

MBA 8590-002/**003** Managerial Decision Modeling

Course Syllabus – Fall Term 2020

Course number and title	MBA 8590-002 Managerial Decision Modeling (face-to-face) <i>MBA 8590-003 Managerial Decision Modeling (online)</i>
Academic term	Fall Term 2020
Course record number (CRN)	85025/ 88380
Number of credits	3 credits
Dates, day and time	August 17, 2020 – December 11, 2020 Monday 6:00 PM – 8:45 PM
Classroom	Clemson at ONE Building Campus <i>Synchronous teaching mode</i>
Office hours	Wednesdays, 7 to 8 pm (face-to-face & <i>online</i>) <ul style="list-style-type: none">• by appointment made on Canvas Calendar application• via Zoom (online)
Instructor	M. Gabriela SAVA, PhD 420D College of Business building msava@clemsn.edu

Course Description

The Managerial Decision Modeling course applies management science tools and methodologies to analyze and solve problems arising in business area. It is designed to develop your analytical problem-solving skills and to teach you decision-making techniques that are of key importance for managing the functional areas of any enterprise - i.e. operations, marketing and finance. The course will cover methodologies for *optimization* which is a field of applied mathematics whose principles and methods are used to solve quantitative problems. We will cover methods as linear, integer and nonlinear programming and revenue management techniques.

In this class you will learn how to solve Make versus Buy, Investment, Transportation and Blending optimization problems; how to apply Sensitivity Analysis methods to linear optimization problems; Network modeling problems; Integer linear programming problems including Scheduling and Fixed charge problems; Nonlinear programming problems. You will also learn how to use Revenue Management to make managerial decisions. We will be constructing, evaluating, and using models, and when necessary we will discuss the mathematical model behind the spreadsheet implementation, but we will not be discussing the mathematical theory or proofs that underlie the methods by which those models are solved.

As spreadsheets have become indispensable in any company, this course will use *Microsoft Excel spreadsheet* software throughout. Thus, in addition to the concepts and quantitative skills mentioned above, this course emphasizes opportunities to develop and practice your skills in using Microsoft Excel.

Learning Goals

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

- Think critically and analytically about business problems encountered in real life.
- Be able to model the real-life situations using the mathematical tools presented during the class.
- Gather and evaluate the information available in the real life situations effectively and appropriately.
- Understand and be able to apply basic quantitative reasoning and methodologies to real business problems.
- Use spreadsheets to analyze problems from different business areas.

Students will also improve their competency in Business Analysis and Decision Making applied to fields like operations, finance, marketing and other areas.

Course Textbook

The course requires the following textbook:

- Cliff T. Ragsdale, *Spreadsheet Modeling and Decision Analysis. A Practical Introduction to Business Analytics*, **8th edition**, Cengage Learning

You are welcome to use a hardcopy or an electronic version, if you prefer.

Course Software

We will be using primarily Microsoft Excel and the software available with the textbook which includes the *Analytic Solver Platform* for optimization. To get the software proceed as instructed in **“Instructions to install the Analytic Solver Platform”** posted on Canvas. The course code and the textbook code are provided in Canvas too. The SolverSetup.exe Setup program *may* prompt for a password and license activation code, which will be emailed to you. There will be a cost associated with the software installation that each student will need to pay.

Make sure that the Solver Add-in is installed in your laptop before coming to class.

Zoom will be used to connect the online students for the synchronous class and ALL students while online classes only are scheduled by the University. Weekly connection links are provided on Canvas – Zoom.

Remote Proctor NOW will be used for proctoring purposes during the Midterm. Installation details are provided on Canvas.

Canvas

We will be using Canvas (<https://clemsun.instructure.com/login/canvas>), the Clemson University course management system. I will post here all the material necessary for this class and the assignments. You will find there the following items:

- Syllabus - updated as needed throughout the term.
- Course schedule - with week-by-week readings and problem assignments dates (subject to updates during the semester).
- Course handouts – lecture slides, problems templates, assignments solutions, class recordings, group project details.
- Course assignments and Group Project - are to be submitted online using the links provided on Canvas.

Course Method of Evaluation

- **Course Requirements**

Requirement	Percentage of Final Grade
Assignments (equally weighted)	30%
Group Project	35%
Midterm exam	35%
Total	100%

Note: All parts of the grade are mandatory.

Final grades will be assigned as follows:

A: 90-100%; **B:** 80-89%; **C:** 70-79%; **F:** < 69%

- **Assignments**

Assignments need to be organized and complete to be acceptable. I expect you to clearly label your work and present all the steps you followed to obtain the final results.

