

**DSCI 3870: Management Science**  
**Course Outline: Spring 2021**  
Section 12436 INET

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**INSTRUCTOR INFORMATION**

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Office Hours: Thursday 3:00 – 5:00 pm [via Zoom], or by appointment  
(The details of test office hours to be announced during lectures)

**COURSE OBJECTIVES**

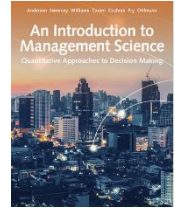
To provide the student with a working knowledge of management science/operations research techniques for use in business. This will be achieved by using a real-world problem oriented approach, and using examples that emphasize the multi-disciplinary nature of business problems. Spreadsheets will be used to strengthen students' ability to make business decisions. The course uses case studies and assignments that require communication and interaction, to strengthen students' understanding. Techniques covered will include linear, integer, and non-linear programming, network optimization and implementation issues. This course may seem challenging, but it will provide you with "current" and "marketable" skills in the field of Quantitative Analysis/Business Analytics.

**Prerequisite(s):** Please see UNT Undergraduate Catalog:

(It is assumed that students taking this course have completed the college algebra course and also have a good foundation in calculus, basic statistics and probability theory as covered in the basic statistics course. Although some review of elementary concepts and terminology is provided in the textbook, it is not intended to replace a complete course, but rather to refresh your memory. While a high degree of mathematical skill is not necessary in an “applied” course such as this, there are certain insights into the course that are gained through the mathematics involved.)

## REQUIRED TEXTBOOK

Anderson, Sweeney, Williams, Camm, Cochran, Fry and Ohlmann, *An Introduction to Management Science: Quantitative Approaches to Decision Making*, 15th Edition\*, © 2018, Cengage Learning ISBN-10: 133740652X, ISBN-13: 9781337406529.



You can also purchase or rent the digital version of the textbook at the following address: <https://www.cengage.com/c/an-introduction-to-management-science-quantitative-approach-15e-anderson>

\* It is alright if you have bought the 13<sup>th</sup> or 14<sup>th</sup> Edition of this textbook. (14<sup>th</sup> Edition, ISBN-10: 1111823618, ISBN-13: 9781111823610)

If you intend to enroll in DSCI 4510 later, please don't sell your book (either edition). We will be using it in DSCI 4510 too.

## ADDITIONAL ASSISTANT

Statistics Lab (Zoom). This is available for students seeking additional help. Hours and link will be announced to the course website on Canvas. The purpose of the lab is to assist students to overcome difficulties they may encounter in attempting statistics problems. It is not meant to be an extensive tutoring service. Hours will be announced during the semester and/or posted on the course website.

*If you need any additional assistance, simply contact me via email. I am here to help you.*

## REQUIRED RESOURCES

Business or scientific calculator; must be able to perform at least the following functions: square, square root, raise to nth power, extract nth root, logarithm. The lack of a calculator does not excuse the student from making math errors on exams. Graph paper will also prove to be quite useful.

## ASSIGNMENTS/READINGS

Problems, including those marked as “Self test” from the textbook will be assigned as the course progresses. Some “Self test” problems are already assigned in the “Tentative Course Agenda” which appears later. The student is responsible for solving these problems in a timely manner. The assigned problems will not be collected or graded. However, I can provide you feedbacks if you needed. Students are also welcome to see me if they have difficulty solving any of the assigned problems. Some of the problems are challenging.

In addition to the “Self test” problems, there are **three assignments** in this course. Please make sure to submit your solutions to these assignments online by their due dates. You may work together on homework assignments in groups of up to two people, however it is required each student submit their own assignment individually. I will also provide you real business cases and hand out readings (magazine articles, newspaper clippings etc.).

## **EVALUATION**

Grades are a measure of the performance of a student in individual courses. Each student shall be judged on the basis of how well he or she has command of the course materials.

Group Project = 14%

Group Evaluation = 8%

3 Assignments = 21% ( $3 \times 7\% = 21\%$ )

One Test = 7%

Midterm = 20%

Final Exam = 20%

+ 10% your best performance over two exams (Midterm and Final)

### **Letter Grades:**

90% + = A

80% + = B

70% + = C

60% + = D

Below 60% = F

All exams will be multiple choice or a combination of multiple choice and problem formulation/analysis. The exams will be open book, open notes. Laptops and calculators will also be allowed. Extra credit assignments will be added directly to the overall grades.

Students are responsible for their materials on an exam. There will be no loaning or sharing of books, calculators, or other items, or sharing of any type of information among students while taking the exam. If the student fails to bring his or her required materials, she or he must perform the exam to the best of his or her ability without them. Students are encouraged to collect the exams when they are returned.

