

How Doctors Think

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Course Mode: In person

Time & Location: Tuesdays 12noon to 3pm (PSYL C16)

Course Description

In many ways, physicians are just like the rest of us! Their visual attention is limited, their decision-making is fallible, their choices susceptible to persuasion. But in other ways, physicians are quite different from us. They can read an EKG in fraction of the time it would take a neophyte –and through years of training they have honed the ability to efficiently extract clinical diagnoses from their interviews with patients. Which raises the question: how does Cognitive Science explain their behavior, and how does their behavior inform Cognitive Science theories? In this course, we will address these questions by exploring the domains of Judgment & Decision Making, Perception, Learning & Memory, and Social Cognition, among others.

Course prerequisites.

Neither the class discussions nor the readings will emphasize technical specialized material such as medical knowledge, biology, nor mathematical foundations of Judgment and Decision Making research. Background in these topics is not required, but students do need to feel comfortable with concepts of statistical distributions, probability, and correlation (high school level). A course in Cognition would prove helpful, but it is not indispensable.

Readings

We will read chapters from popular press books, as well as primary source articles. I will provide an electronic version of all required readings. The books are excellent, and some of you might want to purchase them to read the remaining chapters in your free time (they are *that* good!). Here is a list

Medicine

- Groopman, J. E., (2008). [How doctors think](#). (\$9)
- Marsh, H. (2016) [Do no harm: Stories of life, death, and brain surgery](#) (\$16)
- Gawande, A (2009) [The checklist manifesto](#) (\$9)
- Gawande, A (2008) [Better: A surgeon's notes on performance](#) (\$10)
- Gawande, A (2003) [Complications: A surgeon's notes on an imperfect science](#) (\$13)
- Ubel, P. (2012) [Critical Decisions: How you and your doctor can make the right medical choices together](#) (\$20)

- Brush Jr. J. (2015) [The science of the Art of Medicine](#) (\$30) This is a more technical book, but an excellent and very accessible introduction to some of the topics discussed in class.

Decision Making (General)

- Kahneman, D. (2011). [Thinking fast and slow](#). (\$4 used in Amazon)
- Kahneman, Siboni, & Sunstein (2021) [Noise](#) (\$18)
- Duke, A. (2020) [How to decide: Simple tools for making better choices](#). ISBN-13: 978-0593418482 (\$8 used in Amazon). We will only read one chapter in class. Praise from Philip Tetlock (Wharton): “you can’t learn to ride a bicycle by reading physics textbooks. You need to get on the bike and practice. And you can’t become a better decision-maker by reading microeconomic textbooks. You need to practice by working through the real-world exercises in this state-of-the-art book.”

Course Website:

Course materials will be posted in the course website in **Canvas**.

Getting Help and Information

Contacting Me: I encourage you to ask questions in class, as other students may have the same question and will benefit from hearing/reading your question and my response. If you have a private question to ask, the best way to get in touch with me is by email to my Penn address diegofer@sas.upenn.edu. I will make every effort to respond to your questions promptly; however, please understand that I cannot always respond immediately; you should expect a response in two business days.

Course Communication: If I need to communicate with you (e.g., change in assignment, etc.), I will often do so by email and/or Canvas. It is your responsibility to check your college email account regularly in order to receive such messages. If you prefer to use another email address, it is your responsibility to modify your college account so that your email messages are forwarded appropriately.

Grades

	% of course grade
- Midterm Exam	20%
- Final Exam (cumulative)	20%
- Term Paper	30%
- Oral presentation of your paper	10%
- Class participation and involvement	10%
- Assignments	10%

Exams. The exams will include short answers and essay questions. Exams will include all readings, lectures, discussions, videos, and activities. If you miss an exam, you will be allowed to take a make-up exam if I judge that your absence was unexpected and unavoidable.

Term Paper (10-12 pages, double spaced, 12 point font, excluding title page, abstract, figures/tables, references, and appendix)

Design an experiment on some aspect of material discussed in this course, or on the relation between something discussed in this course and something you've studied in another course. Ideally, this should be a study one could actually do, *though I don't expect you to do it during the semester*. A good place to look for ideas is to read the list of articles assigned for this course. The paper should include the following sections:

0. Abstract (150-170 words)

1. Introduction

- a. What is the problem or phenomenon and what is known about it?
- b. Why is it interesting or important?
- c. What hypothesis(es) will you be exploring?

