RUTGERS–CAMDEN
School of Business

BUSINESS ANALYTICS

Sections: 53:716:502:01 (In-person) and 53:716:502:98 (Online)
Thursday 6-8:50 pm
In-Person (BSB 336) and Synchronous (Zoom) Online

Professor: **Dr. Emmanuel Peters**

Office: BSB 423

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Office Phone: (856) 225-6841

Zoom Office Hours: Tuesday 7-8 pm, Thursday 4-5:30 pm and by appointment

Course Description:

Analytic competency is essential in building a successful career in the business world and is often the factor that distinguishes leading firms in any industry. Companies like Netflix, Marriot International, Capital One and Progressive Insurance have succeeded in their industries mainly due to their distinctive analytic competencies.

This course is intended to provide an introductory overview of how firms implement data-driven decision making. Students will learn statistical concepts, use spreadsheet modeling and learn through a mix of lectures, cases and class discussions. Students are required to have a functioning computer with Microsoft Excel installed. Within Excel, you must have the DATA ANALYSIS tab and the SOLVER functionality working prior to the start of the class. We will use TreePlan add-in for decision analysis. The primary goal of the course is to coach students on "fact-based decision making" and to enable them to carefully plan and run "business experiments" to make managerial decisions.

Learning Goals/Objectives:

After completing this course, a student must be able to:

- Explain how companies use analytics
- Make fact-based decisions, grounded in statistical data analysis
- Perform data analysis and statistical tests in Excel
- Design and implement small-scale business experiments

Prerequisites:

Basic knowledge of probability and statistics, e.g., the concepts of mean, standard deviation and a probability distribution.

Instructor Availability

You may request for an appointment by sending an email. I encourage e-mail communication and normally make every effort to answer your question(s) within 24-48 hours.

Course Materials:

TEXTBOOK (Required):

Data, Models, and Decisions: The Fundamentals of Management Science
By Dimitris Bertsimas and Robert M. Freund
Year: 2004
Publisher: Dynamic Ideas
ISBN 0-9759146-0-X
Book can be purchased at: https://www.dynamic-ideas.com/books/ecbcnthsfb6hnzf-dezpw0aldtvl9yr

OTHER:

- Video lectures, PowerPoint slides, readings, and other posted material is available on the class Canvas site.
- Laptop with Microsoft Excel with Data Analysis and Solver installed.
- Laptop with video facility for those in Section 98 (online section).
- This course may use various periodicals and websites (Wall Street Journal, Financial Times, Kaggle, etc) as a supplement.

How to succeed in this course:

This is a converged learning environment. Please note that some students will be present in the classroom and some on Zoom. It is imperative that you come to class having read the assigned materials and watched any lecture videos posted to Canvas. The class time will be used to discuss and reinforce concepts presented in the lecture videos.
Your success depends on keeping up with the materials and reaching out to the professor in a timely manner for any questions. From my end, I will strive to respond to your questions within 24-48 hours.

1. Purchase the required textbook and ensure that you have access to a laptop/computer with Microsoft Excel. I recommend using a laptop vs using a mac.
2. You will need read assigned materials from the textbook, watch lecture videos posted, read the accompanying PowerPoint slides and follow along the Excel workbooks for each week.
3. You should plan at least 3 hours for reading and watching lectures each week. Additionally, expect 2-3 hours of assigned work per week.
4. Actively engage in discussions, questions, and solving problems during the class time.
5. Use published calendar to keep track of due dates, exam dates, etc. I do not accept late work, unless you had a university approved reason. In that case, you will need to submit necessary documentation.

Communication:

Canvas: All class materials can be obtained via Canvas. You are strongly encouraged to access this course via Canvas several times a week. To access this system, go to http://canvas.rutgers.edu log in, and click on the course on the dashboard.

