

MGMT 560: Management and Decision Science

**Course Time: Thursdays 6pm-10pm, Oct 22, Oct 29, Nov 5, Nov 12, Nov 19,
Dec 3, Dec 10**

Course Description

Leaders must be able to use advanced quantitative techniques to make informed decisions for an organization. This course provides an introduction to quantitative techniques used in management decisions. Learners will take an in depth look at quantitative tools to make decisions on topics such as transporting goods around a network, assigning projects, project management, minimizing waiting time, and decision making under uncertainty.

Course Facilitator

James Murray, Ph.D.

Office: Murphy Center 505 (enter through room 501)

Office phone: 608-796-3365

Mobile phone: 608-738-5408

Email: jmmurray@viterbo.edu

Textbook

Taylor, B.W. (2007). *Introduction to Management Science (9th Edition)*, Upper Saddle River, NJ: Pearson Prentice Hall.

This is an excellent, well written, textbook that dives in depth into a number of quantitative tools used in management science. Every chapter of the textbook goes into great detail about how to conduct the analysis using Microsoft Excel. Every chapter has a number of problems and case studies that accompany the chapter's ideas.

Course Outcomes

The following MBA program-level outcomes will be refined in this course:

- Use critical and integrative thinking along with appropriate technical and quantitative tools to identify and solve complex business problems.
- Communicate with a high level of professionalism

Upon completion of the course, each learner will also have demonstrated the ability to:

- Understand use of unique quantitative tools applied to business decisions.
- Identify and apply the appropriate decision making tools for specific problems.
- Support the use of selected approaches and identify strengths and weaknesses of such approaches.

- Demonstrate the use of management science tools in an application-oriented approach to business problem solving.

Assessment

The learning outcomes will be assessed through weekly quizzes, homework, presentations, and critical analysis of original research in management science. The grading breakdown will be:

Quizzes (1 each week - 7 total): 50%

Article critique presentation: 20%

Weekly homework: 10%

Case problem presentation: 10%

Attitude/Attendance/Participation: 10%

Weekly Quizzes

An in-class quiz will be given every week, including the first week of class. Adequate preparation for the quiz will involve reading ahead for class and completing weekly homework assignments. Classes will begin with your questions so that you can resolve any problems with assigned work before the quiz begins. All quizzes are open book / open note.

Weekly Homework

You will be given weekly homework assignments from your textbook that will help you develop your skills to applying quantitative techniques to real life business problems. As this is a challenging quantitative course, I expect that homework assignments may take a lot of time, and you may not be able to figure out everything on your own. Therefore, make sure you give plenty of time throughout the week to your assigned work and ask your instructor questions when you have them. The homework assignments are graded on effort.

Case Problem Presentation

Every chapter has one or two case problems at the end that provide, sometimes fictional, business problems that can be answered using the techniques learned in the chapter. Every week we will have a group of three students present the case problem and the solution to the class. The presentation should involve the use of a PowerPoint presentation, though you may find it necessary to use other teaching methods as well. These presentations should be somewhat informal, allowing for interruption and discussion from your classmates and/or instructor. You may form your groups of three on your own and volunteer for which case problems you present. If there is a lack of volunteers, I will select a group randomly.

Article Critique Presentation

A journal article review and critique involves reading a peer-reviewed published article on any topic related to management science. The critique will be presented to the class during the last class period. The purpose of the article critique is to explore the theory and/or application of management science beyond what can otherwise be covered in this course. Good journals to find articles include (but is certainly not limited to!): *Management Science*, *Production Inventory Management Journal*, *International Journal of Applied Management Science*, *Journal of Applied Operations Research*, and *International Transactions in Operational Research*.

It is very likely that the article you choose to present differs greatly in subject matter than most of the course material. This is an intended and welcome aspect of the article critiques. While you are taking a one seven-week course on management science, it is possible to take dozens of courses on management science, and spend a lifetime, working full time on management science, staying current with the latest research and management science applications. The purpose of the article critique is to allow the learner to expand their knowledge of management science beyond the scope of the course into subjects she/he finds interesting.

