Statistics
Course Number: 22:960:575
Course Title: Data Analysis & Decision Making

COURSE DESCRIPTION

Data Analysis & Decision Making aims to introduce the fundamentals of data models tools and methods and related topics. Students will learn how to use mathematical and software tools to analyze the data and make better decisions. Business applications (such as Finance, Marketing, Supply Chain Management, Economics, Accounting) of the topics covered will be highlighted. The emphasis will be on modeling and evaluating uncertainty, understanding the nature of decision-making, using data and limited information efficiently, simulating complex systems, and optimally allocating resources.

COURSE MATERIALS

Required Textbook(s):
- • Business Analytics: Data Analysis & Decision Making, by S. Christian Albright and Wayne L. Winston, 7th edition, ISBN - 13: 9780357109953.
- • Course notes - http://canvas.rutgers.edu (Require a NetID).
- • Softwares: MS Excel and R

LEARNING GOALS AND OBJECTIVES

The aim of the course is to develop decision-making skills. Since it is not possible to teach one all there is to know about data analysis techniques in a semester, the objective is to enable you to become intelligent users of data analysis techniques. This will necessitate some use of formulas and computer manipulations of data. However, the goal is not that you will become experts on equations and computer software, but rather to give you a perspective on how data models and techniques are used in practice. Hence, much of the material will be presented in a setting of practical business situations. The focus is on ways of modeling and structural ideas about decision problems. Students who complete this course will demonstrate the following:

1. Identify and apply important quantitative methods developed in the fields of statistics and optimization that are commonly used to solve business related problems.
2. Perform skilled statistical data analysis, summarization and interpretation of datasets by use of analytical software.
3. Utilize appropriate methods of optimization on data for the analysis of decision outcomes in business environments.

4. Utilize mathematical and software advances to build your own models for forecasting and optimization of data.
5. Have a collection of written resources on quantitative methods that will help you successfully meet a broad range of challenges you may encounter in a business career.

PREREQUISITES

1. Basic undergraduate statistic courses with a grade of B or better, or Statistics for Managers (22:135:572)
2. Calculus-I with a grade of B or better, or Calculus for Managers (22:135:571)

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 PREPARATION POLICY

- Expect me to attend all in-class sessions. If I am to be absent, my department chair or I will send you notice via email and Canvas as far in advance as possible. If you are to be absent, report your absence in advance at https://sims.rutgers.edu/ssra/. Some lectures may be provided via the web. In such a case you will be notified in advance to be present via your own computer and/or in class.
However, I do not take formal attendance, and attendance has no direct effect on your grade.
- 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.
- Class materials for each class will be posted on Canvas before class day. Homework assignments and other information will be posted on the course web page on Canvas.
- 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 class session, you have prepared by studying for at least twice as many hours as the class 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

The use of cell phones, or other mobile communication devices is disruptive, and is therefore prohibited during class. Except in emergencies, those using such devices must leave the classroom for the remainder of the class period. Students are permitted to use computers during class for note-taking and other class-related work only.

Improper behavior, such as coming late, leaving early, snoring in class, or inappropriate computer usage in class, such as e-mails, IM-ing, unrelated web surfing or computer use may be reasons for being requested to step out of the classroom.

EXAM DATES AND POLICIES

Midterm Exam: - in-class, closed book/notes (one two-sided cheat sheet), basic calculator allowed, no cellphones, laptops or similar electronic devices.

Final Exam: - in-class, closed book/notes (two two-sided cheat sheet), basic calculator allowed, no cellphones, laptops or similar electronic devices.

GRADING POLICY

Course grades are determined as follows:

Homeworks 25%
Case Exercises 15%
Midterm Exam 25%
Final Exam 35%
Class Participation (Bonus) 2%

Grade distribution: Letter	Percentage	Letter	Percentage
A	92-100	C+	72-75.99
A-	88-91.99	C	68-71.99
B+	84-87.99	C-	64-67.99
B	80-83.99	D	60-63.99
B-	76-79.99	F	0-59.99

Homeworks: There will be 6 homeworks assigned as a means to help you understand the concepts and to give you practice in applying them. Homeworks will be graded and returned to the student. Only 1 late unexcused homework assignment will be accepted besides medical or family emergencies. The highest grade you can get on unexcused late homework is 70. Late homework will be accepted one class late. You are allowed to seek or give help to other students on homework assignments, but you have to hand in your own work.

