MARTIN TUCHMAN SCHOOL OF MANAGEMENT
NEW JERSEY INSTITUTE OF TECHNOLOGY

Marketing Analytics
MRKT 378-001
Fall 2024

Instructor: Jorge E. Fresneda, PhD

Office: 4030 CAB **Phone:** 973-596-8569 (office)

Office Hours: M & W (CAB 4030) 11:30 am -12:30 pm or by appointment

Email: fresneda@njit.edu (*the best way to contact me*)

Class Time & Location: Mondays & Wednesdays 10:00 am - 11:20 am, KH 203

Credit Hours: 3 **Course Prerequisites:** MRKT-330, MGMT-216 and MGMT 316

(Instructor's personal Zoom room:
https://njit-edu.zoom.us/j/3714287486?pwd=TlIwYjBOanRpUjljUnpDcHJoNU90dz09**)**

Course Description
The goal of this course is to immerse students in the technical challenges associated with contemporary marketing analytics as applied to business processes and data-driven decision making. To achieve this mission, the course will introduce modules covering the state-of-the-art in R programming applied to data analysis for marketing problems.

Course Objectives:
Upon completion of this course, students should be able to:

1. Crisply articulate a data-centric marketing problem as an analytics problem;
2. Design a data software architecture for efficient R-code based data analysis;
3. Use R to perform necessary analysis:
   - Extracting, Transforming and Loading (ETL) data in R
   - Descriptive statistics, analysis and visualization
4. Transform quantitative results into actionable qualitative insights for decision making.

Course Materials:
Textbook (Mandatory)
"***R for Marketing Research and Analytics***", by Chris Chapman and Elea McDonnell Feit (2015 or 2019). Springer International Publishing. ISBN: 9783319144351. Students will be required to read book chapters and familiarize themselves with the corresponding R code before class, as specified in the class schedule.

Course Software:
The majority of computing in the course will be done using R (in some cases MS Excel may be used as well). This will include in-class demonstrations and tutorials on how to use R.

Case Studies (Mandatory)
Students will be required to complete two case studies (Cloverleaf and Winters Attribution) available through the Stukent.com platform. These case studies will present two marketing analytics problems and will provide the appropriate data to address them. Students will find additional information on Canvas on how to complete these assignments. Students are responsible for purchasing these two cases (case studies are $4.99/each) and can be accessed through the following link:

https://join.stukent.com/join/C88-F50

Recommended Materials:

- "***R for Beginners***", by Emmanuel Paradis (Free Download: https://cran.r-project.org/doc/contrib/Paradis-rdebuts_en.pdf).
- "***An Introduction to R: Notes on R***" by W. N. Venables, D. M. Smith, and the R Core Team (Free Download: https://cran.r-project.org/doc/manuals/r-release/R-intro.pdf).
- "***R Programming for Data Science***", by Roger Peng (Free Download: https://leanpub.com/rprogramming).

- "***Storytelling with Data: A Data Visualization Guide for Business Professionals***", by Cole Nussbaumer Knaflic (2015). Wiley, 1st ed. ISBN: 978-1119002253.
- "***Marketing Research: An Applied Orientation***", by N. K. Malhotra (2009). Prentice Hall, 6th ed. ISBN: 978-0136085430.

Course Website

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

Course Deliverables/ Final Grade Components

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

Component	Effort	Weight
5 x Homework Assignments	Individual	5 x 6 points = 30 points
2 x Case Studies	Individual	2 x 15 points = 30 points
Article Presentation	Group*	10 points
Research Project Final Presentation	Group	10 points
Research Project Paper	Group	20 points
TOTAL		**100 points**

*- Depending on enrolment size

Homework Assignments

The main purpose of the homework is to strengthen your problem-solving abilities. The homework should also prepare you for the Final Project. Approximately every two weeks, students will complete a homework assignment. The assignments will typically direct students to develop R code to address specific questions/problems. Students may be required to provide an interpretation of the results obtained through the R code developed as part of the assignment. Homework will be available on Canvas. Homework is available on **Mondays at 12 AM and is due on Sunday by 11:59 PM**, unless otherwise specified on the schedule or on Canvas.

