



## COURSE INFORMATION

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**Course Number:** MGT 405

**Course Title:** Modeling Managerial Decisions

**Professors:** Anjani Jain and Nathan Novemsky

**Term and Year:** Fall 2019

**Class Meeting Times:**

Sec 01: ( <b>Red</b> ):	M W 10:10 AM – 11:30 AM	Evans Hall 2410
Sec 02: ( <b>Green</b> ):	M W 01:00 PM – 02:20 PM	Evans Hall 2410
Sec 03: ( <b>Blue</b> ):	M W 02:40 PM – 04:00 PM	Evans Hall 2410
Sec 04: ( <b>Gold</b> ):	T Th 10:10 AM – 11:30 AM	Evans Hall 4410
Sec 05: ( <b>Silver</b> ):	T Th 01:00 PM – 02:20 PM	Evans Hall 4410

Course Support: [somcoursesupport@yale.edu](mailto:somcoursesupport@yale.edu)

## CONTACT INFORMATION

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Professors	Teaching Assistants
<p><b>Prof. Nathan Novemsky</b> Evans Hall 5508 Ph: 203-436-4261 <a href="mailto:nathan.novemsky@yale.edu">nathan.novemsky@yale.edu</a></p> <p><b>Prof. Anjani Jain</b> Evans Hall 1514 Ph: 203-432-4671 <a href="mailto:anjani.jain@yale.edu">anjani.jain@yale.edu</a></p>	<p>Vince Caruso Jeffrey Gu Rehan Kukar Drew Madden (Head TA) Sam Marullo Yuliana Onopriyenko Nick Peranzi Gerry Rosales Anna Schickele Emily Turner Will Vanderbilt</p>
<b>Review Sessions: TBD</b>	

## TEXTBOOKS AND RECOMMENDED/REQUIRED READINGS

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**Textbook:** (PMS) Practical Management Science (revised 3<sup>rd</sup> edition) by Winston and Albright. Scanned chapters 2, 3, and 10 will be available online through Canvas (under Course Reserves).

### Required Readings:

- HBR articles “Hidden Traps in Decision Making” (Class 9); “Even Swaps: A Rational Method for Making Trade-Offs” (lecture 10).
- HBS cases *Mountain Man Brewing Co.* (HW 4/Class 14), *Freemark Abbey Winery* (Class 10)
- DRRC case *Carter Racing* (Class 11)

## SOFTWARE USED

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Microsoft Excel with the built-in Solver Add-In.

## COURSE DESCRIPTION AND OBJECTIVES

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In this course students will learn how to approach, analyze, and solve complex problems in a structured way. Specifically, students will learn to i) view problems through multiple lenses and think across disciplines to understand and define problems; ii) extract important information from a complex situation; iii) develop the ability to model these problems in a quantitative manner using tools in Excel; iv) learn linear optimization techniques for problems with multiple decisions and constraints; v) find out how to examine assumptions and biases that often distort decisions and understand risk in uncertain decision making environments; and vi) learn how to use decision trees to inform the analysis of situations with uncertainty. The course will survey a variety of management decision problems arising in finance, marketing, operations, and public policy. For certain sessions, students will be asked to bring their laptops to class in order to participate in quantitative exercises.

## COURSE REQUIREMENTS AND SPECIFIC GRADING POLICY

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### Course Requirements

<b>Homework Problem Sets (HW)</b> Please submit your homework on Canvas. Although you are encouraged to discuss the problems with your classmates, you are expected to turn in your own work. You will learn more by trying the problems on your own. Even if you get help from others, you should make sure you understand and can reproduce what you are turning in. Some problems will be done in teams. Late homework submissions will receive a grade of zero.	See “Detailed outline of class sessions” for due dates	30%
<b>Participation and Attendance</b>	Every class session	15%
<b>Final Exam</b> (closed-book, closed-notes; basic calculators will be provided; laptops and mobile devices not allowed)	<b>Tuesday, October 15, 9:00AM-12:00 noon</b>	55%

