

Draft as of 10/12/26

**Psychology PSYC 4803/8088
Human Intelligence and Artificial Intelligence
Spring Semester, 2027
Mondays, 3:30 p.m. - 6:45 p.m., Room TBA J.S. Coon Building**

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Course Description:

An extensive review of human intelligence theory and applications, along with contemporary attempts to reconcile defining adult human intelligence in context of AI advances.

Objectives/Course Learning Outcomes:

The course will impart knowledge of the history of modern intelligence theory and assessment (including review of psychometric considerations of reliability, validity, and test construction), and trace how IQ, once considered only in the context of predicting child and adolescent school success, became integral to the prediction of post-secondary school success. Course content will focus on knowledge about theory and applications of adult intelligence and related abilities, which will then be considered in the context of broader issues regarding tools use, and specific recent and near-term future developments in Artificial Intelligence (AI) platforms. Discussion in the course will consider criteria for Artificial General Intelligence (AGI), when and in what domains one can expect to see AGI applications. In addition, we will discuss more general philosophical issues regarding what it means for human adults and AI systems to be considered ‘intelligent,’ and what impacts can be expected in work and non-work contexts.

Required Texts:

Ackerman, P. L. (in progress). *Human Intelligence and Artificial Intelligence*. [currently unpublished manuscript]. Specific chapters will be assigned prior to the class meeting when they are to be discussed.

Additional readings (see meeting dates below) are required.

General Course Information and Requirements:

The first part of the course will consist of lectures by the instructor covering background materials on intelligence theory and assessment, including a review of psychometric considerations (e.g., reliability and validity, test construction, normative vs. absolute assessment), and then operate as a discussion-oriented seminar. A project/presentation will be required, along with participation in class discussions. The grade will be determined by a quiz following the didactic portion of the course, performance on the presentation and active participation in class discussions.

Course Grading:

Your grade for the course will be determined as follows:

	<i>Weight</i>
Quiz	40%
Project/Presentation	30%
Class Participation	30%

Grading for the Quiz will be (90+ = A, 80-89 = B, 70-79 = C, 60-69 = D, Below 60 = F). For "S/N" registration, a grade of A, B, or C will be assigned a grade of "S" -- a grade of D or F will be assigned a grade of "N."

Project/Presentation Purpose

The general framework for each project is to consider a specific AI platform or similarly situated platforms, and to evaluate the scope of what the platform can accomplish, vis à vis human operators. The presentation should evaluate the tasks for which the AI platform is designed, and compare the capabilities of the platform in relation to the range of human intelligence (e.g., mean and exceptional adults, in terms of their knowledge, skills, and abilities) and related capabilities (e.g., perceptual and motor abilities and skills). Moreover, for the occupations for which the AI platform is designed, consider the list of O*NET identified 'tasks' and determine whether the AI platform is capable of performing some or all of the tasks associated with the occupation. In this context, determine whether the AI platform will augment or replace human operators, and also take account of the cost/benefits of such systems.

Project/Presentation Format

The projects will be presented to the class in person. Generally, these presentations should be accomplished in about 15 minutes. The presentation should: (1) describe the AI platform -- its foundation and capabilities, along with any limitations and the potential for errors or failures; (2) describe the capabilities and limitations of human operators, and the intellectual

demands (both abilities and knowledge/skills), along with the range of performance within the occupation; and (3) provide an assessment of the potential utility of the AI platform, either as a stand-alone or as part of an AI-Human partnership. Finally, consider whether use of the AI platform requires changes to other humans (e.g., clients, customers, patients, users) that will require greater or lesser demands on their intellectual abilities and knowledge/skills.

Academic Integrity

Georgia Tech aims to cultivate a community based on trust, academic integrity, and honor. Students are expected to act according to the highest ethical standards. [Review Georgia Tech's Honor Code](#) and the [student Code of Conduct](#).

Any student suspected of cheating or plagiarism on a quiz, exam, or assignment will be reported to the Office of Student Integrity, who will investigate the incident and identify the appropriate penalty for violations.

