University of Colorado Denver
CU IN THE CITY

Decision Support Toolkit Users Guide

Course Efficiencies Module

University of Colorado Denver
Office of Institutional Research & Effectiveness and
The Budget Office

8/19/2021

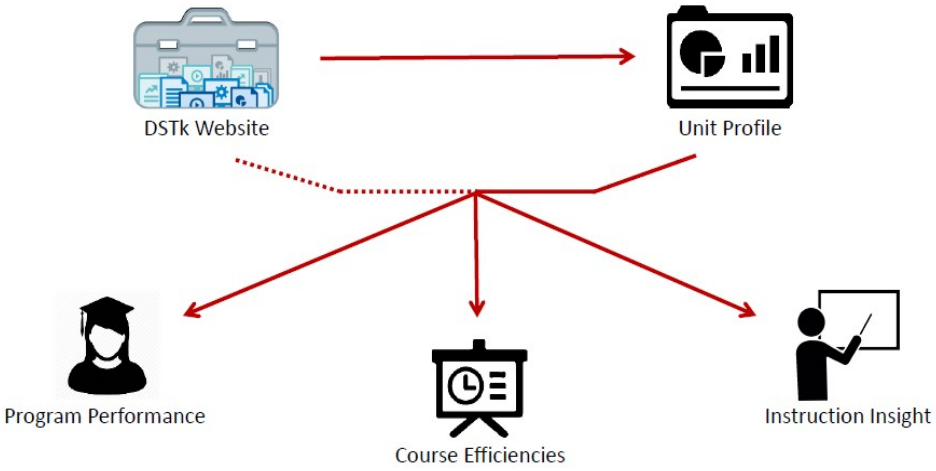
About the Decision Support Toolkit

The DSTk is a series of Tableau dashboards that bring together data visualizations that show important metrics and analysis to support academic and fiscal planning decision-making.

The Program Performance module provides comparisons and trends across your programs, with data on student headcount, student credit hours, demographics, and more. These metrics allow users to measure efforts and drive progress toward strategic priorities such as cost efficiency, student outcomes, equity and enrollment.

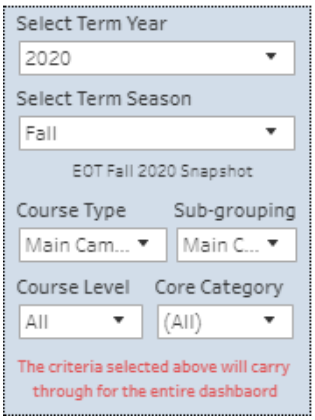
Connecting to Course Efficiencies

Navigate to the DSTk Site to access any of the 4 modules that make up the Toolkit. You may also go directly to the Course Efficiencies module in Tableau Server. Remember, you must be logged on to the campus network or VPN to access Tableau.



Navigating the Course Efficiencies Module

- Start with the Level-Set page to begin exploring school/college level data – set your filters and parameters, which will apply to every metric on this page.



The **Course Efficiencies** module is designed to help provide insight into your courses. Identify course areas that are thriving and others that may need some attention.

First, select your School or College: College of Liberal Arts and Sciences

School/College Comparison

- Compare growth in student credit hours, sections offered and median class size across schools/colleges
- Note: All measures within this module are based on organized instruction only
- Remember to hover over graphs, reference lines, and information icons to see details

Course Offerings

Main Campus, State Reportable (D1) course info with totals and 3 year % change.

Note: All measures (credit hours, section counts, fill rates, etc) within this module are based off of organized instruction only - non-main lab sections, recitations and all specialized instruction are not included in this module

	Instruction Student Credit Hours		Sections Offered		Median Class Size		Trends (Sections Offered | Student Credit Hours)
Business School	22,694	13%	198	-7%	38	13%	
College of Architecture and Planning	8,280	6%	96	-8%	15.5	3%	
College of Arts and Media	15,587	7%	272	16%	17	-15%	
College of Engineering, Design and Computing	14,907.5	12%	187	2%	27	17%	
College of Liberal Arts and Sciences	75,468	-9%	935	-2%	22	-4%	
School of Education and Human Development	10,877	9%	188	9%	19	6%	
School of Public Affairs	4,890	9%	70	-5%	23	28%	

