Business Management 4242
Sports Analytics
Spring 2018 Syllabus

Instructor:	Dr. John Draper	When:	MWF 10:20-11:15
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Course Description

Analytical techniques and quantitative methods are on the rise in many areas of industry, and, of late, have made their foray into the sports realm. Skills such as critical thinking, mathematical modeling, statistical analysis, predictive analytics and optimization are crucial in the data-centric realm. The class seeks to develop and refine these skills in the business application area of sports.

Prerequisites
BM2320 and BM2321 or equiv. (Somewhat in flux at the moment)

Textbooks
Winston, Wayne L. *Mathletics: How Gamblers, Managers, and Sports Enthusiasts Use Mathematics in Baseball, Basketball, and Football.* Princeton: Princeton UP, 2009.

Moskowitz, Tobias J. and L. Jon. Wertheim. *Scorecasting: The Hidden Influences behind How Sports Are Played and Games Are Won*. New York: Crown Archetype, 2001.

Grading
The final course grade will be based on:

Mastery Homework	20%
Group Presentations	15% (5% each)
Mini-Quizzes	40% (10% each)
Final Project	25%

Mastery Homework
There will be approximately biweekly online homework assignments throughout the course of the semester. Practice is the name of the game in analytics classes so these are the best way to learn and internalize the information. The homeworks will be in the form of Carmen quizzes. You will have as many attempts as you desire to get the questions correct. I have found this to be an effective way for busy individuals to carve out some time to practice applying the information. You are permitted to consult with other members of the class but strongly advised to NOT divide and conquer.

Group Presentations
One of the goals of the class is to improve your logical thought process and presentation of an argument. You will be given a list of sports questions from which to choose to present a short 5-10 minute discussion of your group's position. The questions will be assigned by the professor for analysis by the groups. The presentation should contain solid insight, visuals, and statistics to back up the argument. A paper may be required as well outlining your analysis (1 per group).

Mini-Quizzes
The quizzes may require the use of a computer with Excel for some simple analysis. The quizzes will consist of multiple choice, true/false, and some simple data analysis using techniques in the class. Most of the computer output will be provided for you. Overall, if you follow the material of the class, the quizzes should not be difficult.

Project
The project will consist of a group effort to analyze a sports question of interest. You have the leeway to choose whatever question in any sport (pending my approval). The requirements are that the question is clearly explained and answerable via data analysis and using methods discussed in the course (i.e., linear regression, logistic regression, hypothesis testing, optimization, etc.). The current plan is a short paper defining the problem, an analysis of the methods used, and a short conclusion in addition to a short (10-15 min) presentation of your results.

Software
The primary software for this course is Microsoft Excel with StatTools. We will also make use of other functionality in Excel as well (such as the Solver and Data Analysis Add-ins). StatTools is available in the Mason Lab if needed.

There are a variety of very good statistical software packages that you may certainly use if you are familiar with them although I will primarily teach using StatTools and Excel. Minitab is probably the most pervasive in the business market but comes at a price. R is the up-and-coming software of choice for most in the analytics business due to its flexibility, open source, and price tag (free), but the learning curve is a little steeper.

Academic Misconduct
Please help maintain an academic environment of mutual respect and fair treatment. You are expected to produce original and independent work on the exams. Although students are often encouraged to work together on homework assignments, all students must submit their own work in their own words. It is the responsibility of the Committee on Academic Misconduct to investigate or establish procedures for the investigation of all reported cases of student academic misconduct. The term academic misconduct includes all forms of student academic misconduct wherever committed; illustrated by, but not limited to, cases of plagiarism and dishonest practices in connection with examinations. Instructors shall report all instances of alleged academic misconduct to the committee (Faculty Rule 3335-5-487). Academic misconduct will not be tolerated and will be dealt with procedurally in accordance with university policy, which can be found at http://oaa.osu.edu/coam.html. The Code of Student Conduct is available at http://studentaffairs.osu.edu/csc/.

Tentative Schedule

WEEK	DATES	TOPICS	DELIVERABLES (FRI)	QUIZZES (FRI)
1	1/8-1/12	Descriptive Stats		
2	1/15-1/19	Hypothesis Testing/Comparisons/R basics		
3	1/22-1/26	Probability/Streaks	MH1	
4	1/29-2/2	Decision making in Sports		Quiz 1
5	2/5-2/9	Summarizing Games/Game Theory	Presentation 1 - HOF	
6	2/12-2/16	Linear Regression	MH2	
7	2/19-2/23	Logistic Regression		Quiz 2
8	2/26-3/2	Optimization Using Solver/Daily Fantasy	MH3	
9	3/5-3/9	More optimization (including nonlinear)/team ranking/player evaluation	Presentation 2 – Decision/Regression	
	3/12-3/16	**SPRING BREAK**		
10	3/19-3/23	Simulation	MH4,	
11	3/26-3/30	More Simulation		Quiz 3
12	4/2-4/6	Home field advantage/Officiating	MH5	
13	4/9-4/13	Draft/Financial considerations/Psychological Concerns	Presentation 3 - TBA	
14	4/16-4/20	Discrete data analysis	MH6	Quiz 4
15	4/23; 4/26	**FINAL PRESENTATION**		