**NJIT**

**MARTIN TUCHMAN SCHOOL OF MANAGEMENT**

NEW JERSEY INSTITUTE OF TECHNOLOGY

**Instructor:** Jae-Hyuck Park
**Office:** 4035 CAB     **Phone: (**973) 642-4153
**Email:** jaehyuck.park@njit.edu
**Class Time & Location: N/A (Online Course)**
**Prerequisites: MIS 245, OM 375**
**Office Hours:** Tue & Thu 10-11 a.m. or by appointment.

TA: Bhaskar Goswami (bg362@njit.edu)

| **Decision Support Tools & Technology for Managers MIS 445-002 Spring 2024** |
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## Course Overview

This is an online course, which will be conducted fully online, asynchronously via Canvas. For more information on using Canvas and other supported learning tools, visit the IST Service Desk Knowledgebase. Since this is an accelerated online course, you will have to take responsibility for spending the appropriate amount of time to learn the material. You should expect to spend at least 12-15 hours each week on the course.

This course covers computer-based systems used to inform decisions in an organization or a business. A particular focus is given to data-driven systems capable of extracting useful information from large volumes of data. Students will be exposed to different data-driven tools and techniques through hands-on assignments, and learn how to use them to draw conclusions, make determinations, and recommend courses of action to address different business problems.

## Course Materials

1. Textbook (optional): Camm et al., Business Analytics, 2019, 3rd edition, Cengage; ISBN: 9781337406420
2. Software (required): We will use the following software packages throughout the course: Tableau Desktop, SPSS, and JMP Pro 16. Software installation instructions will be provided on Canvas.

## Learning Outcomes

By the end of this course, students will be able to:
1. Determine whether and how data can improve performance.
2. Distinguish the role of data as it relates to business intelligence and analytics.
3. Utilize data visualization techniques on an introductory level in business reporting.
4. Describe the basic data mining processes, techniques, concepts and applications used in supporting decision-making.
5. Utilize the applications of descriptive analytics.
6. Utilize the applications of prescriptive analytics in combination with reporting and predictive analytics.
7. Apply acquired knowledge and skills to the solution of practical, professional, and business

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problems.

8. Recognize how to select the technique(s) appropriate for solving a particular problem and how to execute the technique(s) and be able to critically analyze its solution.
9. Execute cloud-based tools and learning environments to access, share, and present data analysis.
10. Communicate decisions/ideas in an effective, convincing, and professional way, both orally and in writing.

## Expected Learning Outcomes

| Competencies | Outcome |
|---|---|
| **LC 1** Understand how to make business decisions using data and analysis | **LO 1** Explain the need for data-driven insights in managerial decision-making. Acquire ability to frame business hypotheses, understand users, and ask the right questions. Learn how to handle data and identify analytics insights using IBM SPSS and JMP Pro. Pick up skills to influence actions with data visualization using Tableau. |
| **LC 2** Acquire skills to apply advanced analytics for solving business challenges | **LO 2** Get familiar with deeper pattern-spotting to answer business questions using machine learning and deep learning techniques. Understand when to use them and how to interpret the results for business decisions. |
| **LC 3** Develop an appreciation for ethics, fairness, and privacy | **LO 3** Recognize data privacy and ethical issues with data. Understand the most common model bias and explainability challenges and what does it take to tackle them. |
| **LG 4** - Develop critical organizational skills | **LO 4** – Learn about the skill sets and jobs in a data analytics team. Understand the relevance of humans in a world that is increasingly influenced by algorithms, and what it takes to be successful in this space. |
| **LG 5** – Interact Effectively in teams | **LO 5** – Collaborate and negotiate to achieve common goals. Communicate ideas effectively through visual presentation of information. |

## 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.

## Final Grade Components

Your grade for this course will be based on the following components:

| Component | Weight |
|---|---|
| **Quizzes** | *7%* |
| **Discussions** | *20%* |
| **Assignments** | *40%* |
| **Reflections** | *3%* |
| **Group Project** | *30%* |
| *TOTAL* | *100%* |

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**Course Work**

**Quizzes: (7% of grade)** There will be frequent quizzes throughout the course. They are meant to help you practice course concepts.

**Discussions: (20% of grade)** You are expected to participate in weekly discussion forums in Canvas. When all students participate in a discussion, it creates an active learning environment that will help you better understand the materials and be more successful in the class.

During weeks of the course that there are two discussions (Weeks 1, 3, and 4), while you must post initial responses for **both** prompts, you can choose which discussion (one out of the two) you respond to two peers.

Initial posts will be due by Thursday at 11:59 pm and responses to two peers are due no later than Sunday at 11:59 pm each week they are assigned. Due to the participatory nature of discussion forums, no late assignments can be accepted.

