

Strategic Analytics: A primer (previously “a sampling of analytics resources for the SEP”)

March 30, 2023

Context and today's game plan

- The provost and I worked together to develop a curated list of analytics exhibits that could, in principle, inform the Strategic Enrollment Plan
- We were biased towards exhibits that were
 - Visually compact & hopefully appealing
 - Relatively high frequency
 - Relatively high level (generally geared more for leadership and strategy)
 - But it's important to note that we have a lot of analytics focuses on operational areas, too
- Everything here pulls from REX
- Not everything here is actively maintained
- This presentation is
 - Organized roughly around the recruitment cycle, then the retention cycle
- It is not
 - Comprehensive

Some additional context for non-SEP members

Snippets from UMBC's strategic plan, and self study (that are likely to be persistent)

- Employ information systems and analytics...to support student success throughout students' careers at UMBC
- Improve undergraduate and graduate student progression through academic programs [and] reduce time to degree

Snippets from the Self Study (the next one starts sooner than you think!)

- We need to improve our ability to assess the results of strategic planning decisions [and] build our analytics capabilities
- We must improve our ability to monitor plans and results through the development of dashboards that are widely agree upon, accessible, and well understood

My big goals for today are

- To give you a sense of some the key issues leadership considers regarding enrollment (and its counterparts in success and progression).
- To get thoughts and ideas on useful things we might do to support colleges and departments

Snippets of the Strategic Enrollment Plan

Probably common to most, probably largely persistent

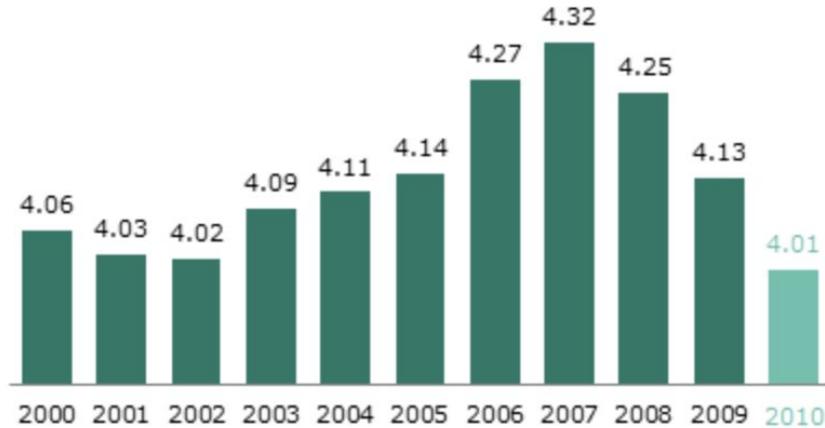
- Recruitment, Admissions, and Marketing Infrastructure
 - use of data and technology to enhance recruitment, selection, and yield outcomes; build digital marketing expertise and strategy...*we want students and families to be fully informed so that they can make good choices*
- Student Success Infrastructure
 - [Use] analytics to enhance student success and retention...*we want students who make the choice to attend UMBC to reach their goals and help them overcome any obstacles they may face*
- Academic Flexibility
 - Increase flexibility & reduce barriers to support students' efforts to graduate on a timeline that aligns with their expectations...*we don't want unexpected delays to become the enemy of long term plans*
- Bottom line: the big pieces of university strategy are in alignment

My 2 cents

- A big issue (mentioned in the self study, by the way) that people grapple with is using the university's capacity efficiently. That means trying to manage and support changes in student's demand for programs and majors
 - This is a key place where faculty and staff can, and do, help, especially by helping to manage surging demand in some areas and helping to recruit students in areas where demand is currently lower than the past
- Two more big challenges
 - The looming age-demographic cliff (they aren't making as many 18 year olds as they used to, and the housing crisis and pandemic aren't helping)
 - There is a potential 10-15% drop in "traditional" incoming college students projected to occur starting in 2025. It is being called the Enrollment Cliff or the Demographic Cliff
 - Learning losses (especially in math) during the pandemic
 - "States' annual testing data for spring 2021 showed that unfinished learning in the wake of COVID-19 is most pronounced—and most troubling—in math" [NASBE](#)

A picture of the enrollment cliff

Since 2007, Total U.S. Births Have Declined Sharply
in millions



Note: Birth data for 2009 are preliminary, and birth data for 2010 are provisional.

