

DSCI 3870/Management Science - Section 001

Instructor Contact

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Class Format: face to face

Class Meetings: Tuesdays 3:30 pm – 6:20 pm @ BLB 010

Office Hours: Mondays 4:00 pm – 5:30 pm, Tuesdays 6:30 pm – 8:00 pm in my office. Eventually, I might offer them via [Zoom](#).

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Communication Expectations: The instructor will communicate with students via in-class announcements, e-mails, Canvas, and office hours. The students will communicate with the instructor via e-mails and office hours.

It is the instructor's aim to answer e-mails within 48 hours of their receipt during business days. Please, be courteous and professional when communicating with your instructor and follow the provided [Online Communication Tips](#). The instructor may not answer e-mails that do not abide to these tips.

Course Description

Introduction to operations research for business decision making. Spreadsheet methods are used to evaluate the following: deterministic models; allocation problems, linear programming, sequencing and scheduling, and network models.

Course Structure

This course will be delivered in face to face format and will take place between the weeks of August 29th, 2022 and December 12th, 2022. The course structure is detailed below:

Week	Topics/Cases¹	Reading/Practice	Deliverables
1	Course Introduction	Chapter 1; STE ² – 8, 12	
2	An Introduction to Linear Programming	Chapter 2; STE – 1, 2, 6, 13, 24	
3	An Introduction to Linear Programming	Chapter 2; STE – 34, 42, 43	Form groups for projects and assignments
4	Sensitivity Analysis and Int. of Solutions <i>Review for first exam</i>	Chapter 3	Assignment 1 due
5	Sensitivity Analysis and Int. of Solutions	Chapter 3; STE – 6, 10	<i>Exam 1 (09/27)</i>
6	Sensitivity Analysis and Int. of Solutions	Chapter 3; STE – 12, 13	
7	Linear Programming Applications in Marketing, Finance and Operations Management	Chapter 3; STE – 12, 1 Chapter 4	Assignment 2 due
8	Linear Programming Applications in Marketing, Finance and Operations Management	Chapter 4; STE – 1, 15	Select topic for project
9	Linear Programming Applications in Marketing, Finance and Operations Management <i>Review for second exam</i>	Chapter 4; STE – 19	Assignment 3 due
10	Distribution and Network Models	Chapter 6 STE – 1, 2, 6	<i>Exam 2 (11/01)</i> Develop your projects' models (soft)
11	Distribution and Network Models	Chapter 6; STE – 11, 17, 23, 29	
12	Integer Linear Programming	Chapter 7	<i>Quizzes about papers (11/15)</i>
13	Integer Linear Programming	Chapter 7; STE – 2, 5, 7	Assignment 4 due
14	No class (Prepare for your group project)		Project Reports due
15	Project Presentations		Presentations due
16	No class		<i>Final Exam: schedule according to UNT's official final exam schedule</i>

STE's will not be collected nor 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 exams.

Course Prerequisites or Other Restrictions

ECON 1100, ECON 1110, MATH 1100. DSCI 2710 or consent of instructor; ACCT 2010 and ACCT 2020 with grades of C or better; MATH 1190 or equivalent.

¹ Course structure is subject to change in order to accommodate for specific circumstances throughout the semester.

² Self-test Exercise. These exercises are numbered according to the 15th version of the textbook.

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 skills is not necessary in an “applied” course such as this, there are certain insights into the course that are gained through the mathematics involved.

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.

By the end of this course, students will be able to:

1. Interpret a mathematical optimization model as a representation of actual business processes.
2. Classify optimization problems depending on their level of difficulty.
3. Formulate their own optimization models.
4. Develop solutions to those models.
5. Apply their solutions to areas such as finance, marketing, and operations management.

Materials

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](#).

The 13th or 14th edition of this text book are also acceptable.

If you intend to enroll in DSCI 4510 you will also use this book, so do not sell it!