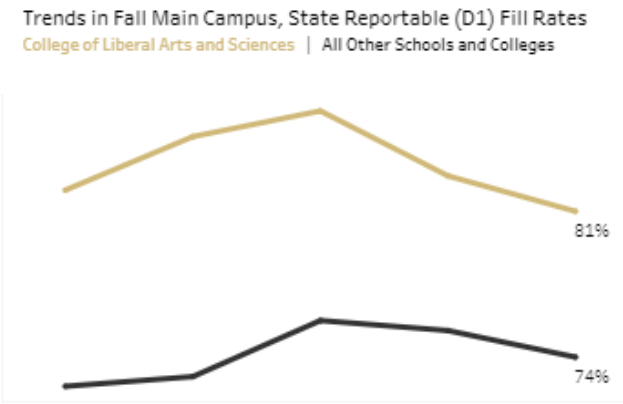
- Examine your course fill rates, how they compare to other CU Denver schools/college, and how these figures are trending

Course Fill Rates

Fill rates for College of Liberal Arts and Sciences Main Campus, State Reportable (D1) courses as compared to all other schools/colleges.

The table below details sections that fall into higher (>90% full) and lower (<70% full) fill rate categories. Courses with low fill rates could potentially be collapsed into a similar section.
More on Collapsable Courses on the Detail page.

	Average % Full	Number of Sections Offered	Percent of Sections <70% full	Percent of Sections >90% Full
College of Liberal Arts and Sciences	81%	935	27%	51%
Average for all other Schools/Colleges (selected School/College excluded)	74%	1,039	37%	37%

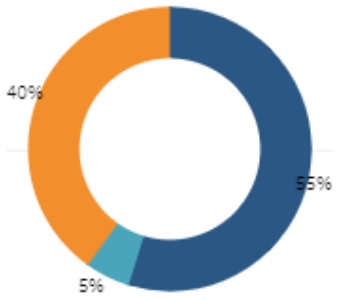


- The section below provides a snapshot and 5-year trend on the proportion of student enrollments by course modality (left) and the proportion of student credit hours taught to majors within and outside of your school/college (right).

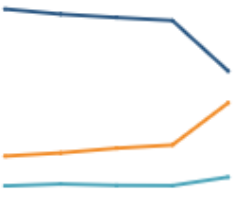
Modality

College of Liberal Arts and Sciences enrollments by modality
Online | In Person | Hybrid

