Visualizing LSSU courses

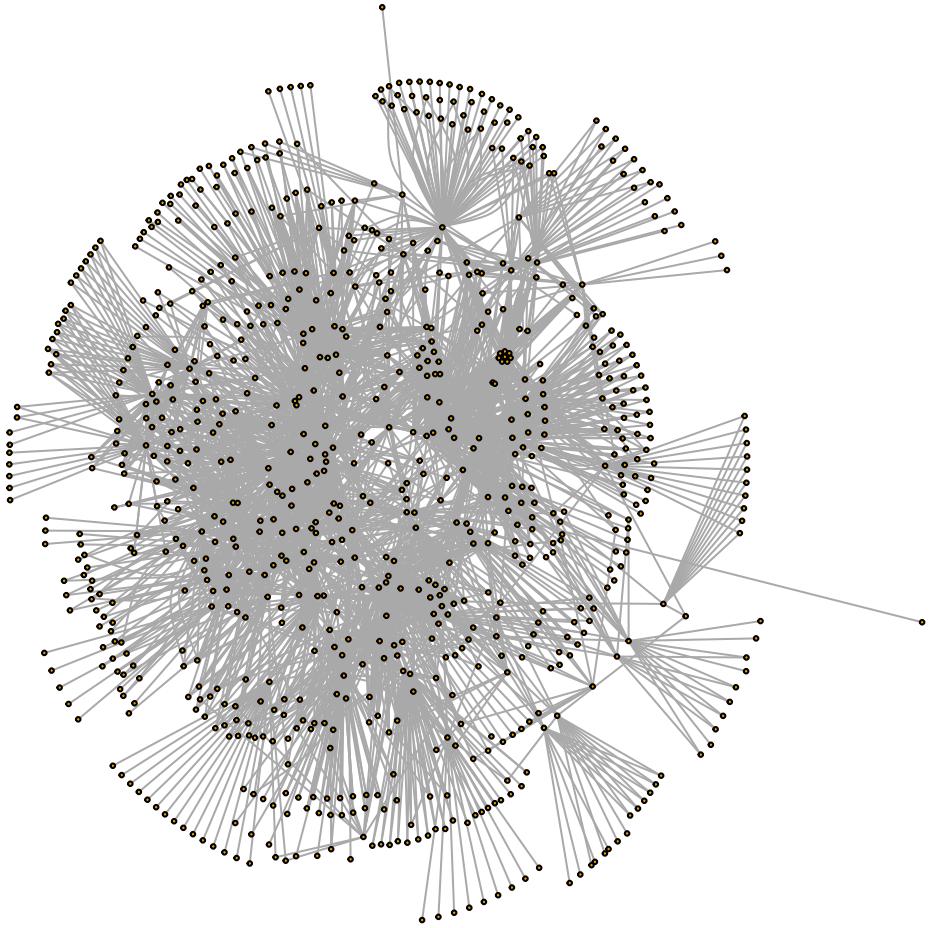
July 26, 2016

Introduction

In this document I look at the course requirements of Lake Superior State University's different degree programs. The purpose of this analysis is to provide insight to degree requirements and cross curriculum collaboration. The initial research for this analysis was provided by Collette Coullard and her class.

Naive visualization

The provided Excel spreadsheet has a page called "Pivot by Course". Detailed in this sheet are all of the degrees offered by LSSU and their required courses. Obviously some courses may be required by more than one degree program. However, Dr. Coullard mentioned that many courses were required only by a single degree (or department).

