

**BUDT 725: Models and Applications in Operations Research  
Syllabus for Fall 2004**

- When: TuTh 3:30 – 4:45 pm
- Where: VMH 1415
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- Texts: \* **Mastering Data Mining** by M. Berry and G. Linoff, John Wiley & Sons (2000), available at both the University Book Center (in the Stamp Student Union) and the Maryland Book Exchange.
- \* Two volumes of overhead slides and research articles are available for purchase at the University Book Center (in the Stamp Student Union) beginning Friday, August 27<sup>th</sup>.
- Electronic Access: \* Once you purchase a hard copy of your course packs, you will be able to access your course pack materials online, as well. To do this, visit [www.xanedu.com](http://www.xanedu.com) and create a user name and password. More detailed instructions, and the 16-digit code you will need to verify your identity, are enclosed in the paper course pack.

- \* The course syllabus can also be found online via the R.H. Smith “Blackboard” tool. Visit <http://bb.rhsmith.umd.edu> and login with your University Directory (LDAP) login name.

### Overview

The course is designed as an introduction to the field of operations research/management science (OR/MS). It introduces the student to a variety of valuable analytical and quantitative skills. The focus will be on applications, data analysis, and decision making. It is not our intent to train OR/MS theoreticians in this course. Neither is it our intent to survey the broad field of OR/MS.

Rather, we will focus on several topics, three in some detail. First, we will apply data mining to problems in marketing, such as customer relationship management. Second, we will learn a little about logistics and vehicle routing. Finally, we will study the widely applicable analytic hierarchy process (AHP), a process for facilitating complex decision making.

### Software Packages

We will use Clementine for data mining and Expert Choice for AHP. Both packages have been installed on all computers in the Smith School’s Laboratories. All Smith School students are welcome to use the Open Computer Lab in Van Munching Hall room 1572. Graduate students are also welcome to use the Graduate Computer Lab in Van Munching Hall room 3515. Information about computer lab hours can be found at: <http://www.rhsmith.umd.edu/labs>.

### Grades

Your final grade will be determined on the basis of a single composite score based on the following components:

Class Participation:	10%
Homework:	30%
Mid-term Exam:	30%
<u>Project:</u>	<u>30%</u>
Total:	100%

The course grades will be determined by comparing your composite score to those of your classmates, as well as some absolute standards of performance. I expect that the top 40 to 50% of the class will receive an “A” and most other students will receive a grade of “B”. Grades lower than “B” will be assigned, reluctantly, to students who perform significantly below the class average.

## The Team Concept

The class will be organized into teams of 2 or 3 students each. These teams will be assembled by the instructor. Team members are encouraged to sit together in class. They will work on homework assignments and the course project together. New teams will be assigned after the mid-term exam. The purpose is to encourage development of teamwork skills and learning and to make the course more enjoyable. It is important to note that most OR/MS studies are products of team effort.

## Homework Assignments

There will be between 6 and 10 homework assignments. These will typically be assigned on Thursday and due at the start of class the following Thursday. No late assignments will be accepted. Assignments should be neat and legible, with papers stapled or clipped together. Homework will be worked on and turned in by teams (one submission per team).

## Mid-term Exam

The mid-term exam will be closed-book, closed-notes. You are encouraged to prepare for the exam as a team, however, you will take the exam individually. The exam date and the topics covered will be announced well in advance. The exam must be taken on the day scheduled. If you cannot take the exam due to a serious and verifiable illness or emergency, notify me in advance so that appropriate arrangements can be made.

## The Course Project

The course project will involve a sophisticated application of AHP. Each team will be expected to prepare a written report along with a poster presentation. You will have about a month to work on the project and it will be due during the final week or two of the semester.

## Class Participation

Class participation will be graded subjectively. I want each student to come to class and to contribute. You will be given a variety of opportunities to do so.

## Sequence of Coverage

1. Data Mining/CRM
2. Logistics/vehicle routing
3. AHP

## Special Features

1. Panel discussion on data mining by leading practitioners from MD, DC, and VA
2. Leading experts in logistics and AHP will speak in class
3. Team Project Poster Session
4. Prizes to members of winning team

## Other Course Policies

1. The University's Code of Academic Integrity is designed to ensure that the principles of academic honesty and integrity are upheld. All students are expected to adhere to this Code. The Smith School does not tolerate academic dishonesty. All acts of academic dishonesty will be dealt with in accordance with the provisions of this Code. Please visit the following website for more information on the University's Code of Academic Integrity: <http://www.studenthonorcouncil.umd.edu/code.html>

On each exam or assignment, you will be asked to write out and sign the following pledge: *"I pledge on my honor that I have not given or received any unauthorized assistance on this exam/assignment."*

2. Any student with special needs should bring this to my attention as soon as possible, but not later than the second week of class.

## Key Dates

To be announced.

## References

1. V. Dhar and R. Stein, *Seven Methods for Transforming Corporate Data into Business Intelligence*, Prentice Hall, 1997.
2. B. Golden, E. Wasil, and P. Harker, *The Analytic Hierarchy Process*, Springer-Verlag, 1989.
3. A. Mercer, M.F. Cantley, and G.K. Rand, *Operational Distribution Research: Innovative Case Studies*, Halstead Press, 1978.

## Web Sites

1. Expert Choice, Inc. (<http://www.expertchoice.com/>)
2. INFORMS Online (<http://www.informs.org/>)
3. KDnuggets (<http://www.kdnuggets.com/>)