

**MBA 8590-001 Managerial Decision Modeling**  
**Course Syllabus – Spring Term 2019**

<b>Course number and title</b>	MBA 8590-001 Managerial Decision Modeling
<b>Academic term</b>	Spring Term 2019
<b>Course record number (CRN)</b>	14065
<b>Number of credits</b>	3 credits
<b>Dates, day and time</b>	January 7, 2019 – May 3, 2019 Monday 6:00 PM – 8:45 PM
<b>Classroom</b>	603, Clemson at ONE Building Campus
<b>Office hours</b>	Mondays, 5 to 6 pm or by appointment
<b>Instructor</b>	M. Gabriela SAVA, PhD 368A Serrine Hall <a href="mailto:msava@clemson.edu">msava@clemson.edu</a>

**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*, **8<sup>th</sup> 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.docx.”** The course code and the textbook code are provided in the file. The SolverSetup.exe Setup program *may* prompt for a password and license activation code, which will be emailed to you.

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

## Canvas

We will be using Canvas (<https://clemsontech.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)	20%
Group Project	20%
Midterm exam	30%
Final exam	30%
<b>Total</b>	<b>100%</b>

**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. 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 20% of your final grade.

- **Midterm and Final exam**

Open book/notes midterm and final exams will be given in class 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. Both the midterm and final exam will count each for 30% 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 final exam 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.

### **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

### **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 with Disabilities**

Appropriate accommodations will be made for students with disabilities that are documented by Disabilities Services. Students must present a letter stating that the disability has been documented and requesting the specific accommodations early in the semester. Additionally, it is the responsibility of the student to give the professor at least one-week notice prior to each instance where an accommodation will be needed.

### **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 (e.g., opposition to prohibited discrimination or participation in any complaint process, etc.) 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/campuslife/campus-services/access/non-discrimination-policy.html>

Jerry Knighton serves as Clemson's Title IX Coordinator and he may be reached at knightl@clemson.edu or 656-3181.

### **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."

## Course Schedule

Day	Lecture topic	Readings	Assignments - Due on MONDAYs at 6 pm
<i>Lecture 1</i> <i>January 7</i>	<b>Introduction</b>	Chapter 1	
<i>Lecture 2</i> <i>January 14</i>	<b>Introduction to Optimization and Linear Programming</b>	Chapter 2	<b>HW 1</b> <b>Due January 28</b>
<i>January 15</i>	<i>Last day to register or add a class or declare Audit</i>		
<i>Lecture</i> <i>January 21</i>	<b>No class – Martin Luther King Jr.</b>		
<i>January 23</i>	<i>Last day to drop a class or withdraw from the University without a W grade</i>		
<i>Lecture 3</i> <i>January 28</i>	<b>Modeling and Solving LP Problems</b> <ul style="list-style-type: none"> <li>• Production Problem</li> <li>• Make vs Buy Problem</li> <li>• Investment Problem</li> </ul>	Chapter 3 - 3.0 to 3.10	<b>HW 2</b> <b>Due February 4</b>
<i>Lecture 4</i> <i>February 4</i>	<b>Modeling and Solving LP Problems</b> <ul style="list-style-type: none"> <li>• Transportation Problem</li> <li>• Blending Problem</li> <li>• Production and Inventory Planning Problem</li> </ul>	Chapter 3 – 3.11 to 3.13	<b>HW 3</b> <b>Due February 11</b>
<i>Lecture 5</i> <i>February 11</i>	<b>Modeling and Solving LP Problems – Case study</b>  <b>Sensitivity Analysis for LP Problems</b>	Chapters 3, 4	<b>HW 4</b> <b>Due February 18</b>  <i><u>Groups for the Group Project are due</u></i>
<i>Lecture 6</i> <i>February 18</i>	<b>Network Modeling</b> <ul style="list-style-type: none"> <li>• Transshipment Problem</li> <li>• Shortest Path Problem</li> <li>• Assignment Problem</li> </ul>	Chapter 5 – 5.0, 5.1, 5.2, 5.4	<b>HW 5</b> <b>Due February 25</b>
<i>Lecture 7</i> <i>February 25</i>	<b>Network Modeling</b> <ul style="list-style-type: none"> <li>• Generalized Network Flow Problem</li> <li>• Maximal Flow Problem</li> </ul>	Chapter 5 – 5.5, 5.6	<b>HW 6</b> <b>Due March 4</b>

Lecture 8 March 4	Network Modeling – Case studies  Midterm revision	Chapter 5	
Lecture March 11	<b>Midterm Exam</b>		
<b>March 15</b>	<i>Last day to drop a class or withdraw from the University without final grades</i>		
Lecture March 18	<b>No class – Spring Break</b>		
Lecture 9 March 25	<b>Integer Linear Programming</b> <ul style="list-style-type: none"> <li>• Employee Scheduling Problem</li> <li>• Capital Budgeting Problem</li> </ul>	Chapter 6 – 6.0 to 6.13	<b>HW 7</b> <b>Due April 1</b>
Lecture 10 April 1	<b>Integer Linear Programming</b> <ul style="list-style-type: none"> <li>• Fixed Charge Problem</li> </ul> Case study	Chapter 6 – 6.14, 6.17	<b>HW 8</b> <b>Due April 8</b>
Lecture 11 April 8	<b>Nonlinear Programming</b> <ul style="list-style-type: none"> <li>• Production Problem</li> <li>• Economic Order Quantity Model</li> <li>• Location Problem</li> <li>• Portfolio Selection Problem</li> </ul>	Chapter 8 – 8.0 to 8.5, 8.9	<b>HW 9</b> <b>Due April 15</b>  <b>Group Project is assigned</b> <b>Due April 22</b>
Lecture 12 April 15	<i>Revenue Management</i> <b>Nonlinear Programming – case study</b>  Final exam revision		
Lecture 13 April 22	<b>In-class Group Project presentations</b>		
Lecture April 29	<b>Final Exam</b>		