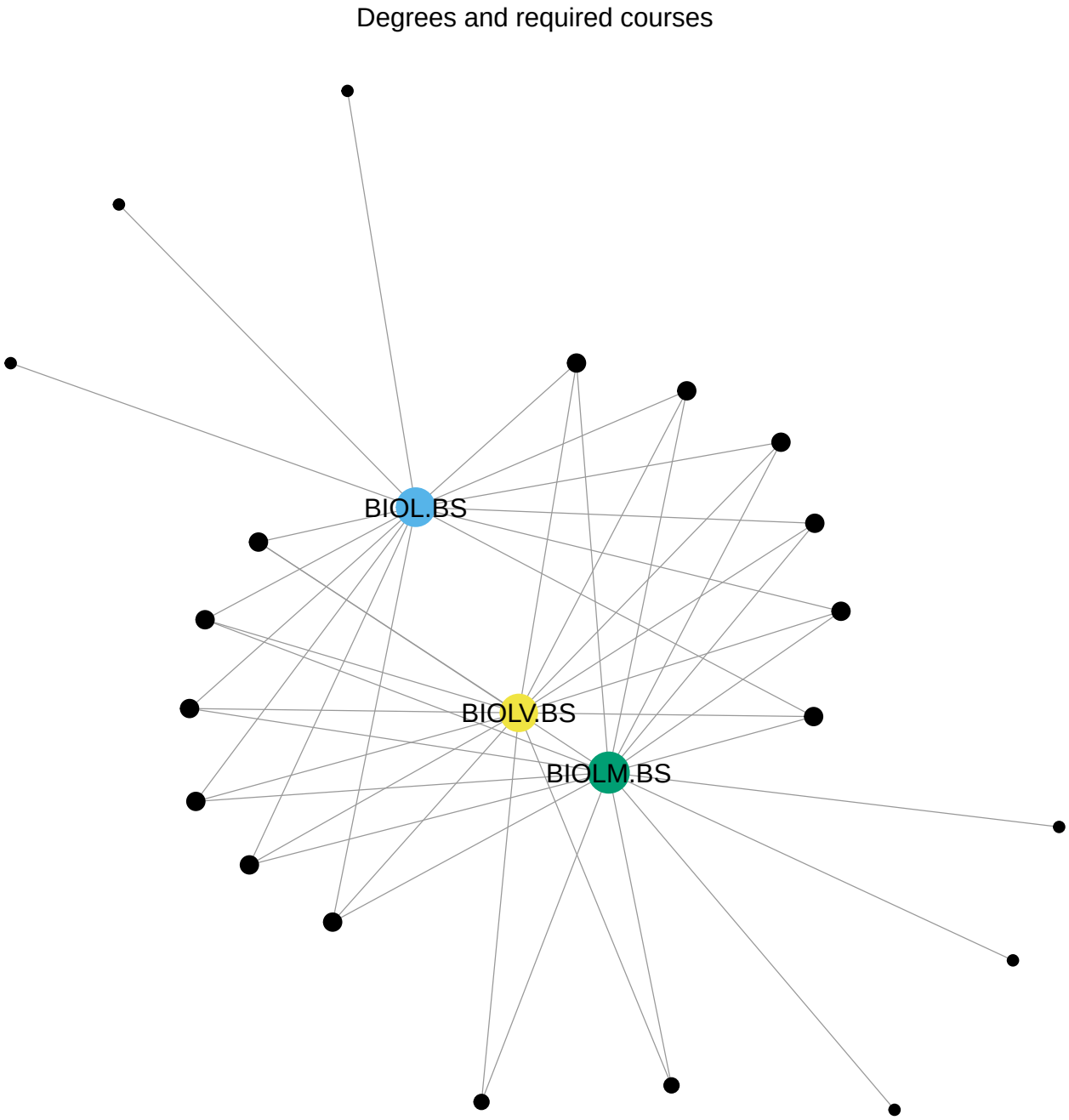


Although this is a very unsophisticated visualization, some things do stand out. First, there are many "spoke and hub" configurations. The hubs likely represent degree programs and the spokes likely tie the programs to the required (or elective) courses. However, there is way too much overplotting to make any real sense out of this visualization.

