

University of Waterloo

Waterloo ON

Phil/Psych 256 (Section 001), Introduction to Cognitive Science

Fall 2017, MWF, 9:30-10:20a, AL 208

INSTRUCTOR INFORMATION

Dr. Nicholas Ray (nmray@uwaterloo.ca)

Office: Hagey Hall, 322

Hours: Mondays and Wednesdays, 10:30-12:00

TA INFORMATION

Amanda Plain (aplain@uwaterloo.ca)

Office: Hagey Hall, 339

Hours: *to be announced*

COURSE DESCRIPTION

This course will be an introduction to some of the main themes and interdisciplinary questions at the heart of cognitive science. As a relatively new scientific discipline (in comparison with, say, physics or chemistry), many of the foundational issues are still to be settled. This has led to lively debate and congress between people from competing schools of thought, coming from a wide range of backgrounds, including philosophy, psychology, linguistics, anthropology, computing and AI research, mathematics, and neuroscience (to name but a few). While cognitive science gets its proper start after WWII, we will see how the roots of cognitive science go back much deeper in the Western intellectual tradition. One should not be surprised about this much longer history, given that cognitive science asks a range of very specific questions about how thinking works, but also very general (perhaps even philosophical) questions, such as:

- What is intelligence? How is it studied?
- Can we make intelligent machines?
- Is the mind a computer? If so, what kind of computer? What is the nature of computation?
- Do we think by using discrete rules? What is the content of thought—is it quasi-linguistic, conceptual, imagistic, analogical?
- What differences and similarities are there between cognition in humans and non-human animals?
- Is some cognition inherently social?
- Does cognition happen in the head, or does it extend into the world? Is some cognition social?
- What is the role of emotion in cognition?

While we will discuss different things minds can do, and the different ways various disciplines study the mind, we will concentrate primarily on theories of mental representation and mental content. The first two weeks of the course will cover the philosophical and psychological prehistory of cognitive science, and then we will start looking at views of the mind that have been developed since the 1950s.

INTENDED LEARNING OUTCOMES

The hope is that everyone learns new ways of thinking about how the mind works, and comes to gain a respect for interdisciplinary studies of the mind. However, we also hope to achieve some learning outcomes not specifically tied to course content, including critical reading and writing skills, the development of peer evaluation skills, and debate and discussion skills. By the end of this class, students should be able to

1. **Conceptualize** the different theories of mental representation we will encounter.
2. **Critically assess** the different arguments made for different theories of mind (mental representation and content).
3. **Discern** normative/evaluative questions about how we ought to think from descriptive or factual questions about how we think.
4. **Hone your writing and research skills.**
5. Be able to **identify, name, analyse/define, and apply key terminology** from the various disciplines we will encounter.
6. **Speak meaningfully** about the promises and pitfalls of interdisciplinary research.

WHAT YOU MUST DO TO SUCCEED

- **Attend classes, and do the readings.** Nick will be posting lecture material (when it is possible to post it), but there aren't always lecture slides, and they do not contain all of the necessary content, nor a record of our enlightening discussions. Missing lecture will make it hard to do well on the assessments in this course.
- **Be critical but fair** when dealing with ideas that are coming from a different perspective than your own. If you're a computer scientist, you might not initially get why the philosophers and psychologists are talking so much about consciousness; if you're an engineer, you might not understand why the computer scientists talk about thought as rule-governed inference; philosophers and psychologists might not mean exactly the same thing by "concepts"! Be open to meeting each other using overlapping vocabularies and shared ideas.
- Be willing to **clarify** your views using course concepts and terminology.
- **Engage in criticism and debate.** Treat your interlocutor with respect, and apply the principle of charity. We want to be humble in the process of knowledge production. We are all fallible, and we are all part of a community of inquirers that can help limit the deleterious effects of bias and unclear thinking.
- **Expect** the professor and TA to hold regular office hours, respond to e-mails in a timely manner (usually within 24 hours), offer you substantive feedback that explains your grade and helps you improve on future assignments.

TEXTBOOK

Primary texts will be made available as PDFs or as links to online content on the course LEARN site. The following text is available in the University Bookstore:

Paul Thagard, *Mind: Introduction to Cognitive Science*, Second Edition.
Cambridge, Massachusetts: MIT Press (A Bradford Book), 2005.

ASSESSMENTS (Detailed Handouts and Guides to be Posted on LEARN)

Assessment	Due Date	Page Length	Value
Online Quizzes	Sept. 21; Oct. 5 and 26; Nov. 9 and 23	NA	4% x 5 = 20%
Critical Analysis	October 9	3 pages	20%
Term Project Proposal	November 17 (rough) November 19 (final)	3 pages	10%
Peer Review of Proposal	November 17 (in class)	1-2 pages	10%
Term Project	December 4	6 pages	30%
Participation	Ongoing	NA	10%

Writing assignments are to be submitted to the relevant dropboxes on LEARN. Late submissions late will be penalized **10% of the assessment value per day**, including weekends.

