**FALL 2026 • PSYC 4803-B • CRN 94295 • SPECIAL TOPICS**

# Structured Analytic Techniques (SATs) and Cognitive Modeling

A senior seminar on disciplined analysis, explicit models, and calibrated judgment

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|---|---|---|---|
| **Instructor** | Dr. Rick Thomas | **Meetings** | Monday & Wednesday, 9:30–10:45 a.m. |
| **Email** | rick.thomas@psych.gatech.edu | **Location** | J. S. Coon 148 |
| **Office** | J. S. Coon 233 | **Office hours** | Thursdays by appointment; in person or virtual |
| **Canvas** | Announcements, readings, templates, submissions, and feedback | **Response time** | Within 24 hours on weekdays; within 48 hours on weekends |

## Course overview

This seminar examines how people reason and make decisions under uncertainty, especially in high-stakes analytic settings. Students learn structured analytic techniques (SATs) as interventions for identifiable cognitive limits, then use explicit models to predict when those interventions should help, fail, or introduce new distortions. The course is applied: five modeling-based assignments, four case-based SAT application assignments, and a final integrative reflection connecting psychological theory to defensible analysis. All ten graded submissions are individual.

**Organizing question.** For every technique, we will ask: What cognitive limitation is being addressed? What mechanism should the technique change? What evidence would show improvement? Under what conditions could the technique fail?

## Learning outcomes

- Explain how memory limits, hypothesis generation, confirmation, coherence, confidence, and group processes shape analytic judgment.
- Select and correctly execute SATs appropriate to exploratory, diagnostic, foresight, and decision problems.
- Evaluate competing hypotheses using diagnosticity, source reliability, disconfirming evidence, evidence dependence, and uncertainty.
- Represent uncertain judgments with natural frequencies, Bayesian updates, evidence diagnosticity, information gain, and signal-detection concepts.

- Produce probabilistic forecasts and evaluate accuracy and confidence calibration with the Brier score and calibration summaries.
- Use cognitive, normative, ecological, lens, forecasting, or network models to predict when a SAT should improve—or impair—judgment.
- Communicate conclusions, assumptions, uncertainty, limitations, and alternative interpretations transparently.

## Background and course access

No prior intelligence-analysis, statistics, advanced mathematics, or programming experience is required. All quantitative work begins with percentages, natural frequencies, 2 × 2 tables, and visual explanations. The course teaches the spreadsheet operations it uses; optional notebook examples may be provided for students who want to explore further. Comfort with basic algebra and percentages is helpful but not assumed.

## The undergraduate modeling strand

| Model | Core question | Undergraduate activity | Course use |
|---|---|---|---|
| Fast-and-frugal trees + signal detection | How do cue order and stopping rules affect discrimination and response criterion? | Build a three-cue tree, classify outcomes, and compare sensitivity, criterion, cue cost, and error costs. | Assignment 2 |
| Bayesian updating, diagnosticity + information gain | How should evidence change belief, and which question is most useful next? | Use natural frequencies, likelihood ratios, and a workbook ranking possible collection questions. | Assignment 3 |
| Brunswikian lens / policy capture | Do an analyst's cue weights match cue validities? | Judge repeated cases and compare estimated cue-utilization weights with criterion-validity weights. | Assignment 4 |
| MINERVA-DM + HyGene | How do memory traces, similarity, retrieval, and working-memory limits shape judgment? | Compare one controlled MINERVA-DM run and one SiRJ contrast using a shared scenario. | Assignment 5 |
| Forecasting + proper scoring + calibration | How can forecasts be improved and evaluated without rewarding strategic probability reports? | Use base rates, decomposition, aggregation, updating, Brier scores, and a calibration table. | Assignment 8 |

# Materials and reading access

## Required books

- Pherson, R. H., & Heuer, R. J., Jr. (2020). Structured analytic techniques for intelligence analysis (3rd ed.). CQ Press. ISBN 978-1506368931.
- Beebe, S. M., & Pherson, R. H. (2014). Cases in intelligence analysis: Structured analytic techniques in action (2nd ed.). CQ Press. ISBN 978-1483340166.
- Heuer, R. J., Jr. (1999). Psychology of intelligence analysis. Center for the Study of Intelligence.

Required articles, book excerpts when permitted, worksheets, spreadsheet templates, and links are posted in Canvas or available through the Georgia Tech Library. Schedule entries labeled "Recommended" are optional extensions and are not assumed on assignments unless a student chooses to use them.

