Carleton UNIVERSITY

FYSM 1607 (C): Cognitive Science: Thinking and Knowing
Course Outline
Fall/Winter 2020-21

Course Information

	Fall	**Winter**
Dates:	Monday and Wednesday	Monday and Wednesday
Time:	11:35 am - 12:55 pm	11:35 am - 12:55 pm
Location:	N/A	TBA
Course type:	Blended / Delivered online	TBA

Course prerequisites: Normally restricted to students entering the first year of a B.A., B.Cog.Sc., B.Co.M.S., B.Econ. or B.G.In.S. program.

Instructor Information

Instructor: **Dr. Nadiya Slobodenyuk**
Office: DT 2207 (Not available in fall 2020)
Phone: 613-520-2600 x 4210 (Not available in fall 2020)
E-mail: NadiyaSlobodenyuk@cunet.carleton.ca

Office Hours: Monday and Tuesday from 1 pm to 4 pm. During these time slots, I will be available to respond on course Discord channel and schedule Zoom meetings.
I will also respond to e-mails throughout the week.

1. Course Overview & Objectives:

This First-Year Seminar is about minds, brains, and machines. Our goal in this course is to understand how the mind works by considering research on minds, brains, and machines conducted in the fields of artificial intelligence, neuroscience, linguistics, evolutionary biology, cognitive psychology, and philosophy of mind. The course is organized into three core modules: 1) animal minds, 2) human minds, and 3) artificial intelligence. We will discuss some of the most fascinating questions about animal minds, human minds, and machine minds, including the following. Is the mind an immaterial thing? Is the mind a software running on brain–the hardware? What kind of computations do brains do? Do we perceive objects around us as they really are? How do babies learn and do machines learn the same way? How does consciousness emerge? Can machines become conscious? Do animals recognize themselves and have some form of self-consciousness? What would make uploading our minds into machines possible?

2. Student Learning Outcomes:

By the end of the course you will:

1. gain factual knowledge about cognitive systems and the field of cognitive science

You will also be able to:

2. relate early research in cognitive science to current developments in the field
3. integrate research from different disciplines into coherent theory of information processing

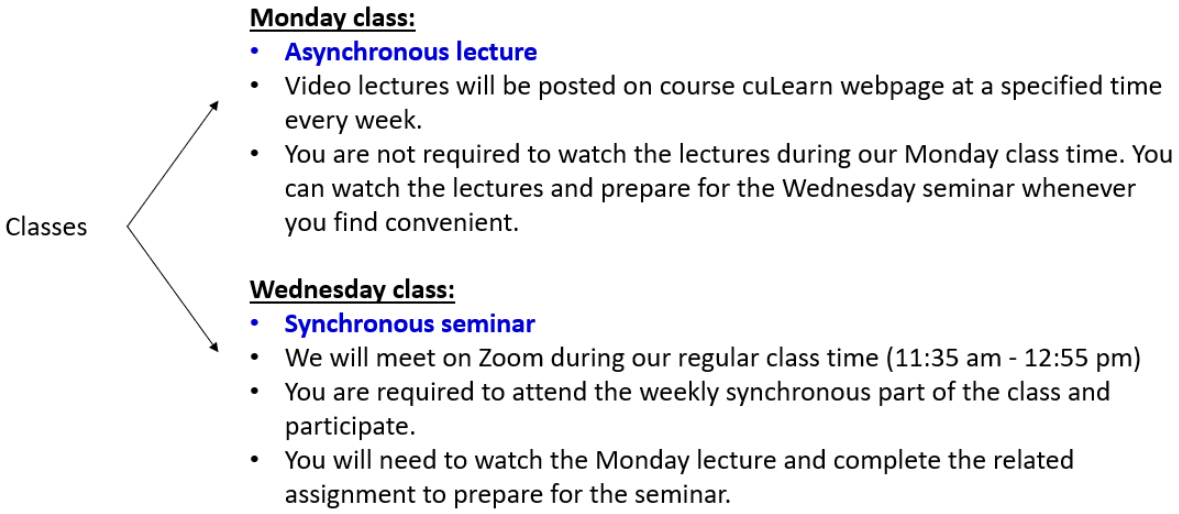
4. analyze from the methodological standpoint and critically evaluate empirical research
5. compare and critique interpretations of the empirical findings obtained on the basis of behavioral and physiological methods

