



Gifted LearningLinks Program Course Syllabus

Instructor name: Per Stinchcombe

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Course Title: Gaming: Is It Really All Up to Chance?

Session Date: 2011-2012 Monthly Enrollment

Course Description:

Go beyond basic probability and combinatorics through the study of games of chance. Participants cover dozens of math concepts, solve various levels of equations and are introduced to math programming while studying random trials based on common games of chance.

Outcomes: Upon successful completion of this course, students will:

- Know the basics of program design and Java syntax.
- Have experience designing algorithms and translating algorithms into code.
- Understand fundamental laws of probability, and know how to apply these to real-world situations.
- Be able to design experiments to answer questions, and draw conclusions and new hypotheses from the results of those experiments.
- Be able to present experimental findings and mathematical theories in a professional fashion.

Resources and Materials:

- Although we're not directly using a text, having a Java textbook handy as a reference isn't a bad idea.
- The Java API is at download.oracle.com/javase/1,5.0/docs/api. This is where you can find information about what particular Java classes, methods, etc. do – it's a very useful reference.
- NetBeans, the IDE we'll be using (more on that later) can be found at www.netbeans.org

CTD Statement on Third-Party Web Sites

Instructors are required to thoroughly review any third-party web sites they intend to use in their courses for inappropriate content. However, because web content continuously changes, CTD disclaims any responsibility for any of the content contained on third-party web sites used in course materials. If you become aware of anything that may be inappropriate, please notify CTD staff immediately.

Schedule:

	Topic/Focus	Activities & Reading Assignments	What do I need to turn in?
Week 1	Orientation to Online Learning	Introduction to Java/NetBeans Dice: Part One	Dice: Part One write-up
Week 2	Dice	Dice: Part Two	Dice: Part Two data, analysis
Week 3	Craps	Craps: Part One (Code)	Dice write-up Craps code
Week 4	Craps/Liar's Dice	Craps: Part Two (Data and Analysis) Liar's Dice: Part One (Experiment)	Craps experimental results Liar's Dice experiment code
Week 5	Liar's Dice	Liar's Dice: Part Two (Analysis and Strategy)	Craps write-up Liar's Dice odds table
Week 6	Yahtzee	Yahtzee: Part One (Code)	Liar's Dice write-up Yahtzee code
Week 7	Yahtzee	Yahtzee: Part Two (Strategy Design and Testing)	Yahtzee strategy algorithms and data
Week 8	Blackjack	Blackjack: Part One (Code; Experiment 1)	Yahtzee write-up Blackjack code
Week 9	Blackjack	Blackjack: Part Two (Basic Strategy)	Blackjack strategy analysis
Week 10	Blackjack	Blackjack: Part Three (Counting Cards)	Card counting worksheet
Week 11	Blackjack	Blackjack: Part Four (Experiment 2)	Card counting results
Week 12	Poker	Poker: Part One (Code)	Blackjack write-up Poker code
Week 13	Poker	Poker: Part Two (Computing the Odds)	Poker odds table
Week 14	Poker	Poker: Part Three (Strategy Design)	Poker strategy algorithm

	Topic/Focus	Activities & Reading Assignments	What do I need to turn in?
Week 15	Poker	Poker: Part Four (Strategy Testing) Final Project Intro	Poker strategy code Final project proposal
Week 16	Final Project	Final Project	Poker write-up Final Project Status Report
Week 17	Final Project	Final Project	Final Project code
Week 18	Final Project	Final Project	Final Project: Full Write-Up

Student Evaluation and Grading Policies for Credit Courses Only:

a. CTD Grading scale

A+ 97-100	B+ 87-89	C+ 77-79	D+ 67-69	F Below 60
A 93-96	B 83-86	C 73-76	D 63-66	
A- 90-92	B- 80-82	C- 70-72	D- 60-62	

b. Breakdown of final grade:

- 36% final project write-up;
- 34% experiment/topic write-ups, proportional to the time spent on each topic:
 - Dice, Part 1 (2%)
 - Dice (4%)
 - Craps (4%)
 - Liar's Dice (4%)
 - Yahtzee (4%)
 - Blackjack (8%)
 - Poker (8%)
- 30% smaller assignments (15 @ 2% each)

c. Grading Expectations:

Smaller assignments are intended to be stages on the road to larger projects – therefore, they'll be graded pretty loosely, and the primary expectation for them will be that they show that you're really thinking about the content, and making progress toward a good project. Even if your grade on one of them is good (it will be), don't ignore the criticisms or comments; your grade reflects the fact that you're making progress, but the comments reflect the progress you still need to make in order to get there.

Larger assignments will be graded much more strictly – the goal here is to get you to the point where your project presentations do justice to the real science and mathematics you're doing. Your grades here will reflect the progress you still need to make, but

definitely don't get discouraged early on. Remember that the projects' weights go up as the semester goes on, and that this happens for a reason: the point of the first few small write-ups is to get you used to the expectations and the formats, so that when it really counts (especially on the final project) you can do a great job.

Instructor Biography:

Per Stinchcombe is a Ph.D. student in the mathematics department at the University of California, Berkeley. After graduating from Wesleyan University in 2008, he spent three years teaching high-school mathematics in Chicago Public Schools – first at Lincoln Park High School and then at Fenger Academy. During two of those years, he also taught math, science, and technology courses in the Saturday Enrichment Program. This is his first year teaching online.

Contact Information:

During office hours (I'll arrange these with each cohort of students to make sure there's overlap in the times we're available), I can be reached at xxx-xxx-xxxx. At other times, I can be reached by email at xxx@xxx.xxx

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