Schedule key. SAT = Pherson & Heuer (2020); Heuer = Heuer (1999); Cases = Beebe & Pherson (2014). Articles and book chapters are required unless the schedule explicitly labels them Recommended.

# Assessment and grades

| Component | Weight | Evidence |
|---|---|---|
| Assignment 1 | 10% | Challenge Analysis SAT Application |
| Assignment 2 | 10% | Fast-and-Frugal Trees and Signal Detection |
| Assignment 3 | 10% | Bayesian Updating, Diagnosticity, and Information Gain |
| Assignment 4 | 10% | Lens Model Policy Capture |
| Assignment 5 | 10% | MINERVA-DM and HyGene/SiRJ |
| Assignment 6 | 10% | Multiple Hypothesis Generation and ACH SAT Application |
| Assignment 7 | 10% | Scenario Generation and Warning SAT Application |
| Assignment 8 | 10% | Forecasting, Proper Scoring, and Calibration |
| Assignment 9 | 10% | Decision Support SAT Application |
| Assignment 10 | 10% | Final Integrative Reflection Paper |
| Total | 100% | |

## Letter grades

| Grade | Percentage |
|---|---|
| A | 90–100% |
| B | 80–89.99% |
| C | 70–79.99% |
| D | 60–69.99% |
| F | Below 60% |

Georgia Tech course grades do not use plus/minus marks. Any adjustment to a boundary will only benefit students and will be applied consistently.

## Common individual-submission rubric

| Dimension | Share | Observable evidence |
|---|---|---|
| Completion | 25% | All required steps and files are present. |
| Correct use | 25% | The assigned SAT, model, or course concepts are applied accurately. |
| Interpretation | 25% | The result is tied to the case or model and one limitation. |
| Communication | 25% | The submission is concise, labeled, readable, and sourced. |

## Forecast-and-confidence log

Across the semester, students record judgments before and after applying a SAT or model. The log begins in Assignment 1 during Week 2 and is reused in Assignments 3, 4, 5, 8, and 10. No assignment begins or is due during Week 1.

### First baseline entry - begins with Assignment 1 in Week 2

At the beginning of Week 2, complete the instructor-provided worksheet containing three short analytic or forecasting questions. For each question:

- Record your initial conclusion or prediction.
- Assign a probability or confidence rating.
- Provide a brief rationale.
- Identify one assumption or piece of evidence that might change your judgment.

Complete this entry before applying a structured analytic technique. It supplies the baseline for later comparisons and is part of Assignment 1, not a separate assignment. Plan approximately 15-20 minutes.

### Ongoing log entries

- Record an initial and revised judgment only when a named assignment requests one.
- Use the provided workbook for the combined forecasting, proper-scoring, and calibration exercise in Assignment 8.
- Add a brief note explaining whether the method changed the judgment or confidence.

## Course schedule

The schedule follows the Fall 2026 academic calendar. Readings listed as Required should be completed before the first class in which they appear. The instructor may make limited changes through a dated Canvas announcement; changes will not accelerate a major deadline without consultation.

| Week / dates | Topic | Modeling or practice | Readings and deliverables |
|---|---|---|---|
| 1<br>Aug 24, 26 | SATs as cognitive interventions; course orientation | Ungraded model-to-SAT demonstration and case familiarization | Heuer chs. 1, 2; SAT chs. 1, 2, 3; Burns (2022), Required<br>No assignment is due in Week 1. |
| 2<br>Aug 31, Sep 2 | Cognition, bias, intuitive expertise, and limits of structuring | Complete the baseline worksheet; orient to challenge techniques with Cases 1 and 3 | Heuer ch. 3; SAT chs. 4, 5, 6; Required; Kahneman & Klein (2009), Required; Cases chs. 1 and 3<br>Assignment 1 begins Mon Aug 31. |
| 3<br>Sep 7, 9 | Heuristics, assumptions, and challenge analysis<br>No class Sep 7 (Labor Day) | Apply Premortem/Self-Critique to a short example; complete Key Assumptions Check and Devil's Advocacy for Case 3 | Heuer ch. 6; Heuer chs. 9, 10, 11, 12; Folker (2000), Required; Cases ch. 3 (Key Assumptions Check and Devil's Advocacy)<br>Assignment 1 due Fri Sep 11. |
| 4<br>Sep 14, 16 | Fast-and-frugal trees and signal detection | Build a three-cue tree; classify outcomes; compare sensitivity, criterion, cue cost, and error costs | Larrick (2004), Required; Banks et al. (2020), Required; Gigerenzer & Goldstein (1996), Required; Swets et al. (2000), Required; Luan et al. (2011), Recommended<br>Assignment 2 due Fri Sep 18. |
| 5<br>Sep 21, 23 | Bayesian updating, diagnosticity, and information gain | Natural-frequency display, sequential update, evidence ranking, and next-question choice | Heuer ch. 5; Gigerenzer & Hoffrage (1995), Required; Nelson (2005), Required<br>Assignment 3 due Fri Sep 25. |
| 6<br>Sep 28, 30 | Lens models and policy capture | Judge repeated cases; compare cue-use and cue-validity weights; diagnose inconsistency | Heuer ch. 7; Kaufmann et al. (2013), Required<br>Assignment 4 begins Mon Sep 28. |

