**RU Zoology and Entomology – Statistics Module for Honours 2021**

**General Linear Model – Class Exercise**

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Requirements:

For the class exercise, you will be required to submit an .R script file with your code and a word/text document with your answers to me via email by Thursday 22nd July 2021 at 2pm. Remember that there will be a 2 hour video conference directly after your hand in where you can ask any questions you have about the course materials.

You will then be allowed to re-submit this class exercise by Monday 26th July 2021 by 1pm. Your first submission will be marked primarily in terms of your effort towards answering the questions, not on accuracy of your answers. The second submission will be marked on how you revised your answers/code and the accuracy of the final answers.

What is the exercise?

For this exercise, you are going to be analysing a dataset concerning the abundance of a tick on different grass species and across seasons.

* You have collected 30 stems from each of 3 different grass species, namely: grass\_sp1, grass\_sp2 and grass\_sp3 in both summer and winter.

Ultimately, you want to know whether:

(1) The number of ticks recorded differs between the different grass species?

(2) The number of ticks recorded differs between seasons?, and

(3) Whether season impacted tick abundance differently for the different grass species?

You will need to import the dataset that I have sent you (`tick\_abundance\_data.csv`) into R and answer the questions that follow.

Questions:

1. What is the response variable? (1 mark)
2. What are the predictor variables? (2 marks)
3. Do we need to specify an interaction term to answer our research question? Explain. (2 marks)
4. Which GLM provided the best fit (e.g. Gaussian, Poisson, Negative Binomial, Binomial, Multivariate)? Explain, and make use of at least three figures to support your argument. (5 marks)
5. Should you use type I, II or III sum-of-squares to test for parameter significance? Explain. (2 marks)
6. Write a short summary paragraph (6-12 lines) summarizing the results of your statistical analysis? (5 marks)