Here's a **checklist** that you can follow when completing your assignment for both the pen and paper and Excel problems:

- Each problem should be identified by the chapter number, the problem number and the textbook page;
- Provide complete explanations for the problems requiring solution interpretation;
- All the problems assigned should be saved in ONE Excel file with multiple tabs identifying each problem;
- Excel file should be saved with your name and the assignment number (e.g. *GabrielaSava_HW1.xlsx*);

The assignments are shown in the course schedule and there are **due on Monday at 6 pm**. I expect you to complete the assignments on time. **Late assignments will not be accepted**. Please submit the online assignments using the **Assignment** tool feature in Canvas page for this class.

You are permitted and encourage working and discussing the problems with your classmates; however you must submit your work independently.

- **Group Project**

A case study is going to be assigned during this class, which can be solved in *groups of up to five students*. You have to communicate to me **by the end of the fifth class** your groups or I will assign students randomly in groups. The deliverables for the group project will be your Excel files, a brief report and a presentation during the last day of class or recorded. The case study solution is going to be submitted online and its due as it is shown in course schedule. The case study will count for 35% of your final grade.

Students enrolled in the online section of the course can form their own groups or can decide to work with students from the face-to-face section. You will be able to work with your peers face-to-face or online, function of your time constraints. During the last class you will have the option to (1) come to class and present the projects OR (2) connect and present online.

A *Google sheets* document have been made available on Canvas to facilitate the groups formation.

- **Midterm**

Open book/notes midterm will be given in class and/or online as identified in the course schedule. You should bring your own laptop for the exams. During the exams there will be no communication with fellow students and the web browsing is forbidden. Make sure that you downloaded all the necessary materials before coming to exam. The midterm will count for 35% of your final grade.

All students are expected to take the examination on the scheduled day. In general, there will be no make-up exams. However, in the event of midterm is missed to either a pre-approved absence by the instructor or due to an illness documented by a physician's note, arrangements may be made to make-up the exam. Make-up examinations are at the discretion of the instructor.

Students enrolled in the online section will take the exams from home using an online proctoring software that will record their entire exam. The software installation details will be posted on Canvas. Be aware, that the software will need to be installed into your personal computer.

The time allocated to the exams will be the same one as for the face-to-face students. Details about the logistics of the tests will be posted on Canvas.

Attendance policy

Students who must miss class are responsible for all material covered and all announcements made in their absence. In the unlikely event that the professor may miss a class, students may leave after 15 minutes. In the event of snow, class will be held if the university is in session.

COVID-19 related information: For a student who reports being tested positive or is being asked to quarantine/isolate because of exposure to the virus, it will be up to the student to inform the

instructor that they will be moving to online-only instruction for at least the next 2 weeks. Students should use the Notification of Absence module in Canvas to initiate this notification. Additional information via email is encouraged; students should follow up with their instructor to develop a continued plan of study for the course.

Classroom Decorum

Please come to the class on time, and do not leave during the class unless it is absolutely necessary. Please turn off your cell phones, pagers, etc. to not disturb the class unless you expect a medical emergency, in which case please take a seat near an exit. Please do not engage in conversations with your colleagues during class, or engage in other activities that may be distracting to others nearby (for example, Facebook, e-mail, web surfing unrelated to the course discussion, etc.)

Students may not record classroom lectures, discussion and/or activities without my advance written permission. Any such recording, properly approved in advance, can be used solely for the student's own private use.

Students enrolled in the online section will attend the courses via the online system implemented for them by the MBA program. Details about the software necessary to connect during the class time will be made available on Canvas. During the live stream of the class, the online students will have the option to connect and interact with a Teaching Assistant, if questions arise.

Accessibility Statement

Clemson University values the diversity of our student body as a strength and a critical component of our dynamic community. Students with disabilities or temporary injuries/conditions may require accommodations due to barriers in the structure of facilities, course design, technology used for curricular purposes, or other campus resources. Students who experience a barrier to full access to a class should let the instructor know, and make an appointment to meet with a staff member in Student Accessibility Services as soon as possible. You can make an appointment by calling 864-656-6848 or by emailing studentaccess@lists.clemson.edu. Students who receive Academic Access Letters are strongly encouraged to request, obtain and present these to their instructors as early in the semester as possible so that accommodations can be made in a timely manner. It is the student's responsibility to follow this process each semester. You can access further information here: <http://www.clemson.edu/campus-life/campus-services/sds/>.

The Clemson University Title IX (Sexual Harassment) Statement

Clemson University is committed to a policy of equal opportunity for all persons and does not discriminate on the basis of race, color, religion, sex, sexual orientation, gender, pregnancy, national origin, age, disability, veteran's status, genetic information or protected activity in employment, educational programs and activities, admissions and financial aid. This includes a prohibition against sexual harassment and sexual violence as mandated by Title IX of the

Education Amendments of 1972. The policy is located at <http://www.clemson.edu/campus-life/campus-services/access/title-ix/>. Ms. Alesia Smith is the Clemson University Title IX Coordinator and the Executive Director of Equity Compliance. Her office is located at 110 Holtzendorff Hall, 864-656-3181 (voice) or 864-656-0899 (TDD).

