

CSC587 Cognitive Science

Syllabus

Professor Clark Elliott

Winter 2023-24

Logistics:

Professor: Dr. Clark Elliott

Class website: <http://condor.depaul.edu/~elliott/587>

email: elliott@depaul.edu.

[Include "587: " prefix in subject line and MEANINGFUL mail header!]

Course grader email: celliottgrader@gmail.com

Course Management: [D2L.depaul.edu](https://d2l.depaul.edu)

Class meets: Online section meets remotely, asynchronously with required, remote, in-person proctored exams. On-campus section meets on campus on Wednesday evenings as needed 5:45—9:00 PM in flipped-class style, in CDM 218 with required in-class, proctored exams. **All lectures are recorded for asynchronous study.**

You are *strongly* encouraged to wear a mask when we meet in class.

Textbook:

Jose Luis Bermudez, Cognitive Science: An Introduction to the Science of the Mind, 4th Edition
Cambridge University Press, November 10, 2022

Extensive readings from online papers, and D2L-posted sources.

ISBN-13: 978-1316513378

I recommend the Kindle edition, which currently is \$44.99 and available for instant download.

Note: you can also get by with the 3rd edition, from 2020, which covers the material we use in class.

Both editions are currently available in multiple formats at Amazon.

If you don't have a Kindle (and even if you do), you can download the free Kindle for PC reader which gives a great, navigable, searchable, high-resolution, big-screen version of the text. (The web reader is *horrible*—don't use it, ever!) A nice combination is to use it on an additional vertical monitor which can be had for about \$120.

Grading:

Assignments	52.5%
Quizzes	27.5%
Exams	20%

Grading Scale:

95%	A
90%	A-
86, 83, 80	B+, B, B-
78, 74, 70	C+, C, C-
65, 60	D+, D

I reserve the right to raise the grade of a student that has demonstrated exceptional contributions in some particular portion of the class (especially on the forums). I reserve the right to draw exam points from quizzes and / or assignments if needed to ensure coverage of the material.

Students who listen to the lectures, read the course material, and engage in active, timely discussions with their peers will tend to very well in the course.

Topics:

In this graduate seminar course we will cover both a broad traditional introduction to the field of Cognitive Science, and an introduction into current research in the area through the reading and discussion of published research papers, and book chapters.

Cognitive Science has been described as the meeting point of artificial intelligence, cognitive psychology, neuroscience, linguistics, and philosophy . We will study the ways in which (a) AI models can suggest possible architectures of the human brain, (b) experimental psychology studies can suggest both architectures of the human brain and also possible architectures of intelligent computer systems (c) theories of computational intelligence can suggest designs for both the human brain and intelligent computer systems, and (d) difficult theoretical and philosophical problems can arise when we consider building systems with the staggering complexity of the human mind. Cognitive Science, also known as *Information Processing Psychology*, also embraces the disciplines of linguistics, philosophy, neuroscience and physiology, and we will consider topics from these areas as well. Specific topics include, but are not limited to: Cognitive Psychology, Vision, Categorization, Imagery, Representation and Symbols, Perception, Memory, Attention, Language, Semantic Networks, Emotion, Cognitive and Biological Aspects of Romantic Love, Gender, Case-based reasoning, Scripts, Metaphor, new frontiers of science, Psi, Philosophical concerns, Brain plasticity.

Class structure:

This is a reading, recorded lecture, and discussion seminar-style class. **Scholarly discussion of the ideas is the focus of the course.** Discussion will take place online on the D2L forums. Students are expected to keep up on the reading each week, and to actively participate in the discussions.

The central element of this course, by far, is the online discussions we hold on the course topics. Students are expected to do the reading, and listen to the appropriate lectures, on each topic, well in advance of the related online discussion being held. For a class of twenty students, for example, we will typically have 1,500 very substantial postings on the forums, making the average about 75 significant postings per student.

