**Title**:

Build an interactive course recommendation website for student success.

Build and deliver an interactive course recommendation tool to support academic advising.

**Session Abstract:**

While there are many studies on sequential course trajectory, few researchers focus on courses to be taken together in one semester. Students may have very different academic performance due to taking different courses in a semester. The purpose of this study is to investigate when given one or more courses a student already decides to take and this student’s characteristics, what other courses this student should take in the same semester to achieve better academic performance. Market basket analysis and enumeration analysis were conducted and then compared. Two versions of business intelligence tools based on the analysis, one programmed website and one Power BI dashboard, will be demonstrated. The tools can help both faculty and advisors with or without data knowledge fully utilize findings from this study to improve student success through better curriculum planning.

**Proposal Narrative:**

In previous AIR Forums and other institutional research conferences, we have seen a lot of presentations in sequential course analysis. And they answered the question that if a student takes certain courses in a semester, what courses will or should be taken in the next semester. However, even for students in the same program on the same academic level, they usually don’t take the same courses in one semester, and different course combinations in a semester often lead to different academic performance, such as different semester GPAs.

In this study, we will answer the questions that given one or more courses a student already decides to take, what other courses are usually taken together in the same semester, and what academic outcomes different course combinations may lead to. We will furtherly investigate how the pattern varies by student’s characteristics. Findings from our research can improve students’ academic outcomes through better curriculum planning.

As statistical methodologies in education search are increasingly sophisticated, it’s important for IR professionals to come up with more innovative and efficient ways to communicate their findings with a broad range of clients. In this study, we provide two options that transform complicated statistical models into user-friendly tools. The tools developed by us provide a straightforward interface that automatically display recommended course(s) according to users’ selections of course(s) and student features.

In our presentation, we will briefly introduce the background and the purpose of this study at the beginning, and then there will be three main components.

In the first part, we will present two statistical models that find courses frequently taken together. One of them is market basket analysis, also known as associate rule mining, based on Apriori algorithm. And the other is enumeration algorithm. We will present a few results from the two models and explain why we chose the enumeration algorithm as our final model for further steps in this study. We will also show how we measured the performance of students taking different courses by semester GPA and course DFW rates, as well as how their performance varies by demographic and academic factors such as race, gender, career level and first-time status.

In the second part, we will demonstrate two interactive tools that integrate and visualize our analysis in the previous step. One of them was a website developed through Python programming, and the other was built as a dashboard with Power BI. We will talk about their advantages and disadvantages in terms of development, deployment and management. We will also explain how end users can utilize our tools to recommend courses to students for better performance. Audience will have the opportunity to try at least one of our tools on their cell phones or laptops.

In the last part, we will talk about how our study and tools can help students, academic advisors, faculty, college administrators and student success staff to improve students’ academic performance through better curriculum planning.

The presentation will take approximately 30-35 minutes, and we plan to leave ample time for the audience to ask questions. PowerPoints slides that contain graphs, tables, and bullet points will be used to better deliver our presentation. Power BI Desktop and a browser will also be used to walk the audience through our tools.

The central theme is helping various stakeholders plan better curriculum pathways to improve student success through statistical modeling and business intelligence tool development, which is a topic rarely discussed in previous studies.

**Keywords:**

Curriculum planning, course recommendation, business intelligence tool, student success

**Learning Outcomes:**

Participants in this session will see similar students can have very different academic performance due to taking different courses in a semester

Participants in this session will learn how business intelligence technology transforms complicated statistical models into a user-friendly tool

Participants in this session will learn basic concept of market basket analysis and enumeration algorithm