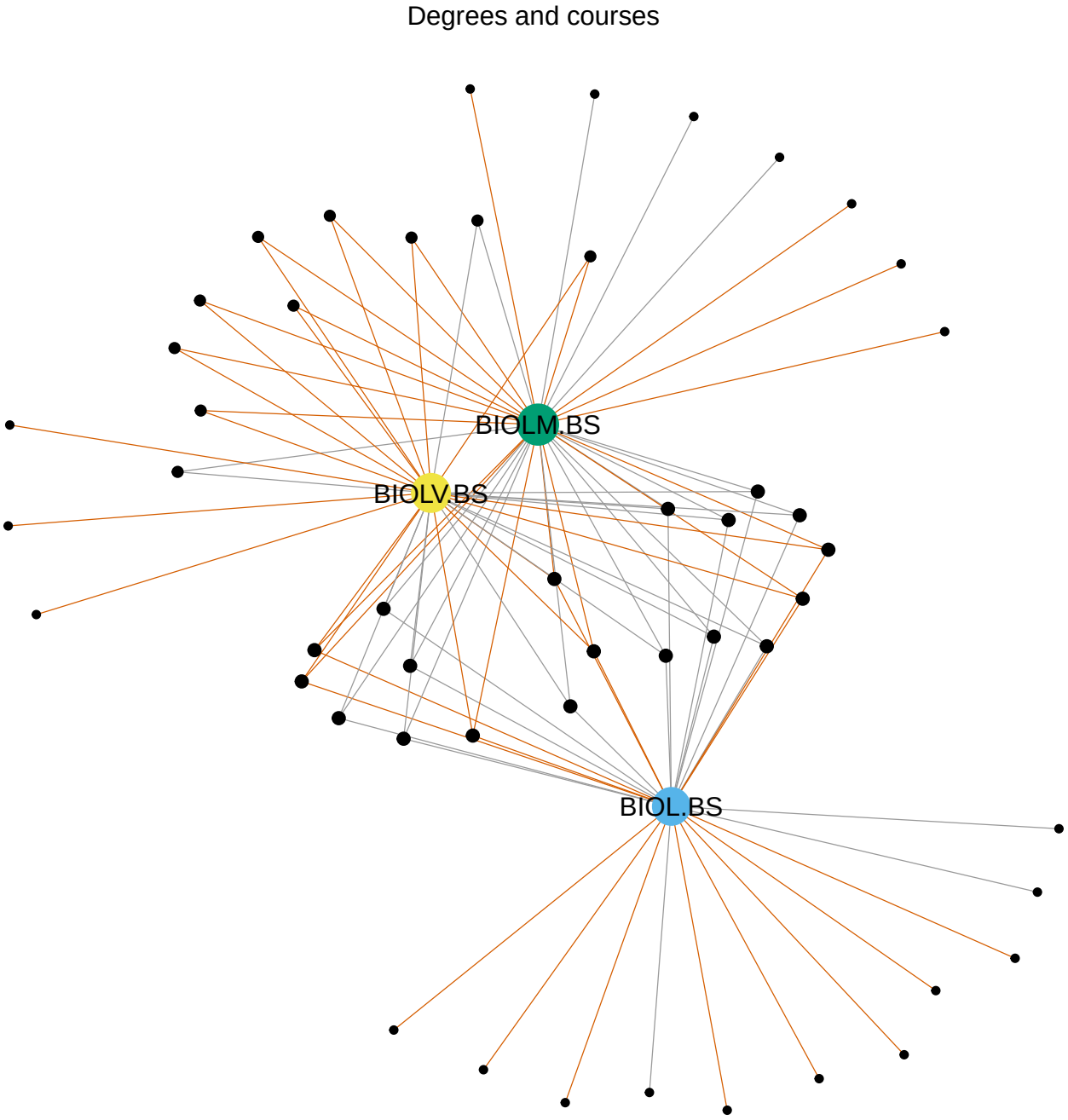
A more sophisticated visualization

An option to improve this visualization may be to look at only a subset of the degree programs. This could free up the clutter substantially. It would then make sense to add degree/course coloring as well as informative labels.