| Week / dates | Topic | Modeling or practice | Readings and deliverables |
|---|---|---|---|
| 7<br>Oct 5, 7 | Memory-based likelihood judgment and MINERVA-DM<br>No class Oct 5 (Fall recess) | MINERVA-DM default run and one controlled memory/similarity contrast | SAT Ch. 7; Dougherty, Gettys, & Ogden (1999), Required; Heuer ch. 3; Assignment 5 begins Wed Oct 7; Assignment 4 due Fri Oct 9. |
| 8<br>Oct 12, 14 | Hypothesis generation, memory constraints, and HyGene | Map the HyGene sequence; run the assigned SiRJ scenario; connect retrieval to the hypothesis set | Heuer ch. 4; SAT Ch. 8, Thomas et al. (2008), Required; Thomas et al. (2014), Required; Dougherty et al. (2010), Recommended; SiRJ Shiny app<br>Continue Assignment 5. |
| 9<br>Oct 19, 21 | MINERVA-DM/HyGene integration; Multiple Hypothesis Generation and ACH logic | Review memory models; generate alternatives; introduce the ACH matrix | SAT ch. 9; Dhami et al. (2019), Required; Cases ch. 7; Cases ch. 9, Recommended<br>Assignment 6 begins Mon Oct 19; Assignment 5 due Fri Oct 23. |
| 10<br>Oct 26, 28 | ACH, evidence dependence, and sensitivity | Build a small ACH matrix; flag source credibility, dependence, and pivotal evidence | SAT ch. 10, Heuer ch. 8; Wheaton & Chido (2006), Required; Valtorta et al. (2005), Recommended; Cases ch. 8; Cases chs. 4 and 10, Recommended<br>Continue Assignment 6. |
| 11<br>Nov 2, 4 | Group processes, networks, and alternative perspectives | Inspect bridges, bottlenecks, and correlated reporting; begin Red Hat Analysis and structured brainstorming with Case 12 | Borgatti et al. (2009), Required; Cases ch. 12<br>Assignment 7 begins Mon Nov 2; Assignment 6 due Fri Nov 6. |
| 12<br>Nov 9, 11 | Proper scoring rules, forecast construction, and calibration | Use base rates and probabilities; compare expected and realized Brier scores; introduce calibration | SAT ch. 11; Brier (1950), Required; Tetlock et al. (2014), Required<br>Assignment 8 begins Mon Nov 9. |
| 13<br>Nov 16, 18 | Scenario generation, indicators, and warning | Construct three Case 12 scenarios and use the Indicators Validator; compare Case 14 as a transfer example | Mandel & Barnes (2018), Required; Degaut (2016), Recommended; Cases ch. 12; Cases ch. 14, Recommended<br>Assignment 7 due Fri Nov 20. |
| 14<br>Nov 23, 25 | Forecast decomposition, aggregation, and updating<br>No class Nov 25 | Decompose questions, aggregate estimates, and revise forecasts after staged evidence | Mellers et al. (2015), Required; Prelec (2004), Recommended; Prelec, Seung, & McCoy (2017), Recommended<br>Continue Assignment 8; Assignment 8 due Mon Nov 30. |

