IFSM 425 - Fall 2002
Decision Support Systems

Instructor: Dr. Dongsong Zhang
Class time:

Session #	Lecture (ACIV-B Rm. 150)	Lab (Physics Rm. 226)
0201	Tuesday, 11:00am – 12:45pm	Tuesday, 1:00pm – 2:15pm
0202		Thursday, 1:00pm – 2:15pm

Office: Academic IV-B Wing Room 444
Phone: (410) 455-2851
E-mail: zhangd@umbc.edu
Class Website URL: **http://blackboard.umbc.edu**
Office Hours: Tuesday & Thursday 3:00pm – 5:00pm

Course Description

This course provides an overview of the theoretical and practical aspects of decision support systems (DSS). The course can be broadly divided into three areas. The first part concentrates on the managerial aspects of decision making, the role of automation in decision making, and techniques for DSS development. The second section discusses the design and development of decision support systems, with an emphasis on data management and decision modeling and the impact of Management Support Systems on organizations and individuals. The last section of the course addresses specialized decision support tools such as Enterprise DSS, group support systems, and expert systems.

Learning Objectives

Following completion of this course, the student should be able to: a) be familiar with basic concepts in decision support systems; b) understand the strengths and limitations of human decision-making behavior; c) distinguish among individual, group and organizational decision making and related decision support systems; d) understand and use basic decision models and related automated tools; e) understand and apply the fundamentals of decision support systems design and development; and f) gain a preliminary understanding of special decision support systems tools and techniques; g) have some hands-on experience by developing a small-scale decision support system.

Required Textbook

Decision Support and Expert Systems: Management Support Systems, 6th ed. by Efraim Turban and Jay E. Aronson, Prentice Hall, 2000

Recommended Materials

VBA for Modelers: Developing Decision Support Systems with Microsoft ®Excel by S. Christian Albright, Thompson Learning, 2001. For students who wish to learn VBA in more detail or get insights into how Excel and VBA may be used to support decision making, this book should prove valuable. It will be used in the lab sessions.

Microsoft EXCEL 2000 Power Programming with VBA by John Walkenbach. IDG Books Worldwide, Inc., 1999. This is a book appropriate for VBA beginners.

Prerequisites

Required courses are IFSM 202, 300, 410, and ECAD 210.

Class Format

This course will use lectures and labs as the primary learning formats. Lectures are on every Tuesday from 11:30am to 12:45pm and will typically take the form of some presentation of theoretical material and class discussion. We will also use this time to get periodic updates from teams on the progress of their projects so all class members can share successes and challenges of each team.

Lab sessions will be on Tuesdays and Thursdays and will provide "hands-on" instruction on DSS software, exercises, and discussion of issues presented in the lectures.

It is important to read the assigned material before attending class. I strongly encourage students to come to the class and participate actively in class discussions. Such participation brings additional perspective to classroom discussion and ideally makes the lecture and lab time more interesting for all participants.

I expect that we all show mutual respect for each other in the learning process during lecture and labs. In this context, mutual respect includes beginning and concluding the class on time, turning off cell phone ringers, pagers, and beepers, and allowing all members of the class to participate in dialogue without interruption or distraction. Adopting these practices is intended to minimize disruption to class discussion and dialogue and maximize the value of the class for all participants. PLEASE: no food is allowed in the class. Thanks.

Lab Policies

You will be allowed to attend only those lab sessions to which you are assigned because of the limited seats and management issues. If you miss a lab session, you will not be

able to attend the session for another group unless you present a good reason to the instructor **in advance**. PLEASE: no food and drinks are allowed in the lab. Thanks.

Course Grading

Exam 1	20%
Exam 2	20%
Exam 3	20%
DSS Project	35%
Class/Lab Participation/Peer evaluation	5%

Grading reflects the instructor's objective judgment based on your course performance. Peer evaluations of individual contributions to the DSS projects will be considered. The requirements of DSS project discussed below describe how the peer evaluation process will work in the general comments section. If you have a question about a grade on an exam, please see me during office hours after the grade is released. I would re-grade the **entire** exam instead of individual questions.

Students may meet with me to get feedback regarding their performance throughout the semester. It is important to understand that the grade reflects academic achievement. While I will always correct mistakes in the arithmetic computation of grades, final letter grades are not negotiable and I will not entertain challenges to final letter grades.

The IFSM department has adopted the following grading policy for undergraduate courses. Depending on the size of the class and distribution of the numerical marks, the letter grades of this course will likely be distributed as follows with the parenthetical description of the grade being taken verbatim from the undergraduate catalogue:

Top 15-20% A (superior achievement)
Next 20-30% B (good performance)
Next 35-40% C (adequate performance)
The balance of grades will be Ds, Fs, or Drops.

Exams

All exams will be taken in the regular classroom (ACIV B Wing, room 150) during the class time. Exam questions will consist of primarily multiple choice and questions that require brief essay type answers. Make-up exams are NOT given except under extreme circumstances, and only when the instructor gives permission IN ADVANCE.