Additionally, you will:

6. learn how to write clear and concise research summary
7. learn how to construct an evidence-based argument
8. learn how to present research

3. Course structure:

This is a blended course delivered online in the fall term 2020. The mode of delivery in the winter term 2021 will be announced in fall. During the fall term, class time will be allocated the following way:



4. Text & Resources:

There is no single textbook. The readings for this course include a range of articles and book chapters. The articles will be assigned on a weekly basis and will be available on the cuLearn course webpage.

cuLearn course page also contains the course outline, schedule, course feedback tools, marking rubrics, and a variety of learning exercises and useful links. It is going to be a dynamic space with many opportunities for you to make a meaningful contribution to the course and connect with your peers.

5. Assessment:

Think of the course activities as different ways of leveling up in a game. You get points and rewards, you unlock skills, and ultimately, you reach a higher level of expertise in cognitive science. On this journey, you will have to complete quests and missions to gain knowledge and you will need to acquire skills. Course assignments and activities are designed to help you gain both knowledge and skills.

Activities and assignments will be graded the following way.

Item	Weight
Fall	
Participation and attendance	7
Assignment 1: Research summary	8
Assignment 2: Thought paper 1	10
Weekly quests	24
Winter	
Participation and attendance	7
Assignment 3: Thought paper 2	10
Assignment 4: Response paper	10
Weekly quests	24
Course total:	**100**

* Detailed descriptions are given below. Additional relevant documents and marking rubrics will be available on cuLearn.

- **Participation (both terms: 14%)**

Participation is a key component of this course. To earn a full mark for participation you need to:

1) *Attend Zoom discussion classes*

You are allowed to miss 2 discussion classes per term. Missing more than 2 classes without valid (e.g., health-related) reasons will affect your participation mark.

2) *Participate in class discussions and activities*

- **Assignment 1: Research summary (8%)**

This assignment involves writing a 2-page summary of a research paper. More details concerning this assignment will be provided in class and on the course webpage. This assignment will help you develop the ability to express complex ideas and results of empirical research clearly and concisely.

- **Assignment 2: Thought paper 1 (10%)**

This assignment involves writing a 2-page thought paper on one of the questions discussed in class. This assignment will help you develop the ability to construct evidence-based arguments.

- **Assignment 3: Thought paper 2 (10%)**

This assignment involves writing a 2-page thought paper on one of the questions discussed in class. This assignment will help you develop the ability to construct evidence-based arguments.

- **Assignment 4: Response paper (10%)**

This assignment involves writing a 2-page response to an article we will read in class. This assignment will help you learn how to analyze scientific arguments and detect flaws in reasoning and methodology.

- **Weekly quests (both terms: 48%)**

Weekly quests will be based on lecture material and additional resources. You will be required to complete the weekly assignment before the Wednesday seminar class. You can receive credit for the weekly assignment only if you complete it before the deadline. Credit will not be given for late submissions.

Detailed information about the assignments will be provided in class and will be available on the course cuLearn webpage.

6. Important Dates:

Last day of registration for fall term and fall/winter courses. Last day to change courses or sections (including auditing) for fall term and fall/winter courses.	September 23
Last day to withdraw from fall term and fall/winter courses with a full fee adjustment. Withdrawals after this date will result in a permanent notation of WDN on the official transcript.	September 30
Last day to request Formal Examination Accommodation Forms for December examinations to the Paul Menton Centre for Students with Disabilities. Note that it may not be possible to fulfil accommodation requests received after the specified deadlines.	November 13

Note: The dates for course assignments are listed on cuLearn course webpage. They will be discussed in class and may be adjusted based on class needs.

7. Course Outline & Working Schedule:

This is a tentative schedule. It is likely to be adjusted based on class needs.