You should work in groups of three for the article presentation. Your group should choose an article by the beginning of the third week of class. By the last day of class, so that everyone may benefit from every presentation, everyone should have read all the articles for all the groups. I will distribute the article titles and authors everybody chose by the fourth week of class.

Letter Grades

Grades for assignments, quizzes, and presentations will not be given a fixed number of points or percentage. Rather, assessed work will be given a letter grade (A,AB,B,BC,C,CD,D,F) according to the following Viterbo MBA policy:

- A (4.0) Superior graduate work. This indicates not only high achievement, but also an unusually high degree of initiative.
- AB (3.5) Above average graduate work.
- B (3.0) Satisfactory, average graduate work.
- BC (2.5) Less than average graduate work.
- C (2.0) Work is barely passing at the graduate level.
- CD (1.5) Failing graduate work where small improvements would lead to a passing grade.
- D (1.0) Failing graduate work where significant work would be needed to pass.
- F (0.0) Failing graduate work.

The weighted final grade will be computed using the weights given above in *Assessment* and

individual grades being given their 0.0-4.0 point scale GPA numerical values.

Attendance

If under an extreme circumstance you are not able to attend a quiz, arrangements can be made to make up the quiz at the Viterbo University learning center. Extreme circumstances may include you or an immediate family member being ill or your employer has extraordinary requirements that cause you to miss class. If such extreme circumstances are documented and can be confirmed, an arrangement can be made to make up one quiz. I follow the policy in the Viterbo University MBA handbook that states only one absence is allowed, for any reason.

Preliminary Topics Schedule

Below is a schedule for what topics we will be covering. This is a preliminary schedule though. Depending on time constraints and the topics the class finds most interesting, we may choose to not cover some of the items below, cover items that are not shown below, or re-arrange the schedule.

Week 1: Model building (Ch 1), graphical solution to linear programming, linear programming (Ch 2)

Week 2: Linear programming with Excel (Ch 3,4), Integer Programming (Ch 5).

Week 3: Transportation / Assignment Models (Ch 6), Network Flow models (Ch 7)

Week 4: Project Management (Ch 8)

Week 5: Decision Making with/without uncertainty (Ch 12)

Week 6: Queuing Analysis (Ch 13), catch-up

Week 7: Inventory Management (Ch 16), catch-up, article critique presentations.

Table 1: Class Participation Rubric

Criteria	4.0 (A)	3.0 (B)	2.0 (C)	1.0 (D)	Points
Attendance / Promptness	Learner is always prompt and attends every class.	Learner is late once or twice and misses at most one class.	Learner is late almost half the time and misses one class.	Learner is frequently late and/or misses more than one class.	
Participation	Learner actively contributes to class by offering ideas and answering questions at least three times per class.	Learner actively contributes to class by offering ideas and answering questions one or two times per class.	Learner will go through one class not offering any ideas or answering any questions.	Learner will go through more than one class not offering any ideas or answering any questions.	
Listening Skills	Learner always listens when others talk, and through participation, builds off or incorporates the ideas of others.	Learner always listens when others talk.	Learner sometimes fails to listen when others talk.	Learner often fails to listen when others talk.	
Behavior	Student never has private conversations, is disrespectful of others, nor is otherwise disruptive.	Student rarely has private conversations, is disrespectful of others, nor is otherwise disruptive.	Student occasionally has private conversations, is disrespectful of others, nor is otherwise disruptive.	Student often has private conversations, is disrespectful of others, nor is otherwise disruptive.	
Preparation	Student always demonstrates she/he is prepared with assignments and reading	Student demonstrates she/he is not prepared with assignments and reading for one or two classes.	Student demonstrates she/he is not prepared with assignments and reading for three or four classes.	Student demonstrates she/he is not prepared with assignments and reading for more than four classes.	
Comments	Total:				

