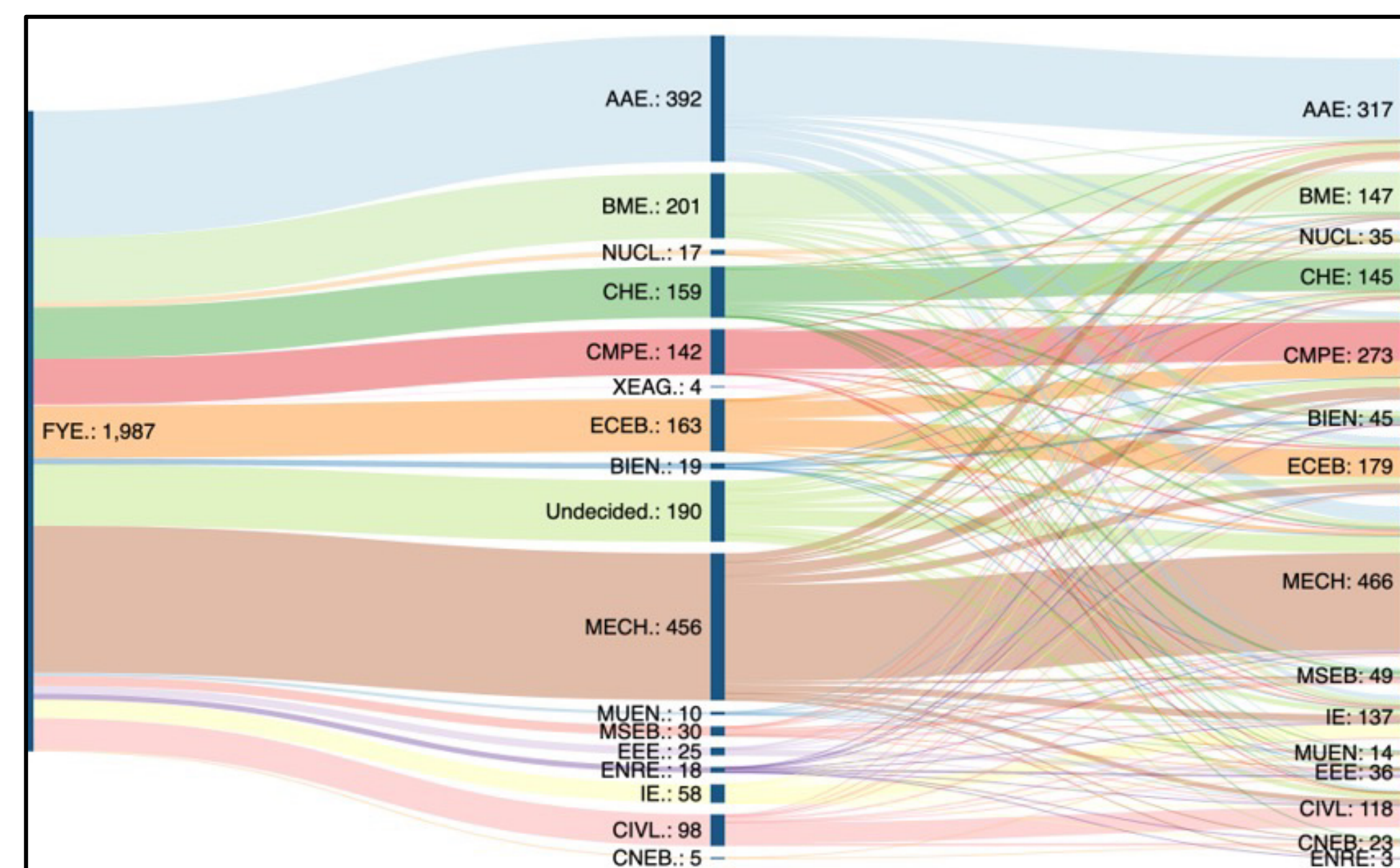


Engineering Majors and Industry Sector Intersections

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OVERVIEW

Many students believe that there is only one engineering major that will take them to the engineering career that they want. However, we know that this is not true and that there is more than one pathway to different industries and careers in engineering. The First-Year Engineering (FYE) program is the entry point for engineering students at Purdue University, and students are encouraged to explore the different engineering majors at Purdue University before choosing their first and second choice of engineering major. The purpose of this project is to put together the information about which engineering majors could take students to specific industries or careers and create a way to communicate this information to students.



Major Movement - Transition to Major (T2M)

One of the major reasons that students choose Purdue over other universities is the opportunity to have a whole year to explore different engineering majors and make a decision about their engineering major. Over the past few academic years, on average, 44% of First-Year Engineering students have changed their choice of engineering major from the moment that they applied to Purdue to the actual major that they moved to after the T2M process.

The figure above shows the way FYE students from the Fall 2021 cohort changed their major choices during their time in the FYE program at Purdue. This cohort has been the largest cohort of students to begin in the College of Engineering at Purdue. With the size and amount of movement, every effort was put into helping the students navigate their options and understand what they can do with a degree in specific majors. This was especially true for students who were seeking some of the more highly competitive majors at Purdue.