Teaching Philosophy

To make the class more dynamic, I will opt for combining slides and hand-written notes. I will write notes on-the-go in class as I explain concepts and exercises. This course has a clear mathematical background and mathematics require work and patience to be understood. I believe that this understanding cannot be attained without writing things down by yourselves and, for this reason, I expect you to be active in

taking notes and in solving exercises on paper. Just by looking at slides, you might deceptively think that you understand something. However, you will also need to create models and manipulate mathematical concepts and this can only be achieved if you work on problems and concepts on paper.

Technical Requirements & Skills

All students are responsible satisfying the requirements below and they must make sure that they comply with them when they perform the tasks that are needed for the successful completion of this course.

Minimum Technology Requirements

- Computer with Webcam
- Reliable internet access
- Speakers
- Microphone
- Plug-ins
- Microsoft Office Suite
- [Canvas Technical Requirements](#)
- Business or scientific calculator. It must be able to perform at least the following functions: square, square root, raise to nth power, extract n^{th} root, logarithm. The lack of a calculator does not excuse the student from making math errors on exams. **Only these calculators will be allowed in quizzes and exams. Calculators from phones, tablets or other electronic devices will not be allowed.**

Computer Skills & Digital Literacy

- Using Canvas and supported embedded apps such as LockDown Browser and Respondus Monitor.
- Using email with attachments
- Downloading and installing software
- Using spreadsheet programs
- Using presentation and graphics programs

Rules of Engagement

Rules of engagement refer to the way students are expected to interact with each other and with their instructors online. Here are some general guidelines:

- Treat your instructor and classmates with respect in any communication online or face-to-face, even when their opinion differs from your own.
- Always use your professors' proper title: Dr. or Prof., or if in doubt use Mr. or Ms.
- Unless specifically invited, don't refer to your instructor by first name.
- Use clear and concise language.
- Remember that all college level communication should have correct spelling and grammar (this includes discussion boards).
- Avoid using "text-talk" unless explicitly permitted by your instructor.
- Avoid using all caps while communicating digitally. This may be interpreted as "YELLING!"

- Be careful with personal information (both yours and other's) and avoid sending confidential information via e-mail.
- Be cautious when using humor or sarcasm in emails or discussion posts as tone can be difficult to interpret digitally.
- Keep in mind that online posts can be permanent, so think first before you type.

See these [Engagement Guidelines](https://clear.unt.edu/online-communication-tips) (https://clear.unt.edu/online-communication-tips) for more information.

Course Requirements

During this course you will have the following graded and not graded requirements:

- **Self-test problems:** some are already assigned in the Tentative Course Agenda above. Some others may be assigned later on during the course. Students are responsible for solving these problems in a timely manner. Self-test problems will not be collected nor graded. You should expect some of these problems to be challenging.
- **Homework assignments:** these graded assignments will be completed in groups of 4 students. Only one submission with the name of the team members will be needed. The groups will remain the same for each assignment, and will be formed during the first days of class.
- **Group Project:** you will have to complete a graded group project. The groups for the project and the assignments must be the same. More information about this can be found in the section [Instructions for Group Project](#).
- **Readings:** I will provide you with magazine articles, journal papers, newspapers clippings, etc. You will complete a graded quiz about these materials.
- **Exams:** there will be 2 midterm exams and a final exam. All of them will be non-cumulative and will take place in class.

Your final grade will be calculated according to the following breakdown³:

Course Requirement	Percentage of Final Grade
Homework assignments	15%
Quizzes about papers	10%
Exam 1	15%
Exam 2	15%
Final exam	20%
Group project	15%
Additional weight of best exam ⁴	10%
Total	100%

³ The breakdown below is contingent upon the acceptance and signing of this syllabus, its addenda, and the Ethical Academic Behavior form. A student's grade will be held until such acceptance is received by the instructor.

⁴ Your best exam will carry a weight of 10% more than noted above. For example, if your scores are 75 (Exam 1), 85 (Exam 2), and 88 (Final Exam), the portion of your grades corresponding to your exams will be $75*0.15+85*0.15+88*(0.20+0.10) = 50.4$.