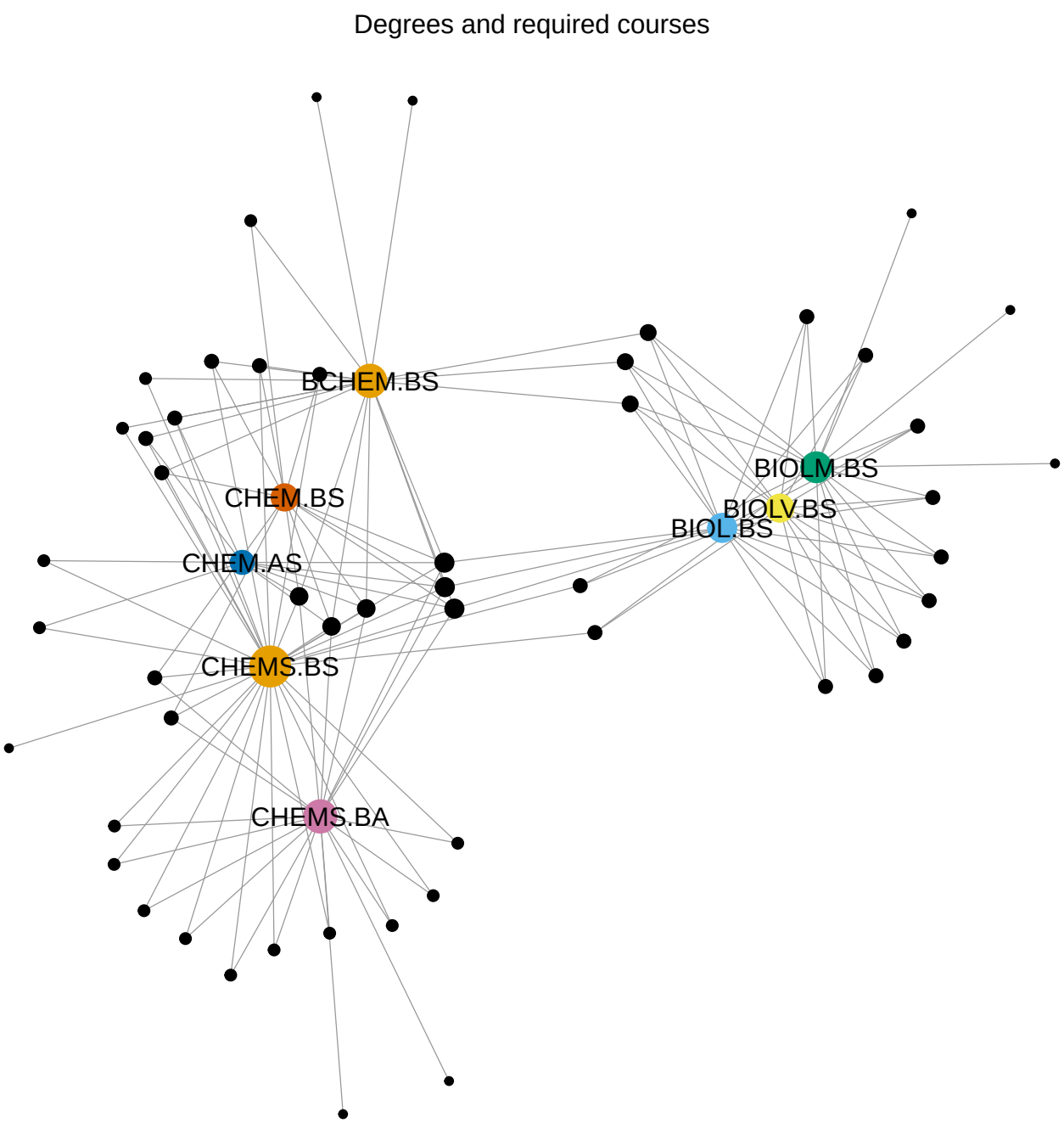
In the example below I show the degrees that contain the string "BIO" and their required courses, we expect that these programs should share a large number of courses. Note that courses are black, and node sizes are tied to the number of edges going in and out.



Now we can look at this with elective courses.

