

Business Administration
Course Number: 22:135:703**Course Title: DBA Seminar III in Data Mining and Business Intelligence**

COURSE DESCRIPTION

The 1st half of the course focuses more on what business intelligence we might be able to derive from data and results. Specifically, we will discuss a list of hands-on topics that drive day-to-day decisions including the basics of data sciences, flows for typical data projects, data cleaning, machine learning, and clustering. The five sessions within the seminar will help you launch a data-driven project and understand the process and relevant tools that can be helpful to deliver meaningful results. We will learn those topics through real-life cases and examples drawn from diverse industries such as healthcare, manufacturing, and IT. The second half of the course focuses on the application of data science in mining large-scale data to derive useful information.

The second half of the course introduces various analytical methodologies and emerging technologies that are frequently utilized in business. In week 6, we first start various analytical methodologies and emerging technologies that are frequently utilized in business. We use a hands-on case where we analyze inventory and accounts receivable. In this case, we use advanced analytics for substantive tests and test of controls, such as sequence and gap analysis, stratification, summarization, aging analysis, duplicate records analysis, outlier detection (using cluster analysis), detection of internal control violations and fraudulent transactions (classification techniques such as decision trees and rule-based systems). Week 7 introduces AI applications in business, and we will also discuss some relevant emerging technologies. As a hands-on application, we use image recognition and counting software (cloud-based) for inventory counting. In weeks 8 and 9 we learn about Exploratory Data Analysis using Visualization, a methodology that is becoming increasingly popular. We will learn how to use tools like Tableau in an applied manner using two cases developed by EY ARC. Our last week of the semester introduces Robotic Process Automation, which is an increasingly popular technology designed to carry out repetitive tasks that allow humans to solve complex business problems. The hands-on component demonstrates the effectiveness of RPA and how it can be integrated with data analytics.

COURSE MATERIALS**(First Half of Course)****Recommended reading and references**

1. Data mining with R, CRS Press, downloadable from Rutgers Library
2. Applied data science online course: Dataiku

Software and Data

In this course, we will use *Dataiku*. Please follow the Dataiku [Academic Program webpage](#) and scrolling down to the button that says "Get Started." We will practice Dataiku for the sessions. It is helpful to be familiar with at least one of the programming languages (e.g., R, Python, SAS, STATA). Please work with your advisor to secure a dataset relevant to your future dissertation before the class starts. We expect to work on the dataset through the class.

(Second Half of Course)

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- The course does not use a specific textbook. Instead, the instructor will provide the students with pre-recorded lectures as well as data analytics cases. Additional notes and documents might be provided online.
 - Students will need to use software applications (educational versions) for assignments as well as live in-class group breakout sessions. We will focus on the use of Tableau (which offers a free Educational version), IDEA Desktop (CaseWare), Count things (a cloud-based software), and UiPath (RPA). All these software applications offer free educational versions. We will learn how to conduct analytics both conceptually as well as hands-on.
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LEARNING GOALS AND OBJECTIVES

Upon completion of this the course, students will be able to:

- Gain an overview of analytical techniques useful for business analytics.
 - Perceive the progressive convergence of analytics methods, information processing, and telecommunication technologies.
 - Link data analytics to corporate continuous monitoring and business process support
 - Obtain hands-on experience of using state-of-the-art data analytical tools.
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METHOD

The course will be taught using PowerPoint presentations, examples, and cases. In each week, we will complete one specific topic and all the associated readings, case studies, exercises and homework (see attached weekly schedule). Class-related material (lecture notes, videos, homework and solutions, etc.) will be posted on Canvas. Students should be enrolled in Canvas to

access the posted materials. The URL is: <https://canvas.rutgers.edu/>. The arrangement for synchronous and asynchronous meetings will be detailed in the tentative course schedule.

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 or plagiarism destroy your hard-earned opportunity to learn and advance. See business.rutgers.edu/ai for more details.

Use of Generative AI policy

- You are allowed and even expected to use Generative AI tools in this course. You may use the free tools; however, I STRONGLY recommend you sign up for the paid version of ChatGPT as it will greatly improve your learning experience.
 - While you are allowed to use Generative AI tools in my class, please make sure you ask the instructors of other courses before using GenAI tools in those classes. Having the permission to use these tools in my class does not automatically mean you may use it in other courses.
 - Whenever possible/applicable, please acknowledge in your response/assignment that you have used GenAI.
 - Write your response using YOUR OWN WORDS. A simple copy/paste from GenAI can be viewed as plagiarism.
 - Remember the benefits of writing your answers using your own words. Research shows that people learn more and retain the information longer when they write about it in their own words. If you instead task AI to generate texts, you won’t learn as much.
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ATTENDANCE AND CLASS CANCELLATION POLICIES

- Attendance consistent with university policy is mandatory. As such, you are expected to attend the live sessions.
- Should you have a reason justifying your absence, please reach out to me IN ADVANCE. This is especially necessary as there will be quizzes during the live sessions. 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

EXPECTATIONS:

- Expect me to attend all class sessions. I expect the same of you.
- Expect me to arrive on time for each class session. I expect the same of you.
- Expect me to prepare properly for each class session. I expect the same of you. •
- Expect me to participate fully in each class session. I expect the same of you.