Projects

You are required to complete a team project during the semester using DSS software. You should consider developing a plan for the effective management of your project since the project gets very intense at the end of the semester. I advise you to stay well ahead of the due date for deliverables so that the final project report and integration of project components runs smoothly. Project teams should generally consist of no less than 3 and no more than 4 members.

Fall 2002 Important Dates of University

Sept. 11   Last day to register
Sept. 25   Last day to change from regular grade to audit
Nov. 6   Last day to drop a class
Dec. 10   Last day of classes
Jan. 02   Final grades due

Statement On Academic Integrity

By enrolling in this course, each student assumes the responsibilities of an active participant in UMBC's scholarly community in which everyone's academic work and behavior are held to the highest standards of honesty and integrity. Cheating, fabrication, plagiarism, and helping others to commit these acts are all forms of academic dishonesty and they are wrong. The instructor takes academic integrity very seriously. Academic misconduct will result in disciplinary consequences including getting zero in an exam, failure of the course, suspension or dismissal. Acts of Academic Misconduct are defined as the following:
- **Cheating:** Knowingly using or attempting to use unauthorized material, information, or study aids in any academic exercise.
- **Fabrication:** Intentional and unauthorized falsification or invention of any information or citation in an academic exercise.
- **Facilitating Academic Dishonesty:** Intentionally or knowingly helping or attempting to help another commit an act of academic dishonesty.
- **Plagiarism:** Knowingly representing the words or ideas of another as one's own in any academic exercise, including works of art and computer-generated information/ images.

To read the full policy on academic integrity, consult the UMBC Student Handbook, Faculty Handbook, or the UMBC Policies section of the UMBC Directory.

DSS Project Requirements

As a part of the requirements for this course, each student will participate in a semester-long project involving the design and implementation of a Decision Support System

(DSS). The goals of this project include the reinforcement of lecture material concerning decision-making and DSS development, practical experience in the design and implementation of a DSS, and exposure to technological tools used to create a DSS in organizations.

Your DSS will be developed in Microsoft Excel and will require some knowledge of simple Visual Basic commands. However, you are free to use any other programming languages, provided the project satisfies the minimum requirements. **If you not proficient in Excel or VBA, you are expected to put in a significant amount of time to practice on your own to learn the software and programming language.**

You may use several sources for the project - your work place, one of the departments in the university, businesses such as grocery or video stores that you visit, or any other institution such as a hospital or a school. The main criterion is that you need to identify a decision situation that will benefit from the development of this system.

Your DSS will contain three primary components:
1) A model that will essentially replicate the decision model or could be used by the decision maker;
2) A data store: a database that contains base data on which your DSS can be tested; and
3) An interface that should be easy for users to use and work with and helps to integrate the model and data store.

1. Creation of Project Teams
Due Date: 5pm, 09/06/02
Students are expected to create project groups by your own. Each group consists of either 3 or 4 students **from the same lab session**. Once a group is determined, a representative of the group should send the instructor an email, listing names of all group members. All groups are expected to send group information to the instructor by email no later than 5pm, September 2002.

2. Project Proposals
Due Dates: 10/01/02, collected at the beginning of the class
Each group may submit up to 2 proposals for the DSS project. The project proposals should contain **details** of the following:
1) An analytical problem or a decision situation that will be supported by the system you are designing should be described. It must clearly establish the need for a decision support system. In other words, you have to convince managers of an organization that it is worthwhile to invest time and money in developing your proposed system. You might want to include specific justifications such as consistent decisions, faster decisions or better decisions leading to improved organizational performance. 2) Expected input(s) and output of your future DSS. In other words, what can your proposed decision support system offer?

Requirements
Each project proposal should look professional (i.e., neatly typed, well written, free of

typos, and organized into logical sections). Your project proposal and the rest of the components that will follow must be turned in to the instructor in a folder. The instructor will suggest the most suitable proposal for this project from the two alternatives. You should specify your preference between the two proposals. This deliverable will be returned the following week along with the instructor's comments during your lab session. The **format** of the proposal: each proposal should be typed or printed on A4 size paper with 1~ 2 pages long. Hand-written proposals will not be accepted. Please use 11 or 12 font size, with 1.5 line spacing.

3. DSS Models and Database

Due Dates: Nov. 5, collected at the beginning of the class

All DSS require a decision model. These models may be mathematical models such as the Expected Value or Expected Utility models that will be discussed in class. These models may also be based on qualitative judgment and can be coded as rules such as "If GPA is greater than 3.0 and GRE is greater than 1200 then admit the student into the graduate program".

This deliverable will require you to develop your DSS model using Microsoft Excel. You may use a model that has been discussed in class or you may use a model currently being used at the decision location. You must, however, have the instructors approve your model.

To ensure that the model is working correctly, you must also have created a database of some sorts in Excel. Your model must be able to pull data from this database and work the model to suggest a solution. Alternatively, you might want to create a model that prompts the user for some input and makes a suggestion or decision based on this input.

Requirements

For this deliverable, each group should submit the following:
1) A diskette containing the model and the database;
2) Printouts of the worksheet areas and cell contents; and
3) A three to four-page write-up that includes a description of your decision model chosen to represent the problem and data.

