

Statistics 5303 — Exam 1
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NAME _____

ID# _____

This exam is open book, open notes; you may use a calculator. **Do your own work!** Use the back if more space is needed. There are seven questions, each worth 10 points. Please attach your data analysis notes for these data sets to your exam with the paper clips provided in the front of the room.

Questions 1 through 3 relate to the bacteria data. **Provide some justification for your answers!**

1. Describe how you checked assumptions and what you decided. Tell me about nonnormality, nonconstant variance, outliers, and so on. Were there any problems that required fixing?

2. Which antibiotics were effective in reducing bacteria counts? Was the reduction consistent across all media and sources?

3. Is there anything peculiar about the way that antibiotics reduce bacterial counts in these data?

Questions 4 through 6 relate to the rennet data. **Provide some justification for your answers!**

4. Describe how you checked assumptions and what you decided. Tell me about nonnormality, nonconstant variance, outliers, and so on. Were there any problems that required fixing?

5. Which combination of treatment factors should be used to maximize meltability?

6. How do you model the interaction in these data?

7. Manufacturing integrated circuits is an enormously complicated task, as there are many process variables that can be manipulated (thickness of this, width of that, doping level of something else, etc). Generally speaking, many copies of a circuit are put onto a single wafer, which is made all at once. We have an experiment where we are varying two factors, each at two levels. We have 20 wafers and assign each of the four factor/level combinations to five wafers at random and make the wafer. We then choose three circuits at random on each wafer and measure the performance of the circuit. Construct a skeleton ANOVA table (that is, I just want to see the sources and degrees of freedom).