Grading

Grades measure the performance of a student in individual courses. Students will be evaluated based on their performance and command of the course materials. A student's final grade will be determined following the scheme below⁵:

A = 90% or higher

B = 80% or higher and less than 90%

C = 70% or higher and less than 80%

D = 60% or higher and less than 70%

F = Less than 60%

The grades for the homework assignments and the project will be assigned as a group. However, I might assign different grades to different students within the same group. **That is, I reserve the right to modify individual grades according to the student's individual performance.** This performance will be assessed via the peer evaluation forms that I will circulate after some deliverables. In these forms students will be asked to rate the contributions/effort of each of their teammates on a scale of 1-5:

- Team members averaging 3 or above will receive no penalty.
- Team members averaging between 2 and 3 will receive a penalty equivalent to 15% of the possible grade.
- Team members averaging between 1 and 2 will receive a penalty equivalent to 30% of the possible grade.

You are required to wait 24 hours before contacting me to dispute a grade. Within that time, I expect that you will review the assignment details and reflect on the quality of the work you turned in. If you would still like to meet, e-mail me to set up a meeting. You should come to our scheduled meeting with specific examples that demonstrate that you earned a higher grade than you received. If you miss your scheduled meeting, you forfeit your right to a grade dispute. If you do not contact me to schedule a meeting within seven days of receiving your grade, you also forfeit your right to a grade dispute.

After all grades have been released, **I kindly ask that you refrain from sending any e-mails requesting a change in your final grades based on scholarships, GPA, visa status, etc.** You must know that I will not entertain these requests and, if I receive any, two things will happen:

1. I will ignore your request.
2. If you received any curving in any of your graded deliverables, I will revert the effect of those curves in all those deliverables. As a result, your final grade, if it was ever impacted positively by the effect of those curves, will be reduced.

⁵ This grading scale is tentative and may be adjusted based on overall class performance.

Course Evaluation

The Student Perceptions of Teaching (SPOT) is the student evaluation system for UNT and allows students the ability to confidentially provide constructive feedback to their instructor and department to improve the quality of student experiences in the course. At some stage during this course, students will be given access to this evaluation. I would certainly appreciate your constructive feedback when the time comes.

Course Policies

Attendance

I expect, but do not enforce, that students attend each class session. Take into account that there will be quizzes and midterm exams during regular class hours. Visit the [University of North Texas' Attendance Policy](#) to learn more.

While I do not enforce attendance, if you finally attend a session, I expect you to be on time. I reserve the right to forbid access to class to students that arrive late to a session. Entering the classroom after the class has started is disruptive for both your colleagues and the professor.

Students are responsible for learning the contents, meet the deadlines, and follow the directions explained in class regardless of their attendance.

Class Participation

Students are expected to actively participate in class and group activities, ask relevant questions and keep up with the material discussed in earlier class sessions.

Announcements Policy

In addition to in class announcements, important messages may be communicated via [Canvas](#) (<http://canvas.unt.edu>). You are responsible for actively monitoring Canvas for announcements which, among other things, may be related to changes in schedule, syllabus, or other key aspects of the course.

Group Participation Policy

This course requires considerable group work. I hope that participation issues do not arise in any team. However, to monitor this, I will circulate a peer evaluation form after some deliverables. Please, bear in mind that:

1. These forms are **mandatory** to submit. **Students who do not submit their peer evaluation forms on time will receive a zero in the deliverable in question.**
2. As mentioned in the [Grading](#) section, I reserve the right to modify individual grades according to how your peers evaluate your work and contribution to the team.

Assignment Policy

Homework assignments will be announced in class and via Canvas. This is also the platform that will be used for submitting them. Assignments submitted in some other form (e.g. e-mail) will not be accepted unless the instructor approves it previously. The due date for each homework will be announced on the posting date along with extra instructions (if needed). As a rule of thumb, homework has to be completed professionally and therefore it needs to be well presented, clean, readable, and easy to follow. The

instructor and the grader may reduce your grade at their discretion if these general guidelines are not correctly followed.