**Assignments: (40% of grade)** Assignments will be given weekly to give you an opportunity to apply course concepts for that week. Similar to quizzes, these activities are designed to help you practice and prepare for the projects.

**Reflections (3% of grade)** At the end of each week, you will complete a brief review of your participation and reflect on what you learned that week.

**Group Project: (30% of grade)** In this group project, you and your team will choose an organization and identify a current problem they are facing related to the use of decision support tools and technologies. The project includes three phases: 1) a proposal and business problem, 2) research and a literature review, and 3) a final presentation. The details of the project are available on the "Group Project Description" page in Canvas.

Each project phase will require you to complete a group evaluation. If you don't complete the evaluation, you'll receive a 0 for the corresponding project phase. The evaluations are important, as they will help give me insight into your team dynamics throughout the semester.

**Final Grades**
Grades are a reflection of the level of understanding of course content.  Therefore, <u>to achieve the grade of A or B in this class expect to</u>:
- Be prepared.  This means actively participating in discussions, exercises, and activities to further understanding.
- Turn in all course deliverables in a timely and professional manner.

With less preparation and participation expect the grade of C or lower.

**Final course grades will be based on the following scale.**

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| A | B+ | B | C+ | C | D | F |
|---|---|---|---|---|---|---|
| 90% | 85% | 80% | 75% | 70% | 60% | <60% |

Please note that incomplete (I) will be given under special circumstances (e.g., major illness, family tragedy, military service). Students must contact the Dean of Students' Office to determine whether a particular circumstance qualifies.

**Late Assignments**
Late assignment submissions may not be accepted for grading unless there is a severe illness or an emergency situation. In these cases, legitimate documentation of the emergency must be presented and approved by the office of the Dean of Students before extensions will be granted.

**Email Etiquette**
This is a business course, and the expectation is that you will conform to appropriate business letter writing practice in all of your email to me. The following are the basics.

- Put the course name (e.g., MIS 445-Section #) in the subject line
- Identify the subject of the e-mail with a brief but descriptive summary of the topic: include a proper salutation and the assignment details such as the title, homework, or test.
- Proofread your e-mail for proper sentence structure, capitalization, spelling and punctuation.
- Conclude the e-mail message with a proper closing (e.g. Regards, Sincerely) and your full name.

(Note: Do not e-mail requests for additional grade points unless there is an error in the grading. Please note that any grade discrepancies must be addressed within 2 weeks of the assignment due date. Grades are not 'given out' by the professor; they are 'earned' by the student. So, make sure that you 'earn' a grade that you can live with.)

**Academic Integrity**
Learning is both an individual and a cooperative experience. Asking for and giving help freely in appropriate settings helps you learn. However, you should present only YOUR work as your own. University rules and standards define and prohibit "academic misconduct" by all members of the academic community including students. You are asked and expected to be familiar with these standards and abide by them.

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***

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***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*.

## Accommodations

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.

## Classroom Policies
Your assignments may be tested by Turnitin to check for plagiarism.

## Final Comments
I reserve the right to change any aspect of this syllabus or the course schedule at any time, as the need arises. Students registered for this course assume full responsibility for reading and understanding the course policies as stated above.

## Course Schedule
The topics are tentative. Updates will be provided.

| Week | Module | Topics | Assignment | Due Dates |
|------|--------|--------|------------|-----------|
| Jan 21 | 1 | Business Analytics | 1. Academic Integrity Pledge<br>2. Introduce Yourself<br>3. Meet Your Project Group<br>4. Module 1 Discussion<br>5. Module 1 Reflection Survey | 1. Due by Sunday at 11:59 pm<br>2. Initial response due by Thursday at 11:59 pm; replies to peers due by Sunday at 11:59 pm.<br>3. Due by Sunday at 11:59 pm<br>4. Initial response due by Thursday at 11:59 pm; replies to peers due by Sunday at 11:59 pm<br>5. Due by Sunday at 11:59 pm |
| Jan 28 | 2 | Taxonomy of Data and Basics of SPSS | 1. Module 2 Review Quiz<br>2. Module 2 Discussion<br>3. Module 2 Assignment<br>4. Module 2 Reflection Survey | 1. Due by Sunday at 11:59 pm<br>2. Initial response due by Thursday at 11:59 pm; replies to peers due by Sunday at 11:59 pm<br>3. Due by Sunday at 11:59 pm<br>4. Due by Sunday at 11:59 pm |
| Feb 4 | 3 | Descriptive Analytics: Descriptive Statistics | 1. Module 3 Review Quiz<br>2. Module 3 Assignment<br>3. Module 3 Reflection Survey | 1. Due by Sunday at 11:59 pm<br>2. Due by Sunday at 11:59 pm<br>3. Due by Sunday at 11:59 pm |
| Feb 11 | 4 | Introduction to Tableau; Data Pre- | 1. Module 4 Review Quiz<br>2. Module 4 Discussion | 1. Due by Sunday at 11:59 pm |