Each collection of readings / lecture topics will have a (generally weekly) closing date, and class discussion of the topic will officially end on that date. Typically, the class will move on to the next topic, but you are free to continue past discussions if you feel you can engage classmates on that older forum.

Most topics will have associated quizzes, but this is just to keep us honest in preparing for the discussions. The quizzes will be repeated in closed-book format at the time of the exams. However, ordinarily, neither the quizzes nor the exams will be the focus on the course. However, if I feel the discussions are lagging, I reserve the right to give a formal, closed-book midterm and final exam. (So far, this has never happened—typically we have about 1,500 substantial postings for a class of 20 students.)

You are *absolutely forbidden* to dump LLM / generative AI output into the discussion forums, which will not only waste my time and the course grader's time, but will also waste the time of every other student in the class. It will also kill any enthusiasm for the subject. I can't think of anything less tasteful. NEVER, EVER, COPY AI-generated output into the forum discussions. See below.

Maintaining a written, ongoing, *ideas file* is required. Ideas files *must never* have sections in LLM / generative AI-style output. If this style is used, the grade will be zero. Think about the content covered in class, and related areas. Write down your ideas about them, in your own words. If you put the time in, this is an easy and fun assignment.

STRONGEST WARNING:

A **Large Language Model (LLM)** AI program is one that uses **generative AI** to mimic the writing and other creative output of a human, producing novel text, computer code, art and etc. DePaul University considers LLM output, such as that produced by ChatGPT to be the work of a hypothetical original author. Using such output in assignments without full, clear, attribution is an academic integrity violation, and could result in failure in the course.

NOTE: Furthermore, and independently, for any and all assignments and course content that might conceivably be turned in with LLM output (of any kind) as a component—**and in particular for all postings on the class discussion forums**—*in addition* to the content grade rubric, I reserve the absolute right to also **grade according to my style preferences**. That is, independently of any other assignment content, If I don't *like* the writing style of what you have posted or turned in, I am absolutely free to give you a zero on the assignment, with no further explanation necessary. I am a successful, award-winning, published author. I have written many research articles, over which I have always taken great care. I taught English. I have developed and taught over forty university courses and graded tens of thousands of written submissions. I believe I am competent to judge the quality of submissions based on my preferences. In short, in addition to all other grade rubric elements for content in assignments, you also must **please me in your writing structure and style**. To be clear: this grade policy applies to any kind of content which may be, in part, mimicked by LLMs.

Note one: I very much like the style of postings that are highly integrated with other postings in the discussion thread in which they are placed. I like a style that is engaging, raises relevant questions, makes arguments in response to what others have posted. In other words, is the style that humans commonly have when they engage in scholarly discussions about interesting topics.

Note two: I hate content presentation styles and structure (e.g., for writing, postings, and etc.) that are similar to that of LLM output. This style and structure does not please me, and is not appropriate for our class discussion, so do not turn in assignments, and never make forum postings, that are written this way.

Note three: In general, except for formal papers, I *tend* to be forgiving of English-as-a-Second- (or Third-, or Fourth-) Language difficulties, as long as the structure of a submission, and its arguments are well laid out. I typically find that even those with limited English vocabularies and limited knowledge of complex English syntax are still often well-able to communicate the structure of their arguments, and ideas, and easily and intelligently respond to the arguments raised by others, and I consider these communicated ideas and structure to be the most important features of submissions to class. Students with less-than-stellar written English skills can still do very well in this course.

CONTENT WARNING:

This is a graduate course at a major university, with a truly international student body. We will necessarily be discussing a wide range of topics in this course. Some can be psychologically and emotionally challenging. **THIS IS A WARNING.**

If you are uncomfortable with any of the topics we are discussing, or with what others are saying as part of the discussion, you must **immediately leave the session--both live and via asynchronous discussion, or stop the lecture video**. Then, send me email and we'll work it out. While it is important for us, in our mission as a major university, to cover many challenging subjects as part of our curriculum, **I don't want my students to be uncomfortable**. It is unlikely to be necessary

for you to participate in any particular discussion. There are many things we can talk about in this course, and we can find something else for you to do during a particular module.

