RUTGERS

School of Arts and Sciences
Center for Cognitive Science

SYLLABUS
COGNITION AND DECISION MAKING

01:185:301 (sections 13721 & 13722)
Fall 2021

COURSE OVERVIEW

Logistics

Main Canvas page: https://canvas.rutgers.edu/

Lecture: Wednesdays, 11am – 2pm (synchronous via Zoom)

- Recitation section 1: Fridays, 11:00 – 11:55am (in-person at Murray Hall, room 212)
- Recitation section 2: Fridays, 1:00 – 1:55pm (in-person at Hardenbergh Hall, room A7)

Instructor: Paul Robinson

- Email: TBA (response within 1 working day)
- Office hours: Wednesdays, 2pm – 3pm (via Zoom) & by appointment

Teaching assistant: Jenn Francesconi

- Email: jennifer.francesconi@rutgers.edu (response within 1 working day)
- Office hours: TBA & by appointment

Course description

Which subject should I major in? Should I eat meat? Who should I vote for? Should I get vaccinated? Which stocks should I buy? Should I overlook unethical behavior by my employer?

The length and quality of your life is largely determined by the decisions you and others make. Human choices also impact animals and the environment. What is it for a decision to be rational or irrational? Why do we make the decisions we do? Can knowledge of how our minds work be used to manipulate our decisions? These are some of most pressing questions of our time.

This course addresses these kinds of questions about decision-making from the interdisciplinary perspective of cognitive science. It uses knowledge and techniques from disciplines such as psychology, neuroscience, anthropology, economics, and philosophy, to investigate the “mental machinery” that underlies human decision-making. Topics covered include unconscious influences on decisions, heuristics that people use to make decisions, systematic biases displayed by decisions, and what people learn and do not learn from their past decisions. The course concludes by examining how we can improve decision-making. Examples are drawn from domains such as marketing, finance, healthcare, public policy, and everyday life. Throughout the course there will be a focus on (i) understanding the mathematical formalisms that guide research on decision-making, such as Bayesian probability theory and expected utility theory, and (ii) critically evaluating the research methods and experimental paradigms employed by classic studies of decision-making.

Core Curriculum Learning Goals

This course fulfills the **"Quantitative and Formal Reasoning"** goal (QQ): You will formulate, evaluate, and communicate conclusions and inferences from quantitative information.

Department Learning Goals

Upon successful completion of the course, students will:

- Appreciate the interdisciplinary nature of cognitive science.
- Be able to read, summarize, and critically evaluate scientific research papers from multiple disciplines.
- Understand the factors that influence decision making, the biases that decisions tend to display, and theories of the mental processes that underlie decision-making.
- Develop strategies for making better decisions.

HOW THIS COURSE WORKS

Mode of delivery

This is a hybrid course with online lectures and in-person recitation classes. Attendance is not mandatory but students who attend online lectures and in-person classes can earn a bonus of up to 1% + 1% on their final score.

- **Synchronous online lectures**: via Zoom, Wednesdays, 11am – 2pm.

  Link:

  Password:

  These sessions will be recorded. However, every Wednesday you must complete a Carmen quiz on the lecture by 11:59pm. Each lecture will feature a student presentation on a classic study of decision-making.
- **In-person recitation classes**: The 55-minute Friday recitation class will be in-person. These classes are discussion-based. To ensure privacy and encourage open discussion, they will not be recorded. However, they will be streamed via Zoom to students who have approved accommodations. The recitation classes will focus on helping students to understand the technical aspects of the course material, such as research methods, statistics, probability theory, expected utility theory, and game theory. They will also be used to help students complete their homework assignments.

Readings

There is one required textbook for this class:

- Kim, Nancy. (2017). *Judgment and Decision-Making: In the Lab and the World*. Macmillan International Higher Education. ISBN: 9781137269560, 1137269561

To give you time to purchase a copy, I will upload photocopies and audio readings of the first two chapters of the book. Thus, you will not need the book until Week 4 of the course.

- Paperback edition from Amazon (~$35):

https://www.amazon.com/dp/1137269553/ref=cm_sw_r_tw_dp_4TDXAYRQ1Y50CD0R7SB9

- Kindle e-book edition (buy for ~$32 or rent until December for ~$25):

https://www.amazon.com/dp/B07YM242WP?ref=KC_GS_GB_US

- Google e-book edition (buy for ~$32):

https://play.google.com/store/books/details?pcampaignid=books_read_action&id=PZY6DwAAQBAJ

Alongside chapters of the textbook, each week we will read an empirical study. These papers will be made available for free on Canvas.

