SPRING 2021
GS14 1612: Biostatistics for Life Scientists

Course Description:
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: None
Possibility to audit the course: YES

Class meets on Monday and Wednesday 9-10 am - WEBEX or ZOOM

Spring Semester Academic Classes Begin on January 11th, 2021

Week 1 Jan 11 Introduction; Probability (order, permutations, combinations)
Jan 13 Introduction to R; Probability, write R code

Week 2 (Jan 18)* Hypothesis testing, binomial probabilities, review
Jan 20 Hypothesis testing, binomial probabilities, hands-on exercises

Week 3 Jan 25 The chi-squared test for independence, non-parametric tests, review
Jan 27 The chi-squared test for independence, hands-on exercises

Week 4 Feb 1 REVIEW
Feb 3 TEST 1

Week 5 Feb 8 Central tendency, the normal distribution, z-test, t-test, review
Feb 10 Central tendency, the normal distribution, z-test, t-test, hands-on exercises

Week 6 (Feb 15)** Confidence interval and power of test, review
Feb 17 Confidence interval and power of test, hands-on exercises

Week 7 Feb 22 Analysis of variance (simple/multiple factors/repeated measures), review
Feb 24 Analysis of variance (simple/multiple factors/repeated measures), hands-on exercises

Week 8 Mar 1 Advanced topics in data analysis: Poisson analysis, review
Mar 3 Advanced topics in data analysis: Poisson analysis, hands-on exercises

Week 9 Mar 8 REVIEW
Mar 10 TEST 2

Week 10 Mar 15-19 SPRING BREAK -------------------------------------------------------------

Week 11 Mar 22 Advanced topics in data analysis: Linear regression, review
Mar 24 Advanced topics in data analysis: Linear regression, hands-on exercises

Week 12 Mar 29 Advanced topics in data analysis: Multiple regression, review
Mar 31 Advanced topics in data analysis: Multiple regression, hands-on exercises
Week 13  April 5 Advanced topics in data analysis: k means, hierarchical clustering
         Apr 7 Advanced topics in data analysis: continued

Week 14  April 12 Advanced topics in data analysis: multidimensional scaling, principle
         component analysis
         April 14 Advanced topics in data analysis: continued

Week 15  April 19 Advanced topics in data analysis: Introduction to Bayesian statistics
         April 21 Advanced topics in data analysis: Introduction to Bayesian statistics, hands-on exercises

Week 16  April 26 REVIEW
         April 28 FINAL EXAM

Week 17  May 3 Student presentations or extra topic
         May 5 Student presentations or extra topic

* January 18 is Martin Luther King holiday; ** February 15 is President's day. There will be no class on these days. The lecture will be recorded and posted or rescheduled.

Last Day of Classes: April 30, 2021; Final Exams: May 3-7, 2021
End of Spring Semester: May 7, 2021