Fall term	
Week 1	
September 9	Introduction to FYSM 1607

Module 1: Introduction to cognitive science

Week 2	
September 14 September 16	• Is the mind a software running on brain–the hardware? • What is the relationship between the mind and the body?
Week 3	• Is the mind an immaterial thing?
September 21 September 23	• What kind of computations do brains do?

Module 2: Animal minds

Week 4	
September 28 September 30	• Are human minds unique? • What are minds good for?
Week 5	• Self-recognition and consciousness
October 5 October 7	

Week 6	
October 12	**Thanksgiving. No classes**
October 14	Types of scientific papers. How to read a research paper. Working on assignment 1: Research summary

Module 3: Human minds

Week 7	
October 19 October 21	**Perception** • What is reality? • Do we perceive objects as they really are? • What is perception for?

Week 8	
October 26 **October 28**	**Fall break. No classes.**

Week 9	
November 2 November 4	**Attention** • Is there perception without attention? • Attentional capture and inattentional blindness • Attention and processing capacity
Week 10	
November 9 November 11	

Week 11	
November 16 November 18	**Memory and learning** • Does the brain store information? • How do babies learn, and can machines learn the same way?
Week 12	
November 23 November 25	
Week 13	
November 30 December 2	

Week 14	
December 7 December 9	How to write a thought paper. Working on assignment 2: Thought paper

Winter term	
Week 1	
January 6	**The future of the human mind** • Does the mind extend beyond the body? • Can we become immortal by uploading our minds into the cloud? • Ethics of cognitive enhancement
Week 2	
January 11 January 13	

Week 3	**Reasoning** • Tools of reasoning • Common fallacies in reasoning • Is Homo sapiens a rational animal? • Are irrational heuristics evolutionary adaptations to our environment? • What is moral? • Morality and rationality
January 18 January 20	
Week 4	
January 25 January 27	

Week 5	
February 1 February 3	How to evaluate an argument. Working on assignment 3: Thought paper

Week 6	
February 8 February 10	**Consciousness** • How does it feel like to be conscious? • The hard problem of consciousness

Week 7	
February 15 **February 17**	**Winter break, no classes.**

Week 8	
February 22 February 24	Working on assignment 4: Response paper

Week 9	
March 1 March 3	**Consciousness** • Small world architecture of the brain and consciousness

Module 4: Artificial intelligence

Week 10	• How can we build a thinking machine? • Which AI is "intelligent"? • Can machines become conscious? • What is the problem of alignment?
March 8 March 10	
Week 11	
March 15 March 17	
Week 12	
March 22 March 24	

Week 13	
March 29	Workshop: How to read your audit*
March 31	Workshop: Your career starts now*

Week 14	
April 5 April 7	Final course discussion

NOTE: The schedule is tentative and is likely to be adjusted based on the needs of the class.

*Likely to change depending on the availability of the staff conducting the workshops.

8. Technical Requirements:

The synchronous part of the course will be delivered over Zoom. You will need a computer with a functioning camera, speakers, and microphone. Please see https://carleton.ca/its/help-centre/faq-technical-specs-for-new-students/ for detailed specifications.

9. Class Policies:

- ***Attendance***

Regular class attendance in the synchronous part of the course (delivered over Zoom) is required.

- ***Extra credit***

There is no extra credit in this course. Your final grade is a result of your performance on the assignments.

- ***Communication***

I will be available for any questions, feedback, and help with the course material during my regular office hours.

Office hours will be held on course Discord channel and by appointment over Zoom.

E-mail is the primary means of communication outside our class time. I usually reply promptly and will certainly reply within 24 hours. I might not be able to reply during the weekend.

Note that I will respond only to e-mails sent from your official Carleton University e-mail account containing your full name.

If you do not have or have yet to activate your Carleton account, you may wish to do so by visiting http://carleton.ca/ccs/students/

Outside the classroom, e-mail is the main means of communication in this course. You will receive regular updates and reminders on your e-mail. It is your responsibility to check your e-mail regularly.

- ***Missed classes***

If you miss a class, please consult your classmates and ask for their notes. If there is a need, I can also discuss with you the material covered in class during my office hours.