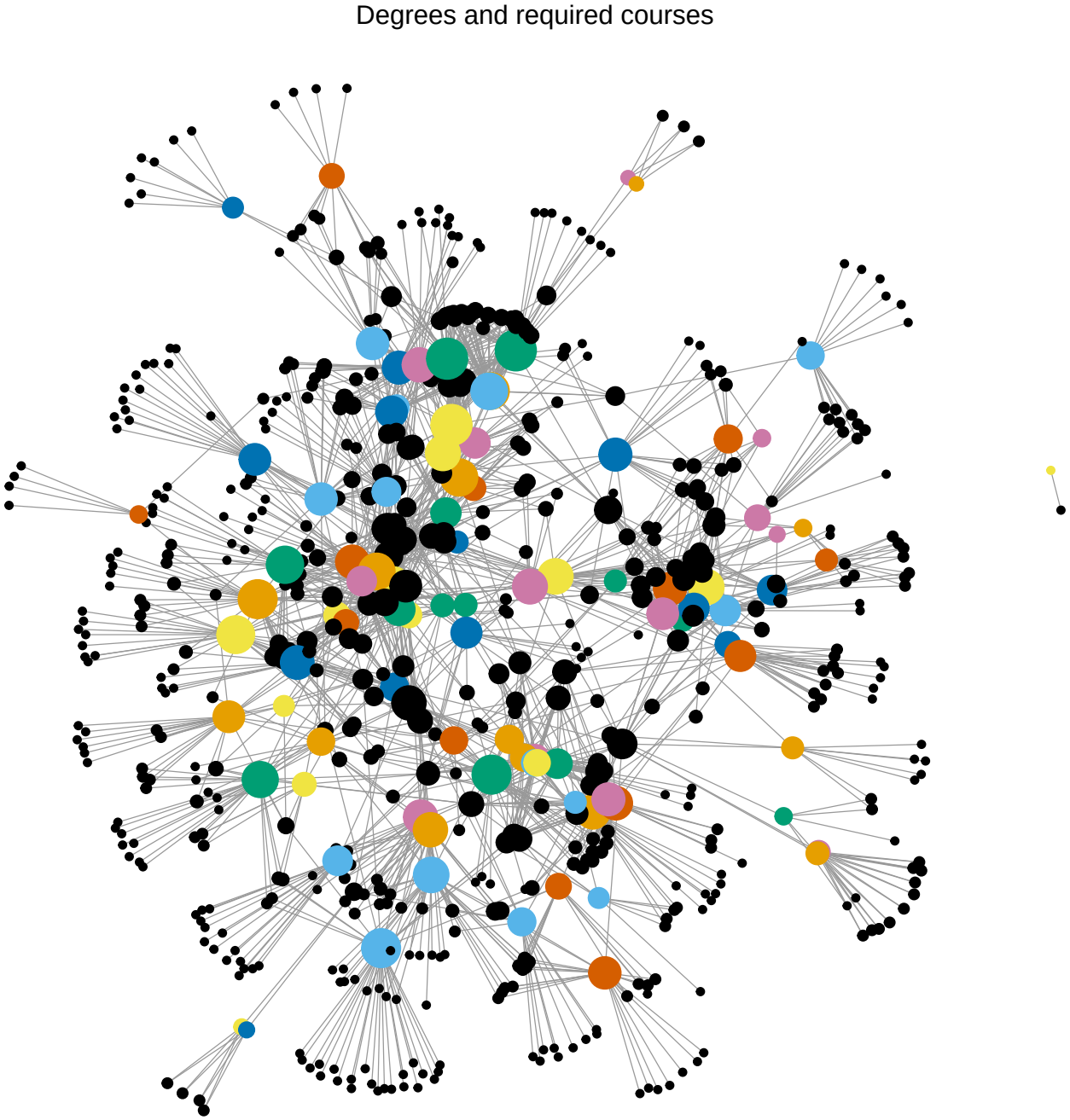


Finally, what if we look at seemingly very different degree programs. Here I will show degree programs that contain the string "BIO" and "CHEM", but I will only be showing the required courses



I can pretty easily visualize any combination.

What the heck, lets look at all of the degrees and courses!

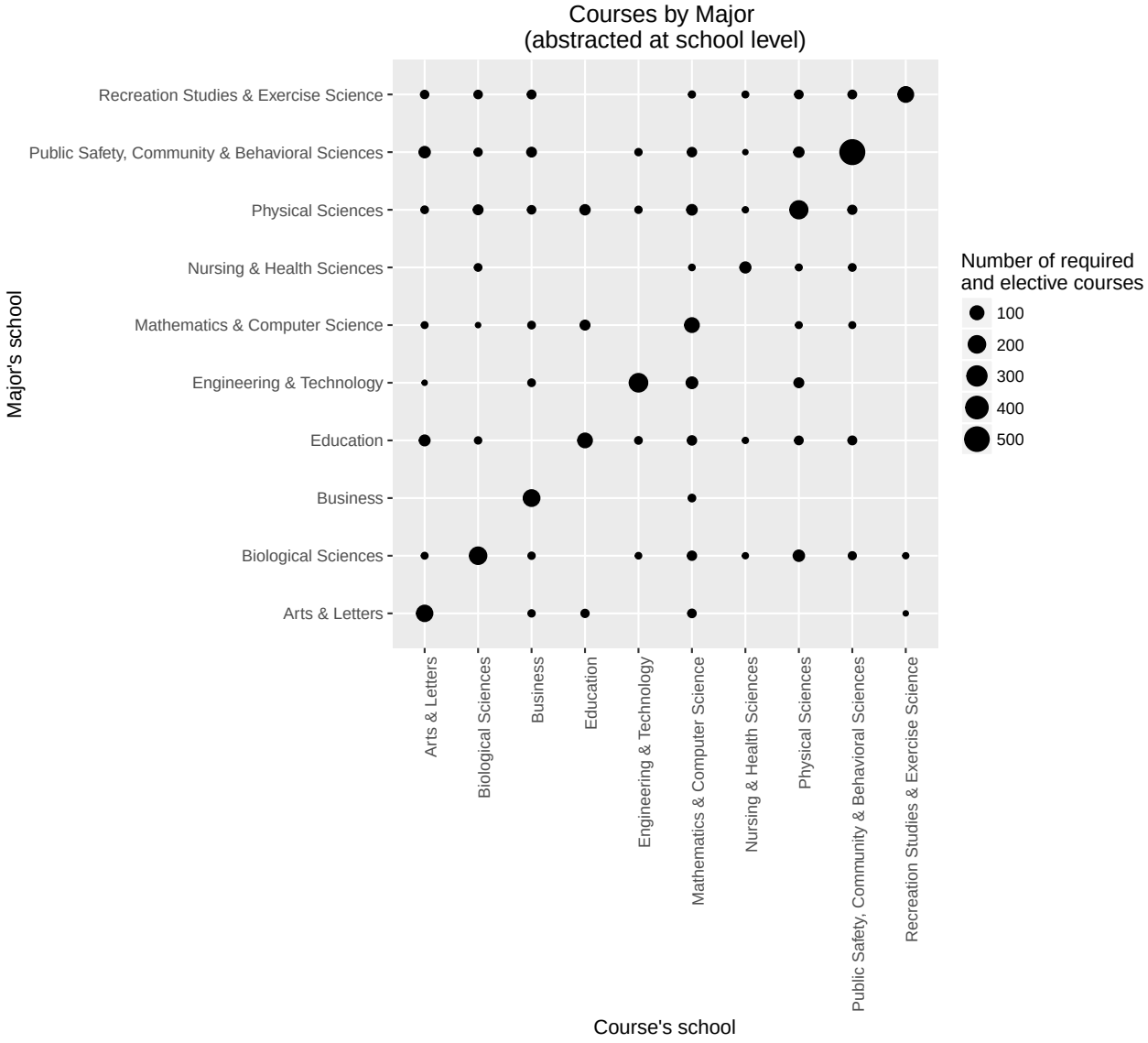


Obviously I did not label the degrees in this version. Some degree programs have very few required courses, it may be that these are related to associate degrees, or very open programs. Additonally, on the far right it is easy to spot a potential data entry error.