Once again your work must be neatly typed and organized, well written and illustrated wherever required, and presented in a folder along with the previous deliverables and the instructors' comments/evaluation sheets. Previous written format still applies. Use 11 or 12 font size, with 1.5 line spacing.

4. Final Project Reports/Documentation

Due Date: 5:00pm, 12/11/02. Submit to my office or department front desk

For this deliverable, you will be compiling all the work done in the past few weeks and will be putting together a report that contains previous documentation, a system manual, and user manual. The user manual is intended to support the user in his/her ability to maneuver through the system. It should be simple to read and should give a tour of the system to the user and provide some guidelines for trouble-shooting. The system

documentation is intended for future systems analysts who will be working on this system. The purpose of this manual is to provide the technical background of the system in terms of the hardware and software platform, the files that form the basis of the system, and any technical troubleshooting guidelines.

Requirements
a) A diskette with integrated DSS including a decision model, database(s), and the interface component
b) A complete system documentation, including a set of appropriate "screen shots", cell contents, and code;
c) A comprehensive user manual.

The standards of neatness, organization, and quality discussed above apply to this deliverable as well. Use 11 or 12 font size, with 1.5 line spacing.

5. Project Presentations in Lab sessions
Due Date: 12/03/02 (session 0201) and 12/05/02 (session 0202)
Each group will have approximately 10 – 12 minutes to present their DSS to the rest of the class. The presentation will be a part of the project grade. It is expected that the presenter(s) appear professional and the material is well organized. The goal of the presentation is to share your work and reflect on the knowledge you acquired concerning decision-making and DSS development.

General Comments
Group and Individual Contribution: Since you will be working in groups, peer evaluations will be used at the end of the semester to evaluate individual performance within a group. The results of these peer evaluations will have an impact on individual grades. If there are group issues that arise, please address them as early as possible. I do not take group incompatibility as an excuse for poor performance at the end of the semester.

Organizing your projects: It is very important that you plan your progress on the project well in advance. Previous students have encountered a range of last-moment problems such as lab machines are down just when you need them, diskettes get corrupted at the last moment, and more importantly, group members do not bring in their projects in time. If you plan your work well, such disruptions will not have a significant impact. Develop a working plan at the beginning of the semester on how you expect your project to progress in the semester and review it each week. Your target should be to have all the components of a deliverable together in working condition at least 4-5 days before the due date.

Revising Your Deliverables: Since there are several opportunities for feedback as the project progresses, it is expected that any suggestions and improvements identified by the instructors will be considered for incorporation into the next phase of the project. If any of the suggestions conflict with the overall objectives of the group, it is the group's responsibility to discuss with the course and/or the instructor. The instructor will keep a

running record of progress on the group projects including comments and suggestions made in reference to earlier phases of the project

Quality of Work: All of your reports must be neatly typed and organized. Take this to be a report that you will be submitting to management for approval. I allocate at least 10 to 20% of the grade for each deliverable to the quality of presentation of your documentation and your electronic files. It would be better to create two sets of files - one containing a copy for yourself and the other for the instructor. You may also choose to maintain a copy for each group member.

Your grade will depend on the quality of your work. By "Quality" I mean 'conformance to requirements.' The following features will give you some guideline on how the 'quality' should be judged.
1) Alignment to Business Problem: Does your system meet the decision support needs identified in your proposal?
2) Reliability: Is your system immune to crash?
3) Error handling: Does your system generate meaningful error messages (if any) and how do you handle error?
4) User friendliness: How easy will it be to allow a novice user to get the DSS work smoothly?
5) Effectiveness and Accuracy: Does the system deliver intended analysis, recommendations and accurate results?
6) Aesthetics: Very subjective. Choice of color, tone, size of controls etc. and overall consistency with the goal of the DSS?

Late Submissions:
Late project deliverables submitted within 48 hours after a scheduled deadline will be assessed 40% penalty. After 48 hours, no deliverables will be accepted and the corresponding grade for that deliverable will be zero.

Tentative Class Schedule

Date	Topic	Readings	Due Dates
9/3	Introduction & Syllabus		
9/10	Introductions & MSS Overview	Chapter 1	
9/17	Decision Making, Systems, Modeling and Support	Chapter 2	
9/24	DSS Overview	Chapter 3	
10/1	DSS Development	Chapter 6	**Project Proposals**
10/8	**Exam 1**	**Chapters 1,2,3,6**	
10/15	Data Management	Chapter 4	
10/22	Modeling and Analysis	Chapter 5	
10/29	Modeling and Analysis (cont.)	Chapter 5	
11/5	Knowledge Management	Chapter 9	**Database and Model Report**
11/12	**Exam 2**	**Chapters 4, 5, 9**	
11/19	Group Support Systems	Chapter 7	
11/26	Enterprise DSS	Chapter 8	
12/3	AI and Expert Systems	Chapter 10	**Project Presentation**
12/10	**Exam 3 (Last day of the class)**	**Chapters 7, 8, 10**	
12/12			**Final Project Reports**