DECISION ANALYSIS

COURSE OUTLINE

1. Introduction

Making decisions is a crucial element of a manager’s work. Making a decision can be difficult and good decision making matters - for the decision maker and his or her surroundings, other people and entire organizations. Learning more about the different elements of decisions, how decisions can be structured and analysed can help us improve our decision process and the outcomes.

2. Objectives

We will study the decision making process, with a focus on uncertainty and risk; on time and the major cognitive biases that prevent us from making good decisions.

3. Learning Outcomes

i. Simplify a decision and reflect its main characteristics in a decision tree.

ii. Specify the consequences of an alternative.

iii. Create and analyze the risk profile of a decision.

iv. Relate the risk profile to the risk taking capacity and relevant circumstances of the decision maker.

v. Project how changes in the decision characteristics would change the risk profile and the preferred course of action. (“What if?” questions).

vi. Distinguish different risk preferences and how they impact the preferred course of action.

vii. Evaluate decision-making habits with respect to standards of rationality and detect biases.
viii. **Apply** probability judgments to managerial decisions.

ix. **Decide** whether critical information for a decision is missing.

x. **Categorize** uncertainties with respect to their value of information.

xi. **Perform** comparative investment decision analysis. **Use** simplified approaches through the NPV and IRR concepts and **detect** possible shortcomings.

xii. **Determine** optimal order quantities under uncertain demand.

xiii. To frame the decision making process within the practice of management

### 4. Competences

This course builds and reinforces the following competences:

**CB6** - Students should possess and understand knowledge that provides the basis or opportunity for originality in the development and/or application of ideas, often in a research context.

**CB7** - Students should know how to apply the knowledge acquired and their problem-solving capacity in new and little-known settings within broader (or multidisciplinary) contexts related to their area of study.

**CB8** - Students should be able to integrate knowledge and deal with the complexity of making judgements based on information that is incomplete or limited, but includes considerations of the social and ethical responsibilities linked to the application of the students' knowledge and judgements.

**CB9** - Students should know how to communicate their conclusions and knowledge and the ultimate reasons that support them to specialized and unspecialized audiences in a clear, unambiguous way.

**CG7** - Identifying and effectively dealing with information that is relevant to the job (Information Management).

**CG18** - Making appropriate decisions at the right time (Prudence).

**CE04** - Understanding and using criteria to apply quantitative and qualitative analysis, decision-making tools and prudence. Understanding the assumptions implicit in models, as well as the limitations and risks involved when models are put into practice.
CE05 - Measuring and being aware of one's own attitude toward risk and uncertainty. Learning methods to identify risk factors, evaluate them and study their impact on decisions. Carrying out awareness studies, advanced simulations and scenario analysis.

5. Content

The course is divided in three parts: (1) Introduction and classical techniques, which include decision structuring, decision under uncertainty, risk attitudes and the value of information (2) Time Value of Money (NPV, IRR) and its application to investment decisions (3) Introduction to continuous probability distributions and its application to order quantity decisions. Within the parts we address both analytical and psychological aspects together with cognitive biases that systematically affect people. Within the psychological aspects of decision making, emphasis is made in biases in assessing uncertainty, in assessing risk, and in assessing long-term consequences of the decisions. The ethical dimension of the decisions is also addressed over the sessions.

6. Methodology

The course is a combination of case discussions (70%), lectures (15%), and in class exercises (25%). The lectures are provided as video clips.

7. Evaluation

Grading is based on contribution to in-class learning and a final exam. In the middle of the semester there is a so called “ejercicio de reflexión” that allows the students to figure out their performance in the course. That exercise has no impact in the final grade.

Learning outcomes are assessed in the following way: Contributions in the classroom and final exam with decision making problems and issues that require translating a verbal description into a decision tree), develop and evaluate risk profiles, discuss risk preferences and biases, calculate value of information, impact of imperfect information, Investment analysis and order quantity problems.

8. Course Outline

1. Introductory case

AD-345 “Del Titanic al huracán Katrina”
Why do you think things happened the way they happened in each described situation? What do these six situations have in common?

2. Situation diagnostics. Action plan

505-S14 “Snapple”
Why do you think Snapple went through what happened? What is the action plan?

3. Course on coherent action

AD-251 “High Place Studios”
What should High Places decide?

4. Course on coherent action. The value of perfect information

AD-314 Berfest AG
What would you recommend?

5. Net present value and internal rate of return

ADE-2 Investment analysis exercises.
Prepare 7 exercises. Come to class with document CN-109- Present value tables. Before attending class, view the video session “Decisiones de inversión” and try to understand the message. We will clarify doubts during class.

After class, you can read ADN-257-E A Note on Net Present Values and Internal Rates of Return

6. Subjective aspects of decision making (I)

ADE-28-E Real Situations - Exercise
Prepare exercises. During class we will comment on questions regarding the survey “Intuitive Decisions”

7. Net present value and internal rate of return

103-S06 RETO S.A.
Prepare this case by answering the first 5 questions on the case.

8. The value of imperfect information
Both these cases/exercises relate to imperfect information.


AD-277 Online Movies (A)

Before class prepare the case and view the video “Introducción a las probabilidades” trying to understand the message. We will solve doubts during class. The note ADN-235 about continuous distributions is also useful.

10. Exercise about mid-course reflections.

11. Probability distributions

AD-281 Genzyme y Geltex Una “Joint Venture” en el sector farmacéutico

Analyze the case from Genzyme’s point of view
a) Why did Genzyme start negotiations with GelTex? Why a «joint venture» instead of an acquisition or another type of client-supplier relationship?
b) Refer to Annex 3 and 4 of the case, What is the maximum that Genzyme should pay to enter this «joint venture»? What are your assumptions?
c) Which are the key variables that affect the value of this «joint venture»?
d) What do you recommend Greg Phelps to do?

12. Production decisions

AD-313 Barbados Star
How many ¨course menus¨ should be prepared every day?

13. Production decisions

ADE-25 Production decision exercises
Prepare exercises

14. Production decisions

AD-225 Química del Vallés (A)
How many ¨bidones¨ should be produced every day? Analyze the situation before the two companies merged and after the merge. What differences do you find?

15. Attitudes towards risk and uncertainty
This class will be a conference in which we will discuss different attitudes towards risk and uncertainty. We will comment on our answers to the survey “Intuitive Decisions”. We will hand out the document ADN-259 Intuitive Decision Making under Uncertainty

16. Decisions under pressure and time limitation

Case: Speed Ventures (A) y (B)
Come to class with a decision and prepare arguments for your position.

17. Final Conference
In this session we will discuss decision making reviewing what was discussed throughout the course.

18. Exam

9. Bibliography

General

Present Value

Behavioral Decision Making
- Daniel Kahneman. Thinking, fast and slow. Allen Lane, 2011. This book summarizes Kahneman’s thinking about judgment and decision making after an almost 40-year research career in the field. Kahneman received the 2002 Nobel Prize in Economics.
- Rolf Dobelli. The art of thinking clearly. Sceptre, 2013. This book contains 99 newspaper columns each dedicated to a different cognitive bias.
“design” choices that lead to better decisions. This book is the basis for the choice architecture movement. Politicians have picked up on the importance of the field to design public policies that will lead to better outcomes in health etc. Governments in several countries (US, UK, Germany...) have hired “choice architects”.

- Robin Hogarth. *Judgment and Choice: The psychology of decision*. Wiley & Sons, Ltd.