Outline of Topics
This is a course designed to introduce graduate students to generalized linear models with examples from various fields of life sciences. Each session will begin with a short lecture by the co-ordinator, followed by a review of homework, and a hands-on interactive session focusing on 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 and RStudio for analyzing and graphing biological data in a generalized linear model framework. Emphasis will be placed on statistical applications and real biological problems. Students will learn how to fit models, how to assess model assumptions, and how to plot results to be maximally informative.

Sessions (1 per week for 6 weeks)
For a variety of reasons, we will meet in weeks 2-4 (15 Jan-2 Feb) and 8-10 (5-23 Mar) of the winter term, with a short session during week 1 (8-12 Jan, time TBA) to decide on the days and times for our weekly sessions.

Weekly topics:
1. Essential R tools
2. Models and families
3. Testing assumptions
4. Transformations, overdispersion and zero-inflation
6. Visualizing and presenting results: tables, graphs, R code, data

Session Structure (about 2 hours of lecture and workshop):
A typical session will involve a short lecture by the faculty instructor, followed by a review of the assigned homework, and a group-learning, hands-on workshop to analyze data using the R statistical program.

Evaluation
6 short in-class assignments @ 2 marks each: 12%
4 short(ish) homework assignments @ 10 marks each: 40%
2 longer assignments in weeks 3 and 6 @ 24% each: 48%

Recommended Texts and Reference Material
Wickham H, Grolemund G. 2017. R for Data Science. O'Reilly Media. Available to read online at http://r4ds.had.co.nz/

Prerequisite and Assumed Background
Biol-860 Introduction to Statistics with R and BIOL-861 Linear Models, or equivalent. Students must have a working knowledge of basic statistical analysis using R for importing data, performing basic statistical tests and plotting base graphics.

Enrolment
Limited to 12 MSc students taking the course for credit plus interested PhD students, postdocs and faculty.