Accommodations for Students with Disabilities

If you are a student with learning needs that require special accommodation, [contact the Office of Disability Services](#) (404-894-2563) as soon as possible to make an appointment to discuss your special needs and to obtain an accommodations letter. Please also e-mail me as soon as possible in order to set up a time to discuss your learning needs.

Student-Faculty Expectations Agreement

At Georgia Tech, we believe that it is important to strive for an atmosphere of mutual respect, acknowledgement, and responsibility between faculty members and the student body. [The Student-Faculty Expectations](#) articulate some basic expectations that you can have of me and that I have of you. In the end, simple respect for knowledge, hard work, and cordial interactions will help build the environment we seek. Therefore, I encourage you to remain committed to the ideals of Georgia Tech while in this class.

Extensions, Late Assignments, and Re-Schedule/Missed Exams

Because the project presentations are built into the schedule, it is expected that students will be prepared to present on their assigned day. For quizzes, in case of illness or GT approved absences, the make-up exam must be completed by the end of the week the quiz is administered, because there will be discussions of the quiz content and results during the next class meeting.

Inclement Weather and Digital Learning Days

If Georgia Tech declares a digital learning day, an e-mail will be sent to registered students with information on how to log-in for web access. Information will also be posted as an announcement on Canvas.

Student Use of Mobile and other Devices in the Classroom

Students are encouraged to take notes during the class, and may use electronic devices for

this purpose. The use of mobile devices and computers should be restricted to supportive activities related to the course, and may not be used in a fashion that is disruptive to other students or the instructor, except in case of medical or other emergencies. Students are not permitted to record audio or video in the class without the explicit permission of all those individuals present in the room.

Special Note on the use of Artificial Intelligence (AI) Platforms for Project/Presentation

The rapid rate of progress on AI and related platforms makes it difficult to specify how much of the project assignment could be effectively completed without an individual engaging in the kind of research, integration, and critical thinking that represents the aims of the course curriculum. This creates a dilemma. On one hand, it would be unreasonable to expect students to avoid using modern technological resources in pursuit of the assignment goals. On the other hand, it is entirely unclear if there would be any ‘residual knowledge’ if students were to turn-over the entire project to an AI assistant (meaning that the students are no better informed or knowledgeable about the topic *after* using AI to generate the presentation).

In light of these considerations, you may use AI platforms to assist you in the project assignment. But if you do so, you **MUST** document the sources of the content, and clearly mark which content was generated from AI, and differentiate your contributions from the AI contributions.

Attendance Policy

Because class participation in discussions is a critical component for building an understanding of the course content, attendance is a requirement of the course.

January 11

Topic: Overview of course content

Early conceptualizations of human intelligence

Tool use and intelligence

Early efforts in AI

Contemporary challenges to both human intelligence and AI

Readings:

Binet, A., & Simon, T. (1905, 1908). The development of intelligence in children. New methods for the diagnosis of the intellectual level of subnormals. The development of intelligence in the child. Excerpts from *L'Année Psychologique*, 11, 163-191, 191-244, and 14, 1-90.

Carroll, J. B. (1982). The measurement of intelligence. In R. J. Sternberg (Ed.), *Handbook of human intelligence* (pp. 29-120). Cambridge: Cambridge University Press.

Turing, A. M. (1950). I. Computing machinery and intelligence. *Mind: A Quarterly Review*, 236, 433-460.

Autor, D. H. (2019). Work of the past, work of the future. *AEA Papers and Proceedings*, 109, 1-32.

Tidler, Z. R., Tatel, C. E., & Ackerman, P. L. (in press). Human tool use, expertise, and expert performance. Chapter to appear in A. M. Williams, A. Kozbelt, F. Preckel, & R. R. Hoffman (Eds.). *Cambridge Handbook on Expertise and Expert Performance*, 3rd Edition. New York: Cambridge University Press.

