



C105: PREDICTION, PROBABILITY, AND PIGSKIN

EA Sports Press Release, January 27, 2014: *The Madden NFL 25 Super Bowl Prediction is calling for Peyton Manning to be the first ever quarterback to lead two different franchises to Super Bowl victories, with the Broncos defeating the Seahawks 31-28 in overtime.* [Broncos subsequently lost to the Seahawks, 43-8; Madden has now correctly predicted the winner of 73% of the last 11 Super Bowls.]

A professional football coach on predictive modeling: *I wouldn't put any faith in math... I don't believe in anything predetermined... My nature is to defy odds... No major sports coach would talk with you (on the subject of modeling) except as a courtesy.*

COURSE DESCRIPTION

Consider this dilemma: Information is everywhere, but so is uncertainty. Despite our society's profuse collection of information, from shopping patterns to counterterrorism intelligence, the challenge remains: how can we use this data to make strategic decisions? In this information age, some of the most successful individuals will be those who can rise to this challenge. The question at the heart of this course is:

How can we use information to make predictions about uncertain events?

This question will be explored in the active, immersive, hands-on learning laboratory of *Fantasy Football*, an online game that provides a plethora of decision making opportunities in the face of uncertainty, and a wealth of data for analyzing these decisions. Students will be exposed to a wide breadth of decision making and modeling techniques while we analyze and predict our way thru the NFL season.

LEARNING GOALS

Successful students will...

- Learn to value empirical inference over speculative supposition.
- Be proficient in manipulating and summarizing datasets, and using data to support decisions.
- Ask educated questions when confronted with decisions in the face of uncertainty.
- Be familiar with common analytical techniques for predicting the outcome of uncertain events.

COURSE DETAILS

C105 Section 16354 - Fall Semester 2014

Lecture: Tuesdays, 2:30-3:45pm in Ballantine 228

Labs: Thursdays

Lab Section 16356 meets 1:00-2:15pm in Ballantine 118

Lab Section 16355 meets 2:30-3:45pm in Student Building 221

There is no textbook for this course. All course readings will be provided on Canvas as PDFs.

BEN MOTZ

Senior Lecturer & Director of Pedagogy
Department of Psychological and Brain Sciences
Email: bmotz@indiana.edu
Phone: (812)855-0318 (but I'm faster via email)
Office: Psychology Building room A200B
Office hours: Tue 1-2pm; Wed 9:30-11:30am

JOSH DE LEEUW

Lab Instructor & Graduate Student
Indiana University Percepts & Concepts Laboratory
Department of Psychological and Brain Sciences
and Cognitive Science Program
Email: jodeleeuw@indiana.edu

GRADING

BLOGGING: 50% OF YOUR GRADE

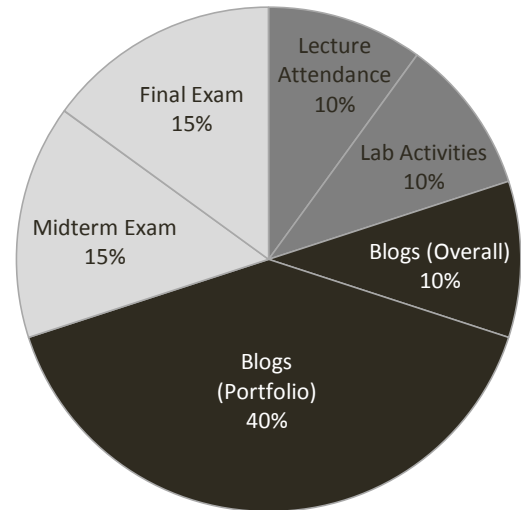
A course blog is hosted at <http://pigskin.psych.indiana.edu>. You must contribute to this blog, acting as a fantasy blogger rendering expert predictions and football advice, either evoking topics from class or your own interests or concerns relevant to fantasy football. All students' posts will be public. Anyone who wishes to maintain anonymity may submit their posts under a pseudonym. Two grades will be determined from your blogging activities:

BLOGGING OVERALL: 10%

You must submit at least 10 *insightful* blog posts, and at least 10 *constructive* comments on other blog posts (0.5% each, 10% total). Additional posts and comments will not increase your grade, but will be appreciated. Overall these posts and comments will not be graded, but there will be penalties if they are particularly poor quality or incomplete. See "Blog Cadence" below.

BLOG PORTFOLIO: 40%

At the end of the semester, you must select your three best posts, revise and improve them, and submit them alongside a short analysis and reflection of your blogging activities in C105. This portfolio will be worth 40% of your grade in C105.



ATTENDANCE IN LECTURE: 10% OF YOUR GRADE

Attendance is required and will be recorded in every lecture, except for the first day of class and the day of the midterm. This equates to 13 days of attendance marks, and you are permitted to miss up to 3 lectures total without penalty. In this way, attendance each day is worth one percent, for a combined 10% of your cumulative C105 grade. Regardless of emergency, **there will be no excused absences**, and if you miss class for any reason it must count toward the three "dropped" attendance marks.

