## Stat 666 HW #3b Due Date: TBA

- 1. The file mandible.dat contains mandible (jaw bone) measurements for two groups of subjects. Each subject was measured at 3 time points using each of 3 types of activator treatments. The columns of the file are: subject, group, activator1&time1 (a1t1), a1t2, a1t3, a2t1, a2t2, a2t3, a3t1, a3t2, and a3t3. SAS should be used to carry out the bulk of the analysis. For each of the following aspects of the analysis, describe and interpret your analysis. Attach your SAS command statements. [FYI: This problem is similar to problem 6.45 in ACR]
  - (a) Comment on the appropriateness (or lack thereof) of a split-plot (univariate) analysis.
  - (b) Carry out a repeated measures analysis to test the main effects for group, activator, and time. Also, test all 2-way interactions and the 3-way interaction.
  - (c) Is there a linear trend over the 3 measurement times? What about a quadratic trend? Do these trends have the same degrees of importance for the 2 groups (i.e., is there a linear-time by group interaction)?
  - (d) Explain how you would construct a test to evaluate whether or not the linear time trend is the same for the 3 activators. Specify the form of your contrast matrix, the distribution of your test statistic (including degrees of freedom), and give a critical value for your test (which is not readily available using PROC GLM but could be carried out in PROC IML, R, etc.). You do NOT need to carry out this test.