

Spring 2021

STS 351-002: Minds and Machines

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STS 351: Minds and Machines

Syllabus

Instructor: Dr. Daniel Estrada

Office: Cullimore 419

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Office Hours: T 12-1pm & by appt.

Lectures: TR 12:30-1:50pm CKB 204

Course Description: Scientific explanations are often mechanical: they explain how things work in terms of the operation of functional components in the context of an organized system. This is true in physics and biology, in engineering and technology, and in the scientific study of the mind. This course will review the historical and philosophical dimensions of minds and machines, through a focus on different kinds of agents and different kinds of minds, with a focus on biological organization, consciousness, and artificial intelligence.

Course objectives:

- Develop an understanding of key issues in historical and contemporary debates in the philosophy of mind and natural philosophy
- Understand various arguments for and against a mechanical theory of mind, and the historical, scientific, and technological context in which they arise
- Engage in peer-led debate and discussion on critical issues like agency, personal identity, collective intelligence, artificial intelligence, and robot rights
- Conduct scholarly research and prepare group presentations exploring the philosophy of mind and the cognitive sciences
- Prepare short, peer reviewed, well-researched argumentative essays defending a strong thesis related to the course themes

Books: All readings will be made available on Canvas or in class

Course Overview: Lessons are organized into 3 thematic units, with readings assigned to each week. Video lectures introducing major lesson themes are provided on Canvas to guide students through the readings. During most scheduled class sessions, students will give presentations on the readings, followed by discussion and conversation with the instructor and class. Attendance is required for class debates and peer review sessions. Classes will be recorded and videos made available on Canvas for asynchronous discussion. A Discord server will also be available for asynchronous discussion and other class activities.

Assignments Overview:

Weekly assignments (due **Fridays by midnight**)

Weekly Comment (200-300 word) on Canvas each week

Engage on **Discord** (no word limit, just demonstrate active engagement)

Unit 1 and 2 assignments (see Canvas for due dates)

Thought Paper (700-1000 word) on Canvas each unit

Unit 3 assignments:

Final paper preparation (see due dates on Canvas)

Thesis Proposal

Full Proposal peer review

Full Draft peer review

Exam Paper

Final debate & commentary

Class assignments:

Two Presentations

Sign up on [Presentation Schedule](#)

Participation in live class debates (including **debate preparation**)

Write **Debate Commentary** (300-500 words) on Canvas after Debates 1 and 2

Required Attendance days for debates and peer review

Extra credit:

Regular attendance

Minds and Machines memes

Encyclopedia entry

Additional Peer Reviews

Assignments in **bold** are required and graded for credit. Full details on assignment requirements and grading policies are given in the syllabus below.

Assignment Structure: Grades in the course will be based on the following assignments:

- **Weekly Comments (20%):** Students are expected to leave one **200-300 word comment** on Canvas by the end of each lesson week.
- **Thought Papers (10%):** Students are expected to produce a **700-1000 word (2-3 page) essay** at the end of Units 1 and 2.
- **Exam Paper (20%):** Students are expected to write one **3000-5000 word (7-10 page) essay** at the end of the semester, and to prepare for it with drafts available for peer review in class.
- **Presentation (30%):** Students are expected to prepare one **10-15 minute presentation** to be given during class, and **one group presentation** on their assigned section of Kinds of Minds (KoM).
- **Debate Commentaries (5%):** Students are expected to participate in class debates, and produce **short (300-500 word) commentaries** on the debate.
- **Participation (15%):** Students are expected to actively participate in debates and discussions on the **Discord** server, and to contribute to **formal class debates and peer review assignments**.

Assignment details:

Weekly comments: A 200-300 word (1-2 paragraphs) comment due at the end of each week, except for debate weeks. Introductions and Final Thoughts are considered part of your Weekly Assignment requirements. Due dates can be found in the schedule below and on Canvas.

