

Fall 2021

STS 375-451: Artificial Intelligence and the Human Mind

Katherine Tyrol

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New Jersey Institute of Technology

Artificial Intelligence and the Human Mind

STS 375
Fall 2021

Instructor: Dr. Kate Tyrol
Office: 310 Cullimore Hall
Contact: katherine.a.tyrol@njit.edu

Office Hours:
Tuesdays 12:30 – 1:30
Wednesdays 9 – 9:50
(Masks required)

Course Meeting Time and Location:
Online

Canvas: <https://njit.instructure.com/courses/12968>

Texts

All readings will be made available online.

Course Description

What does it mean for a machine to know? What does this say about the possibility of human knowledge? In this course, we will explore what artificial intelligence (or, AI) is, how it works, how the field has developed, how the specific technical implementations of AI influence and are influenced by sociocultural factors, what barriers exist to AI research, what threats AI development may pose, and what AI can tell us about ourselves.

This is not a programming course, and although some attention will be paid to AI technologies and algorithms, no coding will be involved. This course is appropriate for students at any level of previous AI experience.

Course Objectives

In this course, students will:

- Define *artificial intelligence* and the related concepts used in that definition.
- Describe the philosophical and historical contexts of AI and AI research.
- List reasons the study of AI is important to cyberpsychologists and to the general public.
- Explain the controversies and challenges facing AI research today.
- Describe the current and anticipated social impacts of AI.

Policies

University Policy on Academic Integrity

“Academic integrity is the cornerstone of higher education and is central to the ideals of this course and the university. Cheating is strictly prohibited and devalues the degree that you are working on. As a member of the NJIT community, it is your responsibility to protect your educational investment by knowing and following the academic code of integrity policy that is found at:

<http://www5.njit.edu/policies/sites/policies/files/academic-integrity-code.pdf>.

“Please note that it is the instructor’s professional obligation and responsibility to report any academic misconduct to the Dean of Students’ Office. **Any student found in violation of the code by cheating, plagiarizing or using any online software inappropriately will result in disciplinary action. This may include a failing grade of F, and/or suspension or dismissal from the university.** If you have any questions about the code of Academic Integrity, please contact the Dean of Students’ Office at dos@njit.edu.”

While this text was written by the university, I stand behind it whole-heartedly and fully expect you to adhere to these guidelines, as will I.

Accessibility

This class is intended to be entirely available to students regardless of health or disability status (whether mental or physical). If you need reasonable accommodations to complete the course because of a disability, you can reach out to the course instructor or to the office of accessibility resources and services.

Course Environment

This course should be a safe space: in the classroom, in one-on-one discussions with the instructor, and in online spaces for this course. This means no hate speech (slurs or derogatory or demeaning comments) and no bullying. You are expected to treat your classmates respectfully and with kindness, generosity, and empathy.

Assignment Submission

All assignments are to be submitted through Canvas unless other arrangements are made with the instructor. Files must be of type .doc, .docx, .pdf, or .txt unless otherwise instructed. *Google Docs are NOT acceptable.*

Should you encounter technical problems, contact the NJIT helpdesk at 973-596-2900 (or simply extension 2900 from campus locations). In the event that it is impossible to submit through Canvas, you must submit a paper version of the assignment that includes an explanation of why online submission was not possible. If you cannot attend class, you may deliver paper submissions to the Humanities Department office in Cullimore Hall. *Emailed work is not an acceptable substitute.*

Late Submissions

All assignments are due at 9 AM on the assigned date unless otherwise stated. This rule is not flexible. I encourage you to complete and submit the assignment the night before to avoid encountering any problems with this deadline.

Late journal entries are not accepted. All other late assignments will be docked 15% per class meeting. If the assignment is more than three class meetings late, it will not be accepted.

No work whatsoever will be accepted after December 10th, 2021 at 5 PM.

Technology

You are required to bring a device with you to class that will allow you to access Canvas. This likely means a tablet, laptop or smart phone. There is no makeup credit if you do not bring such a device and are unable as a result to complete course activities that day.

Miscellaneous

All assignments should be completed individually unless permission granted by instructor ahead of time.

No grade changes will be made without a scheduled, in-person meeting. You can ask questions about your grade in any context you would like, but you need to also schedule an in-person meeting with me if you believe a grade deserves re-evaluation.

This syllabus is subject to change throughout the semester. All efforts will be made to adhere to the main deadlines listed here, but topics covered and readings assigned may change to meet the needs and interests of the class.

I do not read comments made on Canvas assignments after the assignment has been graded. If you have follow-up comments after reviewing your grade, please contact me through the regular channels.

Please ask questions as frequently as possible, both in the classroom, outside of it, and online. Attend office hours or make an appointment. There is no reason for you not to understand assignments or expectations, so please take an active role in obtaining the knowledge you want or need.

Grading (& Rubrics)

Late Submissions

All assignments are due at 9 AM on the assigned date. This rule is not flexible. I encourage you to complete and submit the assignment the night before to avoid encountering any problems with this deadline.

All late assignments will be docked 15% per class meeting. If the assignment is more than three class meetings late, it will not be accepted.

Participation – 20%

Active participation in this course will enhance the quality and enjoyability of the course for both you and others. In-class discussion is the best tool you have for doing so. One-fourth of your course grade will be based on the instructor's assessment of your level of engagement with the course. Assessing participation is a largely qualitative process. The main factors that will be considered in assessing your level of participation are:

- Asking questions in class
- Responding in class to course content
- Responding in class to discussion
- Summarizing the assigned reading out loud at the beginning of class and sharing your reaction to it
- Limited credit may be given for
 - Attending office hours
 - Helping classmates
 - Participating in study groups
 - Participating on the forum

In order to earn full credit for this portion of your grade, you will need to submit a self-assessment of your participation at the end of the semester.