2. Method

How will you test the hypothesis laid out in the introduction? Pay attention to identifying needed control groups or conditions.

3. Results and Discussion

- a. What are the possible outcomes of the study?
- b. What would the different possible outcomes tell you?
- c. Assuming that you got the results you were looking for, what would be the significance of them?
- d. What further research would these results suggest?

4. Appendix: A Pre-registration of your study using <https://aspredicted.org/>

Oral Presentation. The last four weeks of class, students will present their term paper to the class (5-7 mins presentation followed by a 5 mins of Q&A period). I will provide you with more detailed instructions later in the semester.

Class participation and involvement. I will choose pairs of students to lead class discussion on certain weeks (details to follow), and I expect that all students will contribute to class discussion on a regular basis.

Assignments: During the semester, I will periodically ask you to complete various assignments as follows.

Read and write: Submit questions and/or insights about the weekly readings (½ a page approx.).

Watch and write: Occasionally watch a video and answer questions about it.

Do and answer: Do an activity such as completing an online survey, or playing a game in a website and share your opinion.

Grading:

Grades will be assigned according to Penn's "Definition of Grades". Grades will not be assigned on the basis of a curve. Instead, letter grades will be assigned on the basis of the following percentages of the possible points that you can accumulate:

A+	=	98 and above		
A	=	94 - 97.9%	C	= 73 - 76%
A-	=	90 - 93%	C-	= 70 - 72%
B+	=	87 - 89%	D+	= 67 - 69%
B	=	83 - 86%	D	= 63 - 66%
B-	=	80 - 82%	D-	= 60 - 62%
C+	=	77 - 79%	F	= Below 60

Incomplete Grades. Receiving a grade of "incomplete" (N) requires my approval and usually is given only in emergency situations. In any event, do not assume that an incomplete grade will be given automatically if you do not complete all the exams and reports by the time the final exam is given. Nor should you assume that leaving a message on my voice mail or email means you have my approval.

Course Policies

Class Participation: Participation is important and expected.

Late Policy: Assignments should be completed by the designated deadlines (early work is always accepted). Work turned in late raises difficult issues about fairness and also disrupts the schedule for the class. Unless I have heard from you in advance and have authorized an extension (see below), assignments turned in after this grace period will be penalized by a 10% deduction in your grade for each day they are past due. In the case of an emergency (e.g., sudden serious illness, death in the family) please be in touch with me as soon as possible.

Inclusion and Respect: Differences of opinion are welcome and encouraged. I expect those differences of opinions to be communicated respectfully.

Academic Integrity: I expect all students to understand and uphold the Code of Academic Integrity
(<https://catalog.upenn.edu/pennbook/code-of-academic-integrity/>).

Accommodations: University of Pennsylvania provides reasonable accommodations to students with disabilities who have self-identified and been approved by Student Disabilities Services (SDS). If you have not yet contacted SDS and would like to request accommodations or have questions, please visit <https://www.vpul.upenn.edu/lrc/sds/>. All services are confidential. If you have an accommodations letter already on file, please be in touch with me privately to discuss how I can meet your accommodations given the online format of our course.

Absences for Religious Holidays: Students who expect to miss a class or assignment due to the observance of a religious holiday should discuss the matter with me as soon as possible, normally at least two weeks in advance. Absence from classes or examinations for religious reasons does not relieve students from responsibility for any part of the course work required during the absence.

Tentative Schedule

- 1 Intro: Judgment; Intuitive vs Deliberate thinking; Goals in Medicine
- 2 Clinical Reasoning
- 3 Diagnosis, Scripts & Schemas, Categorization ;
- 4 Perception; Visual Attention (Radiologists, Pathologists)
- 5 Learning; Expertise (surgeons)
- 6 Intuition; Naturalistic Decision Making; Fast & frugal heuristics
- 7 Wisdom of crowds; Computer-assisted diagnosis; AI; Individual meetings to discuss project // EXAM (Oct 3rd)
- 8 BREAK
- 9 Midterm // Heuristics & biases
- 10 Heuristics & biases (cont'd)
- 11 Errors , Overconfidence, debiasing, nudges
- 12 Naive Statistics , Communicating risk to patients
- 13 Oral presentations / Social psychology biases, ethics
- 14 Oral presentations / Decision Making in Health psychology
- 15 Oral presentations /Teaching medical students, catch-up/ EXAM (December 5th)

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