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| | | Processing | 3. Module 4 Assignment<br>4. Module 4 Reflection Survey | 2. Initial response due by Thursday at 11:59 pm; replies to peers due by Sunday at 11:59 pm<br><br>3. Due by Sunday at 11:59 pm<br><br>4. Due by Sunday at 11:59 pm |
| Feb 18 | 5 | Descriptive Analytics: Data Visualization with Tableau | 1. Module 5 Review Quiz<br>2. Module 5 Discussion<br>3. Module 5 Assignment<br>4. Module 5 Reflection Survey | 1. Due by Sunday at 11:59 pm<br><br>2. Initial response due by Thursday at 11:59 pm; replies to peers due by Sunday at 11:59 pm<br><br>3. Due by Sunday at 11:59 pm<br>Due by Sunday at 11:59 pm |
| Feb 25 | 6 | Introduction to Data Mining and JMP Pro | 1. Module 6 Review Quiz<br>2. Module 6 Discussion<br>3. Module 6 Assignment<br>4. Module 6 Reflection Survey | 1. Due by Sunday at 11:59 pm<br><br>2. Initial response due by Thursday at 11:59 pm; replies to peers due by Sunday at 11:59 pm<br><br>3. Due by Sunday at 11:59 pm<br><br>4. Due by Sunday at 11:59 pm |
| Mar 3 | 7 | Descriptive Data Mining: Clustering | 1. Module 7 Review Quiz<br>2. Module 7 Discussion<br><br>3. Module 7 Assignment<br>4. Module 7 Reflection Survey | 1. Due by Sunday at 11:59 pm<br><br>2. Initial response due by Thursday at 11:59 pm; replies to peers due by Sunday at 11:59 pm<br><br>3. Due by Sunday at 11:59 pm<br><br>4. Due by Sunday at 11:59 pm |
| Mar 17 | 8 | Descriptive Analytics: Association Rules | 1. Module 8 Review Quiz<br>2. Module 8 Discussion<br>3. Module 8 Assignment<br>4. Project Phase 1<br>5. Module 8 Reflection Survey | 1. Due by Sunday at 11:59 pm<br><br>2. Initial response due by Thursday at 11:59 pm; replies to peers due by Sunday at 11:59 pm<br><br>3. Due by Sunday at 11:59 pm<br><br>4. Due by Sunday at 11:59 pm<br><br>5. Due by Sunday at 11:59 pm |
| Mar 24 | 9 | Predictive Analytics: Regression | 1. Module 9 Review Quiz<br>2. Module 9 Assignment<br>3. Module 9 Reflection Survey | 1. Due by Sunday at 11:59 pm<br><br>2. Due by Sunday at 11:59 pm<br>Due by Sunday at 11:59 pm |
| Mar 31 | 10 | Predictive Analytics: Classification; K-nearest Neighbors | 1. Module 10 Review Quiz<br>2. Module 10 Discussion<br>3. Module 10 Assignment<br>4. Module 10 Reflection Survey | 1. Due by Sunday at 11:59 pm<br><br>2. Initial response due by Thursday at 11:59 pm; replies to peers due by Sunday at 11:59 pm<br><br>3. Due by Sunday at 11:59 pm<br><br>4. Due by Sunday at 11:59 pm |

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| Apr 7 | 11 | Predictive Analytics: Decision Trees | 1. Module 11 Review Quiz<br>2. Module 11 Assignment<br>3. Module 11 Reflection Survey | 1. Due by Sunday at 11:59 pm<br>2. Due by Sunday at 11:59 pm<br>3. Due by Sunday at 11:59 pm |
| Apr 14 | 12 | Predictive Analytics: Model Assessment; Random Forests; Artificial Neural Networks | 1. Module 12 Review Quiz<br>2. Module 12 Discussion<br>3. Project Phase 2<br>4. Module 12 Reflection Survey | 1. Due by Sunday at 11:59 pm<br>2. Initial response due by Thursday at 11:59 pm; replies to peers due by Sunday at 11:59 pm<br>3. Due by Sunday at 11:59 pm<br>4. Due by Sunday at 11:59 pm |
| Apr 21 | 13 | Natural Language Processing; Text Mining; Sentiment Analysis | 1. Module 13 Review Quiz<br>2. Module 13 Discussion<br>3. Module 13 Reflection Survey | 1. Due by Sunday at 11:59 pm<br>2. Due by Sunday at 11:59 pm<br>3. Due by Sunday at 11:59 pm |
| Apr 28 | 14 | Final Project | 1. Project Phase 3<br>2. Module 14 Reflection Survey | 1. Due by Sunday at 11:59 pm<br>2. Due by Sunday at 11:59 pm |

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