Case Exercises: There will be 5 or 6 in-class problem solving sessions in which the problems will be collected. Case exercises will be graded and returned to the student. Case Exercises may not be

announced ahead. I will drop your lowest one Case Exercises score in computing your overall Case Exercises performance. There is no make-up for case exercises.

Exams: There will be one in-class midterm exam and a final. All exams will be closed-book. One two-sided sheet of notes in your own handwriting will be allowed in the midterm exam, and two two-sided in the final exam. The final will be cumulative, covering all topics in the course. A make-up examination for midterm or final exam will only be given under extenuating circumstances (such as serious health or family problems). The student should consult the instructor as early as possible.

Class Participation: Even though there is no formal attendance, you may be evaluated based on your class participation. However, positive contributions are not necessarily right answers. Wrong answers can also be instructive. You are strongly encouraged to take risks and participate. Being disruptive during lecture (e.g., talking to classmates, text messaging etc.) will be thought of as negative factors to your participation grade. I reserve the right to give a zero for participation of any student who I feel has had a detrimental, distracting, or negative effect on the classroom learning environment over the course of the term.

All homeworks, case exercises, and exams are scored out of 100 points. I don't assign letter grades to individual exam or homework assignments, just numerical scores in the range 0-100. Also, I don't curve or alter individual homework or exam scores.

- At the end of the course, you can calculate your overall score by multiplying average score of homeworks, average score of case exercises, exams, and class participation scores with their corresponding weights specified above. These multiplications will be combined to get an overall score from 0-100. This score may contain fractions, but it won't be rounded.

- Grade posting: Grades will be provided within two-weeks of an exam, homework, or class exercise. Grades on hardcopy items will be provided in person in the class when the specific items are returned.

- Return of graded items: Graded items will be returned within two weeks to check in person for hardcopy items. Final exam will not be returned. Canvas for this course will be turned off and archived at the end of the final exam.

- Grade related information: No grade related information will be provided through email. All grade related information will be provided in person via appointments. It is expected that you are respectful when you review your grade with me and accept the grade you have earned. Please do not use abusive language in email or in person. Any instances of that will be reported according to university guidelines.

- Warning grade roster: Warning grades will be issued if needed.

- Pregrading & regrading: Requests to review assignments before final submission (pregrading) will be provided by appointment and primarily after class hours. Requests to regrade assignments, case exercises, and exams must be done in writing to the instructor within one week of the specific items being returned. Regraded items will be delivered back to students in person during after class hours.

- Grade grubbing: 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 of the specific item. If you want me to review the final grade, submit your written argument to me within one week of receiving your final 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.

COURSE SCHEDULE

Week	Topic	Items Due
Week 1	Course Introduction & Chapter 1: Introduction to Business Analytics Chapter 2: Describing the Distribution of a Variable	
Week 2	Chapter 2: Describing the Distribution of a Variable Chapter 3: Finding Relationships among Variables	
Week 3	Chapter 5: Probability and Probability Distributions	Hw #1
Week 4	Chapter 7: Sampling and Sampling Distributions	
Week 5	Chapter 8: Confidence Interval Estimation	Hw #2
Week 6	Chapter 9: Hypothesis Testing	Hw #3
Week 7	Chapter 9: Hypothesis Testing Review	
Week 8	**Midterm Exam**	
Week 9	Chapter 10: Regression Analysis	
Week 10	Chapter 11: Regression Analysis: Statistical Infer. (11-4, 11-7, 11-9) Chapter 13: Introduction to Optimization Modeling	Hw #4
Week 11	Chapter 14: Optimization Models	
Week 12	Chapter 14: Optimization Models	Hw #5
Week 13	Chapter 15& 16: Simulation	
Week 14	Chapter 15& 16: Simulation Review	Hw #6
Week 15	**Final Exam**	

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.]