

Business Analytics and Information Technology
Course Number: 33:136:385
Course Title: Statistical Methods in Business

COURSE DESCRIPTION

Statistics is a science of extracting information from data, making decisions on the basis of that information, and communicating both information and decisions to others. An understanding of statistics is fundamental to performing many business functions, such as marketing, operations, and finance; moreover, statistics forms an important foundation to enable you to learn these and other fields in more depth. This course is designed with both above mentioned characteristics in mind and will focus on developing your knowledge of the principles of statistics (theory) and their application (practice). Since this is a business statistics course, our coverage of theory will be designed to facilitate your use of the appropriate statistical methods and further study of business topics. We will not concentrate on the mathematical foundations of statistics or probability (but it is of course impossible to completely avoid mathematics in a statistics course).

From an application perspective, the practice of statistics is fundamentally computer-based. The data sets and calculations involved in modern statistical applications can be best handled by computers. To ensure that you develop the appropriate skills, we will be integrating computer based analyses as much as possible in this course. There are many statistical packages available for research and business applications; however, we will use standard Microsoft Excel together with the PHStat add-in. As a statistical package, these two products have some limitations; however, they offer a collection of statistical tools that are appropriate for business analysis and decision making and sufficient for the purpose of this class. Moreover, while other tools may be more powerful, PHStat and Excel have the advantage that they are available in most workplaces. Increasing your sophistication with PHStat and Excel will improve your marketability as many of you may be conducting PHStat and Excel-based analyses early in your professional careers.

COURSE MATERIALS

- Required Textbook: Basic Business Statistics, by Mark L. Berenson, David M. Levine, Kathryn A. Szabat, 14-th Edition (2017), the course covers Chapters 11-15.
- [Edition 13 which may be cheaper to get can be used instead.]
- Other materials beyond the textbook may be presented on the Canvas.

COURSE TECHNOLOGY

- Websites:
 - o For most material I will use [Canvas](#) - Software packages:
 - o For some of the homework assignments you will need a computer. The necessary software is:
 - o MS Excel o PHStat add-in (open-source freeware).
- Please check your officially registered Rutgers email account regularly for possible class announcements.

LEARNING GOALS AND OBJECTIVES

The business school dean's office requires that each course have learning objectives explicitly tied to those of its academic program (in this case the New Brunswick undergraduate business program). Students successfully completing this course should be able to demonstrate the following:

- Ability to ... apply quantitative modeling techniques to analyze business plans and decisions [The second part of overall program objective 1(d)]

Students will be introduced to basic statistical methods, so that they would be able to design an experiment, analyze observations and make reasonable judgments about the business events. Also, they would be able to construct and utilize predictive statistical models. In particular, after taking this course students will learn: analysis of variance, regression analysis, chi-square test and some other nonparametric tests.

PREREQUISITES

- 01:640:135 or 01:640:151 or 21:640:135 *Calculus I* is required
- Introductory level statistics course is required (many variants of the course are accepted, see prerequisites in the official Schedule of Classes)
- Elements of Calculus, Probability Theory, and Basic Statistic; students are supposed to know the content of the first ten chapters (in particular, 4-8) of the textbook. Several opening classes in January will be devoted to recall the content of these chapters. This material will not be included in Homework and Exams.

ACADEMIC INTEGRITY

I do NOT tolerate cheating. Students are responsible for understanding the RU Academic Integrity Policy (<http://academicintegrity.rutgers.edu/>).

I will strongly enforce this Policy and pursue *all* violations. On all examinations and assignments, students must sign the RU Honor Pledge, which states, "On my honor, I have neither received nor given any unauthorized assistance on this examination or assignment." I will screen all written assignments

through *SafeAssign* or *Turnitin*, plagiarism detection services that compare the work against a large database of past work. Don't let cheating destroy your hard-earned opportunity to learn. See business.rutgers.edu/ai for more details.

ATTENDANCE AND CLASS CANCELLATION POLICIES

Attendance:

- I plan to pass around an attendance sheet during all classes and record the results in my private spreadsheet.
- If you miss more than a certain "threshold" number of classes (which will be most likely set to 5 classes), there will be small percentage penalty on your overall aggregate course score for each class missed beyond the threshold. For example, there may be a 0.5% deduction for each meeting missed beyond 5 classes.
- It is **not** generally necessary to inform me if you will be missing a class due to an illness, job interview, religious observance or other reason, unless you are missing an exam or missing more than 5 total class meetings (all of which are strongly discouraged). If homework is due during a class you plan to miss, please hand it in early at my office or have another student hand in your paper for you.
- The goal of my attendance policy is to encourage good attendance, not to enforce or reward perfect attendance. I understand that students are occasionally ill or have job or internship interviews that are inflexibly scheduled. But keep in mind that good attendance will be critical for most students to perform well in this course.
- If you miss an exam or homework due to illness, please contact me to see whether any accommodation is possible. Severe illness or personal emergency is typically the only reason I make accommodations, and there must be written, verifiable documentation. Otherwise, you will receive a zero score on the missed assignment or exam.

