COLLEGE OF INFORMATION STUDIES

INST354-ESG1: Decision-Making for Information Science Spring 2020

Course Description

A critical determinant of success for information professionals is being a good decision maker. But why is it that we don't always make rational and logical choices? How can we improve the quality of our judgments and choices? This course examines the use of information in individual and organizational decision making, including the role of quantitative data analysis in making informed choices. The course has two main goals. The first is to introduce you to a variety of quantitative techniques to help you make informed decisions based on analysis of data. The second is to introduce you to a variety of psychological perspectives on decision making, with an emphasis on errors of judgment and choice.

Learning Objectives

Upon successful completion of this course, students will be able to:

- Describe the roles of quantitative data analysis and of psychology of judgment in decision making
- Apply different decision analysis and data analysis techniques that can support decision making
- Explain how psychological perspectives can modify or restrain rational decision making
- Demonstrate hands-on experience with analytical techniques and software tools that are widely used in practice

The Pre–requisites for this course are: MATH 115 Precalculus; STAT 100 Elementary Statistics and Probability; PSYC 100 Introduction to Psychology; AND INST 314 Statistics for Information Science.

Prof. Lori Perine
lperine@umd.edu

Class Meets:
Thursdays
8:00 – 10:45 am
III - 3220

USG Office Hours:
Room III-5156
Thursdays
11:00 a.m. – 12:00 p.m. and by appointment.
Virtual Office:
https://umd.webex.com/meet/lperine

Teaching Assistant:
Mr. Parth Saraiya
Office Hours: TBD

Course Communication
General information will be sent via ELMS announcements. Students must contact me via email (lperine@umd.edu), NOT ELMS mail to discuss absences, accommodations, or *Here is a link with helpful guidance on writing professional emails (ter.ps/email*).

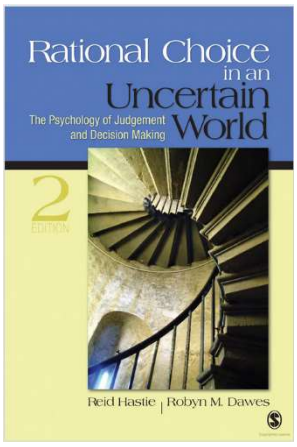
Course Design

This course uses a partial-flipped classroom design. In this course, you are responsible for doing all required reading and watching any assigned video resources before you come to class. Our time in-class will include a brief lecture to synthesize materials, student discussion of the materials, and work on exercises, problem solving, and/or case studies. We will also have occasional speakers, whose presentations you will review and critique in the context of the concepts and techniques that we are learning in class.

Required Resources

1. **Course Website:** ELMS elms.umd.edu

2. **Text Book:**



Reid Hastie & Robyn Dawes, *Rational Choice in an Uncertain World*, 2nd Edition. Sage. Electronic version for sale here: https://us.sagepub.com/en-us/nam/rational-choice-in-an-uncertain-world/book231783
(Hereafter **RC**)

3. Required Software

The following software is necessary for you to successfully complete the course.
Microsoft Excel. For Macintosh users it is available through the university's TERPware website (https://terpware.umd.edu).
R software. It is free and available online (https://www.r-project.org/). You may want to use R Studio (the free version), which is an integrated development environment for R (https://www.rstudio.com/).

Course Workflow

The typical workflow for the course is as follows:

BEFORE THE CLASS:

- Complete the readings
- View any videos, if assigned
- Review any speaker bios and materials, if assigned
- Make note of any questions or comments you might have
- Complete the weekly Reading Quiz on ELMS prior to the class (this will be easy if you have followed the previous bullets)

DURING CLASS:

- Participate in the class discussion and synthesis of materials

- Take notes during the short lecture
- Work cooperatively on in-class activities or exercises
- Alternately, take notes and complete the reflection assignment for a speaker

AFTER CLASS
- Complete any of the in-class activities or exercises that were not finished in class
- Submit assignments and assessments by the due date, if not submitted during class time

Course Activities/Assessments

1. Weekly Reading Quiz

Each week, you will complete a timed quiz on ELMS/Canvas on the materials contained in your readings and videos. This quiz is designed to assess whether you have adequately prepared for the class by completing the assigned reading and looked at the other preparatory materials. Your success in the class and ability to participate well in the in-class discussions and assignments depends on the preparations you have made. You will find this reading quiz to be quick and easy, if you have completed the readings and adequately reviewed other preparatory materials.

2. Participation/In-Class Assignments and Exercises

There are two components to this activity: participation and in-class assignments and exercises.