Any assignment that is submitted after the submission deadline will not be graded and will receive zero marks. This course requires a professional attitude so **I will always follow this rule** except in the cases detailed in the [Late Work](#) subsection. Consequently, make sure that you do not leave your submissions for the last minute. Also, the submissions will typically consist of a Word file and an Excel file. **Make sure that the names of all the students that participated in the homework are listed in the first page of your Word file. Students that participated in an assignment that are not listed will not receive any credit for this submission.**

Examination Policy

The following policies will apply the midterm exams and the final exam:

- All exams will have a combination of multiple choice and problem formulation/analysis.
- You will need a laptop to complete your exams. Make sure you connect it to the power grid. **I will not repeat any exam if your laptop runs out of battery.**
- In the event that you need to complete an exam out of class using LockDown Browser or other online proctoring tool:
 - You will be asked to show a thorough 360-degree view of the room you choose to take your exam. By signing this syllabus, you are consenting to provide this view.
 - If you lose Internet connection during the exam:
 - If you are having a short disruption, Canvas will allow you to keep on working on the exam and will reconnect automatically once your Internet service resumes.
 - If the issues persist, contact the [Student Helpdesk](#) (helpdesk@unt.edu or 940.565.2324) immediately and document the remedy ticket number.
 - If the Student Helpdesk cannot address your problems or if they advise you to contact your instructor, immediately report this disruption to both your instructor and the grader and enclose a copy of the current state of your exam. This is very important to keep a recorded time stamp of the events.
 - If the issues still persist, complete your exam offline and send it via e-mail to both your instructor and the grader. **Important:** always do this within the allotted time for the exam.
- Calculators will be allowed.
- Phones, tablets, and other electronic devices will **not** be allowed.
- Students are responsible for their materials on an exam. Loaning or sharing any materials is strictly prohibited.
- It is **strictly forbidden** that students share information during an exam. Failure to comply with this will result in disciplinary actions as described in the [Academic Integrity Policy](#) subsection of this syllabus and in the *Ethical Academic Behavior in ITDS Classes* form.
- Students who fail to bring their own required materials will take the exams without them and to the best of their ability.
- Exams are not cumulative and therefore I encourage you to take all exams. Exam information and marks will be posted on course website.

- Missed exams will receive zero marks unless a legitimate excuse is presented, as described in the [Late Work](#) subsection of this syllabus.
- In the case that you want to review a midterm exam that you took, this request must be done to the grader/instructor within two weeks since the grades were posted. Later reviews will not be accepted.
- If you want to review a final exam, this request must be done to the grader/instructor within 10 days or before the grades are due at the Registrar's Office, whatever is shorter.
- Further instructions will be announced ahead of time, if needed.

Late Work

It is **highly recommended** that you work on your submissions well in advance to avoid last-minute issues. I will **not** accept any late submissions nor agree to make-up tests or exams except in the following cases:

- Medical emergency cases, in which case a doctor's note is required.
- Family emergency cases, in which case a written verifiable proof is required.
- Any other excused absence specified in Chapter 6 of Faculty Affairs document, [Student Attendance and Authorized Absences](#).

Late submissions and make-up tests or exams must always be agreed **before the corresponding due date**. No makeup tests or exams will be offered due to poor performance in exams.

Electronics Policy

Electronics will be used **strictly as needed** for class purposes. A student that engages in the use of these devices may be directed to leave the classroom according to UNT's policy on [Acceptable Student Behavior](#).

If this behavior persists, I reserve the right to reduce the student's grade in this course at my discretion.

Syllabus Change Policy

The contents of this syllabus might be changed to the instructor's discretion in order to adjust the course to the specific circumstances of each semester.

Getting Help

Technical Assistance

Part of working in the online environment involves dealing with the inconveniences and frustration that can arise when technology breaks down or does not perform as expected. Here at UNT we have a Student Help Desk that you can contact for help with Canvas or other technology issues.