Comments are informal opportunities to engage the reading material and peers each week, and to track how your thinking develops as the course progresses. Write about interesting things you notice in the readings, or work out ideas and concepts that interest you. These should be thought of as low-pressure assignments, and exist mostly to keep students engaged in short writing every week. Demonstrate that you're engaged with the readings and lesson themes. Students can submit comments in weekly reading threads, or as responses to thought papers and debate commentary; basically, all comments on Canvas will be considered for weekly comment credit. Students can submit more than one comment each week, but cannot earn more than the maximum points for comments that week. 11 total weekly comments are assigned, but at most 10 will be graded (not including Introductions and Final Thoughts).

Thought Papers: A 700-1000 word (2-3 page) essays in response to material from Units 1 and 2. Essays should be posted in Canvas in the appropriate unit discussion forum. Due dates can be found in the schedule below and on Canvas.

Thought papers can cover any topic relating to that unit's material, core themes, and in-class discussions. Essays can be argumentative, attempting to defend or critique some perspective or position. But thought papers don't need to be argumentative! Students can dive deeper into the reading material with textual analysis, or present additional outside research related to the lesson. Thought papers should be addressed to the class with the purpose of provoking discussion, and to work out ideas in preparation for presentations, debates, and the Exam paper. Thought papers are semi-formal, should be more polished than weekly comments, and are graded relative to my impression on the effort that went into an essay, including deliberate pre-writing, thoughtful reading and interpretation of readings, evidence of independent research, and sincere engagement with peers.

Presentations: Students are asked to give two presentations during the semester. In Unit 1, students will be assigned groups to cover and discuss Dennett's **Kinds of Minds**. Students are responsible for covering the material in the book, and bringing in any additional issues, research, or theories related to the material. prepare short, In Unit 2, students are asked to prepare 10-15 minute presentations to be given on WebEx during the scheduled class session, followed by leading 10-15 minutes of discussion with the class and Instructor. Students can work individually or in pairs. Both presentations can be scheduled in a shared document on Canvas. Presentations should be short and informative, and should guide the class discussion around topics the student finds most important and interesting. The goal of a presentation should be to inform and educate other students on lesson materials, to explore ideas and arguments the presenter thinks deserves attention, and to prompt the class for further

discussion and debate. Slides are strongly encouraged. Presentations are graded on effort and thoughtfulness. This is your chance to lead the class while exploring your interests, so make the best of it!

Exam paper: 7-10 pages (3000-5000 words) typed and double spaced in a standard font and submitted on Canvas. Can address any issue addressed in class, but must take the form of an argumentative essay. Argumentative essays must include a clear thesis statement and a coherent, reasonable defense of the thesis. They should develop an argument in support of the thesis that considers the relevant scholarly literature, and should include some consideration of objections and alternative views to their thesis. The exam paper will include a drafting period in Unit 3, where students are required to prepare thesis statements, proposals, and eventually a full draft of the paper for peer review and feedback. These drafting stages are a requirement for the class, and will be graded for credit. I am looking for essays that demonstrate that students can prepare a well-structured, thoughtful essay that critically develops an argument through direct engagement with the relevant scholarly literature, and that engages sincerely with meaningful objections to their arguments. Details of the grading rubric can be found on Canvas.

Debate Commentaries: After Debates 1 and 2, students are asked to reflect on the debate in a short (300-500 word) commentary. Your primary assignment is to discuss the most interesting thing you heard **someone else** say during the debate (or preparation), and the implications it has for your understanding of the discourse. This is a good opportunity to reflect not just on your own views, but on the structure of the discourse, and whether it's possible to make progress on certain disagreements. The point of debates is not to "win" an argument, but to give the many different perspectives in class an opportunity to be expressed and defended openly in class, and to reflect how these perspectives interact within the discourse.

Students who do not attend the debates can expand on the debate theme in their commentaries, and explain what they would have said had they attended. Students who missed attendance should clearly say which days they missed; a Debate Commentary will make up for some points lost as Attendance Credit. Add 200-300 words to your commentary for each absence during the required attendance days of the debate.

Participation: Students are expected to participate in group activities and debates, to attend class regularly, regularly engage the readings, and to put good effort into their written work. Three kinds of engagement will be graded for credit, and are considered requirements for the course:

Weekly Discord activity: The [Discord server](#) will be available 24/7 for class discussion and engagement. It is also the best way to reach me for quick questions, or to schedule a meeting in office hours. Discord is free to use, and can be [downloaded here](#). During class I'll take attendance using the Discord server. Students are also asked to leave questions and comments on Discord during presentations and debates. You can think of your Discord activity as weekly informal peer engagement for open discussion, and your

Canvas comment as the final written product of that week's work. Weekly participation on Discord is a participation requirement for the course.

Required Attendance: Students are encouraged to attend all class sessions and activities, but some classes are mandatory, and attendance is considered a graded requirement for the course. Attendance is required for all debates (included debate preparation, see the schedule below) and for all live peer review sessions.

Peer review: Canvas will automatically distribute Peer Reviews after certain assignments. Students are asked to grade peer assignments using the same grading rubric I use, with space to leave comments to the author. These comments are *not* anonymous, and should not be confused with your weekly comment assignments. Leave direct content engagement in the discussion forum, and put grading comments in Peer Review. Please don't comment on grades (writing style, grammar, etc) in the discussion forum! The goal of peer review is a) to provide another avenue for feedback and peer engagement over scholarship and writing, b) to give students insight into the grading process, in order to improve their own writing assignments, and c) as a double-check on my own grading practices, and to make sure my grades are fair and in line with class expectations. Peer reviews on Thought Papers and Exam Paper preparation are a requirement for participation credit. Peer reviews on Weekly Comments, Debate Commentaries, and Exam drafts will earn some extra credit.

Extra credit: Students will have four forms of extra credit available:

Regular class attendance: Attendance will be taken every class session on Discord. Students will be given a small amount of extra credit for attendance on days that are not required. All class sessions will be recorded and made available online for students unable to attend.

Encyclopedia Entry: Students will have the option to complete a 3-5 page Encyclopedia entry that gives an introduction and scholarly overview into some important technical concept related to the class themes. Discuss the concept in detail and provide some analysis of the major scholarly concerns and disputes. Students should also prepare a short annotated bibliography of at least 5 scholarly works as relevant background reading on the topic. Entries will eventually be uploaded to [this website](#).

Minds & Machines memes: Students are encouraged to produce memes on the themes and topics discussed in class. Original memes can earn extra credit at the end of the semester. With permission, some memes will be shared on my Twitter feed. See Canvas for details.

Peer reviews: Some assignments will be available for additional peer review that is not required for class. These peer reviews can earn some extra credit. See Canvas for detail.

Honors Addendum: For students taking the course for honors credit, the following additional assignments apply:

- Honors students are expected to keep regular attendance and participation in class.
- Honors students are required to complete peer reviews.
- Final exam length requirements are changed from 7-10 to 10-15 pages.
- Thought paper length requirement changed from 700-1000 to 1000-1500 words.
- Debate commentaries length requirement changed from 300-500 to 700-1000 words.
- Honors students are required to complete the Encyclopedia Entry extra credit assignment, and to prepare a short (7-10 minute) presentation on their topic to be presented during class.

Accessibility policy: I want all students to succeed in this class, and I will gladly accommodate the special circumstances and needs of all students to make sure that happens. I understand that life doesn't happen on the semester schedule, and that school work can't always be a top priority. In pandemic conditions we all need to be more flexible with scheduling and difficult work conditions; I understand how medical issues or disability can complicate these challenges. If there is any issue impacting your performance in class, please come talk to me in office hours or send me a message by email or on Canvas! Even if you're behind on assignments, drop me a message letting me know what's up, I'm sure we can figure something out =)

Late policy: Assignments are due at midnight according to the schedule below and on Canvas. The Canvas schedule will be considered the "official" and most updated schedule. I'll allow a short (~30 min) grace period; assignments received at 12:01am will not be marked as late. Assignments will receive a late penalty for one week after the due date. After one week, late work will not be accepted without making arrangements with the instructor. See the rubric on Canvas for more details. Note: this policy may be relaxed during pandemic conditions. Talk to me if you're having issues!

Excused Late Work: If you have a legitimate excuse that you know about in advance (an academic conference, National Guard duty, expected delivery date, etc.), please make arrangements with me in advance. Extensions for anticipated issues must be arranged at least 48 hours before a deadline to avoid a late penalty. Unexpected emergencies (medical emergencies, deaths in the family, etc.) should be brought to the attention of the Dean of Students with the [Student Concern Reporting Form](#). The Dean's office is equipped to verify your situation confidentially and provide the administrative support you need. The Dean's office can also coordinate with all your instructors for any issues that arise. After an emergency (when you are able to return to school work), let me know what's up (a short note will do). I'll recommend you contact the Dean with the form linked above, and I'll ask you to come up with a plan for completing your missing work, and we can go from there.

Plagiarism Detection: Students are expected to submit their work to plagiarism detection at the end of every unit. Students should collect their Thought Paper and all comments on Canvas into

a single word document (.doc or .docx), to submit to the full document to the plagiarism detection assignment on Canvas. The final exam paper is also required to submit to plagiarism detection. Failure to submit to plagiarism detection will result in zero credit for these assignments.

NJIT Plagiarism Policy

“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 my 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”*

Copying and pasting from the web is one form of plagiarism. Failing to provide adequate citations is a form of plagiarism. Copying from your own work counts as plagiarism. Changing a few words in an extensively quoted passage is a form of paraphrase and [may constitute plagiarism](#) (click the link for a detailed explanation of paraphrase and plagiarism). Any work you use should be given adequate citation so I can find and review your sources. Just as in mathematics, you need to show your work! If you use any source in your research, (including Wikipedia and other encyclopedias) *even if you don't quote them directly*, provide a citation.

Suspected cases of plagiarism will be given zero credit for the assignment with a warning about the plagiarism policy. Students found plagiarizing will also forfeit all extra credit opportunities for the semester. Repeated or extreme instances of plagiarism will be reported directly to the Dean of Students as a violation of the [Student Code of Academic Integrity](#).

Grades:

- **200 pts: Weekly comments** (20 pts x 10)
- **300 pts: Presentations**
 - 50 pts KoM presentation

- 150 pts Individual presentation
- **100 pts: Thought papers** (50 pts x 2)
- **200 pts: Exam Paper & Preparation**
 - 100 pts: Exam Paper
 - 25 pts Thesis proposal
 - 25 pts Full Proposal
 - 50 pts Full Draft
- **50 pts: Debate Commentaries** (25 pts x 2)
- **150 pts: Participation**
 - 50 pts Peer Reviews (10 pts x 5)
 - 100 pts Required Attendance: (15 pts * 7)

Total points: 1000 pts

Extra credit:

- **30 pts:** Regular attendance
- **50 pts:** Encyclopedia entry
- **20 pts:** AI & Autonomy memes
- **14 pts:** Additional Peer Reviews

Grade scale:

A : 900+
B+: 850+
B : 800+
C+: 750+
C : 650+
D : 500+
F : below 500

Thematic schedule

Unit 1: Kinds of Minds

Week 1: Introductions

Week 2: Ch. 1 & 2

Week 3: Ch. 3 & 4

Week 4: Ch. 5 & 6

Week 5: Class debate

Unit 2: Free Will

Week 6: Agents are alive

Week 7: Agents are machines
Week 8: Agents are conscious
Week 9: Class debate

Unit 3: AI and Autonomy

Week 10: Computation and Machine Learning
Week 11: Can machines think? Turing, Lovelace, and Searle
Week 12: Artifacts and Autonomy
Week 13: AI Ethics
Week 14: Robot Rights
Week 15: Class Debate

Assignment Schedule

Classes meet T/R 12:30-1:50pm on WebEx: njit.webex.com/meet/estrada
Attendance will be taken on Discord during class: discord.gg/NxFvdH7

Comments and debate commentaries are due at **midnight** on the day indicated. **Thought papers and exam drafts** are due **in class** on the day indicated. All assignments must be submitted on Canvas in the appropriate folder. "Attendance required" means attendance and participation are factored into your grades. Attendance is encouraged other days and will earn extra credit points.

Note: There are 11 Weekly Comment assignments listed below. Only 10 are required for "full credit" on this assignment. Same goes for Discord participation.

Unit 1: Kinds of Minds

Week 1: Introduction
1/19: Minds and Machines
1/21: Computers and Agency
Introductions due
Presentation schedule due

Week 2: Kinds of Minds Ch 1 & 2
1/26: Group 1
1/28: Group 2
1/29: **Weekly Comments 1**

Week 3: Kinds of Minds Ch
2/2: Group 3
2/4: Group 4
2/5: **Weekly Comments 1**

Week 4: Kinds of Minds Ch

2/9: Group 5

2/11: Group 6

2/12: **Weekly Comments 1**

Week 5: Debate

2/16: **Debate preparation (Attendance required)**

2/18: **Debate (Attendance required)**

Thought Paper 1 (due before class)

2/19: **Debate Commentary 1**

Plagiarism detection (TP1 + DC1 + 3xWC1)

Unit 2: Agency and Mechanism

Week 6: Agents are alive

2/23: Class presentation

2/25: Class presentation

2/26: **Weekly Comments 2**

Unit 1 Peer Reviews

Week 7: Agents are machines

3/2: Class presentation

3/4: Class presentation

3/5: **Weekly Comments 2**

Week 8: Agents are conscious

3/9: Class presentation

3/11: Class presentation

3/12: **Weekly Comments 2**

SPRING BREAK

Week 9: Debate

3/23: **Debate preparation (Attendance required)**

3/25: **Debate (Attendance required)**

Thought Paper 2 (due before class)

3/26: **Debate Commentary 2**

Plagiarism detection (TP2 + DC2 + 3xWC2)

Unit 3: AI and Autonomy

Week 10: Agents are computers

3/30: Class presentation

4/1: Class presentation

4/2: **Weekly Comments 3**

Peer Review 2 (on Canvas)

Week 11: Can machines think?

4/5: Class presentation **LAST DAY TO WITHDRAW**

4/7: Class presentation

4/9: **Weekly Comments 3**

Week 12: AI Ethics

4/13: Class presentation

4/15: Class presentation

Thesis proposal

4/16: **Weekly Comments 3**

Thesis Proposal peer review (on Canvas)

Encyclopedia proposals due (extra credit)

Week 13: Artifacts and Autonomy

4/20: Class presentation

4/22: **Full Proposal peer review (in class, Attendance Required)**

4/23: **Full Proposal peer review (on Canvas)**

Weekly Comments 3

Week 14: Robot Rights

4/27: Class presentation

4/29: Class presentation

4/30: **Weekly Comments 3**

Week 15: Wrap Up & Debate

5/4: **Full Draft peer review (in class, Attendance Required)**

5/6: **Final debate/discussion (in class, Attendance Required)**

5/7: **Final Thoughts**

Final Draft peer review (on Canvas)

Plagiarism Detection (5xWC3 + Final thoughts)

Encyclopedia Entry (extra credit)

AI & Autonomy memes (extra credit)

5/12: Final Exam paper due (on Canvas)

Final Paper Plagiarism Detection