For the participation component, everyone will begin the course with a full participation score. You will retain that score by:
1. Being on time and in class
2. Contributing to class discussions with questions (see the workflow above)
3. Being an active participant in group work in-class and outside of class

This component will be partially based on my observation and partially based on feedback from your colleagues. My observations will outweigh feedback from your colleagues. I understand that personality and cultural differences "outgoing" you are. I will take that into account.

An important component of the course are the in-class activities and exercises. These are your chances to put the concepts or techniques into action, explore, ask questions, and develop understanding and mastery. In-class activities may include simulations, critiques of a case study, practice questions, reflections on a speaker presentation, and other similar activities. Though these are designed to completed in class, you can finish up any work that needs to be done before turning it in later that week. Completed assignments will be submitted via Elms/Canvas due by 11:59pm on the scheduled due date, typically on Monday after the class session.

Group collaboration is encouraged for these activities, but each student must submit her or his individual assignment. Please take advantage of the Discussion Boards and office hours to ensure that your individual understanding is solid.

3. Unit Case Studies

There will be a total of four (4) unit case studies during the semester. These are your opportunity to apply concepts learned in class to a real world problem and/or data sets. Each case study will have a rubric for completion. Typically, you will be submitting a 2 or 3 page document, with supporting technology files (in the second half of the course).

4. Group Project

You will work in teams of 3-4 students on a Decision Making project. The project will involve understanding a real-world problem and working with your team to make decisions and then present recommendations to a specific audience of your choice. Project instructions will be posted on Week 4. Your team will give a proposal presentation on Week 7. All teams will submit a final report by May 12 and give a final presentation on May 14.

GRADES

Your grade is determined by your performance on course activities according to the weightings below. All graded activity will be posted on ELMS. Please note that Canvas does not always calculate grades properly. 'Final' grades posted in ELMS may vary substantially before the end of the term. If you are concerned about any part of your grade, please come see me.

Activity	Weight
Weekly Reading Quiz	10%
In-Class Participation	40%
Unit Case Studies	35%
Group Project	15%

If you have questions about anything graded, please check with me for clarification. If you believe the work was not graded correctly, please see the re-grading policy below. See below for the grade policy on late work submissions.

Your course grade will be assigned based on the total percent earned, using the following rubric. Grades will be rounded to the nearest 10th of a percent. Please come and talk to me early if you think that there might be a problem. No extra credit will be given at the end of the semester.

A-	90.0-92.9%	A	93.0-100%		
B-	80.0-82.9%	B	83.0-86.9%	B+	87.0-89.9%
C-	70.0-72.9%	C	73.0-76.9%	C+	77.0-79.9%
D-	60.0-62.9%	D	63.0-66.9%	D+	67.0-69.9%
		F	0-59.9%		

COURSE POLICIES

Attendance

Attending class is not mandatory; however, your attendance in class is expected and is likely to influence your class performance and grade. Class sessions will include information gleaned from discussions and hands-on activities, which are not included in written materials on ELMS. If you miss class, it is **YOUR RESPONSIBILITY** to obtain any handouts or materials provided by the instructor and to get copies of notes by classmates covering what you missed. I will be happy to tell you which topics were covered and direct you to materials that you can use to learn what you missed. However, neither I not any other member of the instructional team will not repeat lectures or activities that were missed in class.

Excused Absences

This class is conducted consistent with the University of Maryland excused absence policy, which you will find posted on ELMS along with this syllabus.

If you are absent for any reason, please notify me. An absence without notification will be considered unexcused. Excused absences require proper notification and documentation, per University policy. You will need documentation to excuse your absence. Any work from an excused absence must be made up within one (1) week of the original deadline, but no later than the scheduled date of the final exam. Any work or assessment missed due to an unexcused absence will be given a score of zero (0).

If a student is delayed or absent more than TWO times consecutively, the instructor will require documentation signed by a health care professional. If you have a prolonged sickness/injury or other event that affects your ability to complete assignments, you MUST obtain a signed note from a doctor or similar qualified representative AND that note MUST identify: 1) if you are well enough to attend class or not, 2) if you are well enough to complete assignments in or out of class.

Late Work

Timely submission of the completed assignments is essential. The due date of each assignment will be stated clearly in the assignment description. Late reading quizzes will be subject to a 10% penalty and only will be accepted in the half hour after the due date and time. After that, no late submissions will be accepted. All other assignments, case studies, and projects will be subject to the following penalty:

Late Penalty Schedule

Up to 1 day	1 ≤ 2 days	2 ≤ 3 days	3 ≤ 4 days	4 ≤ 5 days	5 ≤ 6 days	> 6 days
10%	15%	20%	25%	30%	40%	50%

In all cases, work that is submitted late will NOT receive priority in grading and thus most likely will not be returned within the turnaround times noted above. Late work will be graded and returned by the instructional team as scheduling permits.

