MBA 8030-003/*004* Statistical Analysis of Business Operations

Course Syllabus – Fall Term 2020

Course number and title	MBA 8030-003 Statistical Analysis of Business Operations (face-to-face) *MBA 8030-004 Statistical Analysis of Business Operations (online)*
Academic term	Fall Term 2020
Course record number (CRN)	90932/ *90934*
Number of credits	3 credits
Dates, day and time	August 17, 2020 – December 11, 2020 Tuesday 6:00 PM – 8:45 PM
Classroom	Clemson at ONE Building Campus *Synchronous teaching mode*
Office hours	Thursdays, 7 to 8 pm (face-to-face & *online*) - by appointment made on Canvas Calendar application - via Zoom (online)
Instructor	M. Gabriela SAVA, PhD 420D College of Business building msava@clemson.edu

Course Description

"Application of modern statistical inference in business operations. Topics include testing statistical hypotheses, consequences of making decisions with incomplete information, univariate and multivariate regression with emphasis on business applications and design of experiments and analysis of variance. Special attention is given to efficient and relevant data collection and interpretation."

Effective management in the information age relies on the proper use and interpretation of data. Virtually every functional area of management relies on the statistical treatment of data and information. Knowing when and how to use statistics as a tool to make decisions in an uncertain business environment is an essential skill of a successful manager.

Learning Goals

The objectives of this course are to present the most important statistical techniques and illustrate their applications. Emphasis will be on appropriate formation of problems, on proper choice of statistical techniques and on effective interpretation and communication of results. Conceptual understanding will be facilitated by the use of technology this course will therefore show how each of the statistical techniques can be implemented in a spreadsheet (MS Excel) environment. By the end of the course, students should be able to recognize and to deal with situations that involve uncertainty, and you should understand how to apply and to interpret regression analysis and other managerially important analytical models.

Course Textbook

The course requires the following textbook:

- Gerald Keller, *Statistics for Management and Economics,* **11th 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 particularly its package Data Analysis. To get Data Analysis you go: **File → Options → Add-ins → Select Analysis ToolPak from the Add-ins list → then Go (bottom of the window) → Select Analysis ToolPak from the new list → then OK.** The Data Analysis package should be found under the tab Data.

Additionally, we will be using the Minitab software. Details about installation can be found here:

- Students can get an online copy of Minitab at https://cuapps.clemson.edu
- Students can get a download copy of Minitab for Windows by using the CCIT Software Center App
- CCIT also recommends having Citrix and VPN on your computer to help the software run better.

Make sure that the two software are 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://clemson.instructure.com/login/canvas), the Clemson University new course management system. I will post here all the material necessary for this class and also 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 spreadsheet;
- Excel file should be saved with your name and the assignment number (e.g. *GabrielaSava_HW1.xlsx*);

The assignments are shown in the <u>course schedule</u> and there are **due on Tuesday 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 file and a presentation during the last day of class. The case study solution is going to be submitted online and its due it is shown in <u>course schedule</u>. 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 <u>course schedule</u>. 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. so as 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 dur 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 war 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 war 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 instruction may call the Clemson University Police Department.

Course Schedule

Day	Lecture topic	Readings	Assignments - Due on TUESDAYSs at 6 pm
Lecture 1 *August 18*	**Introduction** **Descriptive techniques** **Data collection & sampling** (*online*)	Chapter 1, 2, 3, 4, 5	
Lecture 2 *August 25*	**Random variables and discrete probability distributions** (*online*)	Chapter 6, 7	**HW 1** **Due September 1**
August 25	*Last day to register or add a class or declare Audit*		
Lecture 3 *September 1*	**Continuous probability distributions** **Sampling distributions** (*online*)	Chapter 8, 9	**HW 2** **Due September 8**
September 1	*Last day to drop a class or withdraw from the University without a W grade*		
Lecture 4 *September 8*	**Introduction to estimation** **Hypothesis testing** **Inference about a population I** (*online*)	Chapter 10, 11, 12	
September 8	*Last day to apply for December graduation*		
Lecture 5 *September 15*	**Inference about a population II** (*online*)	Chapters 12	**HW 3** **Due September 22** ***Teams for the Group Project are due***
Lecture 6 *September 22*	**Inference about comparing two populations**	Chapter 13	**HW 4** **Due September 29**
Lecture 7 *September 29*	**Analysis of variance (ANOVA) I**	Chapter 14	**HW 5** **Due October 6**
Lecture 8 *October 6*	**Analysis of variance (ANOVA) II** **Midterm review**	Chapter 14 Chapters 6-14	**HW 6** **Due October 11 (Sunday)**
Lecture *October 13*	**Midterm Exam (online)**		
Lecture 9 *October 20*	**Simple linear regression I**	Chapter 16	**HW 7** **Due October 27**
October 23	*Last day to drop a class or withdraw from the University without final grades*		
Lecture 10 *October 27*	**Simple linear regression II**	Chapter 16	**HW 8** **Due November 3**
Lecture 11	**Multiple linear regression analysis I**	Chapter 17, 18	**HW 9**

November 3			**Due November 17**
Lecture November 10	**No class – Fall Break**		
Lecture 12 November 17	**Multiple linear regression analysis II**	Chapter 17, 18	**Group Project is assigned Due December 8**
Lecture November 24	**No class due to DSI Annual conference**		
Lecture 13 December 1	**Multiple linear regression analysis III**	Chapter 17, 18	
Lecture December 8	**Group Project presentations**		