

***FYSM 1607 (C): Cognitive Science: Thinking and Knowing*****Course Outline*****Fall/Winter 2021-22*****Course Information**

	<b>Fall</b>	<b>Winter</b>
Dates:	Monday and Wednesday	Monday and Wednesday
Time:	10:05 am - 11:25 am	10:05 am - 11:25 am
Location:	Tory Building 208	Southam Hall 402
Course type:	In-person	In-person
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:	<b>Dr. Nadiya Slobodenyuk</b>
Office:	DT 2207 (Not available in winter 2022)
Phone:	613-520-2600 x 4210 (Not available in winter 2022)
E-mail:	NadiyaSlobodenyuk@cunet.carleton.ca
Office Hours:	In winter 2022: By appointment over Zoom

**1. Course Overview & Objectives:**

This First-Year Seminar is about minds, brains, and machines. Our goal in this course is to learn 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

- compare and critique interpretations of the empirical findings obtained on the basis of behavioral and physiological methods

Additionally, you will:

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

### **3. Course structure:**

We will typically meet in-person twice a week for a 1.5-hour class. **Note that due to COVID-19 public health safety regulations, it is possible that some group work will be done online over Zoom, rather than in-person.**

### **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 Brightspace course webpage.

Brightspace 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.

Activity	% towards the final course mark	Short description*
Participation	20	Class attendance and participation in discussions and activities
Quiz 1	10	Multiple-choice and short answer questions
Quiz 2	10	Multiple-choice and short answer questions
Assignment 1	10	Thought paper 1
Midsemester reflection x 2	5 x 2	Short reflection
Quiz 3	10	Multiple-choice and short answer questions
Quiz 4	10	Multiple-choice and short answer questions
Assignment 2	20	Group project**
Online quests	0	Online quests do not <u>directly</u> contribute to your final mark, but the points you get in online quests can be used to raise your mark on quizzes!
<b>TOTAL: 100%</b>		

\* Detailed descriptions are given below. Additional relevant documents and marking rubrics will be available on Brightspace course webpage.

\*\*If permitted by the University's COVID-19 public health regulations. If the regulations do not permit the group work; this assignment will be done individually.

- **Participation (20%)**

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

1) Attend classes (worth 10% of the participation grade).

You are allowed to miss 2 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 (worth 10% of the participation grade).

- **Quizzes (40%)**

There are four quizzes spaced at approximately even intervals throughout the year. The quizzes will focus on the information covered in class and reading assignments. The quizzes will include some multiple-choice questions and some open-ended questions.

- **Assignment 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.

- **Midsemester reflections (10%)**

Short reflections based on the given prompts.

- **Assignment 2 (20%)**

This assignment is a group project. Each group will have to write a research review paper on the topic of your choice and create a poster presentation of your paper. We will have a class discussion of the topics for this assignment and will spend some time in class working on the paper and the presentation. The last class will take a form of a poster workshop and will involve group presentations.

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

- **Online quests (0%)**

Online quests do not directly count towards your final mark. However, by completing online quests you will be able to gain experience points which can be used to improve your marks on quizzes!

## 6. Course Outline & Working Schedule:

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

Fall term	
<b>Week 1</b>	
September 8	Introduction to FYSM 1607
<b>Week 2</b>	Module 1: Introduction
September 13	Is the mind a software running on brain—the hardware?
September 15	What kind of computations do brains do?

<b>Week 3</b>	
September 20 September 22	What is the relationship between the mind and the body? Is the mind an immaterial thing?
<b>Week 4</b>	<b>Module 2: Animal minds</b>
September 27 September 29	Are human minds unique? What are minds good for?
<b>Week 5</b>	
October 4 October 6	Self-recognition and consciousness How to read a scientific paper Quiz 1 preparation
<b>Week 6</b>	
<b>October 11</b>	<b>Thanksgiving. No classes</b>
<b>October 13</b>	<b>Quiz 1</b>
<b>Week 7</b>	<b>Module 3: Human minds</b>
October 18 October 20	<b>Perception</b> <ul style="list-style-type: none"> <li>What is perception for?</li> </ul>
<b>Week 8</b>	
<b>October 25</b> <b>October 27</b>	<b>Fall break. No classes.</b>
<b>Week 9</b>	
November 1 November 3	<b>Perception</b> <ul style="list-style-type: none"> <li>What is reality?</li> <li>Do we perceive objects as they really are?</li> </ul>
<b>Week 10</b>	
November 8 November 10	<b>Attention</b> <ul style="list-style-type: none"> <li>Is there perception without attention?</li> <li>Attentional capture and inattention blindness</li> </ul>
<b>Week 11</b>	
November 15	<b>Attention</b> <ul style="list-style-type: none"> <li>Attention and processing capacity</li> </ul>
November 17	
<b>Week 12</b>	
November 22	How to write a thought paper. How to evaluate an argument. Working on assignment 1: Thought paper Quiz 2 preparation
<b>November 24</b>	<b>Quiz 2</b>
<b>Week 13</b>	
November 29 December 1	<b>The future of the human mind</b> <ul style="list-style-type: none"> <li>Does the mind extend beyond the body?</li> <li>Can we become immortal by uploading our minds into the cloud?</li> <li>Ethics of cognitive enhancement</li> </ul>
<b>Week 14</b>	
December 6 December 8	
December 10	Optional Zoom drop-in session if you need help with your thought paper.