The Engineering Majors and Industries Table

One of the key challenges is to create a way to effectively demonstrate and communicate how overlaps between engineering majors and industries exist. What started as an Excel spreadsheet evolved into a printed poster (below), as well as an interactive website (image to the right) - which not only displays the overlaps between majors and industries, but it describes what those intersections look like from a career perspective.

The posters were distributed to First-Year Engineering advisors, advisors throughout the College of Engineering, as well as other advising units across the campus. The interactive table has been highlighted in a campus-wide advising discussion for major changes. Some next steps for this project will focus on the interactive capabilities of the table and visibility and ease of access of the table.

Table of overlap of engineering majors by industry sectors
Purdue engineers from ALL engineering majors work in the industry sectors listed in this table. The table is meant to highlight the main overlaps.

Most common industry sectors for Purdue engineers	Purdue College of Engineering Majors															
	AAE	AG	BIO	BME	ChE	CE	CpE	CEM	EE	EEE	ENRE	IE	MSE	ME	MDE	NE
Airline, Aviation, Aerospace	X							X		X			X	X	X	
Automotive	X	X							X				X	X	X	
Chemicals					X											
Community Organizations, Non-Profits						X					X					
Computer Software, Hardware				X			X		X							
Construction, Facilities Services						X		X					X			
Consumer Goods, Services	X	X		X					X					X	X	
Energy, Oil, Gas			X		X	X		X	X				X	X		X

Note: A red arrow points to the 'Consumer Goods, Services' row, highlighting the intersection with Mechanical Engineering (ME).

TABLE OF OVERLAP ENGINEERING MAJORS BY INDUSTRY SECTORS

Purdue engineers from all engineering majors work in the industry sectors listed in this table. The table highlights the main overlaps.

MOST COMMON INDUSTRY SECTORS FOR PURDUE ENGINEERS	Purdue College of Engineering Majors															
	AAE	AG	BIO	BME	ChE	CE	CpE	CEM	EE	EEE	ENRE	IE	MSE	ME	MDE	NE
Airline, Aviation, Aerospace	X							X		X			X	X	X	
Automotive	X	X							X				X	X	X	
Chemicals					X											
Community Organizations, Non-Profits						X					X					
Computer Software, Hardware				X			X		X							
Construction, Facilities Services						X		X					X			
Consumer Goods, Services	X	X		X					X					X	X	
Energy, Oil, Gas			X		X	X		X	X				X	X		X
Engineering Services, Consulting	X	X		X		X		X	X	X	X				X	X
Entertainment																X
Finance, Insurance, Consulting							X						X			
Food, Beverage		X	X		X									X		
Government, Military Services	X				X	X					X	X				X
Healthcare, Pharmaceuticals, Medical Devices				X	X	X							X	X		X
Higher Education, Educational Services	X					X				X						
Internet							X									
IT, Telecom				X				X								
Manufacturing, Machinery		X				X				X			X	X	X	X
Real Estate Development						X		X								
Renewables, Environment		X	X		X	X		X		X	X		X			X
Research				X	X	X					X		X			X
Transportation, Logistics, Supply Chain	X					X		X				X				

Identifying Industry Intersections

ENGINEERING ENTRY-LEVEL POSITIONS IN MULTIPLE BOEING LOCATIONS

Job Description

At Boeing, we innovate and collaborate to make the world a better place. From the seabed to outer space, you can contribute to work that matters with a company where diversity, equity and inclusion are shared values. We're committed to fostering an environment for every teammate that's welcoming, respectful and inclusive, with great opportunity for professional growth. Find your future with us.

Basic Qualifications (Required Skill/Experience):

- Currently majoring in one of the following core engineering/applied sciences disciplines (Aeronautical/Aerospace Engineering, Chemical/Material Science, Computer Engineering/Science, Civil/Structural Engineering, Electrical Engineering, Engineering Technology, Industrial Engineering, Material Science, Manufacturing Engineering, Math, Mechanical Engineering, Physics, Software Engineering, Systems Engineering, Industrial Engineering Technical, Industrial Management, Operations Research, Engineering Mechanics, or other Engineering discipline)
- Currently enrolled student attending a college or university with an expected graduation date prior to August 2022

COMPANIES IN THE AIRLINE, AVIATION, AND AEROSPACE INDUSTRY

From Purdue Admission Website Data:

ATA Engineering, Ball Aerospace, Belcan, Blue Origin, **BOEING**, Butler America, Dassault, Falcon Jet, General Electric (Aircraft Engines, Aviation and Transportation), Gulfstream, Lockheed Martin, Northrop Grumman, Orbital ATK, Rolls Royce, SpaceX

Data Analysis and Synthesis

To have a better understanding of the overlaps between majors and industry, an analysis was done of the Purdue Career Center survey data for top industries for Purdue hires, major-specific post-graduation survey data, Purdue Admissions career path data, and engineering school-created videos for self-identified top industries/companies/jobs. During this process, specific groupings and clusters of intersections of majors and careers were noticed and identified. This was confirmed for accuracy by asking the individual engineering schools at Purdue what those overlaps represent and soliciting feedback on the initial findings. Additional confirmation was achieved by looking at job postings for entry-level engineering jobs at prominent companies in specific industries to see if the overlaps are present.