Exams are not cumulative of previous exam coverage. Exam information and marks will be posted on course website. Since exams are not cumulative, please take all exams. Missed exams will receive zero marks unless a legitimate excuse is presented. If you miss an exam, please follow the steps below:

**Step 1:** If you miss an exam for any acceptable reason, please e-mail the instructor as soon as you are able about the reason why you missed the exam.

**Step 2:** Then, you may provide the instructor proof in the form of an official document as soon as you are able with proper documentation. Your documentation should be acceptable based on an interpretation of College of Business or University policy.

**Step 3:** After the instructor receives an acceptable proof, the instructor will then e-mail you to schedule a make-up exam.

## **GENERAL COMMENTS**

1. Doing the assignments is essential for success in this course. You are encouraged to keep up with the homework and meet the submission deadlines.
2. You should not hesitate to ask questions to me, (the professor, Dr. Fouad Mirzaei) or the teaching assistant. I will try to keep a FAQ section on Canvas for commonly asked questions. Usually someone else has the same question, so, when you ask a question, others can benefit from the question. Since we do not meet in person in class, such questions become even more important for an online class.
3. Regular monitoring of the course material posted on Canvas is expected. There will be no make-up if you miss any of the exams, unless you have a University-approved excuse. Whenever applicable, such an excuse is to be provided to the instructor in writing, as early as possible.
4. You have the final responsibility for seeing that you properly withdraw before the scheduled last drop day, in case you wish to withdraw from/ drop the course. If you stop attending class, you should execute the drop procedure since failure to do so will result in a grade of "F" which cannot be changed.

## **DISABILITIES**

The College of Business Administration complies with the **Americans with Disabilities Act** in making reasonable accommodations for qualified students with disability. If you have an established disability as defined in the "Act" and would like to request accommodation, please see your instructor as soon as possible. Office hours and phone number are shown at the top of this syllabus.

## HONOR CODE

<http://facultysuccess.unt.edu/academic-integrity>:

As an institution of higher education, UNT is committed to creating and sustaining an environment that facilitates students' academic, personal, and ethical development. This commitment balances freedom of individual choice and expression with the expectation that individual members of the community will:

- Be honest
- Demonstrate self-respect and respect for others
- Demonstrate respect for the law and University policies, procedures, and standards.

Engaging in any form of academic dishonesty, such as plagiarism (*representing the work or ideas of others as one's own without giving proper acknowledgment*), cheating (e.g., *using unauthorized resources or assistance on coursework, copying the work of another person, falsifying data, sabotaging the work of others, and the unauthorized use of electronics, media, or data*), or other acts generally understood to be dishonest by faculty or students in an academic context will subject the student to disciplinary action. Any UNT policy regarding grounds for Dismissal from the Course is effective in this course.

## CAMPUS CLOSING POLICY

In the event of an official campus closing, please check your UNT e-mail account (EagleConnect) for instructions about how to turn in various assignments, how the due dates are modified, etc. I will do my best to accommodate your needs.

**Please do not hesitate to contact me, if you need to discuss anything.**

## TOPICS AND TENTATIVE LECTURE SCHEDULE

This schedule is subject to change according to the needs of the class. I will try my best to give you advance notice about any changes.

<u>WEEK</u>	<u>TOPICS/CASES</u>	<u>Practice Problems</u>
Topic 1	Course Introduction	Chapter 1 STE – 8, 12
Topic 2	An Introduction to LP	Chapter 2 STE – 1, 2, 6, 13, 24
Topic 3	An Introduction to LP (continued) – Case Problem	Chapter 2 STE – 34, 42, 43
Topic 4	<i>Review for Exam 1</i>	

### Week 5: Test 1, June 11– ONLINE

Topic 5	Linear Programming <i>Sensitivity Analysis and Interpretation of Solution</i>	Chapter 3 STE – 6, 10
Topic 6	Linear Programming <i>Sensitivity Analysis and Interpretation of Solution</i>	Chapter 3 STE – 12, 13
Topic 7	Linear Programming <i>Sensitivity Analysis and Interpretation of Solution</i> – Case Problem: Product Mix	Chapter 3 STE – 12, 1
	LP Applications in Marketing, Finance and Operations Management	Chapter 4
Topic 8	LP Applications in Marketing, Finance and Operations Management (continued) <i>Decision Theory</i>	Chapter 4 STE – 1, 15
Topic 9	LP Applications in Marketing, Finance and Operations Management – Case Problem 3: Textile Mill Scheduling <i>Review for Midterm</i>	Chapter 4 STE – 19

