# LAPS-5395-001 Human and Artificial Cognition

Spring 2023

## Instructor Information

### Instructor(s)

George Siemens, PhD

### Email Address

gsiemens@uta.edu

### Faculty Profile

Information about me can be found here: <https://mentis.uta.edu/explore/profile/george-siemens>

### Office Hours

Given the global nature of the MS LA program, I haven’t set office hours. I am willing to meet with you at flexible times. Please email me and I’ll confirm within 24 hours.

## Course Information

### Time and Place of Class Meetings

This course, and the entire MS LA, is exclusively online. All live lectures will be recorded and learning materials for the coming week will be released Sunday evening. Live sessions are planned weekly based on student interest and availability.

Learning online is a unique experience and requires different forms of engagement. Primary is regular (daily) engagement with course materials. Suggestions on “how to succeed” online will be provided and shared throughout the program. The MSLA course hub in Canvas will also provide ongoing resources and assistance in planning and engaging in online learning.

### Description of Course Content

Artificial intelligence (AI) is exerting growing influence in all aspects of modern life, including how we encounter information and how we interact with one another. It is a “silent agent” that underpins our daily lives. This course surveys AI trends and details prominent models for how human and machine agents intersect in knowledge work, using discrete cognitive processes as the basic unit for determining agent roles.

AI has an extensive history, capturing the interest of scientists and the general public. While much of this history involves technical advances that are out of scope for non-scientists, periods of dramatic innovation punctuate ongoing progress: Watson, Deep Blue, Alpha Go. These innovations were largely out of reach of most people: direct engagement was reserved for experts. New technologies (including DALLE-2, Stable Diffusion, Moonbeam, ChatGPT) have moved AI from an “in the lab” or “behind the scenes” technology into one that is readily accessible to everyone. Education systems are also being impacted. By late 2022, the media attention of generative AI has created public conversation about how AI changes traditional activities, such as writing and assessment, in a classroom.

The course addresses the intersection between human and machine – the middle space where tasks and activities are being actively negotiated as AI continues rapid advances. It will review the history of AI, the various starts and stops between different approaches (e.g. symbolic, neural network), and the current period of explosive investment and international country-level competition in AI technology and talent. Issues of bias, fairness, and ethics will also be considered, focusing on implications of AI that can cause harm as well as the regulatory attempts of both companies and countries. A central theme of this course is how human cognition intersects with artificial cognition and what that means to the human condition and the long-term implications for humanity. Consideration of AI throughout the course is on the educational sector, including impact in classrooms, schools, and universities.

### Student Learning Outcomes

By the end of the course, students will be able to:

1. Detail the historical progression of AI and the critical technology advancements that have led to modern AI.
2. Define human cognition and cognitive processes.
3. Articulate the cognitive capacities of AI, notably generative, artistic, and creative outputs.
4. Describe the ethical dimensions of AI deployment, focusing on the harm that AI can cause and regulation attempts by EU and related regions.
5. Describe models for integrating human cognitive outputs with artificial cognitive outputs, focusing on the coordinating mechanisms between the two systems.
6. Use AI technologies to brainstorm, create, write, and improve knowledge artifacts.
7. Describe the contributions of various academic disciplines in advancing the basic science of AI in learning and education.
8. Explain prominent AI trends and the anticipated impact on education systems, work, and learning.

*Required Textbooks and Other Course Materials*

No texts are required. All resources will be readings and videos– both academic and popular/technical press.

### Descriptions of major assignments and examinations

The rapid advancement of AI means that tracking trends and seeing emerging patterns in tools and tool use is a key skill for educators. The assignments in this course focus on active use of AI technologies, with an emphasis on the “space of negotiation” between human and artificial cognition.

The following assignments will be completed throughout this course:

1. **Weekly diary** of AI technology exploration and use in knowledge tasks (learning, sensemaking, decision making): 25% of final grade.
2. **Creative artifact**: an integrated output of AI and human interaction that solves or addresses a challenge of consequence. 20% of final grade.
3. A shared **task analysis document** of a complex knowledge challenge that relies on integrated artificial and human cognition. 20% of final grade.
4. A **2000-word paper** defining “what remains the unique domain of humanity in knowledge work”. 20% of final grade.
5. **Trend summary** compilation: ongoing summary of trends and patterns related to AI (posted in weekly discussion forums and collated into a final document for submission). 15% of final grade.

### Technology Requirements

This course will primarily take place in Canvas, with some office hours in Zoom or MS Teams.

### Other Requirements

Given the distributed and global nature of the course, interaction with course instructors will be held online in Canvas.

You will also be invited to attend online webinars and conference during the duration of the course, and the MS LA program in general. These events may require additional technologies not detailed above.

You will explore additional technologies as you do your group work and methodologies. These tools will be decided by your group members, but none will be required or mandated.

