Course Syllabus IS 465: Advanced Information Systems

Semester: Fall 2025
Section: 001
Times: Fridays 8:30 AM - 11:20 AM
Location: GITC 3600

Instructor: Keita Ohshiro
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Office Hours: Tuesdays 11:30 AM - 12:30 PM, Fridays 11:30 AM - 12:30 PM, or by appointment
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General Information

Course Description

Prerequisites: (CS 100 or DS 100), and MATH 105 or MATH 120 or MATH 225 or MATH 244 or MATH 279 or MATH 305 or MATH 333 or IE 331 or ECE 321 or MGMT 116 or MNET 315, and (CS 331 or IS 331 or MIS 385).

This course introduces students to the world of business analytics from an information systems perspective, focusing on the application of various data analysis techniques in business practices. We cover a wide spectrum of topics ranging from fundamental statistics to database, data warehouse, data visualization, and data mining, with a special focus on predictive analysis. Being an introductory course, our approach is “shallow and wide”, emphasizing on giving students a complete view of the data analytics profession, covering as many different sub-areas as time allows while not diving too deep into any one specific domain. The goal is to serve as a “guided tour” for students to gain knowledge about the different sub-areas of data analytics and understanding of which area is a best fit for their personal developments. More in-depth materials and discussion for each sub-area will be provided upon students’ requests. Course topics include the rudiments of probability and random variables, and visualization, data warehousing and OLAP analysis, dashboard, scorecard, data mining algorithms, optimization techniques, DSS and knowledge systems.

Learning Outcomes

At the end of this course, the student should be able to:

1. Build a foundation of data analysis such as statistics, probability theories, data structure and algorithms, database and data warehouse, data visualization, basic data mining techniques (e.g. decision trees, clustering, etc), and Python programming.
2. Apply them to real-world data sets for data analysis.

3. Communicate the results of data analysis.

Tools

The students will learn to work with the following tools. Please bring your laptop.

- Tableau
- Google Colab
- Python

Textbooks

Textbooks are not required.

About Grading

Grading Policy

The class will be graded on a 100-point scale. (Also, see Grading Legend)

A Superior	B+ Excellent	B Very Good	C+ Good	C Acceptable	D Minimum	F Inadequate
> 90	85 - 90	80 - 85	75 - 80	70 - 75	60 - 70	< 60

Grading Categories

- 10% Reading assignments
  - 5% * 2 readings
- 30% Technical assignments
  - 5% Assignment 1: Tableau tutorial
  - 10% Assignment 2: Dashboard sketch
  - 5% Assignment 3: Python programming
  - 10% Assignment 4: Data analysis
- 20% Individual project 1: Data visualization with Tableau
  - Due: Class 7 10/17
- 20% Individual project 2: Data mining using Python
  - Due: Class 14 12/5
- 20% Take-home final exam
  - Due: TBD

Please note that there may be slight modifications to the grading policy depending on issues that arise during the semester. I can add or reduce points based on various situations. For instance, exceptional participation and contributions in class may result in additional points, while poor participation and lack of thoughtful contributions may lead to point deductions.

Additionally, I may make slight adjustments to the grading scale or apply a curve as needed to ensure fairness in the overall grading process.

Projects overview

- Objective: To demonstrate the ability to apply Data Analytics techniques to solve real-world problems.
- Two projects will be assigned throughout the semester. Details will be provided in Canvas.
    - Project 1: Data Visualization
        - Individuals are expected to find an interesting data set and visualize it using Tableau.
    - Project 2: Data Mining
        - Individuals are expected to work with a real-world data set, analyze it, and try to extract insightful information/knowledge using Python.

Exams

We will have a take-home final exam. Further details will be provided during the semester.

Attendance Policy

Students are expected to attend every class on time.

- If you miss **3 class sessions**, you will automatically be **deducted a letter grade**.
- If you miss **5 class sessions**, you will automatically **fail the course**.
- Students who arrive after the attendance call/quiz or leave before the class officially ends will be marked as late. Accumulating **3 late attendance will count as 1 absence**.

Please contact the Office of the Dean of Students (DOS) to verify your absence. For more details, please see the Student Absence Verification section below.