Missed homework will be excused only under extraordinary, week-long circumstances such as medical or family emergencies, at the discretion of the instructor and with appropriate documentation at the time of the missed assignment. A missed homework without prior approval and without legitimate reason will not receive credit.

Case Studies

Students will be required to complete two case studies (Cloverleaf and Winters Attribution) available through the Stukent.com platform. Missed case studies will be also excused only under extraordinary, week-long circumstances such as medical or family emergencies, at the discretion of the instructor and with appropriate documentation at the time of the missed assignment. A missed case study submission without prior approval and without legitimate reasons

will not receive credit. The case studies submission will be open on **Mondays at 12 AM and is due on Sunday by 11:59 PM**, unless otherwise specified on the schedule or on Canvas.

Article Presentation
In groups of 2*, students will be requested to present one article in class addressing a relevant topic related to marketing/business analytics and/or how R language is used in real-world settings. These articles will be provided by the instructor and will be available on Canvas, together with additional information on how to implement this assignment. Students will be allotted with 20 minutes to present the article and its key elements and discuss them with the audience. Presentations that allow/encourage audience participation will receive higher grades. Article presentations will take place on **Wednesdays**, as indicated in the class schedule.

*- Depending on enrolment size

Research Project Paper
There will be one written project that is to be completed in groups of 2 and submitted via Canvas. The main purpose of the Project is to demonstrate proficiency using R and apply what you have learned to real-world data for the purpose of decision making and problem solving within the area of either marketing or sales. The project will assess your cumulative understanding of the concepts covered in class and course material and will evaluate your ability to apply these ideas to a real-world business scenario. Project directives and information can be found on Canvas. By week 8, students will be requested to submit a draft of the project. You will receive feedback from your instructor within a week of the draft due date.

Research Project Final Presentation
The group presentation demonstrates your understanding of the whole process of defining a marketing problem, finding the appropriate data, analyzing the data, and reporting and communicating your results for the purpose of decision making. Each group will prepare a presentation of the research project addressing this process.

Some important policies regarding this presentation are:

- 20 minute presentation
- Participation, including audience questions, is mandatory
- Business attire is expected
- Every group member must present

Suggested content of the presentation:

- Problem definition (provide extensive background about the problem and the purpose of your project)
- Data source(s) and data collection
- Data analysis (refer to the data analysis needs, do not provide your R code)
- Results and data result visualizations (identify and use the best available tools to communicate your results)
- Insights (provide a "business meaning" to your results and explain your suggestion to solve the problem)

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 you need to</u>:

- Attend 100% of the classes. During class, new content is introduced, explained, and then applied for better understanding.
- Read and understand all the class materials. This will allow you to participate in class discussions, exercises, and activities to further understanding. Reading the assigned book chapters before class is a key element to achieve a good grade.
- Turn in all course deliverables in a timely and professional manner.
- Do not procrastinate. Do not develop any of the course deliverables when it is already at or past the due date.
- Be an active member of your group and contribute with new ideas and suggestions.

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

I have had students be very casual in taking a class for the first part of a term. Then, as the class nears the end, the student realizes a bad grade may be in the future and asks for additional extra-credit opportunities or extensions to due dates. This is usually done with a **sad face, a soft voice, and a remorseful heart**. Please know now that such opportunities are not fair to the other students. As such, the grading system established in this syllabus is final and no other opportunities for points exist. This means that each student should take this class seriously from the first class.

Final course grades will be based on the following scale (there will be NO curve):

Grading Scale

A	B+	B	C+	C	D	F
90%–100%	85%–89%	80%–84%	75%–79%	70%–74%	60%-69%	0%–59%

Program Learning Goals and Objectives (PLGO) and Program Learning Outcomes (PLO): BS in Business Program