Source: National Center for Health Statistics

PEW RESEARCH CENTER

analytics.umbc.edu

- Our intention is for it to be a curated portal

Division of Information Technology

Analytics

Home Curated Reports and Dashboards ▾ Data Governance ▾ Support ▾ Outreach & Training ▾ Analytics Community ▾

Contact
Contact Us
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REQUEST HELP WITH DATA, REPORTS, OR ANALYTICS

JOIN THE "ANALYTICS AT UMBC" GROUP

Analytics News

Analytics & Student Success Technologies Annual Report FY22
December 5, 2022 10:56 AM

2022-23 Learning Analytics Mini Grant Recipients Announced
October 21, 2022 3:40 PM

FA22 Data Science & Learning Analytics Workshops
September 23, 2022 10:08 AM

Tom Penniston Promoted to Coordinator of Learning Analytics
May 16, 2022 10:23 AM

How likely is it that a student will graduate in six years?
March 16, 2022 9:20 AM

Analytics Events

How Analytics Informs UMBC's Strategic Planning
Friday, April 7, 2023 at 12:00 PM

How Analytics Improved a Dept's Student Success & Enrollment
Friday, May 5, 2023 at 12:00 PM


Admissions & Enrollment Reports and Dashboards


Strategic Enrollment Plan Dashboards


Graduate School/DPS Strategic Enrollment Metrics


Student Success Reports and Dashboards


Official Institution Reports (Public)


Data Science Portal


REX Guided Reports


Helio Campus Portal


Course Engagement, Instruction & Teaching Reports


Learning Analytics Community of Practice


Research Financial Dashboards (hosted by OVPR)


COVID-19 & Other Operational Reports and Dashboards

The resources on this page may require permission and the UMBC VPN to access them. [Request access here](#). See the [FAQ on getting connected](#) for more information.

Who do we compete with?

Fall 2020 NoShow Analysis

Overview

The Purpose of this application is to visualize where non-matriculated, admitted, UMBC students decide to start their college careers. All student from this analysis decided not to attend UMBC during the fall 2020 admissions cycle. Users can filter the data by some student demographics provided by the UMBC Undergraduate Applications data. If there is no graph being shown, this indicates that there are no Admit Noshow encounters based on the filters that were applied to the data. URM is short for Underrepresented Minorities. The far right node end points of each sankey diagram represents the top 5 schools schools from the previous node. The size of each node/bar represents the number of students who fall into that node/bar.