Remote and Zoom optional courses are grouped with in-person courses

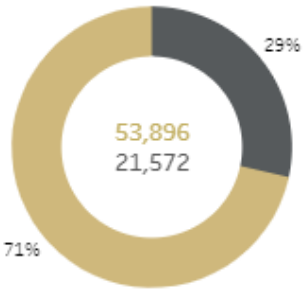


Trend in Modality



Service Teaching

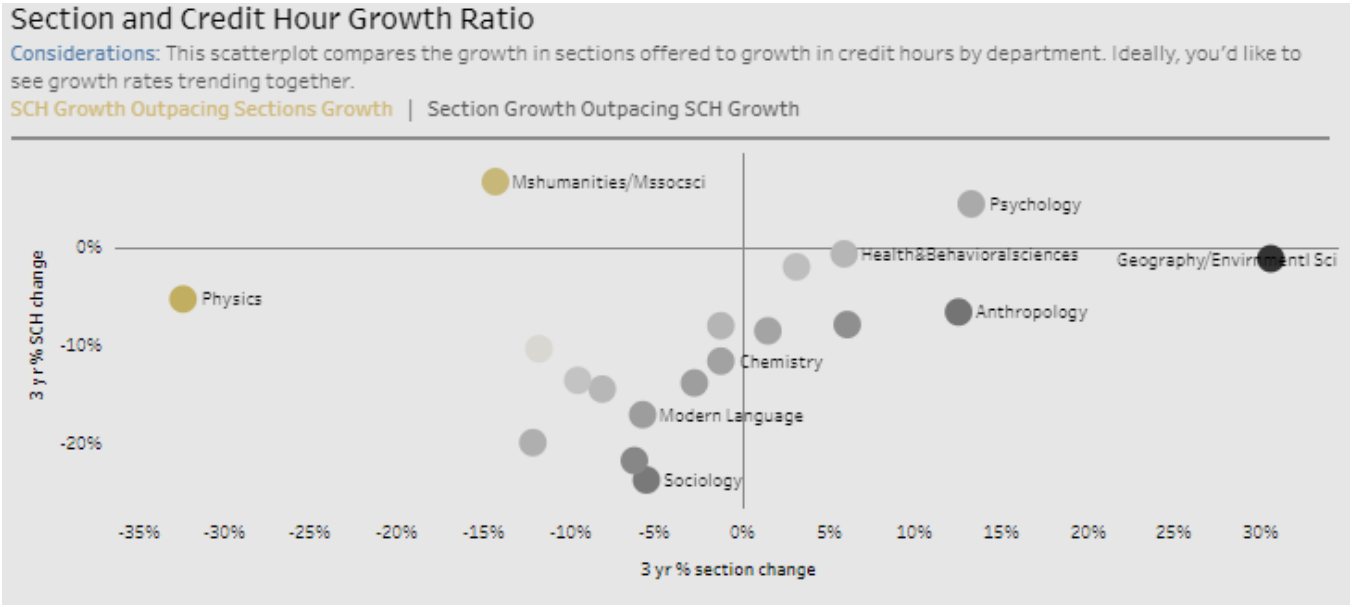
College of Liberal Arts and Sciences course credit hours taught to majors in the college vs. outside the college.



Trend in Service Teaching

The Breakdown section allows users to compare program level data across their college

- The scatterplot below displays growth in SCH and sections offered, allowing users to identify outliers



- The table below allows users to dynamically sort by metric to compare programs and evaluate trends

Department Detail

Take a look at the subjects offered during the Fall 2020 semester.
Use the sorting feature to identify thriving or struggling areas.

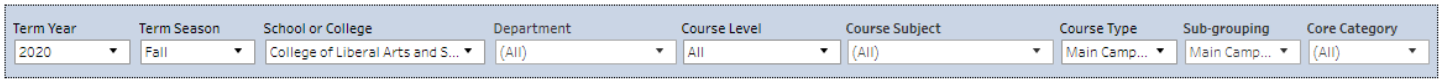
Sort By: SCH total ▼ Descending ▼

Department	Instruction SCH	SCH 3yr Change	Sections Offered	Sec. 3yr Change	Enroll Count	Course Cap	Med. Class Size	Fill Rate	DFW Rate	College Service Teaching	Dept Service Teaching	Trends (Student Credit Hours / Sections Offered)
Mathematics	8,867	-14%	102	-8%	2,656	3,084	30	86%	23%	55%	10%	
Biology	8,727	-8%	79	-1%	3,022	3,597	23	84%	17%	85%	53%	
Psychology	8,681	4%	77	13%	2,849	3,099	32	92%	13%	85%	58%	
English	8,109	-8%	138	1%	2,703	2,939	21	92%	18%	60%	19%	
Chemistry	6,213	-12%	79	-1%	2,430	3,221	22	75%	25%	87%	18%	
Communication	4,863	-2%	66	3%	1,621	1,921	25	84%	13%	71%	37%	

- Now, users can move on to the detail page, which contains similar metrics and analyses at a more granular level of detail.

-Now that you've gathered information, dig into details by visiting the Detail page **Jump to Detail Page**