Table 2: Case Problem Presentation Rubric

Criteria	4.0 (A)	3.0 (B)	2.0 (C)	1.0 (D)	Points
Introduction (15% weight)	Your introduction of the case problem was nearly complete and you explained why it is a complex question to answer.	You left out some significant details of the case problem and/or you failed to explain why it is a complex problem.	You left out most of the details of the case problem, and proceeded to methodology.	You failed to introduce the problem.	
Methodology (25% weight)	You explained the methodology with enough detail so that your classmates can replicate your work without the text/notes.	You explained a significant amount of the methodology, but not enough so your classmates can replicate your work without the text/notes.	You failed to explain much of the methodology making it difficult for your classmates can replicate your work without the text/notes.	You failed to explain any of the methodology.	
Conclusions (25% weight)	You discussed the answer to the case problem, and explained the results using “real world” vocabulary within the context of the problem.	You discussed the answer to the case problem, but relied on some management science terms with some real world vocabulary to explain the results.	You discussed the answer to the case problem, but used primarily management science terms to explain the results.	Your discussion of the answer was very unclear and/or very incomplete .	
Presentation Tools/Style (25% weight)	Style was professional, yet relaxed and inviting, and presentation tools were effective in aiding audience’s understanding.	Style was professional, yet relaxed and inviting, but presentation tools needed to be moderately enhanced to aid in audiences understanding.	Style was not inviting and/or presentation tools needed to be significantly enhanced to aid in audiences understanding.	Style was not inviting and presentation tools were ineffective in aiding audience’s understanding.	
Presentation/Engagement (10% weight)	At least 4 classmates participated in the discussion.	Between 2-3 classmates participated in the discussion.	Only 1 classmate participated in the discussion.	No one participated in the discussion.	

Table 3: Article Critique Presentation Rubric

Criteria	4.0 (A)	3.0 (B)	2.0 (C)	1.0 (D)	Points
Relevance (10% weight)	You brought up multiple reasons why your article is important.	You brought up one or two reasons why your article is important.	You discussed why you picked the article.	You did not defend your choice of the article.	
Methodology (25% weight)	You explained with significant detail for the time allotted the quantitative methods and discussed why these methods are appropriate.	You explained either the quantitative methods or the motivation for the methods with only some detail .	You failed to explain either the quantitative methods or why the methods are appropriate.	You failed to explain both the quantitative methods and why the methods are appropriate.	
Analysis/Conclusion (25% weight)	You clearly explained the results following the methodology, and demonstrated its Relevance (tying in <i>Relevance</i> category).	You clearly explained the results following the methodology, but the tie in with <i>Relevance</i> was somewhat weak/confusing/unclear.	Your explanation of the results were unclear , but the tie in with <i>Relevance</i> was clearly demonstrated .	Your explanation of the results and tie in with relevance were both unclear .	
Organization (10% weight)	The sections (Intro/Motivation, Methodology, Analysis/Conclusion) are clear, and follow naturally and build from one to the other.	The sections (Intro/Motivation, Methodology, Analysis/Conclusion) are clear and they build from one to another, but there are abrupt, unclear transitions.	The sections (Intro/Motivation, Methodology, Analysis/Conclusion) are clear, but it is unclear how the sections build from one to another.	The sections (Intro/Motivation, Methodology, Analysis/Conclusion) are not clear, there are unclear transitions, and they fail to build from one to another.	
References (5% weight)	For every statement either not obvious in context, or not well known in the literature, you provided a full APA style citation.	For the majority of statements either not obvious in context, or not well known in the literature, you provided a full APA style citation.	For the majority of statements either not obvious in context, or not well known in the literature, you failed to provide a full APA style citation.	You did not have any APA style citations.	
Presentation Tools/Style (10% weight)	Style was professional, yet relaxed and inviting, and presentation tools were effective in aiding audience's understanding.	Style was professional, yet relaxed and inviting, but presentation tools needed to be moderately enhanced to aid in audiences understanding.	Style was not inviting and/or presentation tools needed to be significantly enhanced to aid in audiences understanding.	Style was not inviting and presentation tools were ineffective in aiding audience's understanding.	
Presentation/Engagement (10% weight)	At least 10 classmates participated in the discussion.	Between 5-9 classmates participated in the discussion.	Between 1-4 classmates participated in the discussion.	no one participated in the discussion.	
Participation (5% weight)	You read the paper and participated at least once in at least 7 of your classmates' presentations.	You read the paper and participated at least once in 4-7 of your classmates' presentations.	You read the paper and participated at least once in 1-3 of your classmates' presentations.	You did not participate in any of your classmates' presentations.	