Academic Integrity:

As members of the Clemson University community, we have inherited Thomas Green Clemson's vision of this institution as a "high seminary of learning". Fundamental to this vision is a mutual commitment to truthfulness, honor and responsibility, without which we cannot earn the trust and respect of others. Furthermore, we recognize that academic dishonesty detracts from the value of a Clemson degree. Therefore, we shall not tolerate lying, cheating, or stealing in any form. In instances where academic standards may have been compromised, Clemson University has a responsibility to respond appropriately to charges of violations of academic integrity.

COVID-19 related information for in-person classes

While on campus, face coverings are required in all buildings and classrooms. Face coverings are also required in outdoor spaces where physical distance cannot be guaranteed. Please be familiar with the additional information on the Healthy Clemson website, such as the use of disinfectant wipes for in-person classes. If an instructor does not have a face covering or refuses to wear an approved face covering without valid documented accommodation, students should notify the department chair. If a student does not have a face covering or refuses to wear an approved face covering without valid documented accommodation, the instructor will ask the student to leave the academic space and may report the student's actions to the Office of Community and Ethical Standards as a violation of the Student Code of Conduct. If the student's actions disrupt the class to the extent that an immediate response is needed, the instructor may call the Clemson University Police Department.

Course Schedule

Day	Lecture topic	Readings	Assignments - Due on MONDAYs at 6 pm
<i>Lecture 1 August 17</i>	Introduction (<i>online</i>)	Chapter 1	
<i>Lecture 2 August 24</i>	Introduction to Optimization and Linear Programming (<i>online</i>)	Chapter 2	HW 1 Due August 31
<i>August 25</i>	<i>Last day to register or add a class or declare Audit</i>		
<i>Lecture 3 August 31</i>	Modeling and Solving LP Problems <ul style="list-style-type: none"> • Production Problem • Make vs Buy Problem • Investment Problem (<i>online</i>) 	Chapter 3 - 3.0 to 3.10	HW 2 Due September 7
<i>September 1</i>	<i>Last day to drop a class or withdraw from the University without a W grade</i>		
<i>Lecture 4 September 7</i>	Modeling and Solving LP Problems <ul style="list-style-type: none"> • Transportation Problem • Blending Problem • Production and Inventory Planning Problem (<i>online</i>) 	Chapter 3 – 3.11 to 3.13	HW 3 Due September 14
<i>September 8</i>	<i>Last day to apply for December graduation</i>		
<i>Lecture 5 September 14</i>	Modeling and Solving LP Problems – Case study (<i>online</i>)	Chapters 3, 4	HW 4 Due September 21 <i>Teams for the Group Project are due</i>
<i>Lecture 6 September 21</i>	Network Modeling <ul style="list-style-type: none"> • Transshipment Problem • Shortest Path Problem • Assignment Problem 	Chapter 5 – 5.0, 5.1, 5.2, 5.4	HW 5 Due September 28
<i>Lecture 7 September 28</i>	Network Modeling <ul style="list-style-type: none"> • Generalized Network Flow Problem • Maximal Flow Problem 	Chapter 5 – 5.5, 5.6	HW 6 Due October 5

	Network Modeling – Case study		
<i>Lecture 8 October 5</i>	Network Modeling – Case study Midterm revision	Chapters 1 to 5	
<i>Lecture October 12</i>	Midterm Exam (online)		
<i>Lecture 9 October 19</i>	Integer Linear Programming <ul style="list-style-type: none"> • Employee Scheduling Problem • Capital Budgeting Problem 	Chapter 6 – 6.0 to 6.13	HW 7 Due October 26
<i>October 23</i>	<i>Last day to drop a class or withdraw from the University without final grades</i>		
<i>Lecture 10 October 26</i>	Integer Linear Programming <ul style="list-style-type: none"> • Fixed Charge Problem Integer Linear Programming - Case study	Chapter 6 – 6.14, 6.17	HW 8 Due November 2
<i>Lecture 11 November 2</i>	Nonlinear Programming <ul style="list-style-type: none"> • Production Problem • Economic Order Quantity Model • Location Problem 	Chapter 8 – 8.0 to 8.5, 8.9	HW 9 Due November 16
<i>Lecture November 9</i>	No class – Fall Break		
<i>Lecture 12 November 16</i>	Revenue Management Nonlinear Programming – case study		Group Project is assigned Due December 7
<i>Lecture November 23</i>	No class due to DSI Annual conference		
<i>Lecture 13 November 30</i>	Group Project – work		
<i>Lecture December 7</i>	Group Project presentations		