Re-grading

Fairness in giving grades is very important to me, at the same time both our time is best spent on helping you learn the material. Re-grading of assignments and exams must be turned in within one week of receiving the graded work. They must be submitted as a written document in which you include the graded work, an explanation of what you believe was miss-graded, and an explanation for why you think it should be given a different score. For any re-grade requests, the entire assignment will be regarded and your score may go up or down. Please note: All makeup exams and work are EXEMPT from the re-grading policy. Also, you may make no more than two (2) re-grading requests during this course.

Other Policies

Other policies relevant to undergraduate courses are found here: Topics that are addressed in these various policies include academic integrity, student and instructor conduct, accessibility and accommodations, attendance and excused absences, grades and appeals, copyright and intellectual property.

Electronic Devices

Students are requested to place cell phones and other electronic devices on vibrate and to refrain from their use within the classroom. If you have a critical communication to attend to, please excuse yourself from the classroom and return when the communication has been completed.

Except when required for DSS accommodations or during interactive activities, laptops or tablets should remained closed during lectures. Unfortunately, our digital devices present irresistible distractions and detract from the cooperative learning environment. In addition, research shows that we learn and retain information with better comprehension when notes are taken by hand. Please be sure to bring a notebook or other note taking materials to each class.

Syllabus Change Policy

This syllabus is a guide for the course and is subject to change with advance notice. Notice will be given verbally in class and posted via ELMS announcements.

OFFICE HOURS

Please visit during office hours or make an appointment to see me at a time when it is mutually convenient. If you are having trouble in the course please talk to me as soon as possible. If you do poorly or lower than you expected on the first exam, it is imperative that you come to office hours so that we can figure out the problem early.

ACADEMIC DISHONESTY

Cheating in any form (copying, falsifying signatures, plagiarism, etc.) will not be tolerated. It will result in a referral to the Office of Student Conduct irrespective of scope and circumstances, as required by university rules and regulations. There are severe consequences of academic

misconduct, some of which are permanent and reflected on the student's transcript. If you have any questions regarding the University's policies on scholastic dishonesty, please see http://osc.umd.edu/OSC/Default.aspx.

It is very important that you complete your own assignments, and do not share files excluding raw data), partial work or final work.

University of Maryland Code of Academic Integrity

The University of Maryland, College Park has a nationally recognized Code of Academic Integrity, administered by the Student Honor Council. This Code sets standards for academic integrity at Maryland for all undergraduate and graduate students. As a student you are responsible for upholding these standards for this course. It is very important for you to be aware of the consequences of cheating, fabrication, facilitation, and plagiarism. For more information on the Code of Academic Integrity or the Student Honor Council, please visit http://shc.umd.edu/SHC/Default.aspx.

ACCOMMODATIONS

Please come and see me as soon as possible if you think you might need any special accommodations for disabilities. In addition, please contact the Disability Support Services (301-314-7682 or http://www.counseling.umd.edu/DSS/). Disability Support Services will work with us to help create appropriate academic accommodations for any qualified students with disabilities. If you experience psychological distress during the course of the semester you can get professional help at the Counseling Center (301-314-7651 or http://www.counseling.umd.edu/.

Get Some Help!

Taking personal responsibility for your own learning means acknowledging when your performance does not match your goals and doing something about it. I hope you will come talk to me so that I can help you find the right approach to success in this course, and I encourage you to visit tutoring.umd.edu to learn more about the wide range of campus resources available to you. In particular, everyone can use some help to sharpen their communication skills (and improving their grade) by visiting ter.ps/writing and scheduling an appointment with the campus Writing Center. You should also know there are a wide range of resources to support you with whatever you might need (see go.umd.edu/assistance), and if you just need someone to talk to, visit counseling.umd.edu or one of the many other resources on campus.

Most services are free because you have already paid for it, and **everyone needs help**… all you have to do is ask for it.

Basic Needs Security

If you have difficulty affording groceries or accessing sufficient food to eat every day, or lack a safe and stable place to live and believe this may affect your performance in this course, please

visit go.umd.edu/basic-needs for information about resources the campus offers to you and let me know if I can help in any way.

Names/Pronouns and Self Identifications

The University of Maryland recognizes the importance of a diverse student body, and we are committed to fostering inclusive and equitable classroom environments. I invite you, if you wish, to tell us how you want to be referred to both in terms of your name and your pronouns (he/him, she/her, they/them, etc.). The pronouns someone indicates are not necessarily indicative of their gender identity. Visit trans.umd.edu to learn more.