Course requirements

This course is divided into seven modules which typically span two weeks.

- **Reading quizzes:** By Tuesday at 11:59pm you will use CarmenCanvas to complete a multiple-choice quiz on the weekly readings.
- **Lecture quizzes:** By Wednesday at 11:59pm you will use CarmenCanvas to complete a multiple-choice quiz on the lecture.
- **Module reflection posts:** By 11:59pm on Thursdays that fall at the end of a module (weeks 2, 4, 6, 9, 11, 14, 15) you will submit a reflection post to a discussion board on CarmenCanvas. Your reflection should consist of exactly four sentences: (1) state the most interesting thing that you learned; (2) explain why you find it interesting; (3) ask a question concerning something you didn't understand or are unsure about; (4) explain why you didn't understand or why you are unsure.
- **Writing assignments:** You will submit four short (one- or two-page) writing assignments. Assignment A: analyze two good and two bad decisions that you made in the past year. Assignment B: write a memo to your imagined boss explaining how the

cognitive science of decision-making relates to your anticipated future profession. Assignment C: write a literature review section for a journal article. Assignment D: peer review a literature review. Further details about the assignments will be uploaded to CarmenCanvas (Files > Assignments).

- **Mathematical homework assignments:** There will be four mathematical homework assignments throughout the semester. You must submit your answers during recitation class (or, if you cannot attend recitation class, scan your answers and email them to the instructor).

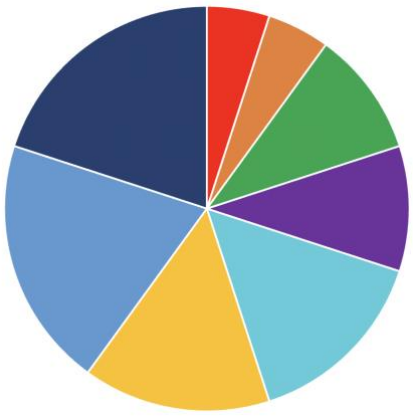
- **Presentation:** During each online lecture, a group of three students will give a 15-minute slideshow presentation on the classic study that we read for the week.

- **Midterm exam:** The exam will be administered online through CarmenCanvas. You will answer multiple-choice questions and submit two short-essays. One short-essay will be on the lecture material. The other short-essay will be on a classic study that we read.

- **Final examination:** The exam will be administered online through CarmenCanvas. You will answer multiple-choice questions and submit two short-essays. One short-essay will be on the lecture material. The other short-essay will be on a classic study that we read.

How your final grade is calculated

ASSIGNMENT CATEGORY	PERCENTAGE
Reflection posts	5%
Presentation	5%
Reading quizzes	10%
Lecture quizzes	10%
Math homeworks	15%
Writing assignments	15%
Midterm exam	20%
Final exam	20%
Total	**100**



I use the following grade scale:

93–100: A
90–92.9: A-
87–89.9: B+
83–86.9: B
80–82.9: B-
77–79.9: C+
73–76.9: C
70 –72.9: C-
67 –69.9: D+
60 –66.9: D
Below 60: E

Late assignments

Late submissions will not be accepted without good reason. Please refer to CarmenCanvas and the course schedule below for due dates. However, I am happy to consider individual circumstances and grant extensions, especially during the pandemic. Please do not hesitate to contact me. There will be no personalized extra credit assignments. If you have concerns about your final grade, please speak to me early in the semester.

RIGHTS AND RESPONSIBILITIES

Health and safety

In order to protect the health and well-being of all members of the University community, masks must be worn by all persons on campus when in the presence of others (within six feet) and in buildings in non-private enclosed settings (e.g., common workspaces, workstations, meeting rooms, classrooms, etc.). Masks must be worn during class meetings; any student not wearing a mask will be asked to leave. Masks should conform to CDC guidelines and should completely cover the nose and mouth:

https://www.cdc.gov/coronavirus/2019-ncov/prevent-getting-sick/about-face-coverings.html

Each day before you arrive on campus or leave your residence hall, you must complete the brief survey on the My Campus Pass symptom checker self-screening app.