Winter term	
<b>Week 1</b>	
January 10 January 12	<b>Reasoning</b> <ul style="list-style-type: none"> <li>Tools of reasoning</li> <li>Common fallacies in reasoning</li> <li>Is Homo sapiens a rational animal?</li> <li>Are irrational heuristics evolutionary adaptations to our environment?</li> <li>Moral reasoning</li> <li>What is moral?</li> <li>Morality and rationality</li> </ul>
<b>Week 2</b>	
January 17 January 19	
<b>Week 3</b>	
January 24 January 26	<b>Memory</b> <ul style="list-style-type: none"> <li>Does the brain store the information?</li> <li>How does remembering work?</li> <li>Memory and selfhood</li> </ul>
<b>Week 4</b>	
January 31 February 2	<b>Consciousness</b> <ul style="list-style-type: none"> <li>How does it feel like to be conscious?</li> <li>The hard problem of consciousness</li> <li>Small world architecture of the brain and consciousness</li> </ul>
<b>Week 5</b>	
February 7 February 9	
<b>Week 6</b>	
<b>February 14</b>	<b>Quiz 3</b>
February 16	Workshop: How to read your audit*
<b>Week 7</b>	
<b>February 21</b> <b>February 23</b>	<b>Winter break, no classes.</b>
<b>Week 8</b>	<b>Module 4: Artificial intelligence</b>
February 28 March 2	<ul style="list-style-type: none"> <li>How can we build a thinking machine?</li> <li>Which AI is “intelligent”?</li> <li>Learning in humans and machines</li> <li>Can machines become conscious?</li> <li>What is the problem of alignment?</li> </ul>
<b>Week 9</b>	
March 7 March 9	
<b>Week 10</b>	
March 14 March 16	
<b>Week 11</b>	
March 21 March 23	
<b>Week 12</b>	
<b>March 28</b>	<b>Quiz 4</b>
March 30	Workshop: Your career starts now*
<b>Week 13</b>	
April 4 April 6	Working on group project
<b>Week 14</b>	
April 11	Project presentations

NOTE: The schedule is tentative and is likely to be adjusted based on the needs of the class. Assignment deadlines will be posted on Brightspace course page.

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

## **7. Technical Requirements:**

Please bring your laptop to class to take notes and for class activities.

## **8. Class Policies:**

- ***Attendance***

Regular class attendance 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 over a Zoom meeting.

- ***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](http://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](http://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](mailto: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](http://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](http://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](https://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 2021 courses: Dec. 11-23, 2021 and Winter 2022 courses: April 14-28, 2022 (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 Brightspace course page 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) <a href="https://carleton.ca/cognitivescience/">https://carleton.ca/cognitivescience/</a>	2201 DT (Dunton Tower) <a href="mailto:ics@carleton.ca">ics@carleton.ca</a>
Registrar's Office (ext. 3500) <a href="https://carleton.ca/registrar/">https://carleton.ca/registrar/</a>	300 Tory <a href="mailto:registrar@carleton.ca">registrar@carleton.ca</a>
Student Academic and Career Development Services (ext. 7850) <a href="https://carleton.ca/career/for-facultystaff/how-can-you-support-career-development/">https://carleton.ca/career/for-facultystaff/how-can-you-support-career-development/</a>	302 Tory <a href="mailto:career@carleton.ca">career@carleton.ca</a>
Paul Menton Centre (ext. 6608) <a href="https://carleton.ca/pmc/">https://carleton.ca/pmc/</a>	501 University Centre <a href="mailto:PMC@Carleton.ca">PMC@Carleton.ca</a>
Writing Tutorial Service (ext. 1125) <a href="https://carleton.ca/csas/writing-services/">https://carleton.ca/csas/writing-services/</a>	4th floor Library <a href="mailto:csas@carleton.ca">csas@carleton.ca</a>
Learning Support Services (ext. 1125) <a href="https://carleton.ca/csas/learning-support/">https://carleton.ca/csas/learning-support/</a>	4th floor Library <a href="mailto:csas@carleton.ca">csas@carleton.ca</a>

- **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

If you have any questions or need help with planning your schedule, please contact undergraduate and graduate advisors by e-mail.

Undergraduate advisor

- Melissa Lett: [melissa.lett@carleton.ca](mailto:melissa.lett@carleton.ca)

Graduate advisor:

- Uzma Khan: [uzma.khan@carleton.ca](mailto:uzma.khan@carleton.ca)

- ***COVID-19 and staying safe***

All members of the Carleton community are required to follow COVID-19 prevention measures and all mandatory public health requirements (e.g. wearing a mask, physical distancing, hand hygiene, respiratory and cough etiquette) and [mandatory self-screening](#) prior to coming to campus daily.

If you feel ill or exhibit COVID-19 symptoms while on campus or in class, please leave campus immediately, self-isolate, and complete the mandatory [symptom reporting tool](#). For purposes of contact tracing, attendance will be recorded in all classes and labs. Participants can check in using posted QR codes through the cuScreen platform where provided. Students who do not have a smartphone will be required to complete a paper process as indicated on the [COVID-19 website](#).

All members of the Carleton community are required to follow guidelines regarding safe movement and seating on campus (e.g. directional arrows, designated entrances and exits, designated seats that maintain physical distancing). In order to avoid congestion, allow all previous occupants to fully vacate a classroom before entering. No food or drinks are permitted in any classrooms or labs.

For the most recent information about Carleton's COVID-19 response and required measures, please see the [University's COVID-19 webpage](#) and review the [Frequently Asked Questions \(FAQs\)](#). Should you have additional questions after reviewing, please contact [covidinfo@carleton.ca](mailto:covidinfo@carleton.ca)

Please note that failure to comply with University policies and mandatory public health requirements, and endangering the safety of others are considered misconduct under the [Student Rights and Responsibilities Policy](#). Failure to comply with Carleton's COVID-19 procedures may lead to supplementary action involving Campus Safety and/or Student Affairs.