Course Syllabus IS 665: Data Analysis for Information Systems

Semester: Fall 2024
Section 001: Thursday, 1:00 PM - 3:50 PM, at FMH 408

Instructor: Keita Ohshiro
E-Mail: keita.ohshiro@njit.edu
Office Hours: Tuesday and Friday, 1:15 - 2:15 PM, and by appointment
Office: Guttenberg Information Technology Center 3902C

General Information

Course Description

(Prerequisite: IS 601 Web Systems Development)
This graduate-level course introduces students to the world of data 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 data warehouse, data visualization, and data mining. Being an introductory course, our approach is “shallow and wide”, emphasizing giving students an overview 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 development.

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.

- Excel
- Tableau
- 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 Excellent	B+ Good	B Acceptable	C+ Marginal Performance	C Minimum Performance	F Failure
> 90	85 - 90	80 - 85	75 - 80	70 - 75	< 70

Grading Categories

- 5% Attendance
- 20% Individual assignments and lab work
- 15% Midterm milestone
- 35% Final project
- 25% Final Exam

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.

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 (DOS verifiable) reason and cannot attend class, **I strongly encourage you to notify me in advance** (not after the class). 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 Assignment Submissions

If an assignment is submitted late, one-fourth of the total points will be deducted per day. For example, if an assignment is due by 6:00 pm and you submit it after 6:00 pm but before 6:00 pm the following day, 25% of the total points will be deducted (50% on the second day, 75% on the third day, and 100% after that). I strongly encourage you to submit your assignments on time, even if you feel they are not yet ready or perfect.

And, **I still strongly encourage you to submit the assignments, no matter how late they are**. I cannot promise, but there may be a remedy. I will try to consider your effort, though I cannot guarantee to what extent.

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	Course Introduction ● syllabus, self-introduction, course overview Introduction and overview of data analysis
9/9	Last day to add/drop a class
Class 2: 9/12	Data basics ● types of data, level of measurement, summary/contingency tables, stem-and-leaf plots, frequency distribution tables, etc. Descriptive statistics
Class 3: 9/19	Data visualization: basic charts ● Amount, distribution, proportion, association Leb: Excel basics ● Function, formula, absolute/relative reference, basic charts, pivot table
Class 4: 9/26	Inferential statistics ● Hypothesis testing Lab: Tableau
Class 5: 10/3	Data management (database, data warehouse, OLTP, OLAP, etc) Lab: Tableau
Class 6: 10/10	Midterm progress checkup

Class 7: 10/17	Midterm milestone
Class 8: 10/24	Data Mining - Introduction Lab: Python • Python basics with NumPy, Pandas, and Matplotlib
Class 9: 10/31	Data Mining - Classification Lab: Python • ML with SciPy
Class 10: 11/7	Data Mining - Clustering Lab: Python • ML with SciPy
11/11	Last day to withdraw from classes
Class 11: 11/14	Data Mining - Association rule (also cover probability theory here) Lab: Python • ML with SciPy
Class 12: 11/21	Data visualization: storytelling Final project checkup
Class 13: 11/26 (Tue)	Course review and preparation for the final exam
11/28-12/1	Thanksgiving recess
Class 14: 12/5	Final project
12/15-21	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.