Academic integrity policy

The Rutgers honor pledge will be included on all (major) assessments for you to sign: *On my honor, I have neither received nor given any unauthorized assistance on this examination (assignment).*

Rutgers University takes academic dishonesty very seriously. By enrolling in this course, you assume responsibility for familiarizing yourself with the Academic Integrity Policy and the possible penalties (including suspension and expulsion) for violating the policy. As per the policy, all suspected violations will be reported to the Office of Student Conduct. Academic dishonesty includes (but is not limited to):

- Cheating
- Plagiarism
- Aiding others in committing a violation or allowing others to use your work
- Failure to cite sources correctly
- Fabrication
- Using another person's ideas or words without attribution–re-using a previous assignment
- Unauthorized collaboration
- Sabotaging another student's work

If in doubt, please consult the instructor. Please review the Academic Integrity Policy: http://nbacademicintegrity.rutgers.edu/home/academic-integrity-policy/

Copyright disclaimer

Almost all original work is the intellectual property of its authors. This includes not just books and articles, but the syllabi, lectures, lecture slides, recorded lectures, course materials, presentations, homework problems, exams, and other materials used in this course, in either printed or electronic form.

Providing course materials to commercial suppliers such as CourseHero, Chegg, etc. and/or publicly distributing or displaying course materials, or helping others to do so, is a violation of academic integrity.

The authors hold copyrights in their works, which are protected by U.S. statutes. Copying this work or posting it online without the permission of the author may violate the author's rights. More importantly, these works are the product of the author's efforts; respect for these efforts and for the author's intellectual property rights is an important value that members of the university community take seriously.

For more instructions on copyright protections at Rutgers University, please refer to:

https://www.libraries.rutgers.edu/research-tools-and-services/copyright-guidance/copyright-students

Requesting accommodations

Rutgers students are expected to attend all scheduled course meetings. University policy excuses absences due to religious observance or participation in Rutgers-approved activities, and permits students to make up work missed for these circumstances.

If you will be absent from a class, lab, or exam for any reason, please report your absence here: https://sims.rutgers.edu/ssra/

If you have been told to quarantine, or are experiencing symptoms of any transmittable disease, please remain at home and do not attend in-person class meetings. In such cases I will provide a password to follow in-person classes via Zoom. If you need help to catch up on material you missed, I am happy to schedule personal sessions with you.

Rutgers University welcomes students with disabilities into all of the University's educational programs. In order to receive consideration for reasonable accommodations, a student with a disability must contact the appropriate disability services office at the campus where you are officially enrolled, participate in an intake interview, and provide documentation: https://ods.rutgers.edu/students/documentation-guidelines.

If the documentation supports your request for reasonable accommodations, your campus's disability services office will provide you with a Letter of Accommodations. Please share this letter with your instructors and discuss the accommodations with them as early in your courses as possible. To begin this process, please complete the Registration form on the ODS web site at: https://ods.rutgers.edu/students/registration-form.

Full disability policies and procedures are at: (848) 445-6800 / Lucy Stone Hall, Suite A145, Livingston Campus, 54 Joyce Kilmer Avenue, Piscataway, NJ 08854 / https://ods.rutgers.edu/

Accessibility of course technology

This hybrid course requires use of Carmen and other online communication and multimedia tools. If you need additional services to use these technologies, please request accommodations with your instructor.

Please visit the Rutgers Student Tech Guide page for resources available to all students. If you do not have the appropriate technology for financial reasons, please email Dean of Students deanofstudents@echo.rutgers.edu for assistance. If you are facing other financial hardships, please visit the Office of Financial Aid at https://financialaid.rutgers.edu/.

Student wellness resources

Counseling, ADAP & Psychiatric Services (CAPS)
(848) 932-7884 / 17 Senior Street, New Brunswick, NJ 08901/
http://health.rutgers.edu/medical-counseling-services/counseling/
CAPS is a University mental health support service that includes counseling, alcohol and other drug assistance, and psychiatric services staffed by a team of professionals within Rutgers Health services to support students' efforts to succeed at Rutgers University. CAPS offers a variety of services that include: individual therapy, group therapy and workshops, crisis intervention, referral to specialists in the community, and consultation and collaboration with campus partners.

Crisis Intervention: http://health.rutgers.edu/medical-counseling-services/counseling/crisis-intervention/

Report a Concern: http://health.rutgers.edu/do-something-to-help/

Violence Prevention & Victim Assistance (VPVA)
(848) 932-1181 / 3 Bartlett Street, New Brunswick, NJ 08901 / www.vpva.rutgers.edu/
The Office for Violence Prevention and Victim Assistance provides confidential crisis intervention, counseling and advocacy for victims of sexual and relationship violence and stalking to students, staff and faculty. To reach staff during office hours when the university is open or to reach an advocate after hours, call 848-932-1181.

