Introduction:

We were interested in seeing how many students a full, assistant, and associate Rose-Hulman professor teaches per class, on average, during a given quarter, and whether the average of one or more of the groups differs significantly from the others. This is important for determining if an individual of a certain group does more work than an individual of another group, on average.

In general, a full professor has been employed as a professor at Rose-Hulman for at least 12 years before applying for full professor status. An associate professor, by comparison, only needs to have been a professor for at least 6 years before applying for associate professor status. An assistant professor is anyone who hasn't met the previous requirements.

We expected the results to show that full professors teach a smaller number of students per class, on average, as opposed to associate and assistant professors.

Method:

We conducted an observational study to see how many students, on average, the three types of professors teach per class during the Fall 2015-2016 quarter. A list of all of the professors teaching, by department, during the Fall 2015-2016 quarter was created. From the list, all of the professors were placed in a random order using a randomizer, and the first 53 professors listed were selected to be studied. Using the Schedule Lookup page on Banner Web, the number of classes taught per professor as well as the enrollment per class was recorded, and the average number of students taught per class for each professor was calculated using these numbers.

Not every course taught by the professors of interest during the Fall 2015-2016 quarter was used. Thesis classes and any course that did not have a designated period were not included in this experiment because their input would heavily skew the data without giving any greater insight to the trends indicated by the data. For any class taught by more than one professor concurrently, the number of students enrolled in the class was divided by the number of professors to give a more accurate representation of how many students the professor teaches, on average.

Null hypothesis: The mean number of students taught per class per professor for each type of professor is equal to the mean of the other types of professors.

Alternative hypothesis: The mean number of students taught per class per professor for at least one type of professor is not equal to the mean of the other types of professors.

We used a one-way ANOVA without assuming equal variance to conduct our study. Constant variance could not be assumed since the residual ranges were not consistent across professor types. There is a much smaller range of data for the assistant professors as opposed to the full and associate professors. Normality was assumed to be reasonable for this data because a probability plot showed that the residuals generally followed the Normal line. Based on our sampling method, we know that our sample is random; each data point was independent of one another, since each professor's schedule for the Fall 2015-2016 quarter was defined before this analysis was conducted.
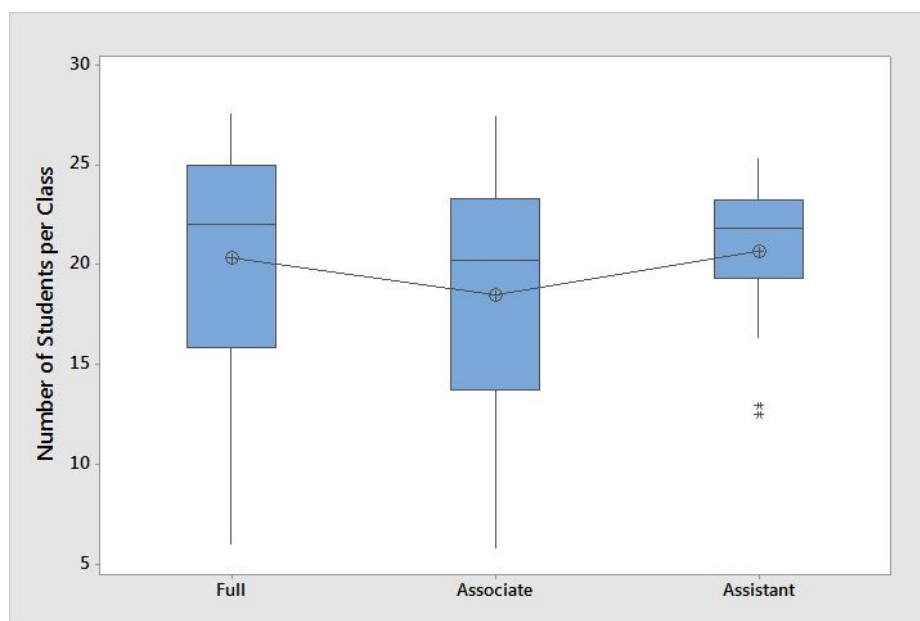

Figure 1: Side-by-side boxplot comparing the number of students per class for full, associate, and assistant professors.

Conclusion:

According to Figure 1 shown above, the average number of students per class for each type of professor appears to be approximately the same. The data does not provide significant evidence (p-value = 0.512) at the 0.05 significance level that any of the types of professors vary from one another in terms of average number of students per class. Our data indicates no difference between assistant, associate, and full professors in the average number of students taught per class.