Severe weather and other cancellations:

- The general policy is to hold class whenever the campus is open and class is scheduled, regardless of the weather or religious observances.
 - Your primary source of information for whether the campus is open is the [Rutgers New Brunswick operating status page](#).
 - If it is impossible or unsafe for me to attend class (e.g. for a last minute illness) and I cannot find a substitute lecturer, I will make every effort to send an e-mail announcement (to your e-mail address officially registered with Rutgers) However, this eventuality is highly unlikely if the campus is open.
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HOMEWORK ASSIGNMENTS, EXAMS

All polices are subject to change at the instructor's discretion:

Assignments:

- I am planning for 3 homework assignments. The course covers Chapters 11-15 of the textbook; for chapters 11, 13, and 14-15 HWs will be given. Chapter 12 will be covered at the end of the

semester, so there will be no time for the HW; instead several "exam-type" problems will be considered in class.

- Each HW will be collected in class before its deadline but can be handed in sooner. The HW problems will be taken from the textbook. Note that their numeration may depend on edition; in such cases not only the number but also the text will be given on Canvas.
- To solve the HW you will need to use a Statistical Package. PHStat is recommended.
- You will get access to PHStat and to all data-files from the textbook.
- The HW solutions will be given on "Canvas".
- Submitted home-works will be checked by graders.
- Note that HWs and exams require different skills. For HW you will need to use a computer and a statistical package, while exams are "computer-free".
- Collaboration in small groups **is permitted** on homework assignments. Working in small groups can often help the learning process, and stricter policies are a waste of time to enforce. You should hand in your own individual assignment even if you collaborated with other students. Please indicate who you collaborated with.
- Due to the difficult logistics of tracking large numbers of students, there is no credit for late assignments. You will receive a zero score for any late assignments.

Exams:

- There will be two exams in this class: one midterm and a final exam.
- Midterm covers Chapter 11 while Final is cumulative, it covers the whole course.
- Plan to bring a calculator (capable of performing basic arithmetic operations, square, sqrt, exp, and natural log) to both exams. All exams are planned to be open book and open notes. No computers, tablets, or phones of any kind are permitted in exams, so if you use a laptop or tablet to take notes, please print your notes and take only the printout to the exam. You **may not use a smartphone as a calculator** during an exam.
- No collaboration with any other individual is permitted on exams.
- If I detect any violation of exam policies, I will prosecute them as a violation of the Rutgers University academic integrity policy outlined here:

(<http://academicintegrity.rutgers.edu/>).

Students are expected to be familiar with the school's academic integrity policies. Additional information may be found at <http://business.rutgers.edu/ai>.

- No makeup midterm, except well-documented cases (medical emergency, doctor's note).
 - Final exam scheduling conflicts will be managed in strict adherence to university regulations, with first preference for any students needing make-up exams to take the exam offered for the other section of the course. I will make announcements about final exam conflicts topic as the exam period nears. Any student with a final exam conflict must email me a screenshot of their entire final exam schedule for the semester by the last day of classes, or have to take the exam at the regularly scheduled time.
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OFFICE HOURS

These office hours are subject to change based on their convenience to student schedules and other factors.

- Regular office hours will be (), () through ().
- Regular office hours will not be held on the day of the midterm exam () and during the ().
- If you cannot make it to scheduled office hours, you are free to send me e-mail to ask questions or request an office appointment at a different time. I obviously cannot promise to honor all appointment requests, but I will make my best effort to find a mutually possible time to meet students unable to attend scheduled office hours.
- Please do not use office hour time to try to catch up on missed classes, no matter how good your reason for missing them (see the attendance policy below).
- During office hours, do not simply hand me a draft of your homework assignment and ask me to check whether it is correct. Instead, please formulate specific questions about points about which you are unsure.

GRADING POLICY

- No letter grades are assigned to individual assignments or exams, only numeric scores from 0 to 100.
- Your course grade will be based on your overall aggregate score, which combines your scores on all written class work with following weights.
 - o 30% midterm exam
 - o 40% final exam
 - o 30% average homework score
- I will assign letter grades based on your overall aggregate score. I will not use fixed cutoff values, but instead use my judgment to select cutoffs that make sense for each particular course and semester. The cutoffs may vary by section when the exams taken by the sections are not identical.
- I will not offer extra credit work to improve grades after they have been issued. Such a policy is not fair to other students: extra credit opportunities would have to be offered to every student whose grade was below “A”, and each course would drag out interminably.
- I plan to post homework and exam grades on [Canvas](#).
- I will attempt to return graded homework assignments at the beginning of class, usually one week after they are handed in. Any unclaimed homework will eventually go into a box outside my office door. Any homework still in this box 30 days after the end of the semester will be recycled.
- I will review the results of the midterm exam in class, with each student receiving a copy of the exam and their answers. I generally plan to review midterm results one week after each exam, but I will announce the definite date once the exams are graded. You must return both the exam and your answers to me before leaving the classroom. If you miss the class in which exams were reviewed or want to look at your exam further, you may inspect your exam in my office, either during scheduled office hours or by appointment (see the office hour policy above).
- I may make mistakes in grading, and I will be happy to regrade any assignment or exam on which you believe there might have been a grading error. However, you should be aware that if there turn out to have been errors in your favor, then regrading has a chance of lowering your grade as well as raising it.

- I will not allow under any circumstances any external considerations such as scholarships with GPA requirements or lost tuition reimbursement to affect my grading.

COURSE SCHEDULE

The planned course schedule is very tentative. Depending on the performance of the class and weather or other emergencies, it may prove necessary to deviate from this schedule.

- Review of the basic concepts of descriptive statistics: random variable; probabilistic distribution, basic examples, normal distribution; population and sample; mean (average, expectation), variance and standard deviation; interval estimators and hypothesis test. This material is covered by Chapters 1-10 (in particular 48) of the textbook. This part of the course will not be included in exams or homework. Yet, you must review this material, otherwise you cannot fully understand Chapters 11-15.
- Chapter 11
- Midterm Recitation:
- Midterm Examination:
- (No Classes):
- Chapter 13
- Chapters 14 - 15
- Chapter 12
- Final Recitation: (last day of classes)
- Final Examination

SUPPORT SERVICES

If you need accommodation for a *disability*, obtain a Letter of Accommodation from the Office of Disability Services. The Office of Disability Services at Rutgers, The State University of New Jersey, provides student-centered and student-inclusive programming in compliance with the Americans with Disabilities Act of 1990, the Americans with Disabilities Act Amendments of 2008, Section 504 of the Rehabilitation Act of 1973, Section 508 of the Rehabilitation Act of 1998, and the New Jersey Law Against Discrimination. More information can be found at ods.rutgers.edu.

[Rutgers University-New Brunswick ODS phone (848)445-6800 or email dsoffice@echo.rutgers.edu]

[Rutgers University-Newark ODS phone (973)353-5375 or email ods@newark.rutgers.edu]

If you are *pregnant*, the Office of Title IX and ADA Compliance is available to assist with any concerns or potential accommodations related to pregnancy.

[Rutgers University-New Brunswick Title IX Coordinator phone (848)932-8200 or email jackie.moran@rutgers.edu]

[Rutgers University-Newark Office of Title IX and ADA Compliance phone (973)353-1906 or email TitleIX@newark.rutgers.edu]

If you seek **religious accommodations**, the Office of the Dean of Students is available to verify absences for religious observance, as needed.

[Rutgers University-New Brunswick Dean of Students phone (848)932-2300 or email deanofstudents@echo.rutgers.edu]

[Rutgers University-Newark Dean of Students phone (973)353-5063 or email DeanofStudents@newark.rutgers.edu]

If you have experienced any form of **gender or sex-based discrimination or harassment**, including sexual assault, sexual harassment, relationship violence, or stalking, the Office for Violence Prevention and Victim Assistance provides help and support. More information can be found at <http://vpva.rutgers.edu/>.

[Rutgers University-New Brunswick incident report link: <http://studentconduct.rutgers.edu/concern/>. You may contact the Office for Violence Prevention and Victim Assistance at (848)932-1181]

[Rutgers University-Newark incident report link: https://cm.maxient.com/reportingform.php?RutgersUniv&layout_id=7 . You may also contact the Office of Title IX and ADA Compliance at (973)353-1906 or email at TitleIX@newark.rutgers.edu. If you wish to speak with a staff member who is confidential and does **not** have a reporting responsibility, you may contact the Office for Violence Prevention and Victim Assistance at (973)353-1918 or email run.vpva@rutgers.edu]

If students who have experienced a temporary condition or injury that is adversely affecting their ability to fully participate, you should submit a request via <https://temporaryconditions.rutgers.edu>.

If you are a military **veteran** or are on active military duty, you can obtain support through the Office of Veteran and Military Programs and Services. <http://veterans.rutgers.edu/>

If you are in need of **mental health** services, please use our readily available services.

[Rutgers University-Newark Counseling Center: <http://counseling.newark.rutgers.edu/>]

[Rutgers Counseling and Psychological Services–New Brunswick: <http://rhscaps.rutgers.edu/>]

If you are in need of *physical health* services, please use our readily available services.

[Rutgers Health Services – Newark: <http://health.newark.rutgers.edu/>]

[Rutgers Health Services – New Brunswick: <http://health.rutgers.edu/>]

If you are in need of *legal* services, please use our readily available services: <http://rusls.rutgers.edu/>

Students experiencing difficulty in courses due to *English as a second language (ESL)* should contact the Program in American Language Studies for supports.

[Rutgers–Newark: PALS@newark.rutgers.edu]

[Rutgers–New Brunswick: eslpals@english.rutgers.edu]

If you are in need of additional *academic assistance*, please use our readily available services.

[Rutgers University-Newark Learning Center: <http://www.ncas.rutgers.edu/rlc>]

[Rutgers University-Newark Writing Center: <http://www.ncas.rutgers.edu/writingcenter>]

[Rutgers University-New Brunswick Learning Center: <https://rlc.rutgers.edu/>]

[Optional items that many faculty include:

- Students must sign, date, and return a statement declaring that they understand the RU Academic Integrity Policy.

- Students must sign, date, and return a statement declaring that they understand this syllabus.]