Online Quizzes: There will be 5 very short assessments spaced throughout the term. Notice that the dates for these are all Thursdays. You will have a limited amount of time to complete this assessment, likely 15 or 20 minutes (depending on the question format for each week), and the window during which you will attempt the quiz will be on Thursday evenings from 4:00pm until the beginning of class on Friday at 9:30am. We will then take up the quiz as a class.

Critical Analysis: You will reconstruct an argument or theoretical position from one of the course readings, tell your reader why it is significant, and assess your chosen passage. Why did you pick this piece (i.e. why do you find it interesting, perplexing, frustrating, etc.)? Is the argument or theoretical position plausible? Do you think it is valid/apt/true/justified/grounded? Why or why not? How might somebody critique the author's views, and how might the author respond?

Term Project Proposal: This will be your plan of attack for the Term Project. We expect to see a working introduction that introduces an interesting problem related to course material, provides a brief indication of the theoretical positions folks have taken on the issue, and your thesis/hypothesis/focus of research for the paper. You will also provide a skeletal outline for how you think the project will proceed, and an annotated bibliography including all relevant course material and at least two external sources.

Peer Review: Bring a copy of your Proposal to class on Nov. 17. A peer will read it, offering helpful feedback for how to amend your project. You will do the same for a peer. You will then reflect on your peer's commentary and refine your Proposal, the final draft of which will be submitted to the dropbox on LEARN by Nov. 19. (Peer Reviews can be submitted after they have served their purposes, likely at lecture on Nov. 20th.)

Term Project: This is a major essay that you will have been developing since approximately the mid-point of the term. You will utilise lessons learned on the Critical Analysis and the Proposal processes to craft a paper that explores one of several questions to be provided to you well in advance of the due date. If students prefer to explore a question of their own devising, or pursue a project that is not a traditional essay, then they should talk to Nick about their interests in advance.

Participation: There will be lots of class discussion. Students are expected to be at every lecture, and are expected to engage in class discussion regularly. Almost every Friday, we will devote some time to structured or semi-structured discussion and activities. The bulk of the participation grade is devoted to these exercises. To get a good participation grade (a grade of 75% or above) you must attend and contribute frequently, and your contributions must be of the highest calibre—always respectful, based on content, and focussed on advancing discussion!

ELECTRONIC DEVICE POLICY

You may use a laptop or a tablet functioning as a note-taking device. Please turn off phones. If you are found to be using your device for non-course related activities, you may be asked to leave.

NOTE: There is a wealth of empirical evidence that shows use of screens in a class has a negative impact on you **AND THOSE AROUND YOU!** If you need to use a laptop or other note-taking device, please move to the back or sides of the room, where you will be less distracting to others.

E-MAIL ETIQUETTE

1. Before sending an unnecessary e-mail to Nick or the TA, make sure your question isn't easily answered by the syllabus or assignment handouts!
2. All e-mails should include "Phil/Psych 256" in the subject heading. We will try to reply later the day of sending, or by the end of the next business day.
3. Craft your e-mails in a professional manner. Offer a salutation, use your addressee's name, and sign off with your name.
4. Think before sending any longer e-mails dealing with substantial content. Save your questions for class discussion, or stop by office hours for extended chats.

LEARN (COURSE WEBSITE)

LEARN is the main mode of communication for this course after lecture and e-mail. Nick will be posting lecture materials, announcements, any possible changes to the reading schedule, readings not from our textbook, and grades via LEARN. Because LEARN is so important, students are strongly encouraged to regularly access the site.

TENTATIVE SCHEDULE

Readings from Thagard's textbook have the starting page in parentheses following the chapter title. Other readings, followed by "(L)", can be found on LEARN—as PDFs, links to online material, or, if necessary, on the Ares Course Reserve System through our library. Readings preceded by an "(O)" are optional.

Sept. 8: Welcome and Introduction – What is Cognitive Science?

