SYLLABUS

Credits: 6

Class Schedule: Tue/Wed/Thu, 10:30–12:30 am, room 9

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Office Hours: Thursday 1.30-3.30 pm, or by appointment

Course website: http://www.unite.it/UniTE/Engine/RAServePG.php/P/58601UTE0641?&VRIC_provenienza=5850&rifm=1UTE0441&VRIC_ID=2511&VRIC_AA=2017&VRIC_IDOC=153&VRIC_doc=mascella&VRIC_nome=&VRIC_Facolta=&VRIC_cds=&VRIC_ins=&SELAA=2017&SELANNO=2&SELTCDS=U&SELCDS=69&SELCOMP=5&http://www.unite.it/Un

Elearning platform course website: http://elearning.unite.it/course/view.php?id=1491

Facebook group: UniTe Logic & DM

1. Course description

This course will introduce students to normative and descriptive decision theory. As such, the emphasis will be on the main conceptual features of decision processes, on the quantitative estimation of qualitative judgments, and on their application to real life problems.

This course is designed for students to build an understanding of how to improve the judgments and decision-making of individuals, groups and organizations. Normative and behavioral decision theories provide the theoretical core of the course. These theories draw on insights form a diverse set of disciplines, including logic and philosophy, economics, cognitive and social psychology, probability and statistics.

This course will cover 3 fundamental aspects in decision analysis:

- *Normative individual models*, which focuses on classical decision theory, i.e. on the normative models of rational choice under uncertainty and risk;
- *Competitive and Cooperative models*, which focuses on Game Theory and Social Decision Theory, i.e. on the normative approach undertaken in competitive and cooperative theories;
- *Descriptive models*, which focuses mainly on Behavioral Economics, i.e. on actual decision behaviors and their neuroscientific/psychological explanation.

Applications of these theories and methods to real-life venues will be used. Overall, the course emphasizes basic skills and concepts that enhance the students' ability to understand why individuals and groups behave the way they do, as well as how to choose rationally among competing courses of action.

2. Course prerequisites

A basic algebraic and arithmetical competence (high school level) is indispensable, and some familiarity with basic inferences in propositional logic is important. However, a brief review on this topic is provided at the beginning of the course (the first week).

No advanced philosophical and mathematical prerequisites are required.

3. Course goals and objectives

The main objective of this course is to acquire knowledge and understanding of different models and decision analysis techniques for rational decision making, together with an understanding of the heuristics that drive actual decisions. By doing so, the course helps to prepare future managers at different levels to address the many challenges involved in everyday personal and business decisions.

More in detail, the learning objectives for this course are:

- *Knowledge and understanding*: to know and understand the most important features and strategies for rational decision making. Furthermore, to know and understand the role of analytic judgment in decision processes as well as heuristics and fallacies in decision-making.
- *Applying knowledge and understanding*: ability to analyze decision problems and put into practive the fundamentals of decision theory in everyday life as well as in professional and business frameworks; ability to recognize the effects of cognition and emotion on decision-making and to think strategically in competitive or cooperative scenarios.
- *Making judgements*: to increase critical thinking skills and how to apply its principles; ability to understand how to solve decision problems or when a decision has been influenced by cognitive and emotional factors.
- *Communication skills*: ability to communicate clearly rational elements and empirical aspects that characterize decisions, either to an expert or to a non-expert audience.
- *Learning skills*: ability to learn further strategies, theories and models of decision making; to know how to improve knowledge and how to retrieve useful information from scientific literature.

4. Textbooks and study materials

Textbook. There are two textbooks, a couple of lectures and some short notes. The first textbook (Peterson, 2009) covers the most part of subjects, explains them in a critical way avoiding much mathematical formalism, is easy to read and includes numerous exercises. This textbook is supplemented with some chapters from another textbook (Bazerman et al., 2009) and some short notes.

In detail, textbooks and required readings are the following:

- M. Peterson (2009), *An Introduction to Decision Theory* (1st ed.), Cambridge: Cambridge University Press. All, except chapter 9.
- M.H. Bazerman, D.A. Moore (2009), *Managerial Decision Making*, 7th ed., John Wiley & Sons, but limited to chapters 1, 2, 3, 4, 6 (only the first paragraph) and 11.
- Bang D, Frith C.D. (2017), Making better decisions in groups, Royal Society Open Science, v. 4: 170-193. (download at http://rsos.royalsocietypublishing.org/content/royopensci/4/8/170193.full.pdf)
- Instructor's notes on "Basic Logic", "Bayes and new Information", and "Utility".

Supplementary materials. Some readings can be helpful to clarify the concepts of the subject. I suggest to read them, but they are not actually required in order to pass the course:

- T. H. Davenport (2009), "Make Better Decisions", Harvard Business Review (download at https://hbr.org/2009/11/make-better-decisions-2).
- HBR Analytic Services, "The Evolution of Decision Making: How Leading Organizations Are Adopting a Data-Driven Culture", Harvard Business Review (download at https://hbr.org/resources/pdfs/tools/17568_HBR_SAS%20Report_webview.pdf).
- D. Ariely (2008), Predictably Irrational, Harper Collins: New York.