- ***Marking***

Students have the right to see their marked work during the regular office hours.

- ***Carleton grading system***

Letter grades assigned in this course will have the following percentage equivalents:

A+ = 90-100	B = 73-76	C - = 60-62
A = 85-89	B - = 70-72	D+ = 57-59
A - = 80-84	C+ = 67-69	D = 53-56
B+ = 77-79	C = 63-66	D - = 50-52

F Failure. No academic credit
ABS Absent from the final examination
DEF Official deferral (see "Petitions to Defer")
FND "Failed, no Deferral" – assigned when the student is absent from the final exam and has failed the course on the basis of inadequate term work as specified in the course outline.

Standing in a course is determined by the course instructor, subject to the approval of the Chair and Faculty Dean.

All final grades are subject to the Dean's approval.

- ***Makeup policy***

If health-related or unforeseeable personal circumstances prevent you from attending the test, you are expected to inform me before the test. Any supporting documents must be presented in a timely manner as well. You will be given a chance to retake the missed exams at a time agreed upon with the instructor.

If you receive zero for cheating or plagiarism on one of the assignments or an exam, you will NOT be given a second chance to fix your grade.

- ***Request for academic accommodation***

You may need special arrangements to meet your academic obligations during the term. For an accommodation request, the processes are as follows:

Pregnancy obligation

Please contact your instructor with any requests for academic accommodation during the first two weeks of class, or as soon as possible after the need for accommodation is known to exist. For more details, visit the Equity Services website: **carleton.ca/equity/wp-content/uploads/Student-Guide-to-Academic-Accommodation.pdf**

Religious obligation

Please contact your instructor with any requests for academic accommodation during the first two weeks of class, or as soon as possible after the need for accommodation is known to exist. For more details, visit the Equity Services website: **carleton.ca/equity/wp-content/uploads/Student-Guide-to-Academic-Accommodation.pdf**

Academic Accommodations for Students with Disabilities

If you have a documented disability requiring academic accommodations in this course, please contact the Paul Menton Centre for Students with Disabilities (PMC) at 613-520-6608 or pmc@carleton.ca for a formal evaluation or contact your PMC coordinator to send your instructor your Letter of Accommodation at the beginning of the term. You must also contact the PMC no later than two weeks before the first in-class scheduled test or exam requiring accommodation (if applicable). After requesting accommodation from PMC, meet with your instructor as soon as possible to ensure accommodation arrangements are made. **carleton.ca/pmc**

Survivors of Sexual Violence

As a community, Carleton University is committed to maintaining a positive learning, working and living environment where sexual violence will not be tolerated, and is survivors are supported through academic accommodations as per Carleton's Sexual Violence Policy. For more information about the services available at the university and to obtain information about sexual violence and/or support, visit: **carleton.ca/sexual-violence-support**

Accommodation for Student Activities

Carleton University recognizes the substantial benefits, both to the individual student and for the university, that result from a student participating in activities beyond the classroom experience. Reasonable accommodation must be provided to students who compete or perform at the national or international level. Please contact your instructor with any requests for academic accommodation during the first two weeks of class, or as soon as possible after the need for accommodation is known to exist. **https://carleton.ca/senate/wp-content/uploads/Accommodation-for-Student-Activities-1.pdf**

For more information on academic accommodation, please contact the departmental administrator or visit: **students.carleton.ca/course-outline**

- ***Learning support services***

Centre for Student Academic Support and Student Academic & Career Development Services offer a variety of services designed to support student learning. For example, they offer group study rooms, free drop-in sessions with study skills specialists and writing tutors, free academic skills workshops, networked computers, a tutor referral service, and supportive peer helpers. Visit their websites for more information:

https://carleton.ca/csas/

https://carleton.ca/sacds/

- ***Official final examinations period***

Fall 2020 courses: Dec. 12-23, 2020 and Winter 2021 courses: April 11-23, 2021 (may include evenings & Saturdays or Sundays)

For more information on the important dates and deadlines of the academic year, consult the Carleton 2020-2021 Calendar: **http://calendar.carleton.ca/academicyear/**

- ***Petitions to defer***

Students unable to complete a final term paper or write a final examination because of illness or other circumstances beyond their control or whose performance on an examination has been impaired by such circumstances may apply within five working days to the Registrar's Office for permission to extend a term paper deadline or to write a deferred examination. The request must be fully and specifically supported by a medical certificate or other relevant documentation. Only deferral petitions submitted to the Registrar's Office will be considered.