This 500-level university class may cover many varied aspects of human cognition, including but not limited to Psi, human sexual preference, gender identity, epigenetic memory, emotion models including romantic love, and quantum physics models of consciousness. If you are not comfortable with any of the topics, *leave the lecture, leave the online session, and/or leave the discussion forum*. Send email to the instructor and we will find something else for you to do.

Learning Goals:

At the end of class you will:

- Have a broad understanding of the basic problems of cognitive science.
- Have a good understanding of some of the approaches taken to modeling human cognition on computers.
- Have developed competency in reading, and discussing challenging research articles.
- Have participated in many high-level discussions of the course material.
- Have developed a sophisticated understanding of how true scientific curiosity and procedure works
- Have demonstrated master's-level understanding of cognitive science on exams such that you are qualified to teach this course in the future.

Office hours for the course are available from my faculty link at cdm.depaul.edu

All assignments, the assignment schedule, and the course materials, are available online at either d2l.depaul.edu or the class website.

Submission File Formats:

All submissions to D2L MUST BE IN THE SPECIFIED FORMAT or they will not be accepted for credit. There are very strict rules on file formats for this class and thus no other (alternate) formats will be graded. Follow the submission instructions for each assignment.

Sometimes this means in STANDARD ZIP FORMAT, including submissions of a single file. No 7zip files, no rar files, etc. No exceptions. In some cases zip files are prohibited.

Sometimes this means Microsoft Word format, or in plain HTML, including text files contained within a ZIP archive. (Free programs are available to produce each of these formats.) In general: NO PDF FILES which are an image format, and often not suitable for plagiarism checking and AI scans.

Follow the instructions for each assignment.

Students are responsible for downloading their assignments after uploading, to make sure that files have not been corrupted. Corrupted files will not be graded.

NO LATE ASSIGNMENTS will be accepted for credit, unless otherwise noted. If you miss a deadline, time to move on!

Academic Integrity:

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Students are required to view the short lecture on Academic Integrity and to pass the Academic Integrity Quiz with a 100% score before other coursework will be accepted for credit.

Cheating, plagiarism, and unethical conduct are not allowed, and will be sanctioned, including referral to the dean's office, and failure in the class (default) or (occasionally) failure on the assignment and an additional 20-40% reduction in the course grade. Please refer to the academic handbook by which rules you are expected to abide. This course will be subject to the university's academic integrity policy. More information can be found at <http://academicintegrity.depaul.edu/>. If you have any questions be sure to consult with the professor.

Violations include, but are not limited to: making false claims on any checklist for work that has not been done; including ANY un-cited work of others in any documents you turn in; turning in work, including any program, that has been authored by someone other than yourself and in some cases including *any* work of others, whether cited or not—see the rules for each assignment; using artificial intelligence tools to author text of any assignments.

Publicly sharing or posting online any prior or current materials from this course (including exam questions and/or answers) is considered to be providing unauthorized assistance prohibited by the policy. Both students who share/post and students who access or use such materials are considered to be cheating under the Policy and will be subject to sanctions for violations of Academic Integrity. If you provide materials to future students who use them to cheat, it could affect your graduation.

ChatGPT and other LLMs

Sadly, because it can be time-consuming and challenging to reliably detect the use of AI LLMs to produce written assignments, I have retired most such assignments until such time as I can determine that they can be fairly graded.

You are free to use ChatGPT (or other LLMs) for *background research* as you would Wikipedia and Google Search. However, you are NEVER allowed to paste output from an LLM directly into the discussion forums (or assignments). EVER! The forums are to be used strictly for your ideas, from

your head, as *integral parts of the discussions*. I reserve the right to remove postings, or refuse assignments, I believe are the work of ChatGPT, and I am the sole judge. Officially, posting directly from an LLM is an academic integrity violation. Using unattributed verbatim text in assignments from an LLM is an academic integrity violation.

