"Although This Year's Incoming Freshman at UAH have an Impressive Average ACT Score of 27.9 there are Approximately 100 Freshman or Transfer Students who have less than 20 on their ACT Math Score"

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**Recommended Citation**
Johnson, Terri, "Although This Year's Incoming Freshman at UAH have an Impressive Average ACT Score of 27.9 there are Approximately 100 Freshman or Transfer Students who have less than 20 on their ACT Math Score" (2018). *RCEU Project Proposals*. 193. [https://louis.uah.edu/rceu-proposals/193](https://louis.uah.edu/rceu-proposals/193)

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RCEU Proposal for Summer 2018

**Faculty Mentor**

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Dr. Johnson previously directed an RCEU in Summer 2012.

**Project Summary**

Although this year’s incoming freshman at UAH have an impressive average ACT score of 27.9, there are approximately 100 freshman or transfer students who have less than 20 on their ACT Math score. These students are underprepared for the typical introductory mathematics classes offered at a research university. In the Spring 2014 semester, two pilot courses were offered with the designation “L-section” in the Math Department. These courses were designed to have “just in time” remediation using skills needed from remedial mathematics. The students attended traditional lecture two days per week, tutoring and remediation two days per week, and academic coaching one day per week. L-sections were taught collaboratively with the Student Success Center. The students used MyMathLab to enhance their learning experience. The goal was for the students to master the material in MA 112 or MA 107 in one semester with these additional resources to help them. The pilot classes had higher success rates than is usually attained by remedial students. We now have three full academic years’ worth of data for the L-sections, and we would like to measure 1) the success rates of students in L-sections compared to the success rates of students in prior years without the L-sections and 2) whether there is a statistically significant difference in the performance of students from the L-sections and those from “regular” sections in MA 113 or MA 120 (the next course in the mathematics sequence). In general terms, the student researcher will gather, examine, evaluate, and quantify success rates of students in L-sections vs regular sections. The student will draw conclusions based on statistical analysis as to the effectiveness of the L-sections.

**Student Prerequisites**

The student should be a math major who has completed the Calculus sequence. The student is expected to have a 3.0 GPA or higher in his/her mathematics courses. The student must be FERPA trained since they will be dealing with student records. The student must have a curiosity about data analysis and an ability to notice trends and correlation between variables.

Women and Minority students are encouraged to apply.
**Student Duties**

The student researcher will pull grades from six academic years for MA 112, MA 113, MA 107, MA 110 and MA 120. Student data will be collected and organized so that a student’s performance in L and non L sections can be correlated with their performance in successor courses. Decisions will be made about controls, if any, that need to be considered. The student researcher will use the Student’s t-test to determine relevant estimators and calculate margin of error. The student will then use the bivariate normal distribution to predict success in future courses based on success in L-sections based on the correlation coefficients. Excel spreadsheets and the statistical calculator StatCrunch will be used to organize and quantify data. The student will be alert for any unexpected correlations. The student will learn ways to manage large data sets and how to decide on the appropriate sample size for drawing conclusions. The final presentation should prove or invalidate the effectiveness of using L-sections to remediate freshman or transfer students whose ACT Math score is below 20. The benefits to the Department of Mathematical Sciences is that we will gain information about the best way to help underprepared students succeed in introductory mathematics classes. The benefits to the student researcher include hands on experience in statistical analysis, learning to use StatCrunch and statistical capabilities of Excel, managing and representing large data sets, and an improved ability to speak and write in mathematically precise terms. The student will work 32-40 hours per week for a 10-week period in the summer of 2018.

**Mentor Supervision and Interaction**

The student will meet with Dr. Johnson several hours during the first week for initial instructions and explanation of the goals of the project. After that, the student will meet with Dr. Johnson twice per week to assess progress and to decide which tasks must be completed by the next meeting. Information, questions and evaluation will flow between Dr. Johnson and the student via email, texts, and face to face meetings on an ongoing basis. In addition, the student will be trained by Ms. Lang, Senior Staff Assistant in the Math Department to learn how to access the student data.