January 18 -- MLKJr. Birthday -- No Class

January 25

Topic: Measurement of Human Intelligence

- a. Goals (identification of mental deficiency and beyond)

- b. Fundamental principles of assessing intelligence in children
- c. Measurement (reliability, forms of validity)
- d. Raw scores vs. scaled scores (norms)
- e. Evidence for the reliability and validity of extant human intelligence assessments

Readings:

Cronbach, L. J. (1990). *Essentials of psychological testing. 5th Edition*. New York: Harper & Row.

Chapter 5: How to judge tests: Validation

Chapter 6: How to judge tests: Reliability and other qualities

Chapter 7: General ability: Appraisal methods

Ackerman, P. L. (2017). Adult intelligence: The construct and the criterion problem. *Perspectives on Psychological Science*, 12(6), 987-998.

Horn, J. L. (1968). Organization of abilities and the development of intelligence. *Psychological Review*, 75, 242-259.

Schneider, W. J., & McGrew, K. S. (2012). The Cattell-Horn-Carroll model of intelligence. In D. P. Flanagan & P. L. Harrison (Eds.) *Contemporary Intellectual Assessment*, 99-144. New York: The Guilford Press.

February 1

Topic: Structure of human intelligence (Spearman, Thurstone, Guilford, Hebb-Carroll, etc.)

Developmental considerations

- a. Adolescent and adult intelligence
- b. Dynamic changes in capabilities (learning, age-related declines)

Knowledge

- a. Types of knowledge (declarative, procedural, tacit)
- b. How knowledge types relate to intelligence

Cronbach, L. J. (1990). *Essentials of psychological testing. 5th Edition*. New York: Harper & Row.

Chapter 8: The meanings of general ability.

Broudy, H. S. (1977). Types of knowledge and purposes of education. In R. C. Anderson, R. J. Spiro, & W. E. Montague (Eds.). *Schooling and the acquisition of knowledge* (pp. 1-17). Hillsdale, NJ: Erlbaum.

Hebb, D. O. (1942). The effect of early and late brain injury upon test scores, and the nature of normal adult intelligence. *Proceedings of the American Philosophical Society*, 85, 275-292.

Ackerman, P. L. (2008). Knowledge and cognitive aging. In F. Craik & T. Salthouse (Eds.) *The Handbook of Aging and Cognition: Third Edition*, (pp. 443-489). New York: Psychology Press.

February 8

Topic: A brief history of AI

Conceptualizations of artificial intelligence (AI)

Human Intelligence vs. AI

Questions of commensurability (can human intelligence assessments be compared to assessments of AI)?

Relative vs. absolute assessments (questions of measuring differences between AI platforms vs. differences between capabilities of humans)

Lowest common denominator vs. ‘relatively’ unique capabilities (e.g., inductive or deductive reasoning vs. language translation)

Mucci, T., Finio, M., & Downie, A. (2026). The history of AI. www.ibm.com/think/history-of-artificial-intelligence

Ackerman, P. L. (2023). Intelligence ... moving beyond the lowest common denominator. *American Psychologist*, 78(3), 283-297. <https://doi.org/10.1037/amp0001057>

Selection of Project/Presentation Topics

February 15

Topic Structure of artificial intelligence

- a. Declarative
- b. Procedural (requires consideration of mechanical systems/robots)
- c. Tacit . AI models of the mind (e.g., see Lenat)

Establishing standards

(Goodhart's Law applies to both human and AI assessments (gaming the assessment))

Different types of AI (and robotics)

1. Conversational AI (ChatGPT, Claude, Gemini, MS Copilot)
2. Generative mediate and creative AI (Midjourney, Adobe Firefly)
3. AI coding and software development (GitHub Copilot, Cursor, Replit)
4. AI automation and agent platforms (nBn, Zapier, Make)
5. Data analysis and predictive AI (DataRobot, Databricks, Palantir AIP, Tableau)
6. Enterprise search and knowledge AI (Glean, Guru, Amazon Q Business)
7. Customer service and conversational bots (Intercom Fin, Zendesk, AI, Salesforce Agentforce)
8. Marketing, sales and content AI (Jasper, HubSpot, Writer, Salesforce Einstein)
9. Document processing and productivity AI (Adobe Acrobat AI Assistant, Google Workspace with Gemini)
10. AI development infrastructure and model platforms (Foundry, Amazon Bedrock, Google Vertex)
11. Robotics, computer vision and physical world AI (NVIDIA Isaac, Ultralytics, YOLO)
12. Industry-specific AI platforms (Healthcare, Finance, Legal, Science and research)