Writing Assignments – 25%

Each writing assignment will be graded on the following criteria:

- On topic
- Demonstrates your own understanding
- References information learned from the course
- 250 – 500 words in length
- Writing is coherent enough for me to understand it. (Spelling and grammar will otherwise be ignored.)

(The book outline will be included in this group for grading purposes.)

Mini-Drafts – 15%

Mini-drafts will be graded on the same criteria as writing assignments.

Final Paper – 36%

Miscellaneous – 4%

Occasionally, I will assign you minor tasks, usually to wrap up at the end of class. (For instance, if you worked in a small group to make a diagram, I might ask you to submit the completed diagram to me sometime that day.) This grade will cover those tasks, and it includes the syllabus quiz.

Assignment Descriptions

Writing Assignments

These are short pieces of writing that require you to apply the knowledge you recently gained in class. The topic of each writing assignment can be found on Canvas shortly before it is due. The purpose of the writing assignments is: to help you better understand course content, to help you know what you do and don't

understand from recent readings and lectures, to help me understand how well you're understanding course content, to verify for me that you are keeping up with the course so far, and to let me know what questions you have.

Beyond the basic requirements outlined above, you won't be graded on the quality of your submission. However, the better your writing assignments, the more I can improve the class.

Mini-Drafts

Mini-drafts are intended to prepare you for your final paper, and, if written carefully and thoughtfully, can be revised for inclusion as part of your final paper. The topics will be assigned on Canvas shortly before the due date. You can expect that at least one mini-draft will entail successfully identifying a suitable work task (see below).

I will additionally give you commentary on how to improve your drafts for use in your final paper, but this commentary will not affect the grade of the mini-draft.

Final Paper

As you will have heard from me many times before this class is over, my aim in this class is to teach you not *how to make AI*, but how to work for, work with, and supervise people who make AI. To that end, your final paper will describe a workplace task that could be solved with AI and your management-level plan for how to use AI to solve it. The *task* must require all of the four original subfields of AI, and therefore, your plan must address each subfield in depth. Within reason, elements of the task can be fictionalized, so long as the whole task is realistic, follows consistent rules, and is sufficiently documented in your paper; you should note that the more concrete the task is and the more familiar you are with it, the easier it will be to write your paper. (This is to make it easier to come up with a single task requiring all four subfields of AI.)

You are expected to demonstrate substantial understanding of course concepts in this paper. You can review most of the writing assignments for examples of how to demonstrate understanding.

Papers will be in 12-point Times New Roman, double-spaced. Papers must use APA style, including for works cited. All references used must be cited.

You will submit a first draft of this paper, exchange feedback on your drafts with a classmate, and then revise to produce a final draft. Your grade for these three tasks will be broken down as follows:

- 1st Draft – 28.6%
- Feedback – 28.6% (No late feedback is accepted.)
- Final Draft – 42.8%

Grading Scale

A	90 - 100
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B+	$88 - 89.\overline{9}$
B	$80 - 87.\overline{9}$
C+	$78 - 79.\overline{9}$
C	$70 - 77.\overline{9}$
D	$60 - 69.\overline{9}$
F	$0 - 59.\overline{9}$

Readings and Schedule

Date	Topic	Activity	Reading	Due
9/7	Philosophy of AI		Chapter 26, Russell and Norvig	
9/9			Mainstream media article on AI (of your choosing)	
9/14	History and Paradigms		Chapter 1, <i>Artificial Intelligence: A Modern Approach</i> , by Russell and Norvig	
9/16				Writing #2
9/21	Natural Language Processing	How to Read a Research Article	Jumping NLP Curves: A Review of Natural Language Processing Research	Mini-Draft #1
9/23				Writing #3
9/28	Machine Learning		Chapter 6 (abbreviated), <i>Artificial Intelligence: A Systems Approach</i> , by M. Tim Jones and excerpt from Chapter 18, Russell & Norvig	
9/30				Writing #4
10/5				Mini-Draft #2
10/7	Knowledge Representation		Chapter 1, <i>Semantic Web for the Working Ontologist</i> , by Allemang and Hendler	Article w/ Summary (optional)
10/12		Mock-up cognitive models	The role of cognitive architectures in general artificial intelligence	
10/14				Writing #5
10/19	Automated Reasoning		"Artificial Intelligence and Human Decision-Making" (abridged), Jean-Charles Pomerol	Mini-Draft #3
10/21				
10/26				
10/28	Neural Networks	Assign Books	Understanding Neural Networks and Explained: Neural Networks	
11/2	TBD		TBD	
11/4				Mini-Draft #4
11/9	Language and Thought		Podcast	
11/11	Artificial Super-Intelligence		<i>Our Final Invention</i> , James Barrat, p 99 – 131	Writing #6
11/16	Artificial Super-Intelligence		"You Should Be Terrified of	Mini-Draft #5

			Superintelligent Machines"	
11/18	Interacting with AI		"Designing Robots for Long Term Social Interaction", Gockley et al.	
11/23	TBD			Book Outline
11/30	AI Imaginaries	Video Discussion		First Draft Due
12/2	Neuralink		TBD	
12/7	Costs and Benefits of AI Development		Automating Inequality, by Virginia Eubanks and / or Algorithms of Oppression, by Safiya Umoja Noble	
12/9				