IBEHS 4QZ3 Modelling of Biological Systems – Assignment 3 2021

Individual assignment due Friday November 7th, 2021 11:59pm to the avenue dropbox.
Submit one PDF, with all code included in an appendix.

1. **(20 marks)** 2. Some real EEG data can be seen in subject1d.mat. The 1D EEG data consists of random movements of either left and right hand (and a baseline set) recorded with eyes closed. Each row represents one electrode, with order being: FP1 FP2 F3 F4 C3 C4 P3 P4 O1 O2 F7 F8 T3 T4 T5 T6 FZ CZ PZ. Analyze the 1D data set. Detail the procedure from start to finish, including doing principle component analysis (PCA) an Independent Component Analysis (ICA). Report the data processing procedures and any conclusions. The data represent 128.6s of recording (sampled at 500Hz).
2. **(15 Marks)** Consider the file **q2.mat** which contains a 80x6 variable called 'goat'. Each column of *goat* contains blood urea concentrations (mmol/l) taken every 3 hours, over 10 consecutive days. The 6 individual goats were maintained at a constant ambient temperature of 19°C with a photoperiod consisting of lights on daily from 8:00am to 8:00pm and food was presented daily at 8:00am. All data collection, for each goat, started the first day at 8:00am. From this data perform a single cosinor analysis of the changes in blood urea for each goat. Is a single cosinor appropriate? Perform a full statistical analysis of the grouped data (i.e. n=6 goats).