**STAT 5340-001**

**Fall 2023**

**Workshop 3 – ANOVA**

In Workshop 1, it was discovered that gate width results were more variable on C Shift than some of the others (especially B & D Shifts). In Workshop 2, it was discovered that there appeared to be a measurement bias between SEM tools, but it was pointed out that the variance among wafers was still high after taking this difference into account. Additionally, it was noted that if the problem was purely a measurement issue, then the actual variation in speed results at the end of the line would not be expected to be as large as observed – there must be some real variation in the actual gate sizes.

Hence, the process engineers again perused the historical database and discovered that not only were more SEM tools used on C Shift, but C Shift (as well as A shift) also tended to run product through more etch chambers than were used on the night shifts (B & D, which recall in Workshop 1 showed less variation than the day shifts).

In order to evaluate some of the different chambers used on days versus those used on nights, 10 wafers produced in each of three different chambers (and all measured on the same SEM tool) were obtained. Your management is expecting a summary of these test results.

Your team needs to evaluate the data obtained as described above and report back to management on any potentially relevant findings.

Teams will be assigned at random. Note: the data for each team is not the same; however, all the data was generated from the same basic process, so conclusions would be expected to be similar.

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| Workshop 3 | Team 1 | Team 2 | Team 3 |
| Data Set | 1 | 2 | 3 |
| Members | Steven | Jaliyah | Jaslynn |
| Job | Sneha | Sidhu |
| Steven | Vivek | Victor |

Your task is to evaluate the data and prepare a 5 to 10 minute presentation of relevant findings.