Additionally, how you identify in terms of your gender, race, class, sexuality, religion, and dis/ability, among all aspects of your identity, is your choice to disclose (e.g., should it come up in classroom conversation about our experiences and perspectives) and should be self-identified, not presumed or imposed. I will do my best to address and refer to all students accordingly, and I ask you to do the same for all of your fellow Terps.

Emergency Preparedness

Please check the USG's notification services for closures during inclement weather and other emergency situations. Please be aware that the USG campus does not necessarily follow closures announced for the College Park campus.

Classroom Environment

Our classroom environment should be professional and mutually respectful. Discussions should be based on course readings and assignments. Remember—others may have different perspectives on issues than you, but they still deserve your respect

TENTATIVE COURSE SCHEDULE
This schedule is for planning purposes and may change. See ELMS/Canvas for schedule updates.

'R-1", "R-2",… "R-5" refer to assigned readings that are shown below under "Readings." Links to these readings will be provided in ELMS/Canvas. Assigned readings and videos may shift as speakers are scheduled.

Wk	Date	Tuesday
1	Jan. 30	**Introduction and Course Overview; What is a "Decision"?** Readings: RC Chapter 1 RC Chapter 2, section 2.1 ***Reading Quiz 1 (free points – no quiz given)*** ***Exercise 1 (Due Feb. 3 at 11:59 p.m.)***
	****Module 1: Decision Analysis****	
2	Feb. 6	**What is Decision Analysis?; Payoff Matrix** Readings: R-1 (1st half: p 803-817) R-2 (p 736 – 751) ***Reading Quiz 2 (Posted 2/4 and due at 8:00 a.m. on 2/6)*** ***Exercise 2 (Due Feb.10 at 11:59 p.m.)***
3	Feb. 13	**Decision Trees** Readings: RC Chapter 2, sections 2.2-2.3 R-2 (p 751 – 753; p 759 – 775) R-3 ***Reading Quiz 3 (posted 2/11 and due at 8:00 a.m. on 2/13)*** ***Exercise 3 (Due Feb. 17 at 11:59 p.m.)***
4	Feb. 20	**Considerations/Pitfalls in Decision Analysis** Readings: RC Chapter 2, sections 2.4-2.6 R-4 ***Reading Quiz 4 (posted 2/18 and due at 8:00 a.m. on 2/20)*** ***Exercise 4 (Due Feb. 24 at 11:59 p.m.)*** ***Module 1 Case Study (Posted Feb. 24, Due Feb. 26 at 11:59 p.m.)***
	****Module 2: Decision Theories****	
5	Feb. 27	**Utility Theory; Prospect Theory; and Decision Weights** Readings: R-5 RC Chapter 11, section 11.1 RC Chapter 12 ***Reading Quiz 5 (posted 2/15 and due at 8:00 a.m. on 2/27)*** ***Exercise 5 (Due March 2 at 11:59 p.m.)***

6	March 5	**Automatic vs. Controlled Thinking** Readings: R-6 Exercise 2 and Quiz 2 posted on Oct 7 ***Reading Quiz 6 (posted 3/3 and due at 8:00 a.m. on 3/5)*** ***Exercise 6 (Due March 9 at 11:59 p.m.)***
7	March 12	**Heuristics** Readings: RC Chapter 4 RC Chapter 5 ***Reading Quiz 7 (posted 3/10 and due at 8:00 a.m. on 3/12)*** ***Exercise 7 – Project Proposal Presentations*** ***Module 2 Case Study (Posted March 23; Due March 25 at 11:59 p.m.)***

March 15-22 (Sunday-Sunday) Spring Break

****Module 3: Mathematical Techniques to Inform Decisions****

8	March 26	**Optimization/Linear Programming** Readings: R-7 ***Reading Quiz 8 (posted on 3/24 and due at 8:00 a.m. on 3/26)*** ***Exercise 8 (Due March 30 at 11:59 p.m.)***
9	April 2	**Solving Optimization Problems in a Spreadsheet** Video: https://goo.gl/AFcC7V Readings: R-8 R-9 R-10 ***Reading Quiz 9 (posted on 3/20 and due at 8:00 a.m. on 4/2)*** ***Exercise 9 (Due April 6 at 11:59 p.m.)***
10	April 9	**Sensitivity Analysis** Readings: R-11 ***Reading Quiz 10 (posted on 4/7 and due at 8:00 a.m. on 4/9)*** ***Exercise 10 (Due April 13 at 11:59 p.m.)*** ***Module 3 Case Study (Posted April 13, due April 15 by 11:59 p.m.)***