COURSE SCHEDULE

The course follows a biweekly schedule. Please note that week 1 differs in structure from the others.

Module A: Cognitive Architecture

Week 1 material	
Reading 1 (overview)	Kim (2018): Introduction.
Reading 2 (classic study)	Nisbett & Wilson (1977): Telling more than we can know: verbal reports on mental processes.
Lecture	Dual-process theories of cognition.

Week 1 schedule	
Wednesday, September 1	Lecture; lecture quiz due.
Thursday, September 2	
Friday, September 3	Recitation on probability theory; reading quiz due.
Saturday, September 4	
Sunday, September 5	

Week 2 material	
Reading 1 (overview)	Dijksterhuis & Nordgren (2006): A theory of unconscious thought.
Reading 2 (classic study)	Dijksterhuis et al. (2006): On making the right choice.
Lecture	Unconscious influences on decision making?

Week 2 schedule	
Monday, September 6	
Tuesday, September 7	Reading quiz due.
Wednesday, September 8	Lecture; lecture quiz due.
Thursday, September 9	Module A reflection post due.
Friday, September 10	Recitation on research methods; homework 1 (probability theory) due.
Saturday, September 11	
Sunday, September 12	Assignment A (decision analysis) due.

Module B: Heuristics and Biases

Week 3 material	
Reading 1 (overview)	Kim (2018): Availability and representativeness.
Reading 2 (classic study)	Tversky & Kahneman (1983): Extensional versus intuitive reasoning: the conjunction fallacy in probability judgment.
Lecture	Availability and representativeness.

Week 3 schedule	
Monday, September 13	
Tuesday, September 14	Reading quiz due.
Wednesday, September 15	Lecture; lecture quiz due.
Thursday, September 16	
Friday, September 17	Recitation on statistics.
Saturday, September 18	
Sunday, September 19	

Week 4 material	
Reading 1 (overview)	Kim (2018): Anchoring and primacy effects in judgment.
Reading 2 (classic study)	Tversky & Kahneman (1974): Judgment under uncertainty: heuristics and biases.
Lecture	Anchoring and primacy effects.

Week 4 schedule	
Monday, September 20	
Tuesday, September 21	Reading quiz due.
Wednesday, September 22	Lecture; lecture quiz due.
Thursday, September 23	Module B reflection post due.
Friday, September 24	Recitation on Bayes theorem.
Saturday, September 25	
Sunday, September 26	Assignment B (memo to your boss) due.

Module C: Learning and Prediction

Week 5 material	
Reading 1 (overview)	Kim (2018): Hindsight bias.
Reading 2 (classic study)	Baron & Hershey (1988): Outcome bias in decision evaluation.
Lecture	Learning from past decisions.

Week 5 schedule	
Monday, September 27	
Tuesday, September 28	Reading quiz due.
Wednesday, September 29	Lecture; lecture quiz due.
Thursday, September 30	
Friday, October 1	Recitation on Bayes theorem; homework 2 (Bayes Theorem) due.
Saturday, October 2	
Sunday, October 3	

Week 6 material	
Reading 1 (overview)	Kim (2018): Risk perception; Prediction.
Reading 2 (classic study)	Eddy (1982): Probabilistic reasoning in clinical medicine: problems and opportunities.
Lecture	Risk analysis.

Week 6 schedule	
Monday, October 4	
Tuesday, October 5	Reading quiz due.
Wednesday, October 6	Lecture; lecture quiz due.
Thursday, October 7	Module C reflection post due.
Friday, October 8	Recitation study session for midterm exam.
Saturday, October 9	
Sunday, October 10	

Midterm Exam

This will be an online exam. On Friday you will receive feedback.

Week 7 material	
Lecture	None
Reading 1 (overview)	None
Reading 2 (classic study)	None

Week 7 schedule	
Monday, October 11	
Tuesday, October 12	
Wednesday, October 13	Midterm exam.
Thursday, October 14	
Friday, October 15	Recitation on midterm exam (debrief).
Saturday, October 16	
Sunday, October 17	

Module D: Choosing Resources

Week 8 material	
Reading 1 (overview)	Kim (2018): Choice and mental accounting.
Reading 2 (classic study)	Knutson et al. (2007): Neural predictors of purchases.
Lecture	Choice architecture.