Even when you don't have a valid reason and cannot attend class, I strongly encourage you to **notify me in advance**. I will try to consider your situation, though I cannot guarantee to what extent.

Student Absence Verification

Students should contact the Office of the Dean of Students (DOS) to verify their absence when missing class due to bereavement, medical concerns, military activity, legal obligations, or university-sponsored events. Once the absence has been verified, the DOS will communicate to your professor(s) on your behalf. Please note that our office only verifies documentation and it is at the discretion of your professor(s) or their department's policy to provide any accommodation. It is the student's responsibility to follow up with the professor(s). Students who select an option (bereavement, medical concerns, etc.) that does not match the presenting concern and supporting documentation will be rejected.

For more information, please see https://www.njit.edu/dos/student-absence-verification.

Late Submissions

Late submissions will be eligible for up to 50% of the full points. Even being one second late will be considered late. I strongly encourage you to submit your assignments on time, even if you feel they are not perfect—meeting the deadline is important. If you anticipate any issue, please contact me before the deadline.

That said, I still encourage you to submit your work even when it's late. While I cannot guarantee any specific outcome, I may consider your effort when reviewing final grades. Please note, however, that this is not guaranteed.

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: NJIT Academic Integrity Code.

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.

Use of Generative AI

Generative AI tools are permitted in this course for reference purposes only, and no citation is necessary when used for inspiration or guidance. However, you are expected to understand any AI-generated content before including it in your work. Simply copying and pasting AI outputs without comprehension is not acceptable. Additionally, in most assignments and labs, I require you to demonstrate not only the final results but also the process of how you arrive at them. For example, when using tools like Excel, you should show your use of formulas and functions rather than just providing the final output. If you have any questions or concerns about the appropriate use of AI technology in this course, please contact me before submitting any assignments.

Schedule Outline

(Subject to modification)

Date	Topics

Class 1: 9/5	Lecture ● Course Introduction ● Stat review quiz
Class 2: 9/12	Lecture ● Key Performance Indicator (KPI) ● Data visualization 1: basics Lab ● Tableau setup Assignment 1 ● Tableau tutorial
Class 3: 9/19	Lecture ● Data visualization 2: dashboard Lab ● Project milestone: find the dataset Assignment 2 ● Dashboard sketch
Class 4: 9/26	Lecture ● Data visualization 3: storytelling Lab ● Project milestone: explore the data
Class 5: 10/3	Lecture ● Data management (database, data warehouse, OLTP, OLAP, etc) ● Assignment 2 review Lab ● Project checkup
Class 6: 10/10	Lab ● Project checkup
Class 7: 10/17	Lecture ● Inferential statistics Project 1 show and tell
Class 8: 10/24	Lecture ● Data Mining - Introduction Lab

	• Google Colab • Python basics with NumPy, Pandas, and Matplotlib
Class 9: 10/31	Lecture • Data Mining - Classification Lab • ML with SciPy Assignment 3 • Python programming
Class 10: 11/7	Lecture • Data Mining - Classification Lab • Project milestone: identify the task
Class 11: 11/14	Lecture • Data Mining - Regression Lab • Project checkup
Class 12: 11/21	Lecture • Data Mining - Association rule Lab • Project checkup
Class 13: 11/26 (Wed)	Lecture • Data Mining - Clustering • Assignment 4 Review Lab • Project checkup
11/28	No class - Thanksgiving Recess
Class 14: 12/5	Course review Project 2 show and tell
12/14-20	Take-home final exam

Others

Center for Counseling and Psychological Services

C-CAPS provides free counseling for full-time students. For more information, see https://www.njit.edu/counseling/.

Getting Technical Help

The IST Service Desk is the central hub for all information related to computing technologies at NJIT. This includes being the first point of contact for those with computing questions or problems.

Accessibility

If you are in need of accommodations due to a disability, please contact Scott Janz, Associate Director of the Office of Accessibility Resources & Services (OARS), Fenster Hall Room 260 to discuss your specific needs. A Letter of Accommodation Eligibility from the OARS authorizing your accommodations will be required.