UIT Help Desk: [UIT Student Help Desk site](http://www.unt.edu/helpdesk/index.htm) (<http://www.unt.edu/helpdesk/index.htm>)

Email: helpdesk@unt.edu

Phone: 940-565-2324

In Person: Sage Hall, Room 130

Walk-In Availability: 8am-9pm

Telephone Availability:

- Sunday: noon-midnight
- Monday-Thursday: 8am-midnight
- Friday: 8am-8pm
- Saturday: 9am-5pm

Laptop Checkout: 8am-7pm

For additional support, visit [Canvas Technical Help](https://community.canvaslms.com/docs/DOC-10554-4212710328) (https://community.canvaslms.com/docs/DOC-10554-4212710328)

Computer Labs

The BLB computer labs on the first floor will open with reduced hours and reduced seating to comply with social distancing guidelines. There will not be BLB laptop checkouts due to potential contamination issues. The library [has computers to check out for up to 24 hours](#) and the [RCOB virtual computer labs](#) will be open for business continuously.

UNT Policies

Academic Integrity Policy

Academic Integrity Standards and Consequences. According to [UNT Policy 06.003, Student Academic Integrity](#), academic dishonesty occurs when students engage in behaviors including, but not limited to cheating, fabrication, facilitating academic dishonesty, forgery, plagiarism, and sabotage. A finding of academic dishonesty may result in a range of academic penalties or sanctions ranging from admonition to expulsion from the University.

Academic dishonesty is an extremely serious issue. It will not be tolerated and will be prosecuted according to UNT Policy 06.003. You are responsible for knowing what those behaviors above (cheating, plagiarism, etc.) mean and when you might be incurring any of them.

ADA Policy

UNT makes reasonable academic accommodation for students with disabilities. Students seeking accommodation must first register with the Office of Disability Accommodation (ODA) to verify their eligibility. If a disability is verified, the ODA will provide a student with an accommodation letter to be delivered to faculty to begin a private discussion regarding one's specific course needs. Students may request accommodations at any time, however, ODA notices of accommodation should be provided as early as possible in the semester to avoid any delay in implementation. Note that students must obtain a new letter of accommodation for every semester and must meet with each faculty member prior to implementation in each class. For additional information see the [ODA website \(https://disability.unt.edu/\)](https://disability.unt.edu/).

Prohibition of Discrimination, Harassment, and Retaliation (Policy 16.004)

The University of North Texas (UNT) prohibits discrimination and harassment because of race, color, national origin, religion, sex, sexual orientation, gender identity, gender expression, age, disability, genetic information, veteran status, or any other characteristic protected under applicable federal or state law in its application and admission processes; educational programs and activities; employment policies, procedures, and processes; and university facilities. The University takes active measures to prevent such conduct and investigates and takes remedial action when appropriate.

Emergency Notification & Procedures

UNT uses a system called Eagle Alert to quickly notify students with critical information in the event of an emergency (i.e., severe weather, campus closing, and health and public safety emergencies like chemical spills, fires, or violence). In the event of a university closure, please refer to Canvas for contingency plans for covering course materials.

Retention of Student Records

Student records pertaining to this course are maintained in a secure location by the instructor of record. All records such as exams, answer sheets (with keys), and written papers submitted during the duration of the course are kept for at least one calendar year after course completion. Course work completed via the Canvas online system, including grading information and comments, is also stored in a safe electronic environment for one year. Students have the right to view their individual record; however, information about student's records will not be divulged to other individuals without proper written consent. Students are encouraged to review the Public Information Policy and the Family Educational Rights and Privacy Act (FERPA) laws and the University's policy. See UNT Policy 10.10, Records Management and Retention for additional information.

Acceptable Student Behavior

Student behavior that interferes with an instructor's ability to conduct a class or other students' opportunity to learn is unacceptable and disruptive and will not be tolerated in any instructional forum at UNT. Students engaging in unacceptable behavior will be directed to leave the classroom and the instructor may refer the student to the Dean of Students to consider whether the student's conduct violated the Code of Student Conduct. The University's expectations for student conduct apply to all instructional forums, including University and electronic classroom, labs, discussion groups, field trips, etc. Visit UNT's [Code of Student Conduct](https://deanofstudents.unt.edu/conduct) (https://deanofstudents.unt.edu/conduct) to learn more.