Rutgers Email - Use Your Rutgers email to send emails to the professor. All communications to students will be done using Canvas and/or the Rutgers email address provided to you. Please forward your Rutgers email to your personal email if necessary. Not checking your Rutgers email is not an excuse for missing any communications

Pronouns

This course affirms people of all gender expressions and gender identities. Feel free to correct me on your preferred gender pronoun. If you have any questions or concerns, please do not hesitate to contact me.

Chosen Name (Preferred Name)

If you have a chosen name or preferred name other than what is listed on the roster, kindly let me know. If you would like to have your name changed within the rosters officially, go to: https://deanofstudents.camden.rutgers.edu/chosen-name-application

Diversity Statement:

This class strives to be an inclusive community, learning from the many perspectives that come from having differing backgrounds and beliefs. As a community, we aim to be respectful to all. We reject all forms of prejudice and discrimination, including but not limited to those based on age, color, disability, gender, gender identity, gender expression, national origin, political affiliation, race, religion, sexual orientation, and veteran status. Faculty and students are expected to commit to creating an environment that facilitates inquiry and self-expression, while also demonstrating diligence in understanding how others' viewpoints may be different from their own.

Our goal as a learning community is to create a safe environment that fosters open and honest dialogue. We are all expected to contribute to creating a respectful, welcoming, and inclusive environment. To this end, classroom discussions should always be conducted in a way that shows honor, respect, and dignity to all members of the class. Moreover, disagreements should be pursued without personal attack and aggression, and instead, should be handled with grace and care. This will allow for rigorous intellectual engagement and a deeper learning experience for all.

Disability Services/Accommodations

The University is committed to supporting the learning of all students and faculty will provide accommodations as indicated in a Letter of Accommodation issued by the Office of Disability Services (ODS). If you have already registered with ODS and have your letter of accommodations, please share this with me early in the course. If you have or think you have a disability (learning, sensory, physical, chronic health, mental health or attentional), please contact https://success.camden.rutgers.edu/disability-services.

Accommodations will be provided only for students with a letter of accommodation from ODS. Their services are free and confidential. Letters only provide information about the accommodation, not about the disability or diagnosis.

Academic Integrity

The Academic Integrity policy can be found at https://studentconduct.rutgers.edu/processes/university-code-student-conduct http://studentconduct.rutgers.edu/student-conduct-processes/academic-integrity/

Students are responsible for understanding the principles of academic integrity and abiding by them in all aspects of their work at the University. Students are also encouraged to help educate fellow students about academic integrity and to bring all alleged violations of academic integrity they encounter to the attention of the appropriate authorities.

Academic Integrity means that you (the student) must:

- properly acknowledge and cite all use of the ideas, results, or words of others,
- properly acknowledge all contributors to a given piece of work,
- make sure that all work submitted as your own in a course activity is your own and not from someone else
- obtain all data or results by ethical means and report them accurately
- treat all other students fairly with no encouragement of academic dishonesty

Adherence to these principles is necessary in order to ensure that:

- everyone is given proper credit for his or her ideas, words, results, and other scholarly accomplishments
- all student work is fairly evaluated and no student has an inappropriate advantage over others
- the academic and ethical development of all students is fostered
- the reputation of the University for integrity is maintained and enhanced.

Failure to uphold these principles of academic integrity threatens both the reputation of the University and the value of the degrees awarded to its students. Every member of the University community therefore bears a responsibility for ensuring that the highest standards of academic integrity are upheld. Violations are taken seriously and will be handled according to university policy.

Artificial Intelligence Use

The use of generative AI tools (such as ChatGPT, DALL-E, etc.) are not permitted in this class; therefore, any use of AI tools for work in this class may be considered a violation of Rutgers University's Academic Honesty policy and Student Conduct Code, since the work is not your own. When in doubt about permitted usage, please ask for clarification.

Code of Student Conduct

Rutgers University-Camden seeks a community that is free from violence, threats, and intimidation; is respectful of the rights, opportunities, and welfare of students, faculty, staff, and guests of the University; and does not threaten the physical or mental health or safety of members of the University community, including in classroom space.