Filters

URM Status

URM Non-URM Unknown

Gender

Male Female Unknown

Early Action

Yes No

High School Control

Public Private, Religious Other
Private, Non Religious

In-State

Yes No

First Generation Status

Yes Unknown No

Academic College

All

All Majors

All

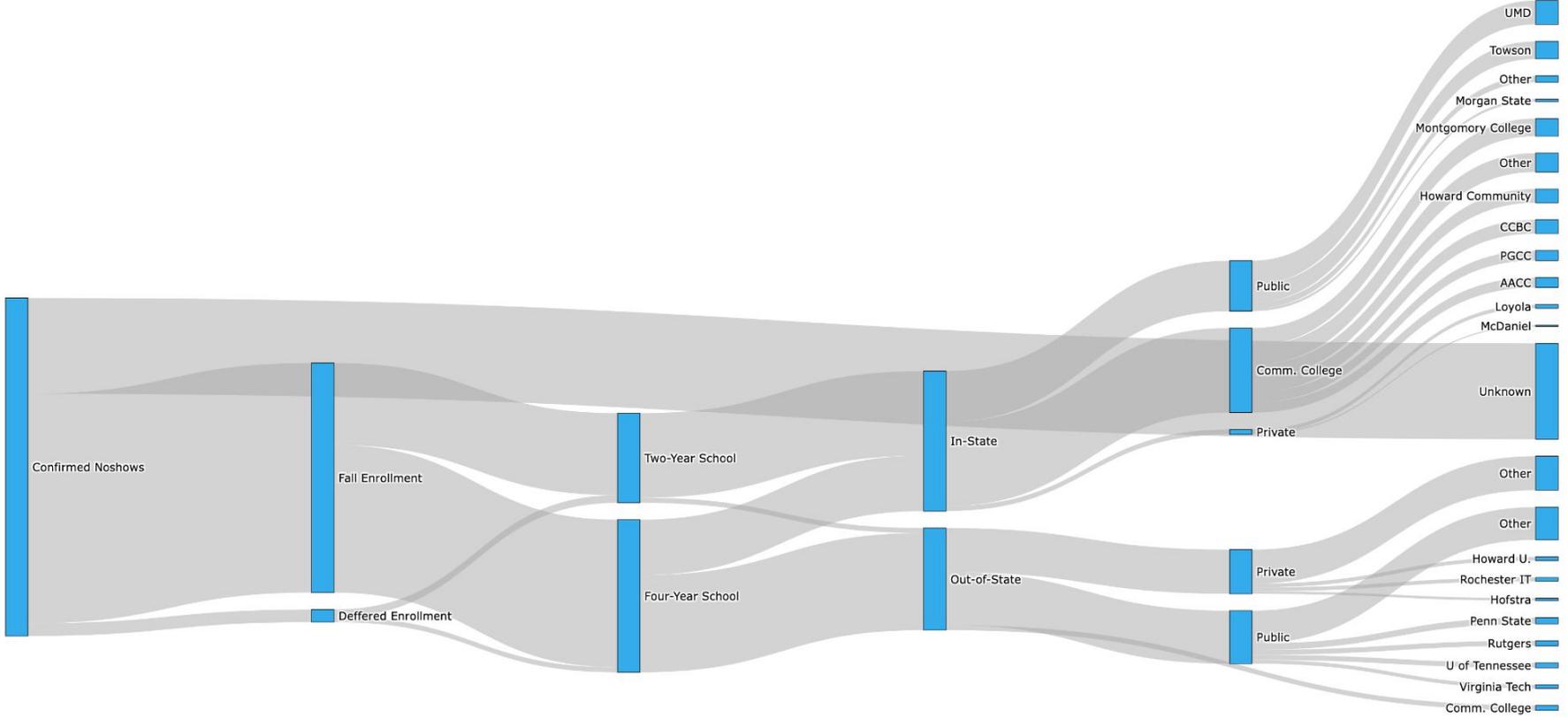
High School GPA



SAT Score



Fall 2020 Noshow Admit Analysis



A high frequency overview
of the admissions cycle

Fall 2023 Enrollment Dashboard

Last Updated: 2023-03-27, -156 days from Fall 2023

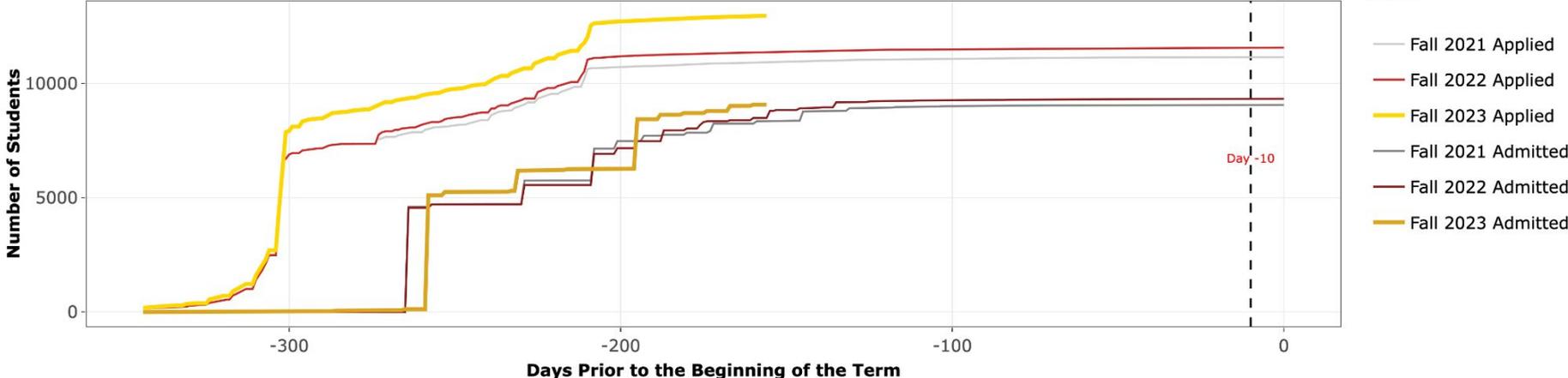
The plots below show the comparison of the number of students who have applied, been admitted, confirmed and registered at UMBC. The red lines show students for Fall 2023 while the blue lines shows students for the Fall 2022 and Fall 2021 semesters. The sample of students include those who came in as new undergraduate freshman. The x-axis indicates the number of days prior to the beginning of the term. The y-axis indicates the number of students who have applied, admitted, confirmed and registered. The first 4 plots below show the most recent 30 days while the 2 plots below show the year in entirety