## DESCRIPTIONS OF ASSIGNMENTS/PROJECTS

**Homework Problem Sets** See “Detailed outline of class sessions”

## DETAILED OUTLINE OF CLASS SESSIONS

Class	Date	Topics	Readings	Submit (before 10:10AM)
1	Mon/Tue Aug 26/27	<ul style="list-style-type: none"> <li>Human vs. statistical decision making</li> </ul>		
2	Wed/Thu Aug 28/29	<ul style="list-style-type: none"> <li>Introduction to constrained optimization and linear programming</li> </ul>	<p><b>PMS Sections 3.1-3.4</b> (for reference)</p> <p><b>Please complete before class the exercise at <a href="#">MGT 405: Decision Making Exercise</a>.</b></p>	
3	Fri/Tue Aug 30/ Sep 03	<ul style="list-style-type: none"> <li>LP geometry</li> <li>LP sensitivity analysis; shadow prices</li> <li><i>Fabulous Nuts</i> problem</li> </ul>	<p><b>PMS Sections 3.7</b> (for reference)</p> <p><b>Self-study assignment #0</b> (Class #2 Lecture Notes Appendix; pp. 16-26): Build spreadsheet solution.</p> <p><b><a href="#">Fabulous Nuts</a></b>: We'll discuss this problem in class.</p>	
4	Wed/Thu Sep 04/05	<ul style="list-style-type: none"> <li>LP formulations: applications to production, transportation, and multi-period planning.</li> <li><i>GlobChem</i> problem</li> </ul>	<p><b>PMS Sections 3.7, 4.1*, 4.5*, 4.7*</b> (for reference): Starting with today's class, we will cover a number of examples to illustrate LP applications in a variety of managerial problems. (*PMS Chap 4 available from CSSI Library)</p> <p><b>Lecture Notes from Class #3: <i>GlobChem</i></b>: We'll discuss this problem in class.</p>	
5	Mon/Tue Sep 09/10	<ul style="list-style-type: none"> <li>How to approach complexity</li> </ul>	Read and prepare group response to <b>Airline Exercise</b>	HW #1
6	Wed/Thu Sep 11/12	<ul style="list-style-type: none"> <li>LP formulations: applications to investment planning and term-structure analysis</li> </ul>	<b>Lecture Notes from Class #4: <i>Real Estate Development Investment</i></b> : Please come prepared to discuss the case described at the end of Lecture Notes for Class 4.	
7	Mon/Tue Sep 16/17	<ul style="list-style-type: none"> <li>Integer programming</li> <li>Plant location</li> <li>Currency arbitrage</li> </ul>	<b>Lecture notes</b> to be provided on Canvas.	HW #2
8	Wed/Thu Sep 18/19	<ul style="list-style-type: none"> <li>How to aggregate information from a group of people</li> </ul>	<b>Lecture notes</b> to be provided on Canvas.	
9	Mon/Tue Sep 23/24	<ul style="list-style-type: none"> <li>Improving our habits in risky decisions</li> </ul>	<b>Read “Hidden Traps,” HBR.</b>	HW #3

Class	Date	Topics	Readings	Submit (before 10:10AM)
10	Wed/Thu Sep 25/26	<ul style="list-style-type: none"> <li>Decisions under uncertainty: decision trees, backward induction</li> <li><i>Freemark Abbey</i> case</li> </ul>	<b>PMS Sections 10.1-10.2</b> (for reference) <b>Read the case <i>Freemark Abbey Winery</i> before class</b>	
11	Mon/Tue Sep 30/ Oct 01	<ul style="list-style-type: none"> <li>Ethical considerations</li> </ul>	<b>Lecture notes</b> to be provided on Canvas.	
12	Wed/Thu Oct 02/03	<ul style="list-style-type: none"> <li>How to use information</li> </ul>	<b>Read and prepare group response to <i>Carter Racing</i> case</b> <b>Read “Even Swaps,” HBR</b>	
13	Mon/Tue Oct 07/08	<ul style="list-style-type: none"> <li>Incorporating new information in decisions under uncertainty; Bayes’ Rule</li> </ul>	<b>Lecture notes</b> to be provided on Canvas.	
14	Wed/Thu Oct 09/10	<ul style="list-style-type: none"> <li>Decision making process for product line extension; sensitivity analysis of assumptions for exploring outcome scenarios.</li> </ul>	Read <b><i>Mountain Man Brewing Co.</i></b> case and do analysis for Homework 5	HW #4

**Final Exam: Tuesday, October 15, 9:00AM-12:00 noon.**

## YALE SOM HONOR CODE

### Guiding Principles

Honesty is fundamental to the profession and practice of management. It is therefore the bedrock premise of management education at Yale. To the community of students, faculty, and staff of the Yale School of Management, honesty and integrity build the trust essential to a free and lively exchange of ideas.