| Week / dates | Topic | Modeling or practice | Readings and deliverables |
|---|---|---|---|
| 15<br>Nov 30, Dec 2 | Decision support, OODA/CECA, and forecast evaluation | Apply Force Field Analysis and a Decision Matrix to Case 17; interpret the final calibration table; introduce the integrative reflection. | SAT ch. 10; Heuer ch. 14; Cases ch. 17; Bryant (2006), Required; Ferreiro et al. (2023), Recommended Assignment 9 begins Mon Nov 30 and is due Fri Dec 4; Assignment 10 begins Wed Dec 2. |
| 16<br>Dec 7 | Final integration and reflective synthesis | Ungraded revision, model-to-SAT synthesis, reflection and planning | Heuer ch. 13; No graded assignment is due during final instructional days. Continue Assignment 10. |
| Final<br>Dec 16 | Alternative final assessment | Assignment 10: Final Integrative Reflection Paper | Due Wed Dec 16 at 10:50 a.m. ET (end of Registrar-designated 8:00-10:50 a.m. period). |

# Assignments

The descriptions below provide the stable syllabus-level framework for each assignment. The corresponding Canvas prompt will provide the specific materials and procedures. Unless a prompt explicitly says otherwise, all graded submissions are individual.

## Assignment sources and case release

Assignments 2-5 and 8 use the required research articles and provided data or tools. Assignments 1, 6, 7, and 9 apply SATs to Case 3 (Cyber H2O), Case 7 (Who Murdered Jonathan Luna?), Case 12 (Colombia's FARC Attacks the US Homeland), and Case 17 (Violence Erupts in Belgrade), respectively. Assignment 10 synthesizes the student's earlier work and required course readings. Canvas will provide the relevant case material and blank template and identify where to stop reading. Do not consult worked solutions, instructor materials, or later case conclusions before submitting a case analysis.

## Submission standards

- Submit work through Canvas by 11:59 p.m. Eastern Time on the stated date, except Assignment 10, which is due at the exact final-assessment time listed below.
- Unless an assignment says otherwise, the written brief is limited to two pages, excluding references. Assignment 10 is a five-page, double-spaced paper, excluding references. Use 11- or 12-point readable type and one-inch margins; no title page is required.
- Submit one accessible PDF plus the completed instructor worksheet or workbook when the assignment uses one. Label any table, figure, or model output.
- State the main result and one important limitation. Cite any outside sources and disclose substantive generative-AI assistance under the course policy.
- Class activities are formative and do not create separate submissions, participation points, or gradebook entries.

## Assignment format and flexibility

**Syllabus-level scope.** The descriptions below establish each assignment's learning purpose, general method, approximate workload, and expected type of product. Detailed prompts and materials will be posted in Canvas.

**Instructor-provided details.** Canvas will specify the cases or data, number of items, model settings, comparison conditions, procedural steps, and response questions. These details may be adjusted to fit the progress of the class without changing an assignment's central learning objective, weight, or general workload.

**Typical submission.** Assignments 1-9 will normally include completed analytic materials and a concise written brief. Assignment 10 is the five-page integrative reflection. Spreadsheet programming is not required unless the Canvas prompt states otherwise.

## Assignment overview

| Assignment | Due | Required submission | Course weight |
|---|---|---|---|
| Assignment 1: Challenge Analysis SAT Application | Fri Sep 11 | Completed SAT materials and concise brief | 10% |
| Assignment 2: Fast-and-Frugal Trees and Signal Detection | Fri Sep 18 | Decision tree, workbook, and concise brief | 10% |
| Assignment 3: Bayesian Updating, Diagnosticity, and Information Gain | Fri Sep 25 | Calculation materials or workbook and concise brief | 10% |
| Assignment 4: Lens Model Policy Capture | Fri Oct 9 | Policy-capture workbook and concise brief | 10% |
| Assignment 5: MINERVA-DM and HyGene/SiRJ | Fri Oct 23 | Model outputs and concise brief | 10% |
| Assignment 6: Multiple Hypothesis Generation and ACH SAT Application | Fri Nov 6 | Hypothesis-generation and ACH materials and concise brief | 10% |

| Assignment | Due | Required submission | Course weight |
|---|---|---|---|
| Assignment 7: Scenario Generation and Warning SAT Application | Fri Nov 20 | Scenario and indicator materials and concise brief | 10% |
| Assignment 8: Forecasting, Proper Scoring, and Calibration | Mon Nov 30 | Forecasting and scoring workbook and concise brief | 10% |
| Assignment 9: Decision Support SAT Application | Fri Dec 4 | Decision-support materials and concise brief | 10% |
| Assignment 10: Final Integrative Reflection Paper | Wed Dec 16, 10:50 a.m. ET | Five-page integrative reflection paper | 10% |