See the additional section in this syllabus on LLMs and grading, which is potentially very significant in determining your grade for the class.

Checklists

Checklists for this course, when we have them, are a **contract** between the student and the professor. The default for all checklist items is *No*. If you change an item to *Yes* you are claiming, absolutely, to have done the work indicated. An inaccurate checklist that claims work not actually done results in zero grade, a significant points penalty in the course, and, possibly a failing course grade, and sanction through the Academic Integrity Board. We will *assume* that you are attempting to cheat your peers by claiming work that was not done. If you are really in doubt, change *No* to *Maybe* or *Probably* and give a short explanation at the bottom of the checklist. Examples would be, "I wrote the code and it usually works, but sporadically fails every tenth time or so" and "I wasn't sure if you meant three list items or three nodes; I did implement three nodes, but not three list items" and so on.

Example:

Citations

There are a number of written assignments, and possibly programs, turned in for this class. The default *assumption* is that any work you turn in is your own. If you submit ANY work of others that is not clearly cited as being the work of others, you will be sanctioned: zero grade on the assignment, outright failure in the class, referral to the academic integrity board for possible expulsion from the university.

Generic example: Louis spends 100 hours over the course of the quarter, completing a thirty-page ethics paper. He includes a really interesting pair of paragraphs that he found on the web, but fails to cite the original work and author. He submits his paper for grading. Ordinarily he would have received full credit for his paper, and possibly even extra points for exceptional work in this area. **Result:** Zero grade for his paper. Failure in the class. Referral to the Academic Integrity Board. No remedy.

For some assignments *no work of others is allowed*, even if you have cited it.

Example: Eddie spends 120 hours over the course of the quarter producing an excellent 8,000-word research/study log for which the rules clearly state he is not allowed to use ANY work of others—even if he cites it. However, Eddie does not pay attention to the rule, includes two paragraphs from the web—clearly cited—in his log, then turns it in. **Result:** Zero grade for his study log. Failure in the class. Referral to the dean's office. No remedy.

When in doubt, cite! (But note that you still might be guilty of plagiarism if you've included too much of the work of others.) Change the font of included text, and possibly use quotation marks, to make absolutely clear that it is the work of others. Make absolute certain that you are allowed to include the cited work of others in a particular assignment. (E.g., not allowed in the study logs!)

Gray Areas

The concepts and programming constructs in this class have been well-covered by others. There will be little that qualifies as original research. As long as you *write your own programs* and write all of the text that you submit (that is, the keystrokes are generated by your own brain) you should be fine, even though there may be small overlaps with the work of others. Example: a small utility java function for iterating through a list that appears in more than 100 forms on the web.

Example: In his programming assignment Joe included his own version of a simple utility list iteration function he found on the web in an unrelated program. He included the URL where he got it in the comments. **Result:** no problem.

Example: Joe include several passages from the book and some references from the web, in his discussion forum postings. He changed the font of the text to give contrast to his own commentary, and clearly cited where the passages came from. **Result:** no problem.

"Minor points" notation:

From time to time I use the point box as a communication vehicle in two specific ways, and I reserve the right to add minor points for this purpose:

- One point extra: I am tipping my hat to you for particularly fine work. That is, if you get 101 points on a 100 point assignment, I may be saying, "Hey, I noticed the five extra modules you wrote. Good job!"
- Two points extra: If you receive two extra points, I am acknowledging an *exceptional* contribution beyond expectations, so 102 points on a 100 point assignment is something to feel really good about, and is a rare compliment.
- Grade of "1": used as a placeholder to let a student know that I have reviewed an assignment, and am waiting for further information or work as per correspondence. A "1" will *always* be resolved to a different grade.
- Grade of "2": a serious warning that you need to communicate with me about possible plagiarism or some other irregularity that is being investigated.

More Policies

Changes to Syllabus

This syllabus is subject to change as necessary during the quarter. If a change occurs, it will be

addressed during class, posted in D2L, and sent via email.

