Course Syllabus IS 665: Data Analysis for Information Systems

Semester: Spring 2024
Section 002: Tuesday 11:30 AM - 2:20 PM at CKB 222
Section 004: Monday 2:30 PM - 5:20 PM at TIER 111
Section 006: Tuesday and Thursday 4:00 PM - 5:20 PM at TIER 106

Instructor: Keita Ohshiro. You can call me Keita, not Professor xxx :)
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Office Hours:

- Monday 1:15 PM - 2:15 PM
- Tuesday 2:45 PM - 3:45 PM
- Thursday 2:45 PM - 3:45 PM
- Or by appointment

TA: TBD
Grader: TBD

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 database/data warehouse, data visualization, and data mining. 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 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:

- Excel
- Tableau
- Python (with Google Collab)
- (if we have time, Rapid Miner for data mining using a graphic interface)

Required Texts

Considering the wide range of topics covered in this class, we will use PowerPoint slides and a collection of papers/articles for our class.

Assignments

We will have the following assignments. Details on each assignment will be posted on Canvas.

Individual Assignments

There will be several individual assignments over the semester.

In-class Quizzes

There will be several small in-class quizzes (not every week, but not a few. Probably about 6 to 8 times, but not fixed. When there is a quiz, it will be announced in advance).

Group Projects

Objective: To demonstrate the ability to apply Data Analytics techniques to solve real-world problems.
Summary: Two projects will be assigned to teams throughout the semester.

PROJECT ONE: Data Visualization

Teams are expected to find an interesting data set and visualize it using Tableau. Each team will then post the visualization model around midterm. Since we have no midterm exam in this class, this will count as the midterm milestone.

PROJECT TWO: Data Mining

Teams are expected to work with a real-world organization to gather data set, analyze it, and try to extract insightful information/knowledge using Python (or RapidMiner if we can cover). This project is due at the last class of the semester.

About Grading

Grading Policy

NJIT Academic Policy has grades for graduate courses assigned as follows:

GRADE	GPA	SIGNIFICANCE
A	4.0	Excellent
B+	3.5	Good
B	3.0	Acceptable
C+	2.5	Marginal Performance
C	2.0	Minimum Performance
F	0.0	Failure

Points Distribution

Final grades will tentatively be assigned as follows. There may be slight modifications, depending on issues that arise during the semester.

- 20% Individual Assignments
- 10% In-class quizzes
- 30% Group Projects (15%*2)
- 10% Individual contribution to group projects (5%*2)
- 30% Final Exam

Excellent participation demonstrated by preparation for discussion and thoughtful contributions can have the effect of additional points. Likewise, poor participation demonstrated by a consistent lack of preparation for discussion and little or no thoughtful contributions can have the effect of deduction of points. Also, I might make slight adjustments and/or curve the grade as needed.

Late Assignments Policy

If an assignment is submitted late, one-third 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 p.m. 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 take your effort into consideration, though I cannot guarantee to what extent).

Attendance Policy

Students are expected to attend every class on time. If you miss 3 class sessions for a once-a-week section (or 6 sessions for a twice-a-week section), you will automatically be deducted a letter grade. If you miss 5 class sessions for a once-a-week section (or 10 sessions for a twice-a-week section), you will automatically fail the course. Students who arrive later than 10 minutes after the class starts will be marked late, and 3 latenesses count as 1 absence. For your absence verification, please see the Student Absence Verification section below.

Honor Code

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.

Schedule

Tentative. Subject to Modification as the semester progresses.

Week	Theoretical Topics	Labs
1 (1/15-21)	Introduction	
2 (1/22-28)	Statistics I	Excel ● Formula and Function ● Simple visualization ● Pivot table
3 (1/29-2/4)	Statistics II Data visualization I	Tableau I ● Basics
4 (2/5-11)	Data visualization II Data structure and algorithms	Tableau II ● Dashboard ● Interaction

5 (2/12-18)	Data structure and algorithms Database and data warehouse	Python I ● Basics
6 (2/19-25)	Lecture about presentation	Python II ● NumPy and Pandas
7 (2/26-3/3)	(Buffer)	Python III ● Visualization using Matplotlib
8 (3/4-10)	Data Visualization Presentation	
(3/10-16)	Spring Recess: No classes	
9 (3/18-24)	Data Mining (I) - Association Rules Where the three types of data mining tasks are introduced ● Supervised learning vs. unsupervised learning ● Association Rule Mining	Python IV ● Clustering
10 (3/25-31)	Data Mining (II) - Clustering Where clustering is introduced	Python V ● Regression
11 (4/1-7)	Data Mining (III) - Classification (I) Where regression – all types – is introduced	Python VI ● Classification
12 (4/8-14)	Data Mining (III) - Classification (II) Where SVM, Neural Networks, Decision Tree, and other techniques are covered	(Buffer)
13 (4/15-21)	(Buffer)	(Buffer)
14 (4/22-28)	Group Project Presentation	
(4/30-5/2)	No class on 4/30 (Tuesday) due to Friday classes meet	
5/3-9	Final Exam	

Others

Student Absence Verification

Students who miss class due to bereavement, medical concerns (including students who test positive for COVID-19), military activity, legal obligations, or university-sponsored events must provide the Office of the Dean of Students (DOS) with official and verifiable documentation related to the absences within 14 days.

Once the absence has been verified, the DOS will communicate on your behalf to your professor(s). 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.

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.

Feedback

I will solicit (anonymous) feedback from students throughout the course through anonymous surveys in Canvas, but if you have pressing or specific issues, please do not hesitate to let me know if any aspect of our course or class community can be improved.