

Schedule Math10170 Spring 2016

Topic 1		<i>How do we schedule a tournament and decide on a winner?</i>
01/13	Wed.	Arrange two tournaments, round robin and contest with judges.
01/15	Fri.	Run tournaments and collect data
Topic 2		<i>Is there a best way to choose who is Number 1? (for a tournament, elections, fantasy football.)</i>
01/18	Mon.	Class cancelled to honor Martin Luther King Jr.
01/20	Wed.	Voting: Plurality and Runoff Methods.
01/22	Fri.	Voting: Borda's Method.
01/25	Mon.	Head-To-Head Comparisons, Condorcet Winner.
01/27	Wed.	Voting: A Perfect Voting System, Arrow's Impossibility Theorem.
Topic 3		<i>Can we predict winners for March Madness or the Six Nations Cup using the current data?</i>
01/29	Fri.	Systems of linear equations and an overview of the Massey method of ranking.
02/01	Mon.	Matrices, Addition, Multiplication, Inverses; bring computer
02/03	Wed.	Solving systems of equations using inverse matrices with Mathematica ; bring computer
02/05	Fri.	More on Colley's method ; bring computer
02/08	Mon.	Using Colley's method to make predictions from current data; bring computer
02/10	Wed.	The Massey Method; bring computer
02/12	Fri.	Comparisons between Massey and Colley predictions from Current Data ; bring computer
Topic 4		<i>The Hot Hand; is it real or a myth?</i>
02/15	Mon.	Basic Probability, experiment, sample space, assigning probability, events and their probability., Venn Diagrams
02/17	Wed.	Modeling runs of baskets in basketball.
02/19	Fri.	Conditional probability and Independent events, probability of a run of success'/failures of a given length.
02/22	Mon.	Review for Exam 1
02/24	Wed.	Exam 1
02/26	Fri.	More on modeling runs of baskets in basketball and identifying the hot hand.
02/29	Mon.	Random variables and their probability distributions, tables and plots, expected value, standard deviation, z-scores.
03/02	Wed.	Basics of the Bell Curve and the Wald Wolfowitz runs test(WWRT) for streakiness in data.
03/04	Fri.	Applying the WWRT to real data

03/07	Mon.	Spring Break
03/10	Wed.	Spring Break
03/12	Fri.	Spring Break
Topic 5		<i>Decisions, Decisions!</i>
03/14	Mon.	Bracketology (getting our act together for march Madness) <i>Endgame Basketball with a 2 pt. lead, Foul or let them shoot for 3 points?</i>
03/16	Wed.	Tree diagrams and probability <i>Do we give the ball to the player with the hot hand or to someone else?</i> <i>If passing is better than running, why don't teams always pass?</i> <i>Does drug testing for athletes work ?</i>
03/18	Fri.	Two Person Games.
03/21	Mon.	Optimal Fixed Strategy
03/23	Wed.	Mixed Strategy
03/25	Fri.	Easter Break
03/28	Mon.	Easter Break
03/30	Wed.	Optimal Mixed Strategy
04/01	Fri.	Optimal Mixed Strategy
Topic 6		<i>What is the best angle to hit a golf drive?</i> <i>How to set a world record in the long jump?</i>
04/04	Mon.	Velocity and acceleration for linear motion.
04/06	Wed.	Linear Motion with constant acceleration.
04/08	Fri.	Review for exam .
04/11	Mon.	Exam 2
Topic 7		<i>What is the best angle to hit a golf drive?</i> <i>How to set a world record in the long jump?</i>
04/13	Wed.	Projectile motion.
04/15	Fri.	Setting that world record in the long Jump
04/18	Mon.	What makes Usain Bolt special?
04/20	Wed.	Is there a curse on the cover of Sports Illustrated?
04/22	Fri.	Can we find a formula to predict the number of fantasy points a quarterback will earn next season?
04/25	Mon.	Review for Final.
04/27	Wed.	Review for Final.
05/02	Mon.	Final Exam