GS14 1612
Course Description: Probability and Statistics for Life Scientists – SPRING 2020

Course Director: Christophe P. Ribelayga
Lecturers: Christophe P. Ribelayga, John Magnotti, and Yin Liu

Offering: Two semester hours. Spring annually. 34 lecture/exam days – Letter grade

Pre-requisite: Instructor’s approval.
Attendance < 20 students.
Possibility to audit the course: YES

Class meets on Monday and Wednesday 9-10 am - GSBS large classroom BSRB S3.8371

Spring Semester Academic Classes Begin on January 6th, 2020

Week 1  Jan 6 Introduction; Probability (order, permutations, combinations)
         Jan 8 Introduction to R; Probability, write R code

Week 2  Jan 13 Hypothesis testing, binomial probabilities, review
         Jan 15 Hypothesis testing, binomial probabilities, hands-on exercises

Week 3  (Jan 20)* The chi-squared test for independence, non-parametric tests, review
         Jan 22 The chi-squared test for independence, hands-on exercises

Week 4  Jan 27 REVIEW
         Jan 29 TEST 1

Week 5  Feb  3 Central tendency, the normal distribution, z-test, t-test, review
         Feb  5 Central tendency, the normal distribution, z-test, t-test, hands-on exercises

Week 6  Feb 10 Confidence interval and power of test, review
         Feb 12 Confidence interval and power of test, hands-on exercises

Week 7  (Feb 17)** Analysis of variance (simple/multiple factors/repeated measures), review
         Feb 19 Analysis of variance (simple/multiple factors/repeated measures), hands-on exercises

Week 8  Feb 24 Advanced topics in data analysis: Poisson analysis, review
         Feb 26 Advanced topics in data analysis: Poisson analysis, hands-on exercises

Week 9  Mar  2 REVIEW
         Mar  4 TEST 2

Week 10 Mar  9 Advanced topics in data analysis: Linear regression, review
         Mar 11 Advanced topics in data analysis: Linear regression, hands-on exercises

Week 11 Mar 16-20 SPRING BREAK -----------------------------------------------
Week 12  Mar 23 Advanced topics in data analysis: Multiple regression, review  
Mar 25 Advanced topics in data analysis: Multiple regression, hands-on exercises

Week 13  Mar 30 Advanced topics in data analysis: k means, hierarchical clustering  
Apr  1 Advanced topics in data analysis: continued

Week 14  April 6 Advanced topics in data analysis: multidimensional scaling, principle component analysis, R commander  
April 8 Advanced topics in data analysis: continued

Week 15  April 13 Advanced topics in data analysis: Introduction to Bayesian statistics  
April 15 Advanced topics in data analysis: Introduction to Bayesian statistics, hands-on exercises

Week 16  April 20 Student presentations or extra topic  
April 22 Student presentations or extra topic

Week 17  April 27 REVIEW  
April 29 FINAL EXAM

* January 20 is Martin Luther King holiday; ** February 17 is President’s day. There will be no class on these days. Class will be re-scheduled on different dates after consultation with the students.

Last Day of Classes: April 24, 2020; Final Exams: April 27-May 1, 2020  
End of Spring Semester: May 10, 2019