Syllabus for STOR 390-001
Sports Analytics
Fall 2019

Head Coach: Dr. Mario Giacomazzo   **Press Conference**: T   8:45AM - 9:45AM
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Game Days: MWF from 10:10M – 11:00PM in Hanes 120

Course URL: Website: https://supermariogiacomazzo.github.io/STOR390_WEBSITE/
Assignment Submission: https://sakai.unc.edu/ and login with your Onyen

Description: Survey the application of statistics and mathematics to the sports industry exploring the history of analytics across various sports, understanding the advantages of sports analytics for both on-field performance and off-field business decisions, and examining current research to encourage creative thought of future development.

The course will be organized by sport to ensure a comprehensive exploration of sports analytics. We will start with in-depth studies in Baseball, Basketball, American Football, Hockey, and Soccer. Later in the course, we will branch out according to the diverse interests of the class.

The statistical programming language R will be used to generate visualizations and perform basic modeling.

Prerequisites: Math 110 (Algebra) and Love of the Game

Required Textbooks: *Scorecasting,* Moskowitz & Wertheim, 2012 (ISBN: 9780307591807)
Mathletics, Winston, 2012 (ISBN: 9780691154589)
Handbook of Statistical Methods and Analyses in Sports, Albert, Glickman, Et al., 2017 (ISBN: 9781498737364)

Optional Textbooks: *Analytic Methods in Sports,* Severini, 2015 (ISBN: 9781482237016)
Sports Analytics: A Guide for Coaches, Managers, and Other Decision Makers, Alamar, 2013 (ISBN: 9780231162920)

Software: A personal laptop with a working copy of **R** and **R Studio** will be useful. Directions for free downloads of these materials will be provided.

Final Grade: Practice (10%)
Gameday Speeches (20%)
Regular Season (20%)
Playoffs (30%)
Super Bowl (20%)

Practice: Just like **practice** is mandatory for the athlete **attendance** is mandatory for you. Once per week at random, I will take attendance at the beginning of class in the form of an interactive game worth **0-7 points**. Students not present will be placed on the injury report and ineligible for points. At the end of the semester, the practice grade will be curved so students who had perfect attendance get 100% on their practice grade.

Gameday

Speeches: **Gameday speeches** are to be done in teams. **Biweekly**, I will give you a journal article(s) from a refereed journal to read and summarize in a **6 slide** gameday speech using summarized bullet points. First slide should contain the title of the article, the names of the author(s), and the name(s) of the presenters. Second and third slide should summarize the overarching theme of the article(s). Fourth and fifth slide should summarize the methodology used. The sixth slide should conclude with points in the article you found interesting, confusing, and/or problematic. The presentation should be submitted on Sakai before class starts on the due date. On gameday, I will use a random number generator to pick **2 groups** to present. All groups will be graded based on the criteria, but only 2 groups will present. This will be followed by an in-class discussion.

Regular

Season: The **regular season** consists of **biweekly** quizzes on the material presented in class over the previous two weeks. This includes what was taught in lecture and what was presented during gameday speeches. The quizzes will be multiple choice, and you will be given 20 minutes to complete in class.

Playoffs: There will be two rounds of playoffs during the semester both of which can be considered as miniature team projects. Both projects will have detailed rubrics.

Round 1: The **first round** will be a data gathering and summary report. Imagine you are an analyst working for the coach or athlete and want to discover insights that would bring a competitive edge. You will have to establish a research goal, watch an event/game, gather the data, and summarize your results using statistics and visualization. All of your findings will be summarized in a **paper of 3 to 5 pages**.

Round 2: The **second round** will be a sports betting project in which you will gamble **$0**. I will supply you with data, and then you will be required to analyze data for the purpose of making bets against point spreads. You are required to some form of statistical modeling or machine learning. In a **paper of 3 to 5 pages**, you will summarize the data you used, the methodology employed, and your final picks based off prediction.

Super Bowl: The **Super Bowl** will consist of a **4 to 7 paged research paper** with a minimum of **10 citations** studying a sport of interest that is not of focus in the course. Like the playoffs, this final assignment will be done in a team. Sometime during the scheduled final exam time, **Friday, December 13,** between **8:00AM** and **11:00AM,** your team will meet with me to turn in your paper and discuss what you learned. The paper will be organized in the following subsections:

*Introduction***:** Describe the sport selected by writing about how it is played, when is it played, where is it most popular, how much capital is invested, and why you chose it.

Literature Review: Discuss how analytics have been used historically in the sport, what types of metrics are used to evaluate performance on the field and/or off the field, who are the best athletes/teams/organizations based off those metrics. Many obscure sports do not have an extensive history of complex analytics, but all sports track information in order to evaluate performance. Talk about any implementation of gambling and what types of bets exist.

Future Work: Critically think about where you see ways in which analytics can be used to improve the sport. Think about ways in which analytics from other more popular sports could be applicable in the sport you selected. Try to creatively design metrics that could be of use to evaluate performance. This section is the most important and should test your ability to innovate in areas primarily ignored that require innovation for growth. What information does the sport have or not have that could help the organizations, managers, or athletes that are financially invested in the sport you selected.

Conclusion: Summarize your paper and discuss what appreciation you gained for this sport after your in-depth analysis.

Team Projects: Many of the assessments in this course will be done in a team of **4 or 5 students** randomly chosen. For each team-based assignment, you will be given a different team. This will force you to interact with the majority of the class throughout the semester. After each team-based assignment, you will grade the contribution of your teammates on a scale from **0 to 5** and this will contribute to your overall grade for the given assignment. A decent portion of your final grade will be influenced by this.

Grade Scale: The below grading scale is guaranteed. The "+" and "-" designations will only be used in your favor. At the end of the semester, a comprehensive inspection of all the class grades will determine the cutoff points for "+" and "-" designations.

A [90,100]
B [80,90)
C [70,80)
D [60,70)
F [0,60)

Accessibility: The University of North Carolina at Chapel Hill facilitates the implementation of reasonable accommodations, including resources and services, for students with disabilities, chronic medical conditions, a temporary disability or pregnancy complications resulting in difficulties with accessing learning opportunities.

All accommodations are coordinated through the Accessibility Resources and Service Office. See the ARS Website for contact information: https://ars.unc.edu or email ars@unc.edu.

Honor Code: All students are expected to follow the guidelines of the UNC honor code. In particular, students are expected to refrain from "lying, cheating, or stealing" in the academic context. If you are unsure about which actions violate that honor code, please see me or consult honor.unc.edu.

Students are bound by the Honor Code in taking exams and in written work. The Honor Code of the University is in effect at all times, and the submission of work signifies understanding and acceptance of those requirements. Plagiarism will not be tolerated. Please consult with me if you have any questions about the Honor Code.

The University of North Carolina at Chapel Hill has had a student-administered honor system and judicial system for over 100 years. The system is the responsibility of students and is regulated and governed by them, but faculty share the responsibility. If you have questions about your responsibility under the honor code, please bring them to your instructor or consult with the office of the Dean of Students or the Instrument of Student Judicial Governance. This document, adopted by the Chancellor, the Faculty Council, and the Student Congress, contains all policies and procedures pertaining to the student honor system. Your full participation and observance of the honor code is expected (honor.unc.edu).

Legal: Dr. Mario reserves the right to make changes to the syllabus, including all due dates. These changes will be announced as early as possible so that students can adjust their schedules.