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: multidimentional 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