Course Efficiencies – Detail Page

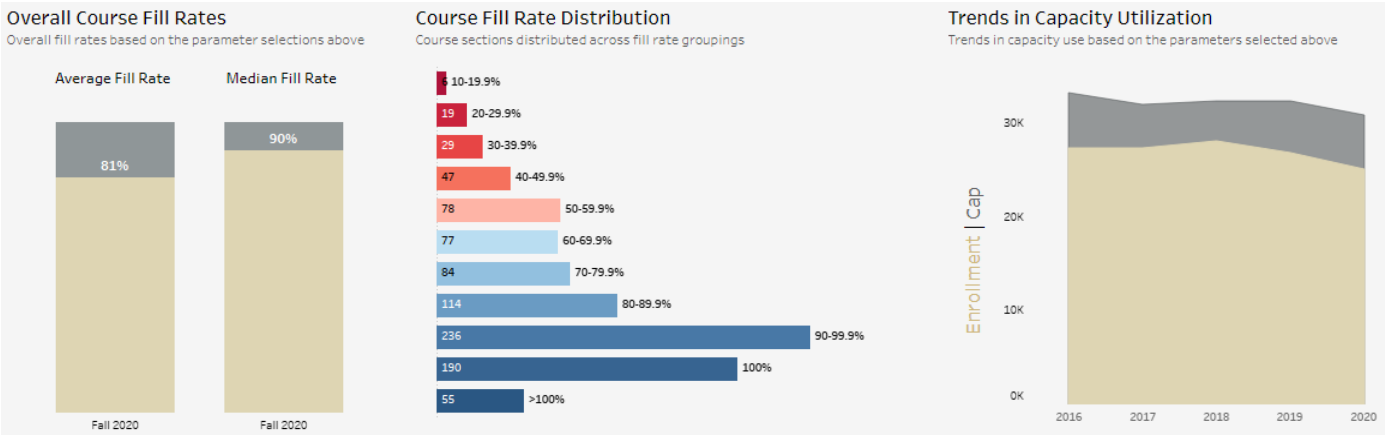


- Parameters selected at the top of the page will apply to all data on the detail page. Use this area to select specific departments, terms, course subjects and course type to explore metrics for specific department and/or program(s).
- Note: 'Year' selected serves as an endpoint for trends
- The table below allows users to dynamically sort by metric to compare programs using the section parameters.

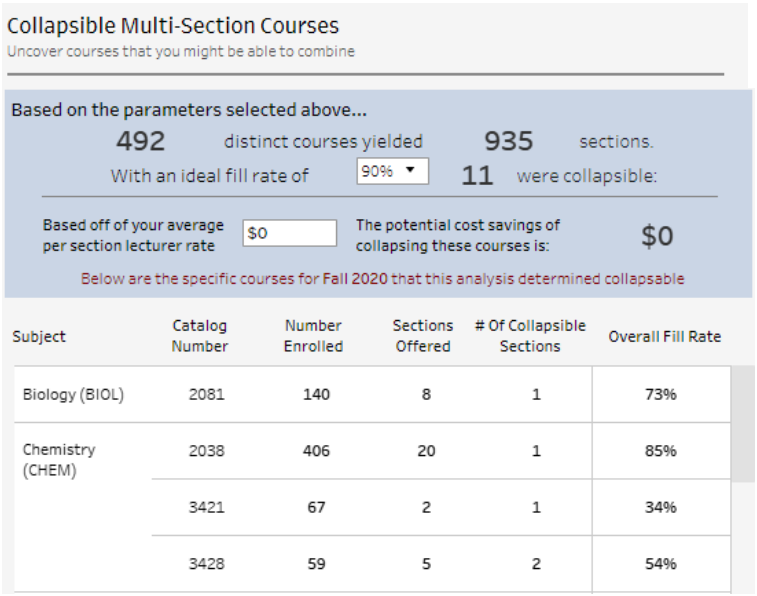
Subject Level Comparison — Sort By: SCH total, Descending

Department	Subject	Instruction Student Credit Hours	SCH 3 yr	Sections	Sec. 3 yr	Enroll Count	Course Cap	Med. Class Size	Fill Rate	DFW Rate	College Service Teaching	Dept. Service Teaching	Trend (Student Credit Hours | Sections Offered)
Mathematics	Mathematics (MATH)	8,867	-14%	102	-7%	2,656	3,084	30	86%	23%	55%	10%	
Biology	Biology (BIOL)	8,727	-8%	79	-1%	3,022	3,597	23	84%	17%	85%	53%	
Psychology	Psychology (PSYC)	8,681	4%	77	13%	2,849	3,099	32	92%	13%	85%	58%	
English	English (ENGL)	8,109	-8%	138	1%	2,703	2,939	21	92%	18%	60%	19%	
Chemistry	Chemistry (CHEM)	6,213	-12%	79	-1%	2,430	3,221	22	75%	25%	87%	18%	
Communication	Communication (COMM)	4,863	-2%	66	3%	1,621	1,921	25	84%	13%	71%	37%	

- The section below displays an overview of metrics that can be used to assess efficiency in sections offered, including course fill rates, the distribution of sections across fill rate groupings, and the capacity gap over time.