****Module 4: Data Analysis to Inform Decisions****

11	April 16	**Data-Driven Decision Making; Steps in Data Analysis Project; Types of Research Questions** Readings: R-12

		R-13 R-14 R-15 ***Reading Quiz 11 (Posted on 4/14 and due at 8:00 a.m. on 4/16)*** ***Exercise 11 (Due April 10 at 11:59 p.m.)***
12	April 23	**Inferential Analysis Techniques** Readings: R-16 R-17 (p 92-104) R-18 ***Reading Quiz 12 (posted on 4/21 and due at 8:00 a.m. on 4/23)*** ***Exercise 12 (Due April 27 at 11:59 p.m.)***
13	April 30	**Predictive Analysis Techniques** Readings: R-17 (p 104-111) R-19 R-20 ***Reading Quiz 13 (Posted on 4/28 and due at 8:00 a.m. on 4/30)*** ***Exercise 13 (Due May 4 at 11:59 p.m.)***
14	May 7	**Predictive Models vs. Human Judgment** RC Chapter 3, sections 3.3-3.6 R-21 ***Reading Quiz 14 (Posted on 5/5 and due at 8:00 a.m. on 5/7)*** ***Module 4 Case Study (posted May 7, Due May 9 at 11: 59 p.m.)*** ***Final Project Report: Due May 12 at 11:59 p.m.*** ***Final Project Presentations: May 14, 9 – 11 a.m.***

If there are updates to the schedule, they will be posted to Canvas.

Readings (available on Canvas if a URL is not provided)

R-1: Keeney, R. L. (1982). Decision analysis: an overview. *Operations research*, *30*(5), 803-838.

R-2: Ragsdale, C. (2014), Spreadsheet Modeling and Decision Analysis: A Practical Introduction to Business Analytics, 7th Edition, Chapter 14

R-3: Magee, J. F. (1964). *Decision trees for decision making* (pp. 35-48). Harvard Business Review.

R-4: Johnson, S. (Sep. 1, 2018). *How to make a big decision.* The New York Times. Available here: https://www.nytimes.com/2018/09/01/opinion/sunday/how-make-big-decision.html

R-5: Chand, S. *The Concept of Utility: It's Meaning, Total Utility and Marginal Utility | Economics.* Available here: http://www.yourarticlelibrary.com/economics/the-concept-of-utility-its-meaning-total-utility-and-marginal-utility-economics/8866

R-6: Kahneman, D. (2011) Thinking, Fast and Slow, p 19-58

R-7: Ragsdale, C. (2014), Spreadsheet Modeling and Decision Analysis: A Practical Introduction to Business Analytics, 7th Edition, Chapter 2.

R-8: Introductory guide on Linear Programming for (aspiring) data scientists. Available here https://www.analyticsvidhya.com/blog/2017/02/lintroductory-guide-on-linear-programming-explained-in-simple-english/

R-9: Optimization Methods in Management Science/Operations Research. Excel Techniques.

R-10: *Linear Programming with Excel Solver.* Available here http://faculty.sfasu.edu/fisherwarre/lp_solver.html

R-11: *Practical Optimization: A Gentle Introduction.* Chapter 6 – Sensitivity Analysis. Available here: *http://www.sce.carleton.ca/faculty/chinneck/po/Chapter6.pdf* Note: They refer to a software program that we are not using (LINDO) but the general principles apply.

R-12: Provost and Fawcett (2013). "Data Science and its Relationship to Big Data and Data-Driven Decision Making." Big data, pp. 51-59.

R-13: Leek, J. T., & Peng, R. D. (2015). What is the question?. *Science*, *347*(6228), 1314-1315.

R-14: Peng, R. D., & Matsui, E. (2015). The Art of Data Science. *A Guide for Anyone Who Works with Data. Skybrude Consulting*. Chapters 2 & 3.

R-15: Ghani, Rayid. *Scoping Data Science for Social Good Projects.* Available here: https://dssg.uchicago.edu/2016/10/27/scoping-data-science-for-social-good-projects/

R-16: The "Online Stat Book". Chapter 14. Regression. Available here: http://onlinestatbook.com/2/regression/regression.html

R-17: The Art of Data Science. Chapter 7.

R-18: The Art of Data Science. Chapter 9.

R-19: *Decision Trees: An Overview*. https://www.aunalytics.com/2015/01/30/decision-trees-an-overview/

R-20: Why and How to do Cross Validation for Machine Learning. https://towardsdatascience.com/why-and-how-to-do-cross-validation-for-machine-learning-d5bd7e60c189

R-21: McAfee, A. (2014). *When Human Judgment Works Well, and When it Doesn't*. Harvard Business Review