LAB ACTIVITIES AND PARTICIPATION: 10% OF YOUR GRADE

During every Thursday lab section of C105 (12 total; see schedule below; not including first and last weeks), there will be an accompanying worksheet that will ask you to address football questions using the data analyses that we discuss in class. You will be given time in lab to work on these, and you must hand them in at the end of lab. They will not be graded, but there may be penalties if you don't

complete the activity, or if you are not involved and participating in lab. You are permitted to miss 2 labs without penalty, so only 10 lab worksheets are required, cumulatively worth 10% of your C105 grade. Regardless of emergency, **there will be no excused absences**, and if you miss lab for any reason it must count toward the two “dropped” worksheets.

MIDTERM AND FINAL EXAMS: 30% OF YOUR GRADE (15% EACH)

The midterm exam (scheduled for 10/14/14, normal class time) will include material up to the 8th week of the class. The final exam (scheduled for 12/18/14, 5:00-7:00pm) will include material from the 9th thru the 16th week of the class. The format of these exams will be multiple choice. No calculators, notes, or study aids will be permitted during the exams. Please bring pencils.

EXTRA CREDIT

Extra credit will be awarded to managers of the top three teams in each fantasy football league (6 leagues total), according to final standing after the 14th week of the NFL season. There will be no playoffs. The top three teams will be determined first by win/loss record, and then by fantasy point totals in the event of a tie. Extra credit will be awarded as follows: 4% for 1st place, 3% for 2nd place, and 2% for 3rd place.

FAIRPLAY, NETIQUETTE, AND CONDUCT

Because success in your C105 fantasy football league is equated with extra credit points in the course, it's particularly important that students maintain standard scoring settings in their league, and follow the [rules of Fantasy Football](#). Each league will be monitored carefully by the instructors. Collusion, illegal roster moves, or changes to default fantasy settings are grounds for a student's dismissal from the fantasy league, and disciplinary sanctions. Moreover, since a neglected fantasy team will disturb the dynamics of the league, students must actively manage their roster, and must try to win (even those who are losing late in the semester must continue to try to win). Lack of participation in the league may reduce your attendance/participation grades at the instructor's discretion.

Posts, prognostications, comments, and league messages should be focused specifically on the performance of NFL players and teams (not classmates' teams) or the performance of one's own fantasy team. These should be supported with evidence, and above all, must demonstrate respect for others. Mutual respect is a critical component in fostering a community of active collaborative learning and exploration. In contributing to our C105 blog, or when communicating with other members of your fantasy football league, students are expected to adhere to the [Code of Student Rights, Responsibilities, and Conduct](#). According to this code, students are expressly responsible for their behavior, and must

respect the rights and dignity of others in the university community (Part II, Section H).

Fantasy football matchups in this course should be civil, playful, and collegial. Any student engaging in verbal abuse of another person is committing misconduct, and will be subject to disciplinary proceedings, grade reductions, and/or other actions as determined by the instructor and/or the Dean of Students.



Another form of misconduct is plagiarism. Every word in your blog posts must be typed by you and be your own ideas, or your original interpretation of the ideas of others. It takes effort to create a sentence, and when you use the construction of others, you are plagiarizing. Points will be deducted for insufficient or sloppy paraphrasing. Your blog posts will be processed through TurnItIn.com, a system for assessing the originality of your submitted papers. It will ensure that your posts (in part or in full) haven't been copied from Wikipedia, other websites, and a host of other sources. Under university policy, all alleged cases of academic misconduct will be reported to the Dean of Students.

MATERIALS

READINGS

There is no textbook for this course. Readings will be provided electronically on Canvas as PDFs. These readings will serve as references for the analysis techniques discussed in class, and your understanding of these readings will be assessed on the midterm and final exams.

DATA, SOFTWARE, AND COMPUTERS

This course will make heavy use of technology. While there are no specific prerequisites to C105, we nonetheless expect that students are computer-literate, and will have regular access to a reasonably capable computer and a reliable connection to the internet, or will have access to an IU computer lab.

A large database of fantasy football statistics has been created for use in C105. Students will connect to this database using a feature of Microsoft Excel called ODBC (open database connectivity). Microsoft Excel is provided to IU students free of charge at <http://iuware.indiana.edu/>, and instructions for installing and configuring the free ODBC drivers will be provided in class and on Canvas. Unfortunately, at this time, the ODBC drivers necessary for connecting to the database are incompatible with Mac OS 10.7+. To connect to the database using a modern Mac, it may best to install a Windows "virtual machine" on the Mac, which will require the student to purchase a copy of the Windows 7 or 8 operating system (available at IU bookstores for \$20 plus tax).

The C105 database has been developed for educational purposes only. Students are encouraged to explore, analyze, and discover patterns in these fantasy football statistics.

Nevertheless, students may not distribute the data or make any commercial use of the data.