- Below, users input their ideal fill rate and see multi-section courses that could offer less sections while still meeting demand.



Collapsible Multi-Section Courses

Uncover courses that you might be able to combine

Based on the parameters selected above...

492 distinct courses yielded 935 sections.

With an ideal fill rate of 90% 11 were collapsible:

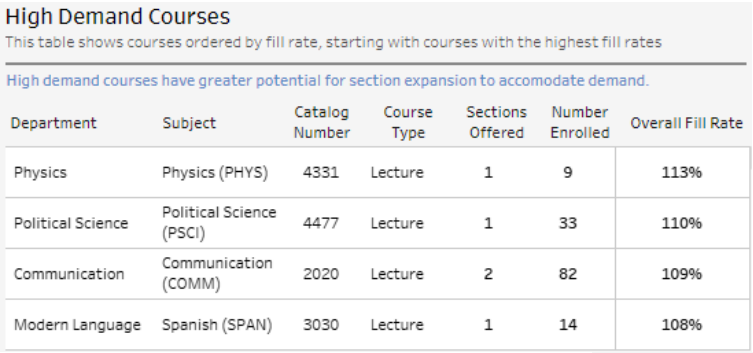
Based off of your average per section lecturer rate $0

The potential cost savings of collapsing these courses is: $0

Below are the specific courses for Fall 2020 that this analysis determined collapsable

Subject	Catalog Number	Number Enrolled	Sections Offered	# Of Collapsible Sections	Overall Fill Rate
Biology (BIOL)	2081	140	8	1	73%
Chemistry (CHEM)	2038	406	20	1	85%
	3421	67	2	1	34%
	3428	59	5	2	54%

- This section highlights courses within your college with very high or very low fill rates, which may suggest the need to add or eliminate sections offered.

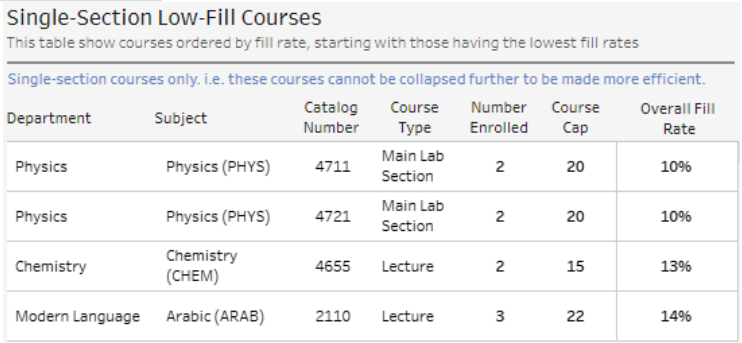


High Demand Courses

This table shows courses ordered by fill rate, starting with courses with the highest fill rates

High demand courses have greater potential for section expansion to accomodate demand.

Department	Subject	Catalog Number	Course Type	Sections Offered	Number Enrolled	Overall Fill Rate
Physics	Physics (PHYS)	4331	Lecture	1	9	113%
Political Science	Political Science (PSCI)	4477	Lecture	1	33	110%
Communication	Communication (COMM)	2020	Lecture	2	82	109%
Modern Language	Spanish (SPAN)	3030	Lecture	1	14	108%



Single-Section Low-Fill Courses

This table show courses ordered by fill rate, starting with those having the lowest fill rates

Single-section courses only. i.e. these courses cannot be collapsed further to be made more efficient.

Department	Subject	Catalog Number	Course Type	Number Enrolled	Course Cap	Overall Fill Rate
Physics	Physics (PHYS)	4711	Main Lab Section	2	20	10%
Physics	Physics (PHYS)	4721	Main Lab Section	2	20	10%
Chemistry	Chemistry (CHEM)	4655	Lecture	2	15	13%
Modern Language	Arabic (ARAB)	2110	Lecture	3	22	14%

Course Demand Calendar

The calendar below provides a summary of demand for courses on different days of the week. All data are from a snapshot taken during the fourth week of the term selected.

