to integrate knowledge from computer science, neuroscience, philosophy, and systems biology. The goal is to develop a solid philosophical foundation for deeper engagement with contemporary cognitive science.

Topics we will look at include: computationalism, artificial neural networks, embodied cognition, extended cognition, enactive cognition, and the philosophy of scientific explanation.

**Course Objectives:**

Our goal for the course will be to develop a critical appreciation for the range of theoretical approaches in contemporary cognitive science. Here “critical appreciation” means that we will focus on unearthing key assumptions behind the frameworks we examine. Such critical thinking skills will benefit you regardless of your particular home discipline. Such skills can only be acquired by practice. In order to develop a feel for “critical appreciation”, you will write short reading

responses on a regular basis. I will provide extensive initial feedback so that the expectations are clear.

In terms of content, our goal is to develop a working knowledge of: (1) top-down approaches to cognition, (2) bottom-up approaches to cognition, and (3) an appreciation of philosophical issues in scientific explanation.

**Texts:** All course readings are available on Blackboard in PDF format.

*Readings Policy:* Everyone is expected to do the assigned readings prior to class, and to come ready to discuss them.

**Course Organization:**

*Lectures:* Lectures are the primary source of course content. They will unfold as an integrated narrative, so it is very important that you attend all the lectures. In a typical week, we will have lecture from 11 to 1. I will post the lecture slides and truncated lecture notes shortly after each lecture.

*Tutorials:* Tutorials in this course have three objectives: (i) review of the previous week's material, (ii) discussion and clarification of the issues raised by lectures, (iii) discussion and clarification of course readings. Tutorials will be held just before lecture, at UC 179 from 10 to 11.

**Course Requirements:**

<b>Assignment</b>	<b>% of Final Grade</b>	<b>Due Date</b>	<b>Return Date</b>
<i>Reading Responses (5 of 10)</i>	15% (3% each)	Variable	One week after
<i>Midterm Test</i>	10%	February 12	February 26
<i>Tutorial Participation</i>	10%	N/A	End of course
<i>Term Paper Proposal</i>	5%	March 11	March 18
<i>Term Paper</i>	35%	April 8	The day of the Final Exam
<i>Final Exam</i>	25%	TBA	TBA

*NOTE: The last day to drop this course without academic penalty is March 13.*

## **Assignment Details:**

### *1. Reading Responses*

The purpose of this assignment is to practice critically engaging with piece of scholarly work, picking out one or more main points, and evaluating them. The assignment is designed to give you early, low-stakes feedback on your writing and critical engagement. Starting from Lecture 2, you will be able to hand in a response to one assigned reading from that week. If the reading was assigned for Week 2, your response is due at the beginning of Week 3. There will be ten weeks in total with readings available for response. You are required to complete at least five. You may complete up to seven reading responses, with the top five counting towards the 15% of your mark. Your first two reading responses will be provided with feedback. Thereafter, you will have to indicate if you want feedback or not.

### *2. Midterm Test*

The purpose of this assignment is to assess your grasp of the course content. The midterm will be held in our usual room (UC 179) during the tutorial time (10-11 am) on February 12. I will provide you with a list of *ten key concepts* from lecture one week in advance. You will be asked to write short answers to three of these, where you will (i) define the concept or term, (ii) indicate its relevance to our main course question and (iii) connect it to at least one other course concept.

### *3. Tutorial Participation*

The purpose of this mark is to get you to participate in reviewing and discussing course material in a smaller group. You are expected to come to tutorial having done the readings for the week and being prepared to discuss them.

*NOTE: The participation mark depends more on the quality of your contribution rather than the quantity of your contribution.*

### *4. Term Paper Proposal*

The purpose of this assignment is to get you to start thinking about your final paper well in advance. The expectations for the assignment are a short (200-250 word) prospectus, which will include a working thesis, and a bibliography of 5 possible readings on the topic that are beyond the course syllabus.

### *5. Term Paper*

The purpose of this assignment is to integrate the skills and knowledge acquired in going to lecture and completing the other assignments. The paper will be argumentative—i.e., it will have a thesis and will be devoted entirely to arguing for it—and will be 2500 words in length (plus or minus 10%).

## *6. Final Exam*

The purpose of the exam is to have you integrate the knowledge acquired during the course. It will be 3 hours in length and cumulative. Towards the end of the course I will provide you with a list of approximately 30 key concepts and four running themes from the course. You will be expected to provide short answer questions (see assignment 2 – Midterm Test) for eight of the key concepts. You will also write a short essay on one of the course's running themes.

## Schedule of Lectures and Readings

Date	Lecture	Readings
January 15, 2016	Introduction: Top-Down and Bottom-Up	N/A
UNIT 1: Theorizing Cognition from the Top Down		
January 22, 2016	Classical Computationalism	Rescorla, Michael (2015). Computational Theory of Mind. <i>Stanford Encyclopedia of Philosophy</i> . Sections 1-3 (pp. 1-16).
January 29, 2016	Contemporary Computationalism	Chemero, Anthony (2009). "Chapter 3: Theories of Representation". <i>Radical Embodied Cognitive Science</i> . MIT Press.  Piccinini, Gualtiero (2008). Computation without Representation. <i>Philosophical Studies</i> 137: 205-241.
February 5, 2016	Artificial Neural Networks	Rescorla, Michael (2015). Computational Theory of Mind. <i>Stanford Encyclopedia of Philosophy</i> . (pp. 18-28).
February 12, 2016	<b>MIDTERM TEST</b> Contemporary Artificial Neural Networks	Hinton, Geoffrey (2007). Learning Multiple Layers of Representation. <i>Trends in Cognitive Sciences</i> 11(10): 428-434.
<i>February 15-19 – Reading Week – No Classes</i>		
UNIT 2: Theorizing Cognition from the Bottom Up		
February 26, 2016	Embedded Cognition, Embodied Cognition	Chemero, Anthony (2009). "Chapter 2: Embodied Cognition and Radical Embodied Cognition." <i>Radical Embodied Cognitive Science</i> . MIT Press.
March 4, 2016	Extended Cognition	Clark, Andy and Chalmers, David (1998). The Extended Mind. <i>Analysis</i> 58(1): 7-19.
March 11, 2016	Enacted Cognition	Thompson, Evan and Stapleton, Mog (2009). Making Sense of Sense-Making: Reflections on