Goal	Outcome
LG 1 – Develop an understanding of business concepts and problem solving	**LO 1** - Students will demonstrate knowledge in business concepts and an ability to apply these concepts to solve business problems
	LO 2 - Students will demonstrate an ability to solve business problems using current technology
LG 2 - Develop Effective Communication and Information Literacy Skills	**LO 1** - Students will demonstrate the ability to deliver effective presentations enhanced by technology
	LO 2 - Students will demonstrate the ability to write clear and concise reports that reflect "critical thinking"
	LO 3 - Students will demonstrate the ability to search databases, locate, use and properly cite relevant information
LG 3 - Interact Effectively in Teams	**LO 1** - Students will demonstrate the ability to understand and use team building behaviors to accomplish group tasks
LG 4 - Develop Ethical Reasoning Skills	**LO 1** - Students will demonstrate the ability to identify ethical dilemmas and make decisions grounded in ethical principles
LG 5 - Acquire Technological Skills	**LO 1** - Students will demonstrate the ability to use technology for effective project management
LG 6 - Understand the Global Context of Business	**LO 1** - Students will demonstrate the ability to understand the global context in which business is conducted

Classroom Policies

Success in business depends on the combined performance of the professional team, not the self-centered interests of one individual. Similarly, a good learning environment is collectively created and requires the contribution of ALL students within the class. To maximize classroom learning:

- **Engage in learning**. Being attentive during class. Giving class your undivided attention and actively contributing to discussion, exercises, and projects.
- **Show respect**. Listening attentively to others' thoughts and ideas.

Disruptive behavior includes:

- Using any device that is distracting to others (including me).
- Engaging in side-conversations.

- Disrespecting others.
- Using language inappropriate to a professional work environment.
- Arriving late and departing before class is dismissed. (Being on time is an expectation. In the business arena, being late to a meeting or appointment is a cardinal sin. It can result in the loss of business, the loss of trust, and sometimes the loss of a job. For this reason, it is important for a student to model the conduct expected **in the NJIT after-life (your future job)**).

Non-compliance:

- Exhibiting behavior that disrupts the class learning environment will result in a deduction of points. Students may also be asked to leave class.
- After continued non-compliance a student may be permanently removed from the class.

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. Marketing 378 or MRKT378) in the subject line
- Identify the subject of the e-mail with a brief but descriptive summary of the topic: include a proper salutation (e.g. Professor Fresneda), and the assignment details such as the title, project report, or quiz.
- 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.)

Late Assignments

Late assignments will 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.

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. I will submit your assignments to *Turnitin* to check for plagiarism if there are clear signs of cheating.

AI Use Policy

Unless explicitly indicated in an assignment, this course expects students to work without artificial intelligence (AI) assistance in order to better develop their skills in this content area. As such, AI usage is not permitted throughout this course under any circumstance unless explicitly indicated in the assignment.

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.

Final Comments

I reserve the right to change any aspect of this syllabus or the course schedule at any time, as the need arises. Changes would be appropriately communicated to students. Students registered for this course assume full responsibility for reading and understanding the course policies as stated above.

Week #	Week of:	Lecture Topics	Readings
1	Sept 03	-Course Logistics & Syllabus	---
2	Sept 09	**-Introduction to R**	-Chapman & McDonnell Feit, Chapter 2
3	Sept 16	**-Fundamentals of Data Analysis I: Describing Data, Relationships Between Continuous Variables**	-Chapman & McDonnell Feit, Chapter 3 & 4
4	Sept 23	**-Fundamentals of Data Analysis II: Comparing Groups: Tables and Visualizations, Comparing Groups: Statistical Tests**	-Chapman & McDonnell Feit, Chapter 5 & 6
5	Sept 30	**-Fundamentals of Data Analysis III: Identifying Drivers of Outcomes: Linear Models**	-Chapman & McDonnell Feit, Chapter 7
6	Oct 07	**-Customer Analytics I: Multidimensional Scaling**	-Chapman & McDonnell Feit, Chapter 8
7	Oct 14	**-Customer Analytics II: Dimension Reduction Techniques: Principal Component Analysis and Factor Analysis**	-Chapman & McDonnell Feit, Chapter 8
8	Oct 21	**-Customer Analytics III: Linear Models for Binary Outcomes: Logistic Regression**	-Chapman & McDonnell Feit, Chapter 9
9	Oct 28	**-Customer Analytics IV: Segmentation: Clustering**	-Chapman & McDonnell Feit, Chapter 11
10	Nov 04	**-Customer Analytics V: Classification: Fundamentals of Machine Learning**	-Chapman & McDonnell Feit, Chapter 11
11	Nov 11	**-Customer Analytics VI: Classification: Deep Learning**	-Materials provided by instructor
12	Nov 18	**-Analyzing Unstructured Data: Text Analysis I. Term Frequency and Sentiment Analysis**	-Materials provided by instructor
13	Nov 25	**-Analyzing Unstructured Data: Text Analysis I. Term Frequency and Sentiment Analysis**	-Materials provided by instructor
	Nov 28 – Dec 01	**Thanksgiving Recess**	

