MgtSci 7222

Simulation, Risk Analysis, and Decision Making

Spring 2018

Tue/Thu 2:45-4:15	OR	Thu 6:15-9:30
Schoenbaum 219		

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INTRODUCTION

There are a number of tools and methodologies to help managers analyze decisions. Optimization methods such as linear programming are the most powerful because they can sift through often innumerable alternatives and help identify the ones that offer the best performance for a chosen objective such as profit or cost. Unfortunately, these techniques require certain simplifying assumptions such as using mathematical relationships that are linear and data values that are known with certainty. In many situations, however, these assumptions cannot realistically be made. Delivery times of raw materials vary from one order to the next. Forecasts of future demand are uncertain. Interest rates or exchange rates may vary greatly. Plant productivity falls as throughput reaches capacity. Synergies among advertising media can interact to increase demand more than either one alone. For these and many other business decisions, inherent randomness and/or complexity necessitate the use of other modeling tools. The purpose of this course is to examine, understand, and learn how to use these tools.

OVERVIEW

This course that will focus on analyzing management decisions that involve uncertainty, risk, and complexity. There will be a strong emphasis on applications and on the use of appropriate decision analysis techniques and software tools. The analytical methods to be studied will include **Monte Carlo Simulation, Forecasting** and **Decision Trees**. In analyzing decision problems in these areas, we will learn several commercial software packages: *@RISK*, and *PRECISION TREE*, both part of the Decision Tools Suite from Palisade. Class exercises and cases will be used by the instructor to provide a hands-on approach to learning how to use the software.

Students will do in-class assignments and homework using the software, and one or more small-team projects that utilize the tools and techniques covered in class.

Due to the "hands on" nature of the class, you will be using computers extensively both in and out of class.

COURSE MATERIALS:
> *<u>Note packet</u>*: This is available at the OSU bookstore. It contains all the notes and
> handouts needed for the course
> *<u>Software</u>*: **DecisionTools Suite** – Palisade Software Inc.
> Includes: @RISK®, PrecisionTree®, StatTools®
> This software will be available in the Fisher computer labs.
> MBA students should have their own copy that accompanied the textbook from
> MBA6271, MBA6273. Other students can purchase a student version for use
> outside the labs, if desired.

COURSE OBJECTIVES

It is our expectation that, after this class, students will be able to analyze real world problems using these tools and techniques and will be able to effectively utilize the software packages listed above.

GRADING

I will regularly assign small homework problems which must be uploaded to the Carmen Dropbox by <u>Noon</u> on the day due. Homework assignments will always be posted on Carmen Announcements.

The effectiveness of your contribution to classroom discussions will be the main component in assessing your class participation.

A primary part of the course evaluation is your work on three assessments. These will involve Monte Carlo simulation, decision trees, and forecasting.

Finally, there will be a team project. Teams of four to five students will develop two business cases applying the methods studied to a realistic decision problem.

Course Evaluation:

Decision Trees (*Precision Tree*) Assessment	20%
Monte Carlo (*@Risk*) Assessment	20%
Forecasting (*StatTools*) Assessment	25%
Homework	10%
Class Contribution	5%
Team project	<u>20%</u>
Total	100%

PREREQUISITES

MBA6271 or MBA6273