As a student at the University, you are expected adhere to the Code of Student Conduct.
To review the code, go to the Office of Community Standards:
https://deanofstudents.camden.rutgers.edu/student-conduct

Note that the conduct code specifically addresses disruptive classroom conduct, which means *"engaging in behavior that substantially or repeatedly interrupts either the instructor's ability to teach or student learning. The classroom extends to any setting where a student is engaged in work toward academic credit or satisfaction of program-based requirements or related*

activities."

Key Spring 2025 Dates:

Spring 2025 classes begin	Tuesday, January 21st
Last day to withdraw with a "W"	Monday, April 21st
Last day of classes	Monday, May 5th
Final Exam period	Thursday, May 8th – Wednesday, May 14th

Expectations of Classroom Civility

The following protocols on the codes of behavior reflect professional business norms on manners, courtesy, and respect. (***In general, you should treat others as you would like others to treat yourself. Be mindful that what is acceptable in a text or chatroom with friends may not be appropriate in a classroom or in an online conversation with an instructor***.)

You should expect weekly materials (lectures and other files) to be posted by **the end of day on Tuesday of each week.**

- You are expected to do your own work. Cheating, plagiarism, and any other form of academic dishonesty will not be tolerated and will result in (include consequences).
- Meaningful and constructive dialogue is encouraged in this class and requires a willingness to listen, tolerance for different points of view, and mutual respect from all participants. All course members will be expected to show respect for individual differences and viewpoints at all times.
- The use of electronic devices can be disruptive to those around you. As a result, the use of such devices should be limited to class-related tasks.

CLASSROOM POLICIES

Exam Make-up Policy/Late Policy

If, for a university approved reason, you cannot take an exam at the scheduled time you must give the professor written notice at least one week in advance so that other arrangements can be made. If the situation does not allow for advance notification (for example, emergency hospitalization), contact the professor as soon as possible after a missed exam. Make-up exams and quizzes for non-university approved reasons are not guaranteed. The professor reserves the right to request written documentation to support your absence (such as a doctor's note, an obituary, or military orders).

Assessments

HOMEWORK: Homework assignments are intended to reinforce the material covered and prepare for the quizzes. Solving homework assignments will take place during the class time. Hence, missing a class without prior written notification and required documentation will result in zero credit for the homework for that week. Completed submissions will get full credit. You are encouraged to collaborate on the homework but need to submit your own writeup/solution. Submitting files created by others will receive zero credit. Completing homework assignments will aid your preparation for the quizzes. If you need help with any assignments, please email me. Homework solutions will be posted the day after the class session.

QUIZZES: Quizzes will be given during on materials from previous week or two. The quizzes will be provided via Canvas and are open book and open notes. You should work individually on the quizzes, and you cannot consult with your classmates or others. Any violations to academic integrity policy may result in receiving a failure for the course. No makeup quizzes will be scheduled without prior notification and a physician's excuse.

EXAMS: The exams will be provided via Canvas. Exams are open book and open notes. However, you might find it useful to create cheat sheet of formulas. You should work individually on the exams. You cannot consult with your classmates or others. Students are reminded to adhere to the university's academic integrity policy. Any violations to academic integrity policy may result in receiving a failure for the course. No makeup exams will be scheduled without prior notification and a physician's excuse.

CLASS PARTICIPATION: It is expected that you will (1) visit Canvas homepage regularly every week, (2) watch any lecture videos and study course materials attentively prior to the class, and (3) contribute actively during class discussions and (4) make meaning contributions to the team projects. Participation grade will be based on (a) on time attendance on the class sessions (30%), (b) active engagement by asking and answering questions (60%), and (c) contribution on discussion posts (10%). **For the in-person section being in the class on time is mandatory. For the online section being on Zoom on time and having the camera on are mandatory. Late arrivals or not having camera tuned on will be counted as absences.**

GROUP ACTIVITIES: There will be two group activities during the course - a decision analysis case and a regression project. During the first week, teams of 3-5 students will be formed. More details will be provided via a Canvas announcement.