14	Dec 02	**-Analyzing Unstructured Data: Text Analysis II. Topic Modeling**	-Materials provided by instructor
15	Dec 09	-Course Wrap-Up -Continue practicing/learning R	---
Dec 12-13		**Reading days**	
Final Exam Week (Dec 15- Dec 21)		---	---

Lecture Topics in blue are *fundamentals of data analysis*, while the red ones are *advanced marketing applications*.

Week #	**Week of:**	**Lecture Topics**	**Activities Due**
1	Sept 03	-Course Logistics & Syllabus	---
2	Sept 09	**-Introduction to R**	-Forming Groups (in class) -Article Presentation Assignment (in class)
3	Sept 16	**-Fundamentals of Data Analysis I: Describing Data, Relationships Between Continuous Variables**	-Article Presentation I (in class, Wednesday)
4	Sept 23	**-Fundamentals of Data Analysis II: Comparing Groups: Tables and Visualizations, Comparing Groups: Statistical Tests**	-Article Presentation II (in class, Wednesday)
5	Sept 30	**-Fundamentals of Data Analysis III: Identifying Drivers of Outcomes: Linear Models**	-Article Presentation III (in class, Wednesday) -Homework I (due on Sunday 10/06 by midnight)
6	Oct 07	**-Customer Analytics I: Multidimensional Scaling**	-Article Presentation IV (in class, Wednesday)
7	Oct 14	**-Customer Analytics II: Dimension Reduction Techniques: Principal Component Analysis and Factor Analysis**	-Article Presentation V (in class, Wednesday) -Homework II (due on Sunday 10/20 by midnight)
8	Oct 21	**-Customer Analytics III: Linear Models for Binary Outcomes: Logistic Regression**	-Article Presentation VI (in class, Wednesday) -Case Study I: Cloverleaf (due on Sunday 10/27 by midnight) -Research Project Draft (due on Sunday 10/27 by midnight)
9	Oct 28	**-Customer Analytics IV: Segmentation: Clustering**	-Article Presentation VII (in class, Wednesday) -Homework III (due on Sunday 11/03 by midnight)
10	Nov 04	**-Customer Analytics V: Classification: Fundamentals of Machine Learning**	-Article Presentation VIII (in class, Wednesday)
11	Nov 11	**-Customer Analytics VI: Classification: Deep Learning**	-Article Presentation IX (in class, Wednesday) -Homework IV (due on Sunday 11/17 by midnight)

12	Nov 18	**-Analyzing Unstructured Data: Text Analysis I. Term Frequency and Sentiment Analysis**	-Article Presentation X (in class, Wednesday)
13	Nov 25		
	Nov 28 – Dec 01	**Thanksgiving Recess**	
14	Dec 02	**-Analyzing Unstructured Data: Text Analysis II. Topic Modeling**	-Article Presentation XI (in class, Wednesday) -Homework V (due on Sunday 12/08 by midnight)
15	Dec 09	-Course Wrap-Up -Continue practicing/learning R	-Research Project Final Presentation
Dec 12-13		**Reading days**	
Final Exam Week (Dec 15- Dec 21)		---	-Case Study II: Winters Attribution (due on Friday 12/20 by midnight) -Research Project Paper (due on Friday 12/20 by midnight)

Lecture Topics in blue are *fundamentals of data analysis*, while the red ones are *advanced marketing applications*.