Access to Information - Eagle Connect

Students' access point for business and academic services at UNT is located at: my.unt.edu. All official communication from the University will be delivered to a student's Eagle Connect account. For more information, please visit the website that explains Eagle Connect and how to forward e-mail [Eagle Connect](https://it.unt.edu/eagleconnect) (https://it.unt.edu/eagleconnect).

Student Evaluation Administration Dates

Student feedback is important and an essential part of participation in this course. The student evaluation of instruction is a requirement for all organized classes at UNT. The survey will be made available during weeks 13, 14 and 15 [insert administration dates] of the long semesters to provide students with an opportunity to evaluate how this course is taught. Students will receive an email from "UNT SPOT Course Evaluations via IASystem Notification" (no-reply@iasystem.org) with the survey link. Students should look for the email in their UNT email inbox. Simply click on the link and complete the survey. Once students complete the survey they will receive a confirmation email that the survey has been submitted. For additional information, please visit the [SPOT website](http://spot.unt.edu/) (http://spot.unt.edu/) or email spot@unt.edu.

Survivor Advocacy

UNT is committed to providing a safe learning environment free of all forms of sexual misconduct. Federal laws and UNT policies prohibit discrimination on the basis of sex as well as sexual misconduct. If you or someone you know is experiencing sexual harassment, relationship violence, stalking and/or sexual

assault, there are campus resources available to provide support and assistance. The Survivor Advocates can be reached at SurvivorAdvocate@unt.edu or by calling the Dean of Students Office at 940-5652648.

Student Verification

UNT takes measures to protect the integrity of educational credentials awarded to students enrolled in distance education courses by verifying student identity, protecting student privacy, and notifying students of any special meeting times/locations or additional charges associated with student identity verification in distance education courses.

See [UNT Policy 07-002 Student Identity Verification, Privacy, and Notification and Distance Education Courses](https://policy.unt.edu/policy/07-002) (<https://policy.unt.edu/policy/07-002>).

Use of Student Work

A student owns the copyright for all work (e.g. software, photographs, reports, presentations, and email postings) he or she creates within a class and the University is not entitled to use any student work without the student's permission unless all of the following criteria are met:

- The work is used only once.
- The work is not used in its entirety.
- Use of the work does not affect any potential profits from the work.
- The student is not identified.
- The work is identified as student work.

If the use of the work does not meet all of the above criteria, then the University office or department using the work must obtain the student's written permission.

Instructions for Group Project – DSCI 3870

Overview

This course requires the completion of a team project. The teams will be the same as those selected for the assignments. They will consist of 4 students, although some modifications might be needed depending on the size of the class. It may happen that a team falls below the minimum number of people required after some of its members decide to drop or withdraw from the course. If that is the case, the team will go on with its remaining members. The grades attained for the group project will be assigned individually. In normal circumstances, all team members should have the same grade, although there could be exceptions see the [Grading](#) section.

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. When doing this project, think of yourselves as management consultants rather than reporters. In short, your project should:

1. Select a company/organization/association.
2. Identify a problem that represents a process that can be improved with a mathematical optimization problem.
3. Formulate and solve that mathematical optimization problem.
4. Discuss the results obtained and, in view of them, propose solutions to the problem stated above.

You should have your teams formed by the end of the third week of class, so you are on track to start your project on time. You will form your teams using this course's Canvas page. By the end of the fifth week of classes, you should communicate your instructor the topic of your project. As soon as you choose your project topic, clear it with me to avoid duplication. If you need to change it later on, that is OK. Bear in mind that sometimes your first choice may not work out, so be sure to allow sufficient time to find an alternative.

The team project is worth 15% of your final grade in this course. One third of that score (i.e., 5% of your final grade) will be assigned to the project presentation. The remaining two thirds (i.e., 10% of your final grade) will be determined by your written report and Excel file.

In order to help future cohorts, I might show your projects to students so they can learn about the requirements of this project and see what has been done in the past. If you, as a student, have any issue with this, please let me know in writing.