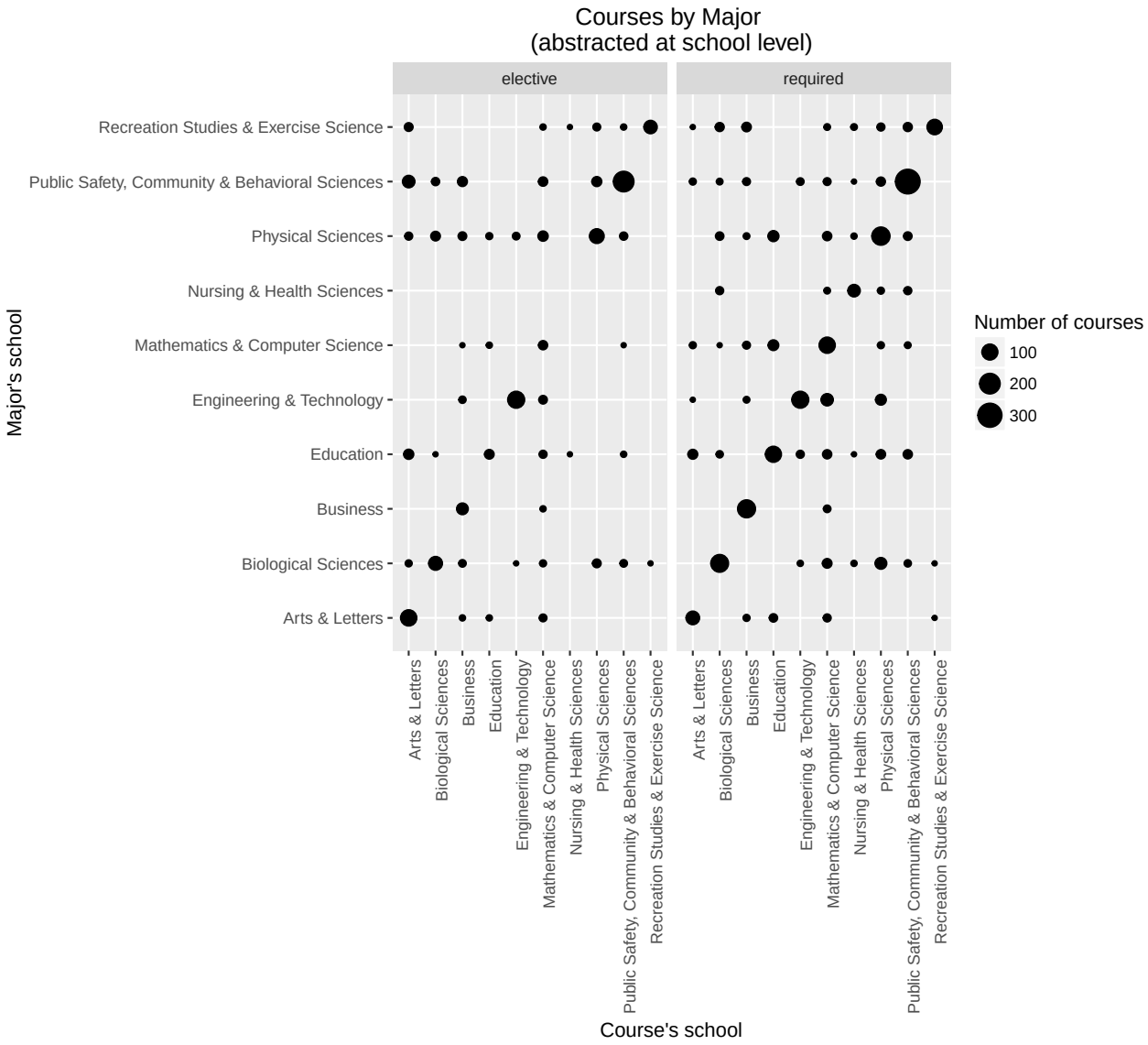
Another visualization

Instead of showing all of the courses/degrees, I tied the degrees and courses to schools within LSSU. Ideally I would have tied these to departments within schools, but I was unable to find that level of information. For example, I would have liked to group degrees and courses that belong strictly to the Chemistry Department, but I was only able to group them to the School of Physical Sciences. This grouping was performed borrowing

information from the Excel sheet called “Pivot Enroll”, searching the LSSU website, and the LSSU course catalog.



This visualization does reveal some greater trends. For example, very few schools have majors that utilize courses from Recreation Studies & Exercise Science, however, all schools utilize courses from Mathematics and Computer Science. This visualization may reveal greater insight if courses are split by required and elective courses.



Additional trends did appear after making this distinction. For example, the Nursing and Health Sciences majors have no electives! This is either quite a regimented set of programs or a sign of data entry errors.

Take away

These data visualizations are very rudimentary, but suggest that data visualization may be a good tool to help tell your story.