LETTER GRADE ASSIGNMENT

Letter grades will be assigned according to the table to the right. Decimals will be rounded to the nearest percent score. If fewer than 70% of students receive a final score of 80% or higher, we reserve the right to increase all students' grades (upward curve) to meet this criterion. No student's grade will be decreased in this situation. This is not a guarantee, and will depend on the shape of the distribution of total percent scores at the end of the semester.

GRADE	PERCENT
A+	98+
A	93-97
A-	90-92
B+	88-89
B	83-87
B-	80-82
C+	78-79
C	73-77
C-	70-72
D+	68-69
D	63-67
D-	60-62
F	<60

BLOG CADENCE, MISSED EXAMS, AND LATE PORTFOLIOS

It will take about five hours to construct a single blog post that demonstrates good insight and critical thinking. Since we expect strong effort, we prefer for you to space-out your blogging activities, and for this reason, **you will only receive credit for two blog posts per week**. Even if they are high quality, more than two posts per week will not be credited toward your overall blogging score.

Start blogging early. **Students must submit their first blog post *before* the 4th week of the semester (deadline: September 20, 11:59pm)**, so that they can receive early feedback on their writing and analyses. Two percent will be deducted from the overall blogging score for each week after the 3rd week that a student's first blog post is late.

If you anticipate that you will miss an exam, tell us about it ahead of time. Reasonable efforts will be made to provide an alternative date/time when you might take the exam. If you miss an exam unforeseen reasons, it is your responsibility to tell us immediately. Short-answer make-up exams may be arranged in these cases, although they are typically more difficult than the standard multiple-choice exam.

If you submit the Blog Portfolio late, your grade on the exercise will be reduced by 10% for each day that it is late, up to 5 days. After 5 days, late work will no longer be accepted without some documented medical, family, or personal emergency.

DISCLAIMER

This syllabus is an outline of the course and its policies, which may be changed for reasonable purposes during the semester at the instructor's discretion. You will be notified in class and/or via email if any changes are made to this syllabus, and an updated syllabus will be provided on Canvas.

COPYRIGHT

Copyrights to the materials in C105 are held exclusively by the instructor, Ben Motz. This copyright statement includes the syllabus, lectures, study guides, exams, fantasy football data, and all other resources provided to enrolled students. Do not redistribute these materials. © Ben Motz, 2014



COURSE SCHEDULE

Week	Date	Day	Topic	Format	Topic
1	26-Aug-14	01	Introduction to Fantasy Football	Lecture	Introductions, Preparing for draft
	28-Aug-14	02		Lab	Live draft in Lab
2	2-Sep-14	03	Summarizing and Manipulating Data with Microsoft Excel	Lecture	Excel basics and the pigskin database
	4-Sep-14	04		Lab	Basic exploratory exercises in Excel
3	9-Sep-14	05		Lecture	Empiricism and summarizing data
	11-Sep-14	06		Lab	Becoming a football analyst
4	16-Sep-14	07		Lecture	Intermediate Excel: Functions & formulas
	18-Sep-14	08		Lab	Is there a home field advantage?
5	23-Sep-14	09		Lecture	Advanced Excel: PivotTables
	25-Sep-14	10		Lab	Home-field redo... More PivotTable practice
6	30-Sep-14	11		Lecture	Advanced Excel: VLOOKUP
	2-Oct-14	12		Lab	What's different about rivalry games?
7	7-Oct-14	13		Lecture	Midterm Review (Collaborative Practice Exam)
	9-Oct-14	14		Lab	Peer review of blog posts
8	14-Oct-14		Midterm Exam		
	16-Oct-14		Lab cancelled		
9	21-Oct-14	15	Human Decision Making	Lecture	Humans aren't robots
	23-Oct-14	16		Lab	Play calling & decision making
10	28-Oct-14	17	Regression Modeling	Lecture	Predictions, Correlation, & Regression
	30-Oct-14	18		Lab	The effect of opposing team
11	4-Nov-14	19	Regression Modeling	Lecture	Multiple Regression
	6-Nov-14	20		Lab	Modeling running back fantasy points
12	11-Nov-14	21	Factor Analysis	Lecture	Factor Analysis
	13-Nov-14	22		Lab	Why do people play fantasy football?
13	18-Nov-14	23	Cluster Analysis	Lecture	Cluster Analysis
	20-Nov-14	24		Lab	Classify your running backs
14	25-Nov-14		Thanksgiving Break		
	27-Nov-14				
15	2-Dec-14	25	Simulation Techniques	Lecture	Going from Modeling to Simulation
	4-Dec-14	26		Lab	Coulda, woulda, shoulda
16	9-Dec-14	27	Skill, Gambling, and Wrap-Up	Lecture	Gambling, the Law, & Fantasy Sports
	11-Dec-14	28		Lab	Review for Final Exam
F	18-Dec-14		Final Exam: 5-7pm, Thursday, December 18, in Ballantine 228		