## Weighting and workload

The course has ten equally weighted assignments, each worth 10% and graded out of 100 points. The final course percentage is the mean of the ten assignment scores. Five modeling assignments (Assignments 2-5 and 8) operationalize models from the required research articles. Four SAT application assignments (Assignments 1, 6, 7, and 9) use case chapters and blank technique templates from Cases. Assignment 10 is a five-page integrative reflection. Assignments 1-9 are designed for approximately 2-3 hours of work outside class, excluding assigned reading, and normally require a two-page brief plus one completed worksheet, workbook, or model output. Assignment 10 requires no new case analysis or model run; it synthesizes work already completed during the semester.

The four-part common rubric applies to all ten assignments. All graded work is submitted individually; collaborative discussion during class does not create a separate participation grade.

## Assignment 1: Challenge Analysis SAT Application

**Timing.** Begins Monday, August 31; due Friday, September 11. Nothing is assigned or due in Week 1.

**Focus.** Use Key Assumptions Check and Devil's Advocacy to test an initial judgment about Case 3, Cyber H2O.

**General task and product.** Students will record an initial judgment, identify and challenge important assumptions, and consider whether the analysis changes their conclusion or confidence. Submit the completed analytic materials and a concise brief. Canvas will specify the case stopping point, scope, and response questions. Do not consult the worked solution.

## Assignment 2: Fast-and-Frugal Trees and Signal Detection

**Due.** Friday, September 18.

**Focus.** Build a fast-and-frugal decision rule and use signal detection concepts to evaluate its decisions and errors.

**General task and product.** Using an instructor-provided decision problem, data, and workbook, students will construct and apply a decision tree, interpret its performance and response tendency, and examine how performance changes under a different decision environment. Submit the tree, completed workbook, and a concise brief. Canvas will specify the cases, cues, and comparison condition.

## Assignment 3: Bayesian Updating, Diagnosticity, and Information Gain

**Due.** Friday, September 25.

**Focus.** Use Bayesian updating, diagnosticity, and information gain to evaluate evidence and decide what information to seek next.

**General task and product.** Students will work through an instructor-provided evidence problem, compare an unaided judgment with model-based updates, evaluate the value of available evidence, and identify a useful next question. Submit the completed calculation materials or workbook and a concise brief. Canvas will specify the evidence, assumptions, and required comparisons.

## Assignment 4: Lens Model Policy Capture

**Timing.** Begins Monday, September 28; due Friday, October 9.

**Focus.** Use the Lens Model and policy capture to compare the cues that drive a person's judgments with the cues that best predict the outcome.

**General task and product.** Students will make judgments about a set of instructor-provided cases and use a supplied workbook to examine cue use, cue validity, and judgment consistency. They will interpret the main patterns and propose a way to improve judgment. Submit the completed workbook and a concise brief. Canvas will specify the cases and required analyses.

## Assignment 5: MINERVA-DM and HyGene/SiRJ

**Timing.** Begins Wednesday, October 7; due Friday, October 23.

**Focus.** Compare how MINERVA-DM and HyGene/SiRJ represent the influence of memory and retrieval on likelihood judgment and hypothesis generation.

**General task and product.** Using preconfigured tools, students will explore how selected changes in memory or retrieval affect model output and the hypotheses available for consideration. They will compare the two models with one another and with their own initial judgments. Submit the recorded model outputs and a concise brief. Canvas will provide the scenario, settings, and comparison to use; no coding is required.

## Assignment 6: Multiple Hypothesis Generation and ACH SAT Application

**Timing.** Begins Monday, October 19; due Friday, November 6.

**Focus.** Generate a broad set of explanations and use Analysis of Competing Hypotheses to evaluate them against the evidence in Case 7, Who Murdered Jonathan Luna?

**General task and product.** Students will develop and refine alternative hypotheses, organize relevant evidence in an ACH matrix, and consider evidence quality, dependence, and the robustness of the resulting conclusion. Submit the hypothesis-generation and ACH materials and a concise brief. Canvas will specify the case stopping point and the expected scope. Do not consult the worked solution.

