GENB 7397 Math and Sports-Wednesdays 6-9 PM Spring 2014

Professor: Wayne Winston

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Office: Office Hours: I will send them out each day, Usually Monday-Wednesday 2-5:30 PM and Thursday 9-11 AM

Purpose of Course

If you saw or read *Moneyball* you know most professional sports teams are using math to make their teams better. In this course you will learn the math behind *Moneyball* and hopefully learn how to build better decision-making models in other areas of business. **You will also learn a lot of useful Excel functions and Excel modeling techniques**

Required Text

Mathletics, by Wayne Winston Princeton University Press, 2012

Recommended Text

Microsoft Excel 2013: Data Analysis and Business Modeling by Wayne WInston, Microsoft Press, 2013

Grade and Assignments

There will be weekly Hand in homework by email. Put your name in first tab and combine all problems in a single workbook using Edit Move or Copy sheet. Please name HW file with following convention: If your email alias is Bspears name file Bspearshw1@uh.edu. HW is 75% of course grade.

The other 25% of the course grade is a project on anything sports and math related of your choice. **Up to 3 people can work on a project. The final project (word file and associated spreadsheet(s)) is due Friday May 2.** Each team will give a 15-20 minute presentation of their results in class. Some examples of projects might include.

- Analyze effectiveness of UH football play calling.
- Write a long-term player personnel plan for your favorite NBA, NFL or MLB team.
- Analyze who is best MLB manager or NFL coach?
- How do high school recruiting ratings predict future college performance?
- Determine a method to predict future player performance.
- Test various sports betting methods to see if they are profitable.

Week by Week Syllabus

DADM refers to Excel book and MATH refers to Mathletics book.

Class # and Date	Topic	Readings
January 15	Baseball: Pythagorean Theorem, Runs Created, and Linear Weights Excel Topics; Data Tables and Regression	MATH Chapters 1-3 DADM: Chapters 15, Chapters 56-57
January 22	Baseball: Monte Carlo Simulation, Evaluating Pitchers, Baseball Decision-Making and Evaluating Fielders Range Names, Conditional Formatting and Excel Tables	MATH: Chapters 4-7 DADM: Chapters 1 ,23 and 25, Chapters 72 and 73
January 29	Baseball: WPA, Player Salaries, Park Factors and Clutch Hitting PivotTables, SUMIFS, AVERAGEIFS and COUNTIFS functions	Math: Chapters 8-11 DADM: Chapters 19, 20 and 43
February 5	Football: What makes teams win, QB Ratings, Play Values and Football Decision-Making, Game theory, Lookup functions, Match, Index ,and Text functions	Math: Chapters 18-21 DADM: Chapter 2-5
February 12	Catchup	
February 19	Football: AdvancedNFLstats.com and FootballOutsiders.com, Two Point Conversions, College Overtime vs. NFL Overtime	Math: Chapters 24-26
February 26	Basketball: Box Score Models vs. Adjusted +/-, Player Salaries, Basketball decision Making, Lineup Analysis, Excel Solver	Math: Chapters 28-33 DADM: Chapters 28 and 29
March 5	Ratings Sports Teams and Simulating NFL playoffs and NCAA tournaments	Math: Chapters 40 and 43
March 19	Sports gambling	Math: Chapters 38 and 44
March 26	Markov Chains and Soccer Analytics	Handouts
April 2	NASCAR and Formula 1 Analytics	DADM: Chapter 36 Also Handouts
April 9	Presentations	
April 16	Presentations	
April 23	Presentations	
April 30	Presentations	