- ***Academic integrity***

The University Senate defines plagiarism as "presenting, whether intentional or not, the ideas, expression of ideas or work of others as one's own." This can include:
• reproducing or paraphrasing portions of someone else's published or unpublished material, regardless of the source, and presenting these as one's own without proper citation or reference to the original source;
• submitting a take-home examination, essay, laboratory report or other assignment written, in whole or in part, by someone else;
• using ideas or direct, verbatim quotations, or paraphrased material, concepts, or ideas without appropriate acknowledgment in any academic assignment;
• using another's data or research findings;
• failing to acknowledge sources through the use of proper citations when using another's works and/or failing to use quotation marks;
• handing in "substantially the same piece of work for academic credit more than once without prior written permission of the course instructor in which the submission occurs."
Plagiarism is a serious offence, which cannot be resolved directly with the course's instructor. The Associate Deans of the Faculty conduct a rigorous investigation, including an interview with the student, when an instructor suspects a piece of work has been plagiarized. Penalties are not trivial. They range from a mark of zero for the plagiarized work to a final grade of "F" for the course, and even suspension from all studies or expulsion from the University.

To learn more, please see the section on academic integrity on the Registrar's webpage: **https://carleton.ca/registrar/academic-integrity/**

- ***Copyright policy***

Student or professor materials created for this course (including presentations and posted notes, labs, case studies, assignments and exams) remain the intellectual property of the author(s). They are intended for personal use and may not be reproduced or redistributed without prior written consent of the author(s). **The PowerPoint presentations, lecture videos, lectures notes, and other materials available to you on cuLearn may not be distributed online.**

- ***Resources (Carleton University: 613-520-2600)***

Please note that following the advice of Ottawa Public Health, the Ontario Ministry of Health, Public Health Ontario and the Public Health Agency of Canada, all classes and services in the fall term 2020 will be delivered online. Please contact services listed below by e-mail and check other ways of getting in touch on their respective websites.

Department of Cognitive Science (ext. 2522) https://carleton.ca/cognitivescience/	2201 DT (Dunton Tower) ics@carleton.ca
Registrar's Office (ext. 3500) https://carleton.ca/registrar/	300 Tory registrar@carleton.ca
Student Academic and Career Development Services (ext. 7850) https://carleton.ca/career/for-facultystaff/how-can-you-support-career-development/	302 Tory career@carleton.ca
Paul Menton Centre (ext. 6608) https://carleton.ca/pmc/	501 University Centre PMC@Carleton.ca
Writing Tutorial Service (ext. 1125) https://carleton.ca/csas/writing-services/	4th floor Library csas@carleton.ca
Learning Support Services (ext. 1125) https://carleton.ca/csas/learning-support/	4th floor Library csas@carleton.ca

- ***Academic advising***

Visit the Cognitive Science Undergraduate Office, DT 2201 to discuss your program. Advisors can answer questions concerning:

- Course selection and meeting program requirements
- Your audit and transfer credits
- Gaining access to courses that are closed
- Information concerning prerequisites and preclusions
- Course equivalencies and substitutions
- Information about whether to pursue the (Honours Project Course) or the Thesis stream and CGPA requirements
- Community Practicum Course
- Concentrations
- Exchanges and course selection

During the fall term 2020 which is held online, please contact undergraduate and graduate advisers by e-mail.

Undergraduate advisers:

- Mark MacLeod: mark.macleod@carleton.ca
- Melissa Lett: melissa.lett@carleton.ca

Graduate adviser:

- Deepthi Kamawar: deepthi.kamawar@carleton.ca