Project Report

The project report **will be due at the end of the semester.** After you have identified the process you want to improve, you will use the tools learned in this class to propose different ways to better that

process. This is an opportunity to be creative and develop insights by integrating suggestions from each member of the group. General instructions are as follow:

- **Length:** No more than 10 pages.
- **Format:** Arial font, size 11 pt, 1-inch margins everywhere, single-spaced.
- **File extension:** .doc, .docx, .pdf.
- **The report must be structured such that it contains at least the following:**
 - Company/Organization/Association background.
 - Description of the problem that is being tackled. Why is this project relevant?
 - Model description, **including the model formulation** (definition of variables, objective function, constraints, and final model).
 - Summary of the solution of the model proposed.
 - Recommendations for improving the management of the process (for example, via sensitivity analysis).
 - Final comments and remarks.
- **IMPORTANT:**
 - The report must have a cover page with the project title and the names of all team members.
 - Style must be consistent throughout the document.
 - Document must be reviewed by all your team members to avoid grammatical errors.
I reserve the right not to grade reports that are poorly written (i.e., to give them a 0). If you think you need external help for formatting and/or writing your report, you are welcome to look for it. If this happens, however, it must be communicated to me and explicitly acknowledged in the cover page of your report.
 - **The mathematical definition and formulation of your model (as explained above) is absolutely essential in your project report.** It has to be there.
 - Please note that copying text or the process diagram for your report from a website or other written material is not acceptable (**be extremely cautious with plagiarism**). This paper should contain your own thoughts and how they relate to the material in this course.

Excel File and Other Attachments

Every group **must** attach an Excel file with their report. This Excel file does not count towards the 10-page limit set for the project report. This file will contain the model formulated in the project report and must be solved with Excel Solver. Any pertinent sheets, such as *answer reports* or *sensitivity analysis reports* must also be included in this file.

- **IMPORTANT:**
 - Make sure that your Excel file is easy to interpret and is well explained, as I need to go over it and understand what you did.
 - I will run your model, **so make sure that the file you submitted works properly.** Your project success depends largely on this.

Any other attachments that you think that are necessary for your project can be submitted along with the Excel file and the written report. They will not count towards the 10-page limit. The written report, the Excel file, and any other additional files will have the same deadline.

Presentation

The project presentation will take place in class and all the team members must be present with business or business casual attire. You are free to decide how many people will speak and for how long. It is not required that everybody speaks during a presentation. Regardless how you decide to do it, the presentation must be well rehearsed and coordinated. Note that **attendance to the entire session of presentations is mandatory. Students who do not attend this session will not receive any credit for their presentations.**

You will have a limit of 10 minutes for your presentation. After those 10 minutes, I will stop the presentation, so make sure that you do not exceed this time. If you do, that might impact your grade in this section. Your talk will be followed by a 5-minute Q/A session in which your colleagues and I may ask you some questions. I encourage the class participation in this aspect, as I will not grade the students' questions nor the team's answers to those questions. I will, however, take into account the answers that you provide to my questions.

Since you have 10 minutes for your presentation, you must take good care in selecting what you are going to talk about. You do not (and, probably because of time constraints, you should not) need to cover all the topics presented in your written report. Be clear and concise in your presentation. **Structure it as if you were giving this presentation to management people in the company/organization/association.**

General instructions for your presentation are:

- File extension: .ppt, .pptx.
- Deadline: **the day before your team presents, at 10 am.** Failure to submit by this deadline will result in your team not presenting.
- Arrive timely: It is very disrupting for your classmates to have people coming in as they present. I reserve the right to not allow access to class if you arrive late, thus forfeiting your right to present.
- Attire: business/business casual. A professional look is a must for this presentation.
- You must:
 - Introduce company/organization/association.
 - Introduce problem that you tackled.
 - Discuss model: very roughly, **do not get into many details about the math** (leave that for the written report).
 - Present model results.
 - Finalize with opportunities for improvement and recommendations.
- Do not read from cell phones or handwritten notes. Your presentation must be sufficiently rehearsed so you do not need notes to give your talk. If you use notes, your final score may be impacted.