### Week 9: Midterm, June 18 – ONLINE

Topic 10	Distribution and Network Models (Online) <i>Decision Making Under Uncertainty</i>	Chapter 6 STE – 1, 2, 6
Topic 11	Distribution and Network Models (Online)	Chapter 6 STE – 11 (17), 17(9), 23, 29
Topic 12	Integer Linear Programming (Online)	Chapter 7
Topic 13	Integer Linear Programming (Online) <i>Business Case: Decision Making Under Uncertainty</i> – Case Problem: Textbook Publishing	Chapter 7 STE – 2, 5, 7
Topic 14	Integer Linear Programming (Online) <i>Please prepare for your group project</i>	Chapter 7
Topic 15	PROJECT PRESENTATION (Optional: Only sending PowerPoint files) <i>Final overview</i>	

**Week 16: Final, June 30 – ONLINE**

Some or all of the Case Problems may be solved in class. Self test Problems will not be collected or graded. However it is imperative for students to solve these problems and also go through any assigned readings in order to be better prepared for the examination.

“STE” above stands for Self test Exercises that appear in the book.

You can check deadlines at:

<https://registrar.unt.edu/exams/final-exam-schedule>

## GROUP PROJECT

As soon as you choose your project topic, clear it with me to avoid duplication. Sometimes your first choice topic may not work out, so be sure to allow sufficient time to find an alternative. Scheduling to meet your group members near the middle of the semester is best, but other schedules will work too. If you plan to take pictures for project, be sure to get permission if needed. Turn in both a printed paper copy and an electronic copy of your final report.

The goal of this project is to observe and understand an actual process and relate it to this course. Think about the key strategic issues and decisions that a DFW-based company (or community, system, project, etc.) faces and relate them to the analytical methods that we study in this course. That is, discuss which of our methods and concepts they are now using, or could potentially use, for their marketing, operations, finance, human resource, or accounting policies and decisions. Think of yourself as a management consultant rather than a reporter, when doing this project.

Working in groups of five or six, this project begins with defining a relevant topic for your project. Toward the end of the semester, each group will give a 10 to 15 minutes online presentation to the class on their group project. This talk could describe a company's products (or services) and the manufacturing process and how the decisions for the process are made. You present different aspect of your analytical model (the decision factors, objective function, the relationship between factors, constraints), the solution, the managerial insights and recommendations. It should include some kind of visual aids such as PowerPoint slides, transparencies or paper charts to hang on the blackboard to make the presentation more organized and interesting. Regardless of the visual aids, the presentation will need some rehearsing and good coordination among the members of your team. If possible, bring in samples of the company's product and/or raw materials to show to the class. The quality of the presentation, as well as the content is important. Presentation PowerPoint file is due the day before the presentation date by 10:00 a.m. The presentation does not need to cover all the topics in the written report and not everyone in the group needs to speak.

### *Sample Outline for the Written Report*

1. Background on the subject/problem (not too long), why this topic is important?
2. Model description
3. Model solution
4. Recommendations for improving the management of the process
5. Final comments.

The written report, which is due at the end of the semester, should be no more than 10 typed pages, plus all attachments. Using what we have discussed in this class, make recommendations for how the management of the process could be improved. This is an opportunity to be creative and develop insights by integrating suggestions from each member of the group. Be sure to have everyone in your group proof read the report to improve its style. Please not that copying text or the process diagram for your report from the website is not acceptable. This paper should contain your own thoughts and how they relate to the material in this course. Your project grade will be determined by the quality of the written report and the presentation, and by your active participation in the project as evaluated by other members of your group. Have fun and good luck!



## EVALUATION FORM FOR GROUP WORK

This form is for evaluating the relative contributions of your team members to the group project *and* the homework (if done jointly). Make comments to clarify differences in the evaluations. This form covers both the level of each member's participation and the value of their contributions. List each member of your team (**including yourself**) and rate their contribution from 8 (High) to 1 (Low) in the two categories. Then sign the form and turn it in at the final exam or return it to my office. (You can fold it and slide it under the door or give it to me directly.) I will keep these evaluations *confidential*.

Team Member	Level of Participation	Value of Contribution
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-----	-----	-----
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Name: \_\_\_\_\_ Signed: \_\_\_\_\_

Describe the things you did on the group project. (If jointly with someone else, say so.)

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**DSCI 3870**  
**STUDENT DATA SHEET**

Name:

Major Field:

MINOR FIELD (If Applicable):

Classification (FR, SO, JR, SR):

Email (Students are required to have EagleConnect by University policy and regularly check the “Official” folder in their account for class related emails. You can easily set an Auto-Forward to your preferred (i.e. hotmail, yahoo etc.) email account from within EagleConnect if you don’t log in regularly. Please provide your EagleConnect address below):

Are you taking this as a “required” course? As an optional elective?

Do you intend to work in the field of decision modeling or related areas in the future? In any case, please pen a few words on your prospective future career choice i.e. after college.

Please read the above syllabus and agree to abide by the class policies and procedures set forth therein. **Please get an EagleConnect account and check it regularly for “official” announcements.**