Demand Metric: Fill Rate
- Sections Offered
- Fill Rate
- Enrollments
- Cap Size

- The Course Demand Calendar shows various metrics to support users in determining how well course demand aligns with course offerings.
- Use the section parameter to select metrics that provide different insights.

	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
Morning	82% Average Fill Rate	81% Average Fill Rate	83% Average Fill Rate	80% Average Fill Rate	60% Average Fill Rate	62% Average Fill Rate
Afternoon	80% Average Fill Rate	74% Average Fill Rate	81% Average Fill Rate	73% Average Fill Rate	51% Average Fill Rate	42% Average Fill Rate
Evening	80% Average Fill Rate	68% Average Fill Rate	77% Average Fill Rate	64% Average Fill Rate		

- Additional detail can be found on the next page

Click Here for the Full Calendar

- Be sure to hover over the chart for detail on all metrics for the selected day and time.

School College Paramet... | Selected Term Season | Selected Term Year | Select Course Level | Department | Course Subject | Catalog Number | Denver Core Categories | Course Type | Course Type Detail

College of Liberal ... | Fall | 2020 | All | (All) | (All) | (All) | (All) | Main Campus, Sta... | Main Campus Cour...

	Monday September 14, 2020	Tuesday September 15, 2020	Wednesday September 16, 2020	Thursday September 17, 2020	Friday September 18, 2020
8 AM	3 Sections	1 Sections	3 Sections	2 Sections	1 Sections
9 AM	6 Sections	5 Sections	6 Sections	6 Sections	1 Sections
10 AM			3 Sections	6 Sections	1 Sections
11 AM			3 Sections	6 Sections	2 Sections
12 PM			6 Sections	8 Sections	1 Sections
1 PM			4 Sections	5 Sections	1 Sections
2 PM			6 Sections	3 Sections	

College of Liberal Arts and Sciences
Department: Biology
Subject:Biology

Fall 2020 All Courses

Main Campus, State Reportable (D1)
Sections offered: 6
Enrollment Count: 346
Total Course Cap: 410
Fill Rate: 84%

* = All or Multiple

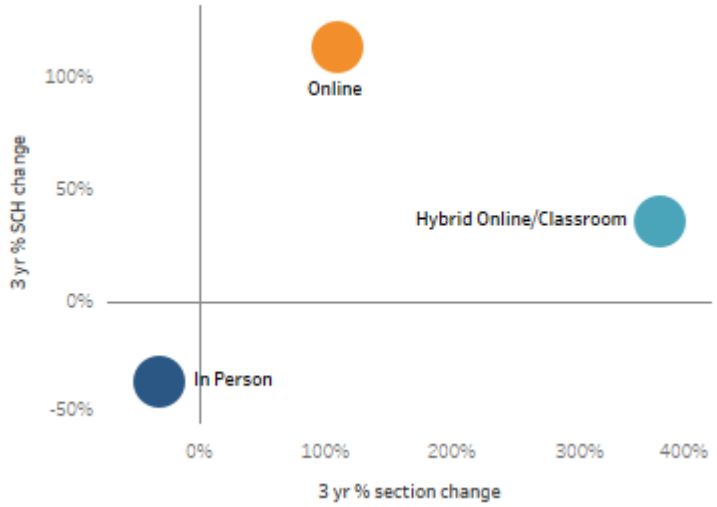
- Click on one of the time slots in the chart above and the chart below will display course sections offered in that time slot, as well as the fill rate for that section.

					Tuesday 12 PM
Biology	Biology	2051	001	General Biology I	82%
		2081	001	General Biology Lab II	96%
		3020	H02	Practical Laboratory Skills	75%
		3124	001	Intro to Molecular Biology	75%
		3521	001	Vertebrate Biology	63%
		3763	001	Biostatistics	76%
		4345	001	Flora of Colorado	88%
		4415	001	Microbial Ecology	48%

Modality Metrics Get a better idea of how your courses are being offered and understand how supply and demand are trending.