Hendrycks, D. et al. (2025). A definition of AGI. *arXiv:2510.18212v3 [cs.AI]* 3 Dec 2025

Lenat, D., & Marcus, G. (2023). Getting from generative AI to trustworthy AI: What LLMs might learn from CYC.

February 22

Midterm Quiz - first half of class

Topic:

How intelligent are humans vs. How intelligent are AI platforms?

- a. Means, extremes

- b. 'Learning' in humans vs. AI systems

Katal, S., York, B., & Gholamrezanezhad, A. (2024). AI in radiology: From promise to practice -- A guide to effective integration. *European Journal of Radiology*, 181, 11798

Schlegel, K., Sommer, N. R., & Mortillaro, M. (2025). Large language models are proficient in solving and creating emotional intelligence tests. *Communications Psychology*, 3:80.

Stulberg, J. J., Reiping, H., et al. (2021). Association between surgeon technical skills and patient outcomes. *JAMA Surgery*, 155(0); 960-968.

Woolley, A. W., Aggarwal, I., & Malone, T. W. (2015). Collective intelligence in teams and organizations. In T. W. Malone & M. S. Bernstein (Eds). *The handbook of collective intelligence*. Cambridge, MA: MIT Press.

March 1

Presentations/Discussion

March 8 Spring Break - No class

March 15

Topic: Humans, AI, and job tasks
A review of O*NET job task requirements vis a vis human intelligence and AI
Occupations, tasks, and human vs. AI/robotics

Readings: TBA

March 29

Topic: Critical Thinking

- Topic: Stupidity
- a. Human stupidity and its determinants
 - b. AI stupidity and its determinants

Facione, P. A. (1990) *Critical thinking: A statement of expert consensus for purposes of educational assessment and instruction. Research findings and recommendations.* American Philosophical Association.

Lendrem, B.A.D., Lendrem, D.W., Gray, A., Isaacs, J. (2014). The Darwin Awards: Sex differences in idiotic behavior. *BMJ*, 2014: 349:g7094.

Bernstein, J. H. (2009). Nonknowledge: The bibliographical organization of ignorance, stupidity, error, and unreason: Part One. *CUNY Academic Works*.

Bernstein, J. H. (2009). The data-information-knowledge-wisdom hierarchy and its antithesis. *CUNY Academic Works*.

Li, C., Lin, Y., et al. (2026). Synthesizing AI failure research: A scoping review. *Bus Int Syst Eng*, 68(5), 1003-1022.

April 5

10. Moving forward
 - a. Is AI making humans stupid?
 - b. Can AI be the ‘great equalizer’ for low-IQ humans?
or Is AI likely to generate a “Matthew Effect” as a human intelligence multiplier?
 - c. Is AI a revolution that has implications beyond ‘tool use’

Marguerit, D. (2025). Augmenting or automating labor? The effect of AI development on new work, employment, and wages. *arXiv: 2503.19159v1*

Tomlinson, K., Jaffe S., et al. (2025). Working with AI: Measuring the occupational implications of generative AI. *arXiv:2507.07935v3*

Gerlich, M. (2025). AI tools in society: Impacts on cognitive offloading and the future of critical thinking. *Societies*, 15(6).

April 12

11. How to prepare the next generation of students for a world with easy access to AI in the school and the workplace?
 - a. Jobs/tasks likely to survive in the next decade vs. those that are likely to be obsolete.
 - b. What (new?) skills are necessary to leverage AI?

Readings: TBA

April 19 – Discussion

Readings: TBA

April 26 - Discussion and Wrapping-Up

Readings: TBA