**COURSE TITLE: Advanced Statistical Analysis**

**COURSE NUMBER: Biol-865**

**TERM OFFERED: Winter 2019 (2191)**

**COURSE COORDINATOR: R. Colautti**

**OUTLINE OF TOPICS**:

This is a course designed to present in depth one or more advanced topics in the statistical analysis of biological data. The course topic(s) each year will depend upon faculty and student interests but may include comparative methods, phylogenetic análisis, general additive models, nonlinear regression, network analysis, time series analysis, resampling, ordination, factor analysis, and path analysis. Each session will consist of a short lecture by the faculty instructor, followed by a student presentation of homework, and a hands-on interactive session using the open source R software environment for statistical computing and graphics. Each student will bring a laptop to class.

**METHOD OF INSTRUCTION**:

Students taking this course will develop skills in using R for one or more techniques of advanced biological data analysis. Emphasis will be placed on practical methods and real biological problems. Students will learn how to use functions in R to analyze and plot data.

This course requires a basic understanding of both statistics and R, as taught in BIOL-860, depending upon the topic may require one or more of BIOL-861, 862, 863, or 864 as well

**Sessions (12 sessions)**

Lecture topics will depend upon the subject being taught and will be determined and advertised before the beginning of the course.

**Session Structure (90 minutes lecture plus workshop):**

Workshops would consist of student presentation of homework assignments and practical experience applying statistical techniques in R. A typical session will involve a short lecture by the faculty instructor, followed by a student presentation of the assigned homework, and a group-learning exercise to analyze data using the R statistical program.

**EVALUATION**:

Homework presentation: 25%

Participation: 15%

Homework assignments: 60% (5% each)

**RECOMMENDED TEXTS AND REFERENCE MATERIAL:**

Textx etc will depend upon the subject being taught

**PREQUISITE AND ASSUMED BACKGROUND**:

Biol-860 or equivalent and possibly one or more of Biol-861, Biol-862, Biol-863 or Biol-864 as determined by the instructor.

**OTHER INSTRUCTIONS FOR STUDENTS**:

**ENROLMENT**:

Limited to 12 students