Growth by Modality

This chart shows credit hour change on the vertical axis and section count change on the horizontal axis, broken out by course modality



- This section offers detail on your courses, split by modality. The chart to the left once again shows growth in sections and SCH and whether they are aligned. Remember, it is ideal to see SCH growth meeting or exceeding growth in sections offered.

- This section displays the fill rates for each course modality by course subject. This is a great tool to determine, within a specific department, if online offerings are meeting demand.

Fill Rates by Modality

This table looks at fill rates by the modality in which courses were offered, by subject area. Determine if certain subject areas are seeing more demand in certain modality types

Department	Subject	Overall Fill Rate	In-Person Fill Rate	Online Fill Rate	Hybrid Fill Rate	Credit Hour Distribution In-person | Hybrid | Online | Other
Anthropology	Anthropology (ANTH)	82%	78%	91%		64% 36%
Biology	Biology (BIOL)	84%	81%	90%	70%	70% 30%
Chemistry	Chemistry (CHEM)	75%	72%	64%	84%	71% 19% 9%
Communication	Communication (COMM)	84%	70%	88%	85%	17% 81%
Economics	Economics (ECON)	78%	76%	88%	50%	63% 34%
English	English (ENGL)	92%	90%	95%	100%	56% 42%
Ethnic Studies	Ethnic Studies (ETST)	77%	59%	93%		34% 66%

Success Metrics Understand how students are succeeding in your course offerings. All data based on the parameters selected at the top of this page.

Overall Success

Overall DFW rate and average GPA for parameters selected above

Use these as benchmarks for comparisons to the individual subjects in the table below.

DFW Rate	Average GPA
16%	3.2

The DFW rate represents the percent of grades awarded that were D's, F's, or withdrawals.

- This section shows the average GPA and the percentage of students earning and D, F or W in courses based on the top-of-page parameters. In this example, the aggregate data for the school college can be used to compare to subject areas below.

Success by Subject

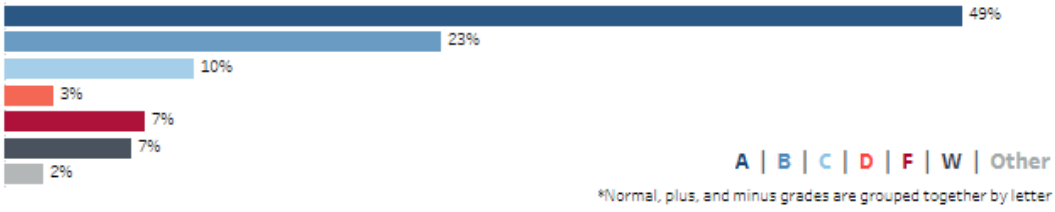
This table breaks out success metrics at the subject level for subjects within the parameters selected above.

Department	Subject	Section Count	Avg DFW	Avg GPA	Grade Distribution
Anthropology	Anthropology (ANTH)	27	15%	3.25	53% 20% 8%
Biology	Biology (BIOL)	79	17%	3.17	44% 25% 13%
Chemistry	Chemistry (CHEM)	79	25%	2.93	32% 25% 15% 15%
Communication	Communication (COMM)	66	13%	3.29	62% 17% 8%
Economics	Economics (ECON)	38	11%	3.34	54% 24% 9%
English	English (ENGL)	138	18%	3.14	56% 18%

- The chart below shows the distribution of grades for selected courses. This can also be compared to departmental data in the table to the right.

Grade Distribution

Distribution of grades for Fall 2020 courses within the parameters selected above

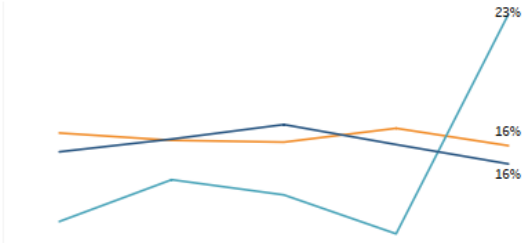


*Normal, plus, and minus grades are grouped together by letter

Success by Modality

DFