STATISTICAL METHODS IN BUSINESS
Spring 2025; 33:136:385
Section 2

Instructor: Vladimir Gurvich

Classes: Monday and Wednesday; 2 - 3:20pm
Classroom: BRR-4071, Livingston Campus.

Office hours:
Monday and Wednesday, 3:30 - 4:15pm
Office: 100 Rockafeller Road, Room 5148
[If the door is closed, please knock, don't go away.]

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All important announcements will appear on "Canvas" (so check it regularly) and/or be e-mailed to all students.

Teaching Assistant: TBD
e-mail:

Course Description

Statistics is about getting 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, finance, etc.; moreover, statistics forms an important foundation to enable you to learn about these and other fields. This course is designed with both these 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 delve into the mathematical foundations of statistics or probability.

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 focus on PHStat and 'standard' Microsoft Excel. As a statistical package, these two packages have some

limitations; however, they offers a collection of statistical tools that are appropriate for business analysis and decision making. Moreover, while other tools may be more powerful, PHStat and Excel has the advantage that it is available in most workplaces. Beyond that, increasing your sophistication with PHStat and Excel will improve your marketability as many of you will 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, 13-th Edition, ISBN-13, Pearson, 2014, Copyright 2015.

[Other editions of this textbook can be used, too.]

- The course covers Chapters 11-15. All materials beyond these chapters will be presented on Canvas.

Learning Goals and Objectives

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

Elements of Calculus, Probability Theory and Basic Statistic; students are supposed to know the first ten chapters (in particular, 4-8) of the textbook. Several (5-6) first classes will be devoted to these chapters. This material will be displayed on Canvas, but will not be included in Homeworks and Exams.

Homeworks [HWs]

- 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.

- HWs is a team work, students will work in one of four teams.

- HWs can be submitted any time before the deadline. If I am not in office, you can leave your HW in the box located next to the room (5148), outside.

- The HW problems are taken from the textbook.
Note that their numeration may depend on edition; in such cases not only the number but also the full text will be given in Canvas.

- To solve the HW you will need to use a Statistical Package. PHStat is recommended, Excel or MiniTab are possible too. You will get access to PHStat and to all data-files from the textbook.

- The HW solutions will be given on Canvas before the midterm and before the final. Submitted homeworks will be checked by the grader, so you can analyze the mistakes.

- Note that HWs and exams require different skills. To do homework you will have to use a computer and statistical packages, e.g., PHStat, while exams are "computer-free".

Exam dates and policies:
There are two exams in this course Midterm [MT] and Final [F]:

Midterm [MT]: 3/12 (Wednesday), standard class time and place.

Final [F]: 5/9 (Friday), 4-7pm, regular classroom

- MT covers Chapter 11 (ANOVA); Final is cumulative, it covers the whole course.
- Both exams are OPEN books and notes.
- NO COMPUTERS, but you will need a SMALL CALCULATOR performing arithmetical operations, square, sqrt, exp, and natural logarithm; other elementary functions (sin, cos, etc.) are allowed (although you won't need them), but NO ADVANCED PACKAGES, LIKE EXCEL. If functions "exp" and "ln" are missing in your calculator, you are allowed to borrow one from your neighbor for a short time.

- No makeup MT, except well-documented cases.
- Final exam can be rescheduled only according to Rutgers Regulations:
if you have three finals in one day, the middle one can be rescheduled;
one of two overlapping exams can be rescheduled.

- In case you need a rescheduling, let me know ASAP.

Exam score:
An exam may include many problems. You may have not enough time to solve them all. In fact, not absolute, but relative (with respect to other students) score matters. For example, 60% may be a good score for a difficult exam and 80% may be average for an easy one. Expect that Final will be more difficult than Midterm: it covers the whole material, including Chapter 11 (ANOVA).

During exams, the following rules apply:
- If you have a disability that influences testing procedures, provide me an official letter from the Office of Disability Services at the start of the semester.
- No cell phones or other electronics are allowed in the testing room.
- You must show a valid Rutgers photo ID to enter the room and to turn in the exam.

Grading policy:
The course grade will be based on the total score, which is a weighted sum of the scores of homework assignments, the midterm examination, and final examination with the following weights:
HW Assignments: 20%
Midterm examination: 30%
Final examination: 50%

- No extra credit.
- Grade distribution: Grades A, B+, B, C+, and C will be "curved", (not necessarily uniformly) depending on the performance of the whole class. Grades D and F will be given only if "deserved", that is, when the score is much below the average.