College
All

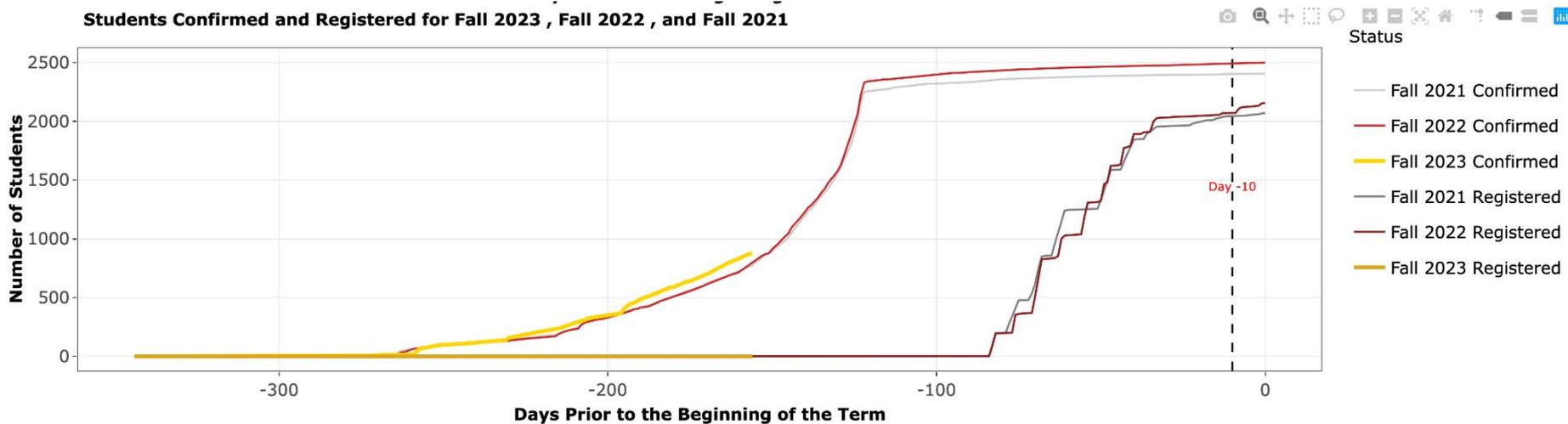
Citizenship
All

Gender
All

Students Applied and Admitted for Fall 2023 , Fall 2022 , and Fall 2021



Students Confirmed and Registered for Fall 2023 , Fall 2022 , and Fall 2021

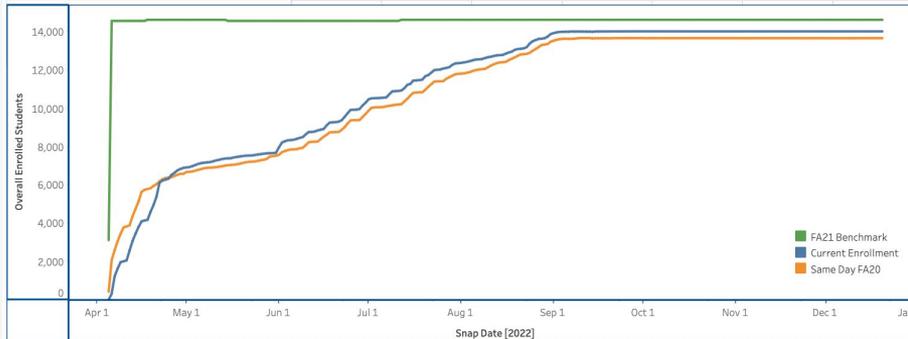


Where are we relative to our goals?



Overall Enrollment for Fall 2022

College	Academic Career	Current Enrollment	Same Day Last Year	Diff. from Last Year	Current Compared to Same Day Last Year	Current Enrollment Benchmark	% of Benchmark Attained	FA25 Goals
UMBC	Total	13,995	13,641	354	▲ 3%	14,599	96%	
	Undergraduate Enrollment	10,628	10,836	-208	▼ -2%	11,421	93%	
	Graduate Enrollment	3,367	2,805	562	▲ 20%	3,178	106%	
CAHSS	Undergraduate Enrollment	3,590	3,680	-90	▼ -2%	3,861	93%	
	Graduate Enrollment	842	913	-71	▼ -8%	1,086	78%	
CNMS	Undergraduate Enrollment	2,253	2,373	-120	▼ -5%	2,416	93%	
	Graduate Enrollment	337	341	-4	▼ -1%	352	96%	
COEIT	Undergraduate Enrollment	4,061	4,004	57	▲ 1%	4,289	95%	
	Graduate Enrollment	2,171	1,534	637	▲ 42%	1,684	129%	
Other	Undergraduate Enrollment	724	779	-55	▼ -7%	855	85%	
	Graduate Enrollment	17	17	0	▲ 0%	56	30%	



Days to Enrollment Deadline

0

CAHSS

Current Enrollment	FA21 Benchmark
4,432	4,947

CNMS

Current Enrollment	FA21 Benchmark
2,590	2,768

COEIT

Current Enrollment	FA21 Benchmark
6,232	5,973

Other

('Erickson', 'Soc Work', & 'UG Acad Aff')

Current Enrollment	FA21 Benchmark
741	911

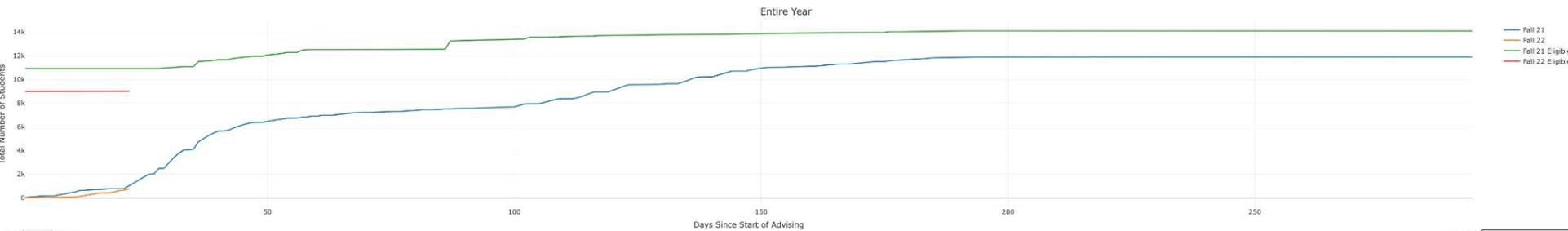
Key pieces of the retention cycle

Fall 2022 Advising and Registration Dashboard

Last Updated: 2022-03-18

Shows total amount of undergraduate students that have been cleared for enrollment and enrolled for the Fall 2022 term compared to previous semesters.

Status: Advised and Cleared
Scale (X-axis): Days Since Start of Advising
Units (Y-axis): Total
College: All
Student Type: All Students
 Show Fall 2019? Show Eligible?



Show 10 entries

Search:

Using data to frame and act on big issues: an example

COEIT Majors Sankey Diagram

Code ▾

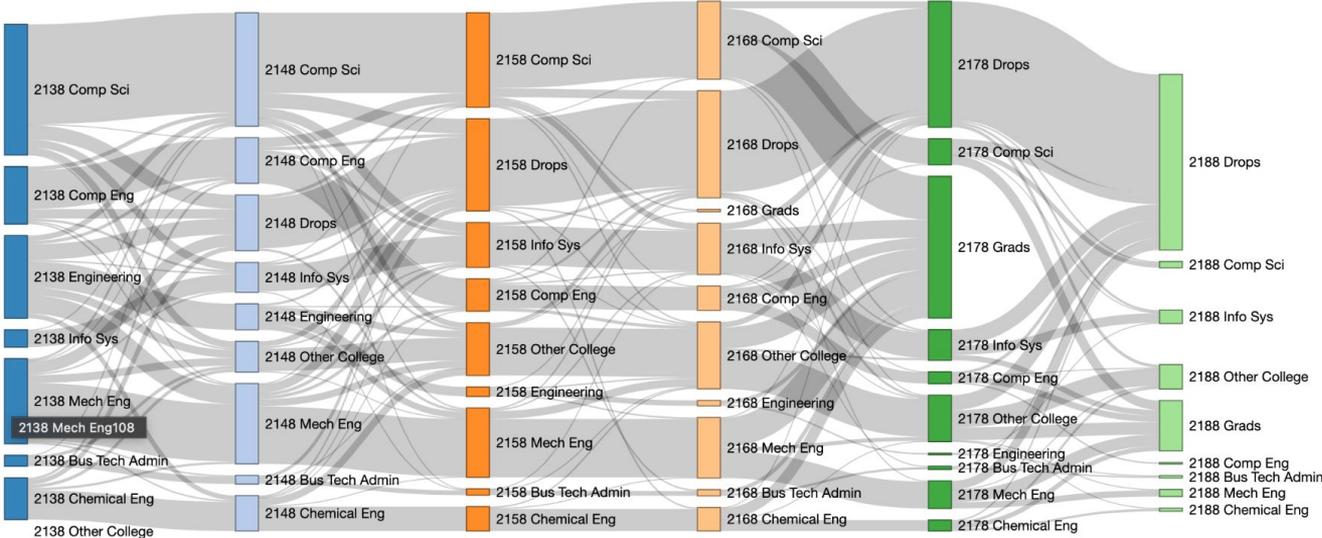
Jessica Gronsbell, Data Science Team

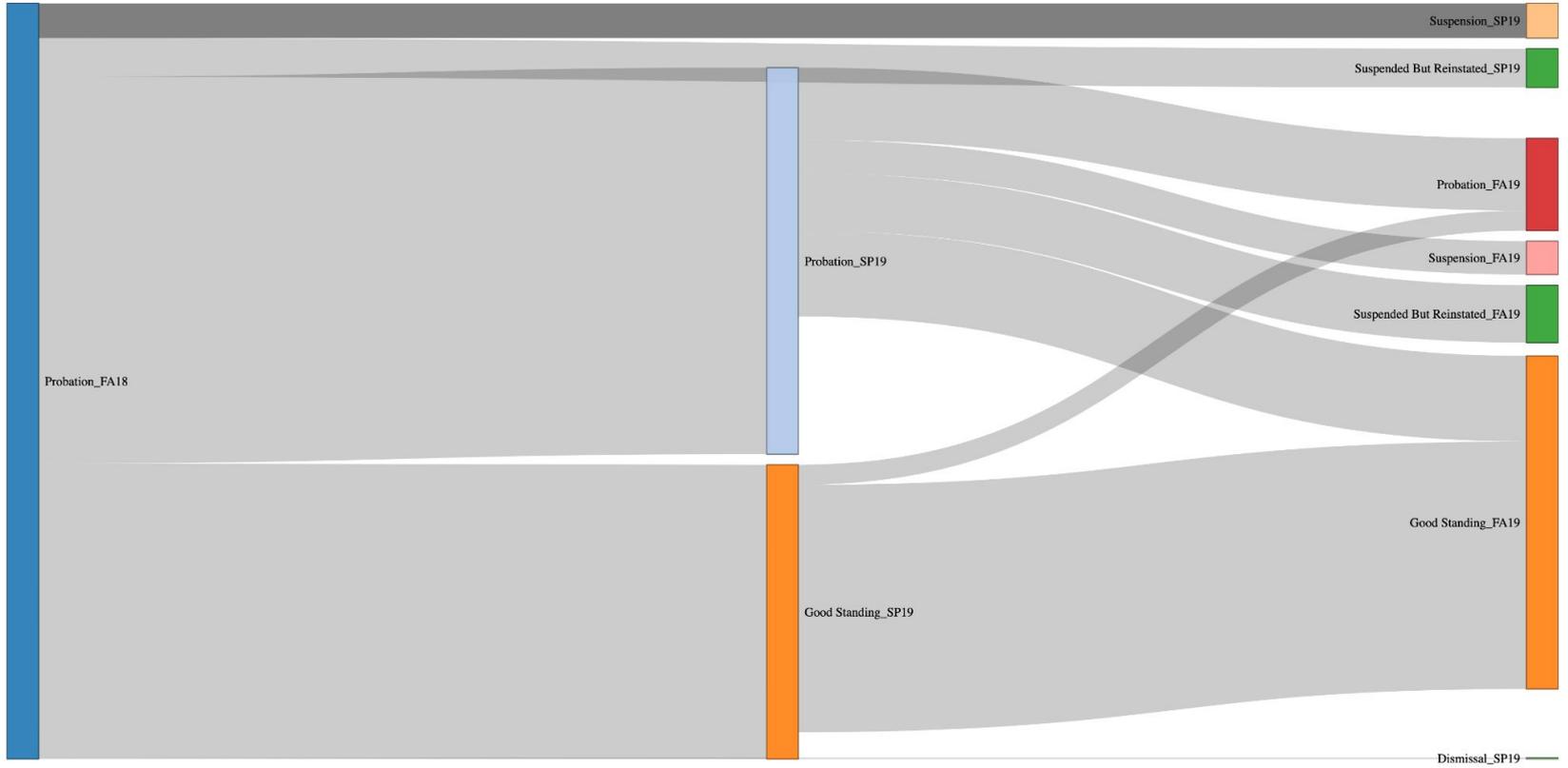
01/22/2019

College Migration of the Fall 2013 Cohort

This diagram shows how COEIT students from the Fall 2013 cohort migrated between its respective majors, other colleges, dropping out, and graduating over a five year span. Each column of nodes represents a specific time period. The migrations show a fall-to-fall transition.

Note: The terms are indicated by a special, four-digit code. The first number indicates the millenia, the middle two numbers indicate the year, and the last one indicates the term. The last digit will be an '8' which indicates spring fall. For example: 2138 indicates the Fall 2013 term.





Coming attractions from data science:

Case Study 1: Annual Enrollment Forecasts

One Year Projections



Methodology: Historical aggregate enrollment counts from Fall terms 2009-2020 were used to forecast future enrollment for Fall 2021.

● **Actual:** Historical enrollment counts for Fall term enrollment as of Census snapshot.

● **Projection:** Projected enrollment counts based on the enrollment forecast model.

● **Projection from validation:** Projection obtained from applying the model methodology to predict prior years' enrollment, based on available data for that year. We show model performance on known data to calibrate expectations for the 2021 enrollment projections.

Model Summaries - One Year

Institution	Segment	Parameter	
State University	Continuing Graduate Degree Seeking	(0.2, 0.1)	Holt Exponential
	Continuing Graduate Nondegree	(0.6, 0.8)	Holt Exponential
	Continuing Undergraduate Degree Seeking	0.8	Exponential Smoothing
	Continuing Undergraduate Nondegree	(0.4, 0.5)	Holt Linear
	First Time Undergraduate Degree Seeking	4	Random walk
	First Time Undergraduate Nondegree	(1, 0, 1)	ARIMA plus trend
	New Graduate Degree Seeking	(1.0, 0.9)	Holt Linear
	New Graduate Nondegree	(0.1, 0.8)	Holt Exponential
	New Transfer	0.4	Exponential Smoothing