## Grading Information

### Grading

Grades will be posted on Canvas following three days after each assignment has been submitted. The grade scale is as follows:

|  |  |
| --- | --- |
| 90-100 points | A |
| 80-89 points | B |
| 70-79 points | C |
| 60-69 points | D |
| < 60 | F |

**There is no extra credit.** The best predictor of a good grade is regular engagement with the course and reading of the assigned material within the assigned week.

### Expectations for Out-of-Class Study

Beyond the time required to view each online lecture, students should expect to spend at least an additional 5-7 hours per week in course-related activities, including reading required materials, engaging with peers, and completing assignments.

### Grade Grievances

Any appeal of a grade in this course must follow the procedures and deadlines for grade-related grievances as published in the current University Catalog.

**Regarding AI and cognitive tools (such as ChatGPT)**

I fully expect students to use all available tools and technologies to produce their best work. When you use automated writing tools (Moonbeam, ChatGPT), please include in the appendix the process of use. For example, include the prompt for producing text and the first generation version and subsequent adjustments that you make or that you re-process with AI tools. The intent is for you to intentionally detail how you produce writing and the ways that AI shapes your output.

## Course Schedule

As the instructor for this course, I reserve the right to adjust this schedule in any way that serves the educational needs of the students enrolled in this course. This may include the addition of a guest speaker or changes to the course material covered during the weeks detailed below.

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Week** | **Dates** | **Topic** | **Assessment Details** | **Comment** |
| W1 | Jan 17 –  Jan 22 | Orientation & Course Overview: What does the human-machine intersection look like? |  | Course overview, assignments, expectations. |
| W1 | Jan 23 –  Jan 29 | Surveying the landscape: HCI, AIED, Cognitive Psychology, LA, LS | Trend forum post, AI exploration |  |
| W2 | Jan 30 –  Feb 5 | Cognitive sciences and cognitive processes | Trend forum post, AI exploration |  |
| W3 | Feb 6 – Feb 12 | Neuroscience and neural networks | Trend forum post, AI exploration |  |
| W4 | Feb 13 –  Feb 19 | Philosophical perspectives of uniquely human cognition | Trend forum post, AI exploration |  |
| W5 | Feb 20 –  Feb 26 | The historical roots of AI: symbolic, GOFAI | Trend forum post, AI exploration |  |
| W6 | Feb 27 –  Mar 5 | The historical roots of AI: Rosenblatt and foundations for NN/DL | **Creative Artifact Due** |  |
| W7 | Mar 6 – Mar 12 | AI: Winters and Springs | Trend forum post, AI exploration |  |
| W8 | Mar 13 –  Mar 19 | Spring Break Week |  |  |
| W9 | Mar 20 –  Mar 26 | Human and artificial cognition I | Trend forum post, AI exploration |  |
| W10 | Mar 27 –  April 2 | Human and artificial cognition II | Trend forum post, AI exploration |  |
| W11 | April 3 –  April 9 | Intersections: function task analysis & design-based models | **Task Analysis Due** |  |
| W12 | April 10 –  April 16 | Bias, ethics, and fairness | **Trend Summary Due** |  |
| W13 | April 17 –  April 23 | AI and creativity | **Paper Due** |  |
| W14 | April 24 –  April 30 | Future of learning, work, and Emerging AI trends | **AI Diary Due** |  |
| W15 | May 1 – May 7 | Exam Week |  |  |

## Please see the Spring 2023 academic calendar for important dates: <https://www.uta.edu/academics/academic-calendar/spring-2023>

## Institutional Information

UTA students are encouraged to review the following institutional policies and informational sections and reach out to the specific office with any questions. To view this institutional information, please visit the [Institutional Information](https://resources.uta.edu/provost/course-related-info/institutional-policies.php) page (<https://resources.uta.edu/provost/course-related-info/institutional-policies.php>) which includes the following policies among others:

* Drop Policy
* Disability Accommodations
* Title IX Policy
* Academic Integrity
* Student Feedback Survey
* Final Exam Schedule

## Additional Information

**Master of Science in Learning Analytics Orientation and Resource Hub**

This [Orientation and Resource Hub](https://uta.instructure.com/courses/98914) is a central resource for students in the master’s program. It has all critical information related to the program, any events, UTA resources, and training for new students.

**Departmental and Program Assistance**

If you have any questions about the MSLA program, please contact George Siemens at [gsiemens@uta.edu](mailto:gsiemens@uta.edu).

### Attendance

At the University of Texas at Arlington, taking attendance is not required but attendance is a critical indicator of student success. Each faculty member is free to develop his or her own methods of evaluating students’ academic performance, which includes establishing course-specific policies on attendance. Since the MS LA is fully online, attendance is less consequential than engagement. As the instructor of this course, I will encourage you to log on daily and be active in readings and discussions.