Week 8 schedule	
Monday, October 18	
Tuesday, October 19	Reading quiz due.
Wednesday, October 20	Lecture; lecture quiz due.
Thursday, October 21	
Friday, October 22	Recitation on expected utility theory.
Saturday, October 23	
Sunday, October 24	

Week 9 material	
Reading 1 (overview)	Kim (2018): Expected utility theory; Framing effects and prospect theory.
Reading 2 (classic study)	Shafir (1993): Choosing versus rejecting: why some options are both better and worse than others.
Lecture	Expected utility theory.

Week 9 Schedule	
Monday, October 25	
Tuesday, October 26	Reading quiz due.
Wednesday, October 27	Lecture; lecture quiz due.
Thursday, October 28	Module D reflection post due.
Friday, October 29	Homework 3 (expected utility theory) due.
Saturday, October 30	
Sunday, October 31	

Module E: Modeling Reality

Week 10 material	
Reading 1 (overview)	Kim (2018): Schemas and framework theories; Judging covariation, contingency, and cause.
Reading 2 (classic study)	Pennington & Hastie (1986): Evidence evaluation in complex decision making.
Lecture	Explanation-based decisions.

Week 10 schedule	
Monday, November 1	
Tuesday, November 2	Reading quiz due.
Wednesday, November 3	Lecture; lecture quiz due.
Thursday, November 4	
Friday, November 5	Recitation on literature reviews.
Saturday, November 6	
Sunday, November 7	Assignment C (literature review) due.

Week 11 material	
Reading 1 (overview)	Kim (2018): Hypothesis testing and confirmation bias; Belief.
Reading 2 (classic study)	Shafir, Simonson, & Tversky, (1993): Reason-based choice.
Lecture	Rationalizing decisions.

Week 11 schedule	
Monday, November 8	
Tuesday, November 9	Reading quiz due.
Wednesday, November 10	Lecture; lecture quiz due.
Thursday, November 11	Module E reflection post due.
Friday, November 12	Recitation on game theory.
Saturday, November 13	
Sunday, November 14	

Module F: Society and Groups

Week 12 material	
Reading 1 (overview)	Newell, Lagnado, Shanks (2015): Group decision making.
Reading 2 (classic study)	Leana (1985): A partial test of Janis' groupthink model: effects of group cohesiveness and leader behavior on defective decision making.
Lecture	Group decision making.

Week 12 schedule	
Monday, November 15	
Tuesday, November 16	Reading quiz due.
Wednesday, November 17	Lecture; lecture quiz due.
Thursday, November 18	
Friday, November 19	Recitation on game theory; homework 4 (game theory) due.
Saturday, November 20	
Sunday, November 21	Assignment D (peer review) due.

Week 13 material	
Lecture	None
Reading 1 (overview)	None
Reading 2 (classic study)	None

Week 13 schedule	
Monday, November 22	
Tuesday, November 23	No reading quiz.
Wednesday, November 24	No class; no lecture quiz.
Thursday, November 25	
Friday, November 26	No class
Saturday, November 27	
Sunday, November 28	

Week 14 material	
Reading 1 (overview)	Kim (2018): Moral judgment and cooperation.
Reading 2 (classic study)	Henrich et al. (2005): “Economic man” in cross-cultural perspective: behavioral experiments in 15 small-scale societies.
Lecture	Game theory.

Week 14 schedule	
Monday, November 29	
Tuesday, November 30	Reading quiz due.
Wednesday, December 1	Lecture; lecture quiz due.
Thursday, December 2	Module F reflection post due.
Friday, December 3	Recitation on WEIRD sampling.
Saturday, December 4	
Sunday, December 5	

Module G: Improving Decision-Making

Week 15 material	
Reading 1 (overview)	Kahneman, Lovallo, Sibony (2011): Before you make that big decision…
Reading 2 (classic study)	Pronin (2007): Valuing thoughts, ignoring behavior: the introspection illusion as a source of the bias blind spot.
Lecture	Improving decision-making.

Week 15 schedule	
Monday, December 6	
Tuesday, December 7	Reading quiz due.
Wednesday, December 8	Lecture; lecture quiz due.
Thursday, December 9	Module G reflection post
Friday, December 10	Recitation study session for final exam.
Saturday, December 11	
Sunday, December 12	

Final Exam

Monday, December 13	
Tuesday, December 14	
Wednesday, December 15	
Thursday, December 16	
Friday, December 17	
Saturday, December 18	
Sunday, December 19	