## Assignment 7: Scenario Generation and Warning SAT Application

**Timing.** Begins Monday, November 2; due Friday, November 20.

**Focus.** Develop meaningfully different future scenarios and identify observable indicators that could help distinguish among them.

**General task and product.** Using the released portion of Case 12, Colombia's FARC Attacks the US Homeland, students will use structured brainstorming and scenario methods to develop alternative futures and evaluate possible warning indicators. Submit the completed scenario and indicator materials and a concise brief. Canvas will specify the stopping point, number of scenarios, and indicator requirements. Do not consult the worked solution.

## Assignment 8: Forecasting, Proper Scoring, and Calibration

**Timing.** Begins Monday, November 9; due Monday, November 30.

**Focus.** Make and revise probability forecasts, then evaluate their accuracy and calibration using proper scoring rules.

**General task and product.** Students will make forecasts for instructor-provided questions, revise them as new information becomes available, and use a supplied workbook to examine Brier scores and calibration. The analysis will also consider useful forecasting practices and the logic of truthful

probability reporting. Submit the completed workbook and a concise brief. Canvas will specify the questions, evidence stages, and analyses.

### Assignment 9: Decision Support SAT Application

**Timing.** Begins Monday, November 30; due Friday, December 4.

**Focus.** Use several decision-support techniques to develop and justify a transparent recommendation under uncertainty.

**General task and product.** Using the released portions of Case 17, Violence Erupts in Belgrade, students will apply Force Field Analysis, a Decision Matrix, and Pros-Cons-Faults-and-Fixes, then compare what the techniques reveal. Submit the completed analytic materials and a concise brief. Canvas will specify the decision options, criteria, case stopping point, and response questions.

### Assignment 10: Final Integrative Reflection Paper

**Timing.** Begins Wednesday, December 2; due Wednesday, December 16 at 10:50 a.m. Eastern Time.

**Focus.** Integrate the modeling and SAT strands of the course and reflect on how the student's approach to uncertain judgment has developed.

**General task and product.** Students will draw on their earlier work, feedback, and course readings to evaluate what they learned, compare modeling with structured analysis, and articulate an approach they could use for a new analytic problem. Submit a five-page, double-spaced reflection paper. Canvas will provide the organizing questions and citation expectations; no new case analysis or model run is required.

## Course policies and procedures

### Canvas, submission, and feedback

Canvas is the authoritative location for announcements, required article files or stable links, prompts, templates, rubrics, submissions, and feedback. Submit assignments as specified in the Canvas prompt, normally as a PDF plus any required spreadsheet or model file. Keep a local copy and verify that the submission is readable. Email is preferred to Canvas messages for individual questions.

The instructor normally replies within 24 hours on weekdays and within 48 hours on weekends. Substantive feedback on Assignments 1-9 is normally returned within ten business days; feedback timing for Assignment 10 follows Institute grade-submission deadlines.

## Late work and extensions

- Each student may use one automatic 48-hour extension on any one of Assignments 1-9 by writing "extension pass" in the Canvas comment before the deadline. It does not apply to Assignment 10, which is the alternative final assessment.
- For additional assignment flexibility, contact the instructor before the deadline whenever possible. Briefly state the requested new deadline; private medical details are not required.
- Without an approved extension, late work loses five percentage points per 24-hour period and is accepted for up to five calendar days. After five days, acceptance requires an individual plan with the instructor.
- Institute-approved absences, disability accommodations, religious observances, and emergencies are handled consistently with Georgia Tech policy and supersede the ordinary late-work rule.

## Attendance

Regular attendance is expected because model demonstrations, structured debates, case discussions, and peer critique cannot be fully reconstructed from slides. There is no separate attendance or participation grade, and class activities do not generate additional points or submissions. Notify the instructor as soon as practical about an absence and consult Canvas for missed material. See the Georgia Tech attendance regulation.

## Final assessment and final instructional days

Assignment 10 is the alternative final assessment required for this letter-graded course. It is due during the official final-assessment period listed above. No test, quiz, or graded assignment is due on December 7 or 8, the final instructional days. The December 7 meeting is an ungraded integration and reflection studio.