While UT Arlington does not require instructors to take attendance in their courses, the U.S. Department of Education requires that the University have a mechanism in place to mark when Federal Student Aid recipients “begin attendance in a course.” UT Arlington instructors will report when students begin attendance in a course as part of the final grading process. Specifically, when assigning a student a grade of F, faculty report must the last date a student attended their class based on evidence such as a test, participation in a class project or presentation, or an engagement online via Canvas. This date is reported to the Department of Education for federal financial aid recipients.

**Academic Success Center**  
The Academic Success Center (ASC) includes a variety of resources and services to help you maximize your learning and succeed as a student at the University of Texas at Arlington. ASC services include supplemental instruction, peer-led team learning, tutoring, mentoring and TRIO SSS. Academic Success Center services are provided at no additional cost to UTA students. For additional information visit: [Academic Success Center](https://www.uta.edu/student-success/course-assistance). To request disability accommodations for tutoring, please complete this [form](https://forms.office.com/Pages/ResponsePage.aspx?id=Q1vcXL7XqkyBc3KeOwpi2ccSjcIXpSJAqJFuDEhczLlUMVVHRVRIVlJJWDZJWlVYOUgxNjRPODdLVS4u).

**The English Writing Center**  
The Writing Center offers **FREE** tutoring in 15-, 30-, 45-, and 60-minute face-to-face and online sessions to all UTA students on any phase of their UTA coursework. Register and make appointments online at the [Writing Center](https://uta.mywconline.com/) (https://uta.mywconline.com). Classroom visits, workshops, and specialized services for graduate students and faculty are also available. Please see [Writing Center: OWL](http://www.uta.edu/owl) for detailed information on all our programs and services.

**Library Information**  
Each academic unit has access to [Librarians by Academic Subject](https://libraries.uta.edu/research/librarians) that can assist students with research projects, tutorials on plagiarism and citation references as well as support with databases and course reserves.

**University Exit and Emergency Procedures**

UTA requires information regarding campus security. This is a fully online course and on-campus emergency procedures do not apply. However, if you physically visit the campus, information is available here: [*UT Arlington Procedure 7-6: Emergency/Fire Evacuation Procedures*](https://nam12.safelinks.protection.outlook.com/?url=https%3A%2F%2Ft.e2ma.net%2Fclick%2Fwgxbwg%2Fwgxzqr%2Fggadgo&data=05%7C01%7Cgsiemens%40uta.edu%7Ccc839aa0300b4a7e0f2808daf285880b%7C5cdc5b43d7be4caa8173729e3b0a62d9%7C0%7C0%7C638088952577301409%7CUnknown%7CTWFpbGZsb3d8eyJWIjoiMC4wLjAwMDAiLCJQIjoiV2luMzIiLCJBTiI6Ik1haWwiLCJXVCI6Mn0%3D%7C3000%7C%7C%7C&sdata=jxL%2B4ASGRm1l%2FaM1gzQ17DuUXRQ4Ua4DQvKUXThJLRA%3D&reserved=0)*. Here is the map of exits for the campus:*[*https://www.uta.edu/campus-ops/ehs/fire/Evac\_Maps\_Buildings.php*](https://nam12.safelinks.protection.outlook.com/?url=https%3A%2F%2Ft.e2ma.net%2Fclick%2Fwgxbwg%2Fwgxzqr%2Fw8adgo&data=05%7C01%7Cgsiemens%40uta.edu%7Ccc839aa0300b4a7e0f2808daf285880b%7C5cdc5b43d7be4caa8173729e3b0a62d9%7C0%7C0%7C638088952577301409%7CUnknown%7CTWFpbGZsb3d8eyJWIjoiMC4wLjAwMDAiLCJQIjoiV2luMzIiLCJBTiI6Ik1haWwiLCJXVCI6Mn0%3D%7C3000%7C%7C%7C&sdata=JrrltjQ%2BcSM0f17QZVVLUUZNYM3qpeg3qPQFyrcPESI%3D&reserved=0)

### Research or General Library Help

Ask for Help

* [Academic Plaza Consultation Services](https://library.uta.edu/academic-plaza)(library.uta.edu/academic-plaza)
* [Ask Us](http://ask.uta.edu/)([ask.uta.edu/](http://ask.uta.edu/))
* [Research Coaches](https://library.uta.edu/subject-librarians) (http://libguides.uta.edu/researchcoach)

Resources

* [Library Tutorials](https://library.uta.edu/how-to) ([library.uta.edu/how-to](http://library.uta.edu/how-to))
* [Subject and Course Research Guides](https://libguides.uta.edu/) ([libguides.uta.edu](http://libguides.uta.edu/))
* [Librarians by Subject](https://library.uta.edu/subject-librarians) (library.uta.edu/subject-librarians)
* [A to Z List of Library Databases](https://libguides.uta.edu/az.php) (libguides.uta.edu/az.php)
* [Course Reserves](https://uta.summon.serialssolutions.com/#!/course_reserves)(https://uta.summon.serialssolutions.com/#!/course\_reserves)
* [Study Room Reservations](https://openroom.uta.edu/)(openroom.uta.edu/)