**Course Description:** Probability and Statistics for Life Scientists – SPRING 2019

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

Offering: Two semester hours. Spring annually. 32 lecture/exam days – Letter grade

Pre-requisite: Instructor’s approval.
Attendance < 15 students.
Possibility to audit the course: YES

Class meets on Monday and Wednesday 9-10 am - GSBS conference room BSRB S3.8355

**Spring Semester Academic Classes Begin on January 14th, 2019**

| Week 1  | Jan 14 Introduction; Probability (order, permutations, combinations)  
|         | Jan 16 Introduction to R; Probability, write R code |
| Week 2  | (Jan 21)* Hypothesis testing, binomial probabilities, review  
|         | Jan 23 Hypothesis testing, binomial probabilities, hands-on exercises |
| Week 3  | Jan 28 The chi-squared test for independence, non-parametric tests, review  
|         | Jan 30 The chi-squared test for independence, hands-on exercises |
| Week 4  | Feb 4 REVIEW  
|         | Feb 6 TEST 1 |
| Week 5  | Feb 11 Central tendency, the normal distribution, z-test, t-test, review  
|         | Feb 13 Central tendency, the normal distribution, z-test, t-test, hands-on exercises |
| Week 6  | (Feb 18)* Confidence interval and power of test, review  
|         | Feb 20 Confidence interval and power of test, hands-on exercises |
| Week 7  | Feb 25 Analysis of variance (simple/multiple factors/repeated measures), review  
|         | Feb 27 Analysis of variance (simple/multiple factors/repeated measures), hands-on exercises |
| Week 8  | Mar 4 Advanced topics in data analysis: Poisson analysis, review  
|         | Mar 6 Advanced topics in data analysis: Poisson analysis, hands-on exercises |
| Week 9  | Mar 11 REVIEW  
|         | Mar 13 TEST 2 |
| Week 10 | Mar 18-22  
|         | SPRING BREAK --------------------------------------------------------------------|
| Week 11 | Mar 25 Advanced topics in data analysis: Linear regression, review  
|         | Mar 27 Advanced topics in data analysis: Linear regression, hands-on exercises |
Week 12  Apr 1 Advanced topics in data analysis: Multiple regression, review
          Apr 3 Advanced topics in data analysis: Multiple regression, hands-on exercises

Week 13  Apr 8 Advanced topics in data analysis: Clustering
          Apr 10 Advanced topics in data analysis: Clustering, continued

Week 14  April 15 Advanced topics in data analysis: Clustering, continued
          April 17 Advanced topics in data analysis: Clustering, continued

Week 15  April 22 Advanced topics in data analysis: Introduction to Bayesian statistics
          April 24 Advanced topics in data analysis: Introduction to Bayesian statistics, hands-on exercises

Week 16  April 29 Student presentations or extra topic
          May 2 Student presentations or extra topic

Week 17  May 6 REVIEW
          May 8 FINAL EXAM

* January 21 is Martin Luther King holiday and February 18 is Presidents Day holiday. There will be no classes on these days. Classes will be re-scheduled on different dates after consultation with the students.

**Last Day of Classes: May 3, 2019; Final Exams: May 6-10, 2019**

**End of Spring Semester: May 10, 2019**