**Official references:** final-assessment policy and Fall 2026 final exam matrix.

## Academic integrity and generative AI

The Georgia Tech Academic Honor Code applies to all course work. Students may discuss ideas with classmates and may use generative-AI systems for brainstorming, practice explanations, critique, or debugging a spreadsheet unless an assignment says otherwise. Submitted analysis must remain the student's own accountable work.

- Disclose substantive AI assistance in a brief note naming the tool and describing its role; retain prompts and outputs until the assignment is graded.
- Cite quoted or closely paraphrased AI output. Do not present generated text, analysis, references, data, or computations as personally produced.

- Verify claims, references, calculations, and model outputs. Fabricated sources or unverified output remain the student's responsibility.
- AI may not substitute for required before/after judgments, assigned case analysis, or the student's explanation of how a model connects to a SAT.
- Unauthorized or undisclosed use may be referred as academic misconduct.

**Read the** Georgia Tech Academic Honor Code. Ask before submitting if the boundary for a particular assignment is unclear.

### Respectful learning environment

Analytic disagreement is expected; personal disparagement, harassment, and conduct that prevents others from learning are not. Critique claims, assumptions, evidence, and methods while treating classmates as partners in inquiry. Course conduct follows the Student-Faculty Expectations and applicable Institute policies.

### Disability access and accommodations

Georgia Tech is committed to providing reasonable accommodations for students with disabilities. Students who encounter barriers or need accommodations should contact the Office of Disability Services and share the Faculty Notification Letter with the instructor. Please meet with the instructor early so arrangements can be implemented effectively; accommodations are not applied retroactively unless the Office of Disability Services directs otherwise.

Office of Disability Services

### Syllabus changes

The instructor may make reasonable adjustments in response to learning needs, campus conditions, or the pace of the course. Material changes will be announced in Canvas and reflected in an updated schedule. Institute policies and official calendar changes take precedence over this document.

## Student support

| Resource | Purpose and link |
|---|---|
| **Academic learning support** | Tutoring, coaching, and learning resources — official site |
| **Disability Services** | Access, accommodations, and testing support — official site |
| **Dean of Students** | General student support and connection to campus resources — official site |
| **Canvas** | Course announcements, readings, submissions, and feedback — official site |

# Reading list

This list distinguishes scheduled required readings from recommended extensions. Required article files or stable links are provided in Canvas or through the Georgia Tech Library; the source links below are included for identification and retrieval.

## Course framework, cognition, and debiasing

**Required —** Burns, W. J. (2022, April 14). The role of intelligence at a transformational moment [Remarks at Georgia Institute of Technology]. Central Intelligence Agency. CIA transcript

**Required —** Kahneman, D., & Klein, G. (2009). Conditions for intuitive expertise: A failure to disagree. American Psychologist, 64(6), 515–526. DOI / source

**Required —** Folker, R. D., Jr. (2000). Intelligence analysis in theater joint intelligence centers: An experiment in applying structured methods. Joint Military Intelligence College.

**Required —** Larrick, R. P. (2004). Debiasing. In D. J. Koehler & N. Harvey (Eds.), Blackwell handbook of judgment and decision making (pp. 316–337). Blackwell. DOI / source

**Required —** Banks, A. P., Gamblin, D. M., & Hutchinson, H. (2020). Training fast and frugal heuristics in military decision making. Applied Cognitive Psychology, 34(3), 699–709. DOI / source

Required — Gigerenzer, G., & Goldstein, D. G. (1996). Reasoning the fast and frugal way: Models of bounded rationality. Psychological Review, 103(4), 650–669. DOI / source

**Recommended —** Gigerenzer, G., & Gaissmaier, W. (2011). Heuristic decision making. Annual Review of Psychology, 62, 451–482. DOI / source

**Required —** Bryant, D. J. (2006). Rethinking OODA: Toward a modern cognitive framework of command decision making. Military Psychology, 18(3), 183–206. DOI / source

**Recommended —** Milkman, K. L., Chugh, D., & Bazerman, M. H. (2009). How can decision making be improved? Perspectives on Psychological Science, 4(4), 379–383. DOI / source

## Modeling judgment and evidence

**Required —** Kaufmann, E., Reips, U.-D., & Wittmann, W. W. (2013). A critical meta-analysis of lens model studies in human judgment and decision-making. PLOS ONE, 8(12), e83528. DOI / source

**Required —** Gigerenzer, G., & Hoffrage, U. (1995). How to improve Bayesian reasoning without instruction: Frequency formats. Psychological Review, 102(4), 684–704. DOI / source