GRADING

The assignment of final grades, the course requirements will be weighted approximately as follows:

First Exam	15%
Second Exam	15%
Third Exam	20%
Weekly Homework	5%
Quizzes	25%
Decision Analysis Case	5%
Regression Project	10%
Participation	5%

Grade Ranges

A Highest grade (90% and above)
B+ Work of distinction (84.5% to 89.4%)
B Work of distinction (79.5% to 84.4%)
C+ Average work (74.5% to 79.4%)
C Average work (69.5% to 74.4%)
D Passing, but unsatisfactory (60% to 69.4%)
F Failure without credit (Below 60%)

COURSE OUTLINE AND ASSIGNMENTS

*Topics subject to change

Week No	Date	Topics*	Reading	Learning Events
1	23-Jan	Introductions Syllabus Decision Analysis - Under Risk Decision Analysis - TreePlan Software	Chapter 1: 1:1-1:3 &1.5 Week 1 Lecture Videos Week 1 PowerPoint Slides	HW #1
2	30-Jan	Decision Analysis - Expected Value of Perfect Information Decision Analysis - Decision Making Under Uncertainty Data, Data Types & Descriptive Statistics Histograms - Excel Pivot Tables and Pivot Charts	Week 2 Lecture Videos Week 2 PowerPoint Slides	HW #2 Kendall Crab and Lobster, Inc
3	6-Feb	Random Variable Discrete Random Variables CDF and PDF of Discrete Distribution Binomial Distribution	Chapter 2:2.1-2.6 Week 3 Lecture Videos Week 3 PowerPoint Slides	HW #3 Quiz 1

		Poisson Distribution		
4	13-Feb	Continuous Random Variables Uniform Distribution Normal Distribution Exponential Distribution	Chapter 3: 3.1-3.5 Week 4 PowerPoint Slides Week 4 Lecture Videos	HW #4
5	20-Feb	Covariance and Correlation Conditional Probabilities and Independence Population and Sample Central Limit Theorem	Chapter 2:2.8-2.12 Chapter 3:3.7 Week 5 PowerPoint Slides	HW#5 Quiz 2
6	27-Feb	Confidence Intervals Minimum Sample Size	Chapter 4:4.1-4.10 Week 6 PowerPoint Slides	HW #6 Quiz #3
7	6-Mar	Hypothesis Testing p-values Exam 1 (Online)	Week 7 PowerPoint Slides	HW #7 Exam #1 (Weeks 1-6)
8	13-Mar	Simple Linear Regression Multiple Linear Regression	Chapter 6:6.1-6.8 Week 8 PowerPoint Slides	HW #8

		Using Spreadsheet Software for Regression	Week 8 Lecture Videos	
13	20-Mar	Spring Break - No Lecture		
9	27-Mar	Regression Project Work	Select Data set and Begin Project Work	Quiz #4
10	3-Apr	Linear Programming Formulating Linear Programs Using Excel to Solve Linear Programs Solution Interpretation Sensitivity Analysis	Chapter 7:7.1-7.6 Week 11 Lecture Videos Week 11 PowerPoint Slides	HW #9 Exam #2 (Weeks 7-9)
11	10-Apr	Introduction to Nonlinear Programming Nonlinear Programming - Excel Solver	Chapter 8:8.1-8.6 Week 12 PowerPoint and Lecture Videos	HW#10 Quiz 5
12	17-Apr	Integer Programming - Excel Solver	Week 13 PowerPoint and Lecture Videos	HE#11
14	24-Apr	Simulation Introduction Simulation in Excel Simulation Using Crystal Ball*	Chapter 5:5:1-5:11 Week 14 PowerPoint Slides Week 14 Lecture Videos	HW#12 Quiz 6
15	1-May	Project Presentations		

	Exam Review	Upload Regression Project Files and Presentation
16	Exam Week	Exam #3 (Weeks 1-15)