Thus, only relative (rather than absolute) scores matter.

- The score for Homeworks, Midterm and Final will be posted on Canvas right after grading. You will be able to see only your own score and the average for the class.

- After grading, HWs will be returned to students for reviewing, while the MTs will be kept in office (5148). Students can use office hours to see their MTs and discuss the score for HWs and MTs.

- Grade grubbing:

Consider a note along these lines: "Your final grade is not subject to negotiation. If you feel I have made an error, submit your written argument to me within one week of receiving your grade. Clarify the precise error I made and provide all due supporting documentation. If I have made an error, I will gladly correct it. But I will adjust grades only if I have made an error. I cannot and will not adjust grades based on consequences, such as hurt pride, lost scholarships, lost tuition reimbursement, lost job opportunities, or dismissals. Do not ask me to do so. It is dishonest to attempt to influence faculty in an effort to obtain a grade that you did not earn, and it will not work."

Tentative Calendar:

Note: The described procedures and the calendar for this course are subject to change in the event of extenuating circumstances. All changes will be announced on Canvas and e-mailed to all students.

School begins: January 21, 2025, Tuesday.

January: Review of 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. Chapters 1-10 (in particular, 4-8) of the textbook. This part of the course will not be included in exams or homeworks. Yet, you must recall this material. Otherwise you cannot fully understand Chapters 11-15.

- February: Chapter 11 (ANOVA);
- Midterm Recitation: March 10, Monday;
- Midterm Examination: March 12, Wednesday;
- March: Chapter 13;
- April: Chapters 14 - 15;
- end of April: Chapter 12;
- Final Recitation: May 5, Monday;
- Final Examination: 5/9 (Friday) 4-7pm.

ACADEMIC INTEGRITY:

No cheating. Students are responsible for understanding the RU Academic Integrity Policy ($https://academicintegrity.rutgers.edu/$)

Don't let cheating destroy your hard-earned opportunity to learn. See business.rutgers.edu/ai for more details.

USE OF ARTIFICIAL INTELLIGENCE TOOLS:

Use of AI such as ChatGPT is not permitted in any stages of the writing process on any assignment.

ATTENDANCE AND PREPARATION POLICY:

- Expect me to attend all class sessions. I expect the same of you. If I am to be absent, my department chair or I will send you notice via email and Blackboard as far in advance as possible. If you are to be absent, report your absence in advance at https://sims.rutgers.edu/ssra/. If your absence is due to religious observance, a Rutgers-approved activity, illness, or family emergency/death and you seek makeup work, also send me an email with full details and supporting documentation.

- For weather emergencies, consult the campus home page. If the campus is open, class will be held.

- Expect me to arrive on time for each class session. I expect the same of you.

- Expect me to remain for the entirety of each class session. I expect the same of you.

- Expect me to prepare properly for each class session. I expect the same of you. Complete all background reading and assignments. You cannot learn if you are not prepared. The minimum expectation is that for each hour of class session, you have prepared by studying for at least two hours.

- Expect me to participate fully in each class session. I expect the same of you. Stay focused and involved. You cannot learn if you are not paying attention.

CLASSROOM CONDUCT:

No food or beverages. No side conversations. Cell phones must be off.

RESPONSIBILITIES :

- Cheating in any form will not be accepted (no plagiarism) and its consequence will be an "F" grade.

- A well documented emergency is a valid excuse to take a make-up exam.

- There will be no form of work for extra credit, so that everyone will be judged according to a common criterion. Regular attendance is required.

- All sources of noise such as mobile phones, music players, etc. should be turned off before entering the classroom.

- A calculator that performs basic operations (square, square root, exponent, logarithm, etc.) is necessary for homework assignments, class exercises, and

exams. Excel software, especially PHStat, complements the course; it is needed for HWs, but not allowed in exams.

- All students are responsible for locating, reading, and abiding by the University Policy on Academic Integrity for Undergraduate and Graduate Students, which is available on-line at integrity.

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 $Dean of Students@newark.rutgers.edu$]

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/]

The Center for Teaching Advancement and Assessment Research supports teaching and learning through a variety of areas. Free for students are software workshops in Excel, Word, PowerPoint, etc. Its website is at workshop.