Required — Nelson, J. D. (2005). Finding useful questions: On Bayesian diagnosticity, probability, impact, and information gain. Psychological Review, 112(4), 979–999. DOI / source

Recommended — Thomas, R. P., Dougherty, M. R., Sprenger, A. M., & Harbison, J. I. (2008). Diagnostic hypothesis generation and human judgment. Psychological Review, 115(1), 155–185. DOI / source

Recommended — Dougherty, M. R., Thomas, R. P., & Lange, N. (2010). Toward an integrative theory of hypothesis generation, probability judgment, and hypothesis testing. Psychology of Learning and Motivation, 52, 299–342. DOI / source

Required — Dougherty, M. R., Gettys, C. F., & Ogden, E. E. (1999). MINERVA-DM: A memory processes model for judgments of likelihood. Psychological Review, 106(1), 180-209. DOI / source

Recommended — Grand, J. A. (2020). A general response process theory for situational judgment tests. Journal of Applied Psychology, 105(8), 819–862. DOI / source

Required interactive model — SiRJ computational-model Shiny app (incorporates HyGene-style hypothesis-generation cycles): Open the SiRJ app

**Required —** Thomas, R. P., Dougherty, M. R., & Buttaccio, D. R. (2014). Memory constraints on hypothesis generation and decision making. Current Directions in Psychological Science, 23(4), 264–270. DOI / source

**Required —** Dhami, M. K., Belton, I. K., & Mandel, D. R. (2019). The “analysis of competing hypotheses” in intelligence analysis: A critique. Intelligence and National Security, 34(4), 457–472. DOI / source

**Required —** Wheaton, K. J., & Chido, D. E. (2006). Structured analysis of competing hypotheses. Mercyhurst College Institute for Intelligence Studies.

**Required —** Swets, J. A., Dawes, R. M., & Monahan, J. (2000). Psychological science can improve diagnostic decisions. Psychological Science in the Public Interest, 1(1), 1–26. DOI / source

**Recommended** — Luan, S., Schooler, L. J., & Gigerenzer, G. (2011). A signal-detection analysis of fast-and-frugal trees. Psychological Review, 118(2), 316–338. DOI / source

**Recommended** — Valtorta, M., Kim, Y., & Vomlel, J. (2005). Soft evidential update for probabilistic multiagent systems. International Journal of Approximate Reasoning, 39(2–3), 195–220. DOI / source

**Recommended** — Illingworth, D. A., Lawrence, A., Dougherty, M. R. P., & Thomas, R. P. (2023). Using perspective taking and information paucity to explore alternative realities. In Human-computer interaction (pp. 17–31). Springer. DOI / source

## Networks, forecasting, and judgment aggregation

Required — Brier, G. W. (1950). Verification of forecasts expressed in terms of probability. Monthly Weather Review, 78(1), 1–3. DOI / source

**Required** — Borgatti, S. P., Mehra, A., Brass, D. J., & Labianca, G. (2009). Network analysis in the social sciences. Science, 323(5916), 892–895. DOI / source

**Required** — Tetlock, P. E., Mellers, B. A., Rohrbaugh, N., & Chen, E. (2014). Forecasting tournaments: Tools for increasing transparency and improving the quality of debate. Current Directions in Psychological Science, 23(4), 290–295. DOI / source

**Required** — Mellers, B., Stone, E., Atanasov, P., Rohrbaugh, N., Metz, S. E., Ungar, L., et al. (2015). The psychology of intelligence analysis: Drivers of prediction accuracy in world politics. Journal of Experimental Psychology: Applied, 21(1), 1–14. DOI / source

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**Recommended** — Prelec, D. (2004). A Bayesian truth serum for subjective data. Science, 306(5695), 462–466. DOI / source

**Recommended** — Prelec, D., Seung, H. S., & McCoy, J. (2017). A solution to the single-question crowd wisdom problem. Nature, 541(7638), 532–535. DOI / source

**Recommended** — Ferreiro, O., Barbería, I., & Gómez, J. (2023). Improving probabilistic reasoning and forecasting accuracy: A review. Judgment and Decision Making, 18, e13. DOI / source

**Recommended** — Degaut, M. (2016). Intelligence analysis in the 21st century: The need for a paradigm shift. Intelligence and National Security, 31(5), 623–639. DOI / source