ASSIGNMENTS

Subject to change at the instructor's discretion:

Assignments:

Case-based homework assignments

GRADING POLICIES

Individual-based analyses

100%

Please note that your final grade for this class will be an average of the scores from this module and the next module

COURSE TENTATIVE SCHEDULE

Module #1	<u>Introduction to Data Science and Business Intelligence</u> - Data science vs data mining - Business intelligence	Lecture Discussion Cases
Module #2	<u>Data Models and Data Processing</u> - Data workflow - Data cleaning and processing	Lecture Discussion Cases
Module #3	<u>Exploratory data analysis</u> - Data fitting - Clustering	Lecture Discussion Cases
Module #4	<u>Machine learning and predictive analytics</u> - Machine learning algorithm - Predictive analytics - Story telling	Lecture Discussion Cases

Module #5	Project work sessions	
	Final submission due	

Below is a tentative course schedule. Depending on the progress of the class and other emergencies, it may prove necessary to deviate from this planned schedule.

Week #	Topic	Material	Software
6	<i>The Analytics Mindset:</i> • Ask the right questions • Introduction to audit analytics in business Sequence & gap analysis • Aging analysis • Duplicate records analysis • Outlier detection	• Read the syllabus Analytical Mindset slides • IDEA Workbook (Inventory Analysis and AR Analysis)	IDEA Desktop
7	<i>AI Applications in Business:</i> • AI background • Relevant emerging technologies • Count things software	• AI Applications in Business • Slides Count things account creation • Bryan's Amazing Animals case • Generative AI and Prompt engineering	Count Things Prompt Engineering
8	<i>Financial Ratio- Visual Analysis</i> • Ask the right questions Exploratory Data Analysis Comparative analysis • Stratify, classify, and Summarize Trend Analysis • Dashboard creation	• Data Visualization • Slides • Tableau account creation DuPont Case	Tableau + GenAI
9	<i>Robotic Process Automation</i> • Concept • Demonstrations • on Case discussion	• Read RPA Slides • Tax form case • ChatGPT	UiPath
10	<i>Student presentations</i>	Students' slides	N/A

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]

Bias incidents: an act – either verbal, written, physical, or psychological that threatens or harms a person or group on the basis of actual or perceived race, religion, color, sex, age, sexual orientation, gender identity or expression, national origin, ancestry, disability, marital status, civil union status, domestic partnership status, atypical heredity or cellular blood trait, military service or veteran status.

Bias incidents can be reported online at:

[New Brunswick Bias Incident Report Form](#)

[Newark Bias Incident Report Form](#)

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/rc>]
[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.]

CODE OF PROFESSIONAL CONDUCT

[If you prefer to direct students to the conduct policy online instead, please use the following link and place it beneath the header above:
<https://myrbs.business.rutgers.edu/students/code-professional-conduct>]

Rutgers Business School is recognized for its high-quality education. To that end, maintaining the caliber of classroom excellence, whether in person or online, requires students to adhere to the same behaviors expected in professional career environments. These include the following principles:

Discussion and Correspondence

- Each student is encouraged to participate actively in class discussions and exercises. Substantive dialogue requires a degree of mutual respect, willingness to listen, and tolerance of opposing points of view. Disagreement and the challenging of ideas must happen in a supportive and sensitive manner. Hostility and disrespectful behavior will not be tolerated.
- In correspondence and in the classroom, students should demonstrate respect in how they address instructors. Students should use proper titles unless there is an explicit understanding that the instructor accepts less formal alternatives. Similarly, appropriate formatting in electronic communication and timely responsiveness are all expectations in every professional interaction, including with instructors. Everything said and written should demonstrate respect and goodwill.

Punctuality and Disruption

- Class starts and ends promptly at the assigned periods. Students are expected to be in their seats or present online and ready to begin class on time.
 - Take your responsibility to attend class seriously. Your attendance is a critical element of the learning experience for in-person classes. Failure to show up disrupts your learning and signals disrespect to your peers and instructors. (Of course, illness is a legitimate exception requiring advanced reporting to the [University](#) and your instructors.)
 - Barring emergencies and within reason, students are expected to remain in their seats for the class duration. In person, packing belongings before the end of class disturbs both other students and the instructor. Online, attending to other tasks is distracting. In addition, even if webcams are not required in your course, your attention is fundamentally lacking if you are engaged in multiple tasks simultaneously.

Technology

- The use of technology is sanctioned only as permitted by the course instructor. As research on learning shows, peripheral use of technology in classes negatively impacts the learning environment in three ways:
 1. Individual learning and performance directly suffer, resulting in the systemic lowering of grades earned.
 2. In the classroom, one student's use of technology automatically diverts and captures other people's attention, thus impeding their learning and performance. Moreover, even minor infractions have a spillover effect and result in others doing the same.
 3. Subverting this policy (e.g., using a phone during class, even if hidden below the table or out of sight from your webcam; tapping on a smartwatch; using a laptop

for non-course related matters) is evident to the course instructor and offensive to the principles of decorum in a learning environment.

- Networking, computing, and associated resources in the trading rooms, advanced technology rooms, and general classrooms are to be used in the manner intended.
- Sharing links to private online classes, attempting to join an online class you are not enrolled in, or posting disruptive content during these sessions are strictly prohibited and may lead to disciplinary action.
- For more instructions on information technology resources at Rutgers University, please refer to the [Acceptable Use Policy for Information Technology Resources](#).

Misappropriating Intellectual Property

- Almost all original work is the intellectual property of its authors. These works may include syllabi, lecture slides, recorded lectures, homework problems, exams, and other materials, in either printed or electronic form. The authors may hold copyrights in these works, which U.S. statutes protect. Copying this work or posting it online (on sites such as Chegg or Course Hero) without the author's permission may violate the author's rights. More importantly, these works are the product of the author's efforts; respect for these efforts and the author's intellectual property rights are important values that members of the university community take seriously.
- For more instructions on copyright protections at Rutgers University, please refer to the [Rutgers Libraries](#).

Rutgers Business School is committed to the highest standards of integrity. We value mutual respect and responsibility, as these are fundamental to our educational excellence inside and outside the classroom.