NJIT

MARTIN TUCHMAN SCHOOL OF MANAGEMENT

NEW JERSEY INSTITUTE OF TECHNOLOGY

ACCT 640 Big Data Analytics in Accounting

2025 Spring – 3 Credit Hours
T 6:00 pm - 8:50 pm … CAB2020

Syllabus

INSTRUCTOR	Dr. Ming F. Taylor
EMAIL	Send through Canvas Inbox, or to mfang@njit.edu with ACCT640 in the subject line
OFFICE	Central Avenue Building (CAB) 4015 Virtual Office
OFFICE HOURS	Thu 12-2pm in office or via Zoom link
COURSE WEBSITE	All materials and announcements can be accessed from Canvas (njit.canvas.edu)

Course Description

This course is intended to provide students with an understanding of data analytic thinking and terminology as well as hands-on experience with data analytics tools and techniques. Students should leave this course with the skills necessary to translate accounting and business problems into actionable proposals that they can competently present to managers and data scientists.

The course will focus both on an analytical mindset and hands-on practice with data analytics tools. The course will start with a general data analytical mindset and then move on to apply them to solve specific accounting problems in areas including Financial, Managerial, Auditing, Taxation, and Forensic accounting. Each module follows the sequence of Concept – Example – Practice. While there will be some use of tools in this course, the focus of this class is on concepts, not algorithms or statistical math.

Course Learning Outcomes

After completing this course, students should be able to:

1. Describe in detail the purpose of data analytics and how it can create value for accountants.
2. Describe the IMPACT model and how it can be used to address most accounting issues that can be addressed by accountants.
3. Demonstrate proficiency in multiple software tools to manage data, perform test analyses, communicate findings through text, tables and visualizations.

4. Explain how data analytics can be used in accounting, auditing, managerial accounting, and financial accounting to find patterns, errors, and anomalies and find insights useful to decision-making.
5. Describe and demonstrate different types of test approaches that can be used to gather insights in decision-making.

Course Materials

Textbook

"Data Analytics for Accounting", 3e By Vernon Richardson and Katie Terrell and Ryan Teeter (DAA). E-book or Physical version are both fine. Earlier editions are acceptable, but it is the student's responsibility to check the differences.

Cases and projects posted by the instructor. All course materials except the textbook will be posted on Canvas.

Course Website

Please go to CANVAS. The Canvas site is where most course materials are posted. Make sure you have an NJIT UCID and password so that you can access Canvas. I will use Canvas to post announcements and supplemental materials throughout the semester. So, please be sure to check the site (canvas.njit.edu) frequently. Please contact helpdesk (973-596-2900) for problems associated with Canvas.

Software

This course offers two tracks, a **Microsoft track** and a **Tableau track**. The Microsoft track uses a combination of Microsoft tools, including Excel, Power Query, Power BI, and Power Pivot. The Tableau track uses Tableau Prep and Tableau Desktop. Tableau is compatible with both Windows and Mac OS. Power BI desktop can only be installed on Windows, though many (but not all) Power BI features are accessible on Mac via a web browser. Demonstrations will be conducted for one or both tracks throughout the course. If a demonstration is done in only one track, instructions for the other track will be available. You can successfully complete the course using either track, but I encourage you to explore and experiment with multiple tools from both.

Some fundamental **Python** programming with Jupyter Notebook will be introduced when appropriate for assembling large-scale financial data and for machine learning purposes. Additionally, we will also learn some **basic SQL for data management**.

Here are instructions to obtain Tableau and Power BI:

- Tableau Desktop and Tableau Prep: https://www.tableau.com/academic/students

- Ensure that your students register using their .edu email address, this is the best way to ensure that they can gain access to the free academic license.
- The link will download Tableau Desktop to your students' computers (regardless of whether they have a PC or a Mac).
- Once Tableau Desktop is downloaded, the students can download Tableau Prep through the Tableau Desktop application.

- Microsoft products:
  - Excel works on a Mac, although the menu paths will occasionally be slightly different.
  - Power BI and the related tool (Power Query and Power Pivot) are only available on PC. If you would like your students who have PC laptops to download Power BI, they can do so for free through the following link: https://powerbi.microsoft.com/en-us/desktop/
  - In this course, we use the desktop version of Power BI (not the web app). The menu paths are different on the web app and some of the advanced analytics are not possible via the web app.

Grading and Evaluation

Assignments (4pts x 12)	48pts
Quizzes (4pts x 3)	12pts
In-class Presentation (5pts x 2)	10pts
Final project (3 milestones)	25pts
Participation/Attendance	5pts
Total	100pts
Bonus for completing Power BI or Tableau Certification	5pts

You are encouraged to find a study partner for In-class Labs and the Final Project. The Final Project will be submitted as groups (study partners) unless you choose to work individually.