Supplementary video contents. Some multimedia contents, consisting in a movie and two documentaries, will be part of the time spent together. In detail, we will watch the movie "Moneyball. The art of winning an unfair game" and the documentaries "How you really make decisions" and "How to make better decisions" from BBC. This activity will be held in room 16, on wednesday 28 february and wednesday 11 April, between 1:30 and 3:30 pm. After the movie/documentaries we will discuss the main features from the subject perspective.

5. Assessment Criteria

Attending students.

If you are an attending student (i.e., you attend at least 80% of the lectures), you can take 2 intermediate tests (one midterm, one final) and deliver 2 homework assignments. Intermediate tests are a combination of multiple-choice and open-answers questions, and will cover both theoretical notions and exercises based on the textbooks and notes. Sample test questions will be made available (see the docs "Topics Unit 1" and "Topics Unit 2&3"). In general, the final course grade will be determined assigning an equal weight to knowledge and

understanding on one side, and to the application of such knowledge on the other. This is why, together with written/oral exams, I require the student to submit projects and explain them because they facilitate more deeply the acquisition of the expected skills.

Exams and assignments will be graded in accordance with the following grading system, where you can see the minimum cutoff for each grade:

A	93.33%	Represents achievement that is outstanding relative to the level necessary to meet course requirements
A-	90%	
B+	86.67%	Represents achievement that is significantly above the level necessary to meet course requirements
B	80%	
C+	76.67%	Represents achievement that meets the course requirements in every respect
C	70%	
D+	66.67%	Represents achievement that is worthy of credit even though it fails to meet fully the course requirements
D	60%	
F+	53.33%	Represents achievement that is not worthy of credit because it fails to meet at large the course requirements
F	less than 53.33%	

Non-attending students.

The exam consists of:
- a written exam covering the entire course's material (theory and exercises),
- an analysis of a multi-attribute decision problem, printed and handed in the same day,
- an oral exam concerning the entire course's material and the analisys presented.

6. Class Participation

First of all, active participation and involvement are critical to students' success in this course.

Students are required to participate and, where possible, to improve learning in class for both themselves and peers. On this line, it is highly beneficial if the student read the paragraphs/chapters on which the lectures are based before coming to class. It will be positively assessed if the student comes to class prepared to that topic and tries to contribute actively to class discussion.

Class participation will be measured on the basis of the following criteria:
- First, of course, have you been in class?
- Have you answered questions when asked directly?
- Have you volunteered answered to questions not directed at any one person?
- Have you offered pertinent comments or questions at other times?
- Have you ever requested to the instructor for a feedback?
- Have you provided insightful analyses and comments in the movie sessions?
- Have you contributed to online discussions into the activity "Forum on Decision Making"?
- Have you set questions or tried to give answers in the same Forum?

If you are reluctant to answer questions or state opinions in class, you may also earn participation credit by contributing more to online discussions. I suggest you to check with me if you want to use only the discussion forum rather than contributing both in class and online.

7. Assignments

Rules.

(1) All the specifications are provided in the "Assignments' Specifications" document. A summary of deadlines is also provided in the "Key dates" document.

(2) Each project assignment has to be submitted in two ways: ONE electronic pdf copy has to be submitted online (on the elearning platform, inside the proper activity), and some printed copies has to be handed in to the instructor before the presentation session starts (TWO copies of the 1st project, ONE copy of the 2nd). Assignments do NOT have to be emailed.

(3) The 1st assignment requires completing also 2 peer-reviews and a self-review of her/his own project. Reviews have to be completed honestly and with the maximum accuracy that the student is capable of as they will be part of the overall assessment that the student evaluator will receive; instead, peer-reviews will not affect the overall assessment of the student whose project is peer-evaluated.

(4) Late assignments will result in an automatic 20% point reduction. Because course material and due dates are available to students well in advance, late submissions will only be accepted for a period of 3 days.

(5) All assignments include a series of steps. Only students who meet all the steps are assessed. Failure to perform any of the steps entails a null contribution for that project in the final average.

(6) Although the assignments are due on an individual basis, students are encouraged to work collaboratively. But, as the set of possibilities is so wide, the problems you choose cannot be identical or too much similar to the problems chosen by any other student. Each assignment will be evaluated also for its originality and uniqueness.

Specifications.

This course has two project assignments. All the details of the assignments are explained in the online document "Assignments' Specifications". In brief:

1) *First Assignment: Decision Analysis*. The goal of this assignment is to gain some experience with analysing a realistic decision problem. It is an individual task, where each student has to choose a risky decision problem, model it and solve it using the multi-attribute utility theory.

2) *Second Assignment: Behavioral Analysis*. The goal of this assignment is to gain some experience with analysing in realistic situations how heuristics affect human decisions. It is an individual task, where each student has to choose a real decision problem, understand through some interviews how people tend to decide, and compare that with what rational methods suggest.

8. Final Recommendations.

To do well in this course, you should be prepared to commit a considerable amount of time outside of class to reading the texts and doing problems for practice and for credit.

In addition, I take academic misconduct, especially cheating on tests and plagiarizing papers, extremely seriously.

To enable you to meet my expectations in this regard and to do so without fear of inadvertently falling short of them, I will provide clear and specific guidance as to what does and does not constitute academic misconduct in advance of tests and other graded work.