Enactive and Extended Mind Theories. *Topoi* 28: 23-30.

March 18, 2016 Is the Bottom-Up Approach Unified? Kiverstein, Julian and Clark, Andy (2009). Mind Embodied, Embedded, Enacted: One Church or Many? *Topoi* 28: 1-7.

March 25, 2016 – Good Friday – University Closed

### UNIT 3: Explaining Cognition

April 1, 2016 Top-Down and Bottom-Up? Clark, Andy (2013). Whatever next? Predictive brains, situated agents, and the future of cognitive science. *Behavioural and Brain Sciences* doi:10.1017/S0140525X12000477

April 8, 2016 Conclusion: What is Cognition? Lyon, Pamela (2006). The Biogenic Approach to Cognition. *Cognitive Processes* 7: 11-29.

Moreno, Alvaro and Mossio, Matteo. (2015) "Chapter 7: Cognition." *Biological Autonomy*. Springer.

Dennett, Daniel (1995). Darwin's Dangerous Idea. *The Sciences* 34-40.

Final Exam – Date TBA

### Course Policies:

**A. Assignment Submission:** All assignments will be submitted at the beginning of tutorials (i.e. 10 am on the day they are due). Please provide a hard copy of all assignments, but make sure to retain electronic records of your assignments in case of unforeseen accidents. If you cannot be in tutorial on that day, please leave the assignment, time-stamped at the UC Program Office (UC 174).

**B. Late Assignments:** Late assignments will be penalized at 10% per day. Extensions may be granted for extraordinary circumstances or humanitarian reasons. Contact me well before the assignment due date to request an extension. In case of medical emergency, please fill out the Verification of Student Illness or Injury Form (<http://www.illnessverification.utoronto.ca/>).

**C. Contact:** I will be available to answer course content questions at weekly office hours and by appointment. I will use Blackboard to post announcements and readings. I will be available by email to deal with issues of course procedure and

administration. Students are expected to check Blackboard and their university email accounts regularly.

**D. Accessibility:** if you need accommodations or have accessibility needs, please make sure you are registered with Accessibility Services ([www.accessibility.utoronto.ca](http://www.accessibility.utoronto.ca)). I am happy to provide any reasonable accommodation suggested by Accessibility Services. If accommodations need to be made for the essays and/or for the final exam, please make every effort to have your accessibility representative contact me well in advance of the exam or essay due date.

**E. Missed Tests:** If you should miss the midterm under extraordinary circumstances, contact me as soon as possible to make alternate arrangements. Valid medical documentation will be required (<http://www.illnessverification.utoronto.ca/>).

**F. Academic Integrity:** Academic integrity is essential to the pursuit of learning and scholarship in a university, and to ensuring that a degree from the University of Toronto is a strong signal of each student's individual academic achievement. As a result, the University treats cases of cheating and plagiarism very seriously. The University of Toronto's Code of Behaviour on Academic Matters (<http://www.governingcouncil.utoronto.ca/policies/behaveac.htm>) 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, please see me at office hours, or go to <http://www.utoronto.ca/academicintegrity/>

**G. Mental Health:** Academic work is difficult and psychologically demanding. It is important to work hard and push yourself outside your comfort zone at times. However, it is even more important to take care of your mental health. There are a number of mental health resources available for you should difficulties arise:

<http://discover.utoronto.ca/health-wellness>  
<http://life.utoronto.ca/get-help/counselling/>  
<http://mentalhealth.utoronto.ca/>

In addition, the Health & Wellness Centre comprises a host of services to which you are entitled as a student here. Visit the Centre on the second floor of the Koffler Student Services Centre, at 214 College Street (use the St. George Street entrance).

**H. Re-grading:** If you feel your assignment has been graded unfairly, I will revisit them provided you have provided me with a clear rationale, in writing, for why you

believe the received grade is unfair. Keep in mind that the re-grading may result in either an increased or decreased grade.

**I. *Drop dates:*** the last date to drop this course without academic penalty is March 13.

**J. *Auditing:*** if you are taking this course not for credit, or are sitting in, feel free to do so. I only ask that you be mindful of the space your comments take up in lecture. Contact me about adding you as a guest on Blackboard so that you may access the course readings.

**K. *Writing support:*** This course involves a significant writing component. Some of your disciplinary backgrounds might make this aspect of the course challenging. There are several avenues of support for those of you who may experience difficulties related to writing. You can always see me, but I am not a writing instructor. The following links include writing clinics, on-line resources and an in-depth writing workshops.

<http://www.writing.utoronto.ca/writing-centres/arts-and-science>

<http://www.writing.utoronto.ca/advice>

<http://www.writing.utoronto.ca/writing-plus>.