Deliverables

Students will be evaluated on successful completion of a series of assignments, quizzes, in-class labs and presentations, final project proposals, and a final presentation, as indicated below. Active participation in-class is expected.

Assignments
Students will be given a set of tasks to complete weekly, documenting their process and interpreting their results. You are encouraged to do the weekly assignments with your study partner, but you must submit them individually.

Quizzes
Three quizzes are given online. Unlike Lab exercises in assignments, the quizzes will be knowledge checks in the form of multiple choices and similar question types. There is no limit on time or tries for taking the quiz.

In-Class Presentation
The second half of the course will be student-led and follow a flipped classroom approach. Students will collaborate with study partners on project-style tasks, present their process, and interpret their results. Each group (study partners) will select two out of four topics—financial, managerial, audit, or tax—to demonstrate their data analytics process and analyze the results. The rest of the class is expected to actively engage by asking questions and providing feedback.

Final Project
To show proficiency and understanding of data analytics techniques, students will work in groups (study partners) to evaluate real-world accounting data using the IMPACT framework, perform analysis, develop a meaningful dashboard or report, and create a formal presentation demonstrating the process and results in a video or in-person presentation. Students will choose from a few options and meet three milestones as follows.

Milestone	Description of deliverables
1	1. Form a team of 2-3 students 2. Select the project and company 3. Collect data for the study
2	1. Preliminary results from data analytics 2. Brief report of findings; any questions? 3. Meet with your instructor to discuss your findings and any questions
3	1. Presentation 2. Provide comments to your classmates 3. Incorporate feedback, revise and submit the final slides

Bonus for completing Power BI or Tableau Certification
You are encouraged to complete certification(s) on Power BI, Tableau or Bloomberg, and will be rewarded with bonus points.

Policy for Late Work
All assignments must be submitted in a timely manner and by the due date. Extensions will be granted to occasional late work within 24 hours after the due date with no penalty. Assignments submitted in excess of 24 hours late will receive a reduction of 50% of the assignment if submitted within a week. No feedback will be provided to late submissions.

Please note, if you miss an assignment for a legitimate medical reason or other emergency, this must be documented with the Dean of Students (dos@njit.edu). Once documented, you will be

excused from the missed assignment (it will have no weight on your grade). Please be proactive in communicating such situations with your instructor.

Grading Scale

A	B+	B	C+	C	F
90%	85%	80%	75%	70%	<70%

Incompletes (I) are only given under special circumstances such as severe illness … not for being unprepared for deadlines.

Statement About Disability Accommodation: Educational access is the provision of classroom accommodations, auxiliary aids and services to ensure equal educational opportunities for all students regardless of their disability. If you are in need of accommodations due to a disability please contact Scott Janz (oars@njit.edu), Associate Director of the Office of Accessibility Resources & Services (OARS), Kupfrian Hall 201, to discuss your specific needs. A Letter of Accommodation Eligibility from the OARS authorizing your accommodations will be required. Accommodations need to be requested in advance and will not be granted retroactively.

Statement on Academic Integrity
"Academic Integrity is the cornerstone of higher education and is central to the ideals of this course and the university. Cheating is strictly prohibited and devalues the degree that you are working on. As a member of the NJIT community, it is your responsibility to protect your educational investment by knowing and following the academic code of integrity policy that is found at: http://www5.njit.edu/policies/sites/policies/files/academic-integrity-code.pdf.

Please note that it is my professional obligation and responsibility to report any academic misconduct to the Dean of Students Office. Any student found in violation of the code by cheating, plagiarizing or using any online software inappropriately will result in disciplinary action. This may include a failing grade of F, and/or suspension or dismissal from the university. If you have any questions about the code of Academic Integrity, please contact the Dean of Students Office at dos@njit.edu"

Exam Information and Policies
This course does not have any exams except bi-weekly knowledge check-ups (quizzes). Per the NJIT Online Course Exam Proctoring Policy, this course will use authentic assessment, meaning you will be assessed and graded on your ability to deliver real-world outputs as well as your participation and feedback to other students.