- The Yale SOM Honor Code is intended to foster the School’s exceptional learning environment and to support conduct that will distinguish the faculty, staff, and students in their lives as managers, at school, at school-related functions, and in the larger management community. The Honor Code will be referred to as the “Code” hereafter.
- The Honor Committee has jurisdiction over all Code violations including matters of academic dishonesty and egregious violations of the social and professional norms of behavior.

### Academic Integrity

The Yale SOM community, including faculty, staff, and students, supports the highest standards of academic integrity. All academic work affords an unparalleled opportunity to put forward new and innovative ideas; at SOM, we aspire to always acknowledge the ideas upon which new solutions are based.

When working on any assignment with a team, students must clarify the expectations for each member of the team.

- Faculty will provide clear guidelines for students on the parameters of any group work, as well as guidelines for proper citation.
- A student will contact the professor for clarification if there is a question about the way in which the group work is to be completed.
- Students are encouraged to consult print resources as well as online resources, available on the SOM portal, concerning proper citation.

### **Community Standards**

A hallmark of the Yale SOM community is its inclusive nature, which respects the diverse backgrounds and views of its members. SOM faculty, students, and alumni aspire to standards of conduct while at Yale, and as they function in the larger management community, that will further distinguish SOM as a center of integrity and fair dealing.

- Students must uphold, among themselves, the highest standards of professional behavior.
- Students must strictly adhere to ethical guidelines during the job search—with interviewers, prospective employers, and their student colleagues.
- Students must remember that they represent the School as they take part in activities in the University, New Haven, and the larger management community.
- Standards of individual responsibility in the job search, and in the use of School and University information technology resources, are detailed under Policies and Guidelines of the Career Development Office and Policies on the Use of Information Technology Facilities in this chapter.

## **GENERAL STATEMENTS**

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### **Attendance**

You are expected to attend classes regularly, be on time, and be prepared to contribute to class discussion. If religious observance, illness, or a personal emergency will prevent you from attending a class, the instructor and the Dean of Students should be informed in advance whenever possible. If the circumstances make advance notice impossible, an e-mail as soon as possible after the missed class is the next best alternative. You must make arrangements with a classmate to get notes and copies of class handouts.

- If you must leave town for a personal or family emergency, or will be out of class for an extended period because of illness, you must first contact the Dean of Students.
- Using cell phones, browsing the Internet, or reading e-mail during class distracts your classmates and the instructor and diminishes the learning experience. Cell phones and other electronic devices are to be turned off during class. Laptops and tablets are not to be used in the classroom unless explicitly permitted by the instructor.

### **Course Recording**

During this course, recordings may be made during regular meeting times and at other times as announced. The purpose of these recordings is to permit viewing by students with excused absences, for student review of classroom presentations and discussion as approved by the instructor, and for use by the instructor to review classroom activity during the course. Only students registered in the course may view the recordings. No other use or distribution is allowed. By registering for and attending this course, you agree to the making of these recordings and their distribution and use as described above.

**Course Recording Request**

If the observance of a major religious holiday will prevent a student from attending class, the student should inform AASL in advance. In the case of an involuntary hospitalization, the student should inform AASL in advance if possible. Students missing class for these reasons may request to have core courses recorded. Classes missed for other reasons, including illness, job interviews, or other personal or professional commitments, will not be recorded. Core courses will be recorded only if the instructor is willing to grant permission for video or audio recording. Please see the SOM Bulletin for further information on course recording request at <http://bulletin.printer.yale.edu/htmlfiles/som/index.html>.

**Laptop/Device Policy**

Usage not allowed without the express permission of the instructor.