Thagard, "Representation and Computation" (3)

G. Miller, "The Cognitive Revolution: a Historical Perspective" (L)

(O) Thagard, "Why Cognitive Science Needs Philosophy and Vice Versa" (L)

Sept. 11, 13, and 15: The Philosophical Prehistory of Cognitive Science

Plato, (VIDEO, viewing in class): "Allegory of the Cave" from *Republic*

Choose ONE of:

(a) Descartes, "Meditation VI" from *Meditations on First Philosophy* (L)

(b) Hume, Sections II and III from *An Enquiry Concerning Human Understanding* (L)

(c) Kant, Introduction to *Critique of Pure Reason* (L)

Sept. 18, 20, and 22: Logic

Thagard, "Logic" (23)

Frege, "The Thought" (L)

Sept. 25, 27, and 29: Rules and Cognition—Representation Beyond Our Finitude

Thagard, "Rules" (43)

Chomsky, "Perspectives on Language and Mind" (L)

Oct. 2, 4, and 6: Concepts Part 1—Concepts as Symbols

Thagard, "Concepts" (59)

Fodor, "Unphilosophical Introduction: What Concepts Have to Be" from *Concepts* (L)

Oct. 9 to 11: (Thanksgiving Break)

No class; no readings

Oct. 13: Concepts Part 2—Are Philosophers and Psychologists on the Same Page?

Machery and Prinz* (VIDEO, viewing in class): "Theories of Concepts"

* *If you choose to write on concepts, you might want to check out these readings (that cover some of the terrain of the discussion):*

Machery, *Precis of Doing Without Concepts* (L)

Prinz, "Empiricism Reconsidered" from *Furnishing the Mind* (L)

Oct. 16, 18, and 20: Concepts Part 3—Prototypes, Exemplars, and Theories

Choose any TWO of:

Rosch, "Reclaiming Concepts" (L)

Nosofsky, "The Generalized Context Model: An Exemplar Model of Classification" (L)

Chaigneau, Barsalou, Sloman, "Assessing the Causal Structure of Function" (L)

Oct. 23, 25, and 27: Analogies

Thagard, "Analogies" (77)

Hofstadter, "Analogy as the Core of Cognition" (L)

Oct. 30, Nov. 1 and 3: Images

Thagard, "Images" (95)

Pylyshyn, "Mental Imagery: In Search of a Theory" (L)

Nov. 6, 8, and 10: Connectionism and Neural Networks

Thagard, "Connections" (111)

Choose ONE of:

Eliasmith, "How to Build a Brain"

Clark, "Connectionist Minds"

Nov. 13, 15, and 17 : Emotion and Cognition**

Thagard, "Emotions" (161)

Damasio, "A Passion for Reasoning" from *Descartes' Error* (L)

** PEER REVIEW in class; bring a copy of your Proposal

Nov. 20, 22, and 24: Consciousness

Thagard, "Consciousness" (175)

Dennett (Video: viewing in class), The Illusion of Consciousness (TED Talk)

Chalmers (Video: viewing in class), How Do You Explain Consciousness (TED Talk)

(O) Nida-Rümelin, "Pseudonormal Vision: An Actual Case of Qualia Inversion?" (L)

Nov. 27, 29, and Dec. 1: Mind in Body and World

Thagard, "Bodies, the World, and Dynamical Systems" (191)

Clark and Chalmers, "The Extended Mind" (L)

(O) Wilson, "Introduction: Depression, Biology, Agression" from *Gut Feminism* (L)

Dec. 4: Social Cognition

Thagard, "Societies" (205)

Jacobson, "Seeing as a Social Phenomenon: Feminist Theory and the Cognitive Sciences" (L)

ACCOMODATION FOR STUDENTS WITH DISABILITIES

Note for students with disabilities: The [AccessAbility Services office](#), located in Needles Hall Room 1401, collaborates with all academic departments to arrange appropriate accommodations for students with disabilities without compromising the academic integrity of the curriculum. If you require academic accommodations to lessen the impact of your disability, please register with the AS office at the beginning of each academic term.

SOURCES OF INFORMATION FOR STUDENTS

[Academic integrity](#) (Definition) [Academic Integrity Office](#) (uWaterloo)

ACADEMIC INTEGRITY

In order to maintain a culture of academic integrity, members of the University of Waterloo are expected to promote honesty, trust, fairness, respect and responsibility.

Discipline: A student is expected to know what constitutes academic integrity, to avoid committing academic offences, and to take responsibility for his/her actions. A student who is unsure whether an action constitutes an offence, or who needs help in learning how to avoid offences (e.g., plagiarism, cheating) or about “rules” for group work/collaboration should seek guidance from the course professor, academic advisor, or the Undergraduate Associate Dean. When misconduct has been found to have occurred, disciplinary penalties will be imposed under Policy 71 – Student Discipline. For information on categories of offenses and types of penalties, students should refer to [Policy 71 - Student Discipline](#).

Grievance: A student who believes that a decision affecting some aspect of his/her university life has been unfair or unreasonable may have grounds for initiating a grievance. Read [Policy 70 - Student Petitions and Grievances, Section 4](#).

Appeals: A student may appeal the finding and/or penalty in a decision made under Policy 70 - Student Petitions and Grievances (other than regarding a petition) or Policy 71 - Student Discipline if a ground for an appeal can be established. Read [Policy 72 - Student Appeals](#).