Course Schedule

Week	Date	Topic	Reading / Lab Assignments
		Unit 1: Data Analytics Tools	
1	1/21	**Course Overview** **Data Analytics in Accounting and Business** • Demand for analytics • Overview of Accounting Analytics • Big Data • Data mining • Other techniques	📖 **DAA: Chapter 1** Find a Study Partner Install Software **Supplementary Materials (LinkedIn Learning Course):** 💻 Excel: Power Query (Get & Transform) 💻 Learning Power BI Desktop
2	1/28	**Ask the Questions** • Asking accounting questions • Identifying appropriate tools	**Complete Tableau Training:** 💻 Get Started with Tableau Prep 💻 Get Started with Tableau Desktop
		Unit 2: Data Analytics Models	
3	2/4	**Master the Data** • Data Requests • Data Quality • Extract, Transform, Load • Cleaning Data	📖 **DAA: Chapter 2** **Pick Microsoft or Tableau Tracks:** 💻 Lab 2-4 Resolve Common Data Problems 💻 Lab 2-5 Generate Summary Statistics
4	2/11	**Perform the Analysis** • Descriptive Analytics • Diagnostic Analytics • Predictive Analytics • Prescriptive Analytics	📖 **DAA: Chapter 3** **Pick Microsoft or Tableau Tracks:** 💻 Lab 3-1 Descriptive Analytics 💻 Lab 3-2 Diagnostic Analytics 💻 Lab 3-3 Predictive Analytics 📘 **Quiz 1**
5	2/18	**Share the Story** • Data Visualization • Sorting • Pattern recognition • Categorization • Outlier detection • Dashboards **Final Project Milestone I**	📖 **DAA: Chapter 4** **Pick Microsoft or Tableau Tracks:** 💻 Lab 4-1 Visualize Declarative Data 💻 Lab 4-2 Visualize Exploratory Data 💻 Lab 4-3 Create Dashboards 👥 Form a team of 2-3 students 👥 Select the project and company 👥 Collect data for the study
		Unit 3: Auditing Analytics	
6	2/25	**The Modern Audit and Tests of Controls**	📖 **DAA: Chapter 5**

		• Working papers • Continuous auditing • Data timing and frequency • Reperformance and recalculation • Segregation of duties and the authorization matrix • Field checks	**Pick Microsoft or Tableau Track:** 💻 Lab 5-1 Create a Common Data Model 💻 Lab 5-2 Create a Dashboard
7	3/4	**Substantive Testing and Tests of Transactions** • Automatic confirmations • Inventory valuation • Statistical analysis • Clustering and outlier detection • Benford's analysis	📖 **DAA: Chapter 6** **Pick Microsoft or Tableau Track:** 💻 Lab 6-1 Evaluate Trends and Outliers 💻 Lab 6-2 Diagnostic Analytics Using Benford's Law
		Unit 4: Managerial Analytics	
8	3/11	**Generating key performance indicators** • Why firms use key performance indicators • The balanced scorecard and finer metrics • Queries that generate KPIs • Evaluation of KPI production	📖 **DAA: Chapter 7** **Pick Microsoft or Tableau Track:** 💻 Lab 7-2 Create a Balanced Scorecard Dashboard 💻🌎 Lab 7-5 Create Advanced Performance Models 📘 **Quiz 2**
		Spring Break – NO CLASS	
9	3/25	**Variance Analysis and Cost Prediction Visualizations, continued**	**Pick Microsoft or Tableau Track:** 💻 Lab 7-1 Evaluate Job Costs
		Unit 5: Financial Statement	
10	4/1	**Using financial statement data** • XBRL • Calculating financial ratios • Using Sparklines and other charts **Sentiment analysis in management disclosure and analysis** • Overview of text mining • Sentiment dictionaries • Performing sentiment analysis	📖 **DAA: Chapter 8** **Pick Microsoft or Tableau Track:** 💻 Lab 8-1 Create a Horizontal and Vertical Analysis using XBRL 💻 Lab 8-2 Create Dynamic Common Size Financial Statements 💻 Lab 8-3 Analyze Financial Statement Ratios 💻 Lab 8-4 Analyze Financial Sentiment
		Unit 6: Tax Analytics	
12	4/8	**Tax Analytics Discussion** **Tax strategy and planning**	📖 **DAA: Chapter 9** **Pick Microsoft or Tableau Track:** 💻 Lab 9-1 Descriptive Analytics: State Sales Tax Rates 💻🌎 Lab 9-3 Calculate Total Sales Tax Paid

			💻🌎 Lab 9-4 Estimate Sales Tax Owed 💻🌎 Lab 9-5 Online Sales Tax 📘 **Quiz 3**
13	4/15	Final Project Milestone II – **individual meeting** with instructor (NO CLASS)	👥 Preliminary results from data analytics 👥 Brief report of findings; any questions? 👥 Meet with your instructor to discuss your findings and any questions
13	4/22	New Advances: Machine learning, Natural Language Processing and Generative AI	📖 Supplemental Material 💻 ChatGPT assignment
14	4/29	**Final Projects Presentation**	👥 Presentation 👥 Provide comments to your classmates
15	5/10-16	**Final Exam Week**	Incorporate feedback, revise and submit the final slides

Tentative schedule ... subject to change. Students will be notified in class of any changes to the Course Schedule.