

AMOS TUCK SCHOOL OF BUSINESS ADMINISTRATION

Dartmouth College

**THE ART OF MODELING**

"The purpose of modeling is *insight*, not *numbers*."

-Art Geoffrion

September 2010 Professor Stephen Powell

The **art of modeling** involves structuring and analyzing a business problem to arrive at compelling insights that help build organizational commitment to action. As in any problem-solving challenge, the analyst must balance the *usefulness* of the solution (for example, the power and credibility of the insights generated) with the *tractability* of the approach (that is, the analysis must be completed within time and resource constraints).

This art is an increasingly vital skill for decision-makers to master. Leaders in both the private and public sectors must make decisions despite a high degree of uncertainty. Well-constructed models facilitate these decisions by capturing and clearly illustrating the impact of critical factors, and facilitating high-quality discussion focused on the most important risks and tradeoffs.

Practical experience in this art is essential -- whether you expect to create your own models, coach an analyst to create models for you, or simply use models built by others in your decision making. In either case, improving problem-solving skills through modeling will improve your ability to lead an organization through a wide variety of decision-making challenges – from rapid-fire problems requiring “quick and dirty” analysis, to strategic conundrums requiring extensive investigation. In both cases, a skilled practitioner will conceive efficient paths to the solution, and effectively communicate how to get there.

The primary objective of this course is to enable the student to develop facility in generating insights via modeling in a variety of realistic situations. The skills needed to be a successful modeler include the ability to recognize the key problem in a situation, the skill to develop a structure for analyzing the problem, the ability to carry out a cogent analysis, and the mental flexibility to present the analysis and insights to interested parties in a convincing, non-technical manner. The course is designed to be useful for any student, regardless of background or career plans. The skills developed here are vital to anyone helping organizations to navigate a course through uncertain and uncharted territory.

Through a series of practical exercises the student will develop these analytic and presentation skills. The course will also reinforce the quantitative analysis skills acquired in the first year. This is not, however, a course in formal quantitative modeling techniques. It builds on first year quantitative analysis methods but its focus is on tailoring the analysis to the problem at hand and the available time and resources.

**Honor Principle**

Each student is expected to work independently of other class members and other students on the modeling cases, except within assigned teams. Teams are specifically prohibited from working together. Students are encouraged to seek outside assistance for gathering *facts* relevant to the cases, but not to use assistance in the process of modeling and analysis. The instructor will be available to work with students on the modeling and analysis aspects of the cases. Students are *encouraged* to discuss their work with the instructor.

**Attendance**

*Each student is expected to attend every class.* If an absence is unavoidable, the instructor should be notified well in advance and appropriate arrangements made jointly by the student and instructors.

**Office Hours**
Students will be assigned to teams of two for major projects on Weeks 2, 3, and 4. Each team will be required to attend office hours scheduled flexibly on Monday and Tuesday of each week.

**Course Materials**

There is no text for this course. Modeling cases will be made available in class as needed.

Students will be expected to use *Excel* and *Risk Solver Platform* on their laptops. Laptops should be brought to each class.

# Grading

The grade in this course will be based on class participation and three team modeling assignments.

Class participation 25%

MediDevice 25%

National Leasing 25%

Draft Commercials 25%

DAILY PLAN

# Date Topic Preparation

**------------------------------------------------------------------------------------------------------------------------------**

9/16 **Introduction to Modeling** **Preparation:**

Read Modeling for Insight pp. 11-26. (coursepack)

 **Topics:**

 -course introduction

 -ill-structured problems

 -modeling process

 -modeling tools

 -influence diagrams

**------------------------------------------------------------------------------------------------------------------------------**

9/17 **Problem Framing and Diagramming Preparation:**

 Read the Red Cross case.

 Frame the problem and create an influence diagram.

 **Topics:**

 -framing an ill-structured problem

 -creating influence diagrams

 -prototyping

**------------------------------------------------------------------------------------------------------------------------------**

**SEPTEMBER 20-21 REQUIRED OFFICE HOURS**

**------------------------------------------------------------------------------------------------------------------------------**

9/22 **Generating Insights Preparation:**

 Prepare presentation to Red Cross management.

 **Topics:**

 -iterative model building

 -generating insights

 -presentation standards

**------------------------------------------------------------------------------------------------------------------------------**

9/23 **MediDevice (A)** **Preparation:**

 Prepare MediDevice (A)

 **Topics:**

 -problem framing

 -influence diagrams

**------------------------------------------------------------------------------------------------------------------------------**

**SEPTEMBER 27-28 REQUIRED OFFICE HOURS**

**------------------------------------------------------------------------------------------------------------------------------**

9/29 **MediDevice (B)** **Preparation:**

Prepare presentation to MediDevice Management.

 **Topics:**

 -iterative model building

 -generating insights

**------------------------------------------------------------------------------------------------------------------------------**

**------------------------------------------------------------------------------------------------------------------------------**

9/30 **National Leasing, Inc. (A)** **Preparation:**

 Prepare National Leasing (A)

 **Topics:**

 -problem framing

 -influence diagrams

**------------------------------------------------------------------------------------------------------------------------------**

**OCTOBER 4-5 REQUIRED OFFICE HOURS**

**------------------------------------------------------------------------------------------------------------------------------**

10/6 **National Leasing, Inc.** **Preparation:**

Prepare presentation to National Leasing management.

 **Topics:**

 -modeling process

 -presentations

**------------------------------------------------------------------------------------------------------------------------------**

10/7 **Draft Commercials** **Preparation:**

Prepare Draft Commercials

 **Topics:**

 -problem framing

 -influence diagrams

**------------------------------------------------------------------------------------------------------------------------------**

10/13 **Draft Commercials** **Preparation:**

Prepare presentation to Commercials management.

 **Topics:**

 -modeling process

 -presentations