Online Course Evaluations

Evaluations are a way for students to provide valuable feedback regarding their instructor and the course. Detailed feedback will enable the instructor to continuously tailor teaching methods and course content to meet the learning goals of the course and the academic needs of the students. They are a requirement of the course and are key to continue to provide you with the highest quality of teaching. The evaluations are anonymous; the instructor and administration do not track who entered what responses. A program is used to check if the student completed the evaluations, but the evaluation is completely separate from the student's identity. Since 100% participation is our goal, students are sent periodic reminders over three weeks. Students do not receive reminders once they complete the evaluation. Students complete the evaluation online in [CampusConnect](#).

Academic Integrity and Plagiarism

This course will be subject to the university's academic integrity policy. More information can be found at <http://academicintegrity.depaul.edu/>. If you have any questions be sure to consult with the professor.

Publicly sharing or posting online any prior or current materials from this course (including exam questions and/or answers) is considered to be providing unauthorized assistance prohibited by the policy. Both students who share/post and students who access or use such materials are considered to be cheating under the Policy and will be subject to sanctions for violations of Academic Integrity.

There is NO CHEATING OF ANY KIND in this class!

Academic Policies

All students are required to manage their class schedules each term in accordance with the deadlines for enrolling and withdrawing as indicated in the [University Academic Calendar](#). Information on enrollment, withdrawal, grading and incompletes can be found at: cdm.depaul.edu/enrollment.

Students with Disabilities

Students who feel they may need an accommodation based on the impact of a disability should have CSD contact the instructor privately to discuss their specific needs. All discussions will remain confidential. To ensure that you receive the most appropriate accommodation based on your needs, contact the instructor as early as possible in the quarter (preferably within the first week of class), and make sure that you have contacted the Center for Students with Disabilities (CSD) at: csd@depaul.edu.

Lewis Center 1420, 25 East Jackson Blvd.
Phone number: (312)362-8002

Fax: (312)362-6544
TTY: (773)325.7296

Other Course Policies

Other Course Policies

Attendance: Students are expected to attend each class when there is an on-campus section (unless otherwise notified), or view the class online. Attendance will not be formally taken beyond the start of the quarter, except as required for on-campus class sections. Unless otherwise noted ALL the course material presented in the lectures is suitable for exams.

Class Discussion: Student participation in class discussions is expected, and this will take place in class for local students, and online for all students. But see the following:

Uncomfortable with lecture or discussion topics: This is a university course. DePaul is a major urban university with many students from all over the world. If you are uncomfortable with any of the lectures, and/or discussions, for religious, gender, social or any other reasons, then stop the video, leave the room and leave the discussion immediately. Make contact with the professor in a timely way to discuss your concerns and work towards a resolution. We cover challenging topics in this university environment, but we are also sensitive to our students' needs.

Attitude: A professional and academic attitude is expected throughout this course. Measurable examples of non-academic or unprofessional attitude include but are not limited to: talking to others when the instructor is speaking, mocking another's opinion, cell phones ringing, emailing, texting or using the internet whether on a phone or computer. If any issues arise a student may be asked to leave the classroom.

Cell phones / laptops in class: If you need to use your cell phone for any reason, or your laptop for any reason other than following the class slides, and taking notes, *leave the room*. You may quietly leave and re-enter as often as necessary unless I note otherwise. Your peers devote many hours out of their busy lives, and thousands of dollars, to come to class. They deserve a vibrant, focused, environment. If you have a special case, discuss it with the instructor ahead of time. NO TEXTING, EMAIL, FACEBOOK, etc. in the classroom.

Civil Discourse: DePaul University is a community that thrives on open discourse that challenges students, both intellectually and personally, to be [Socially Responsible Leaders](#). It is the expectation that all dialogue in this course is civil and respectful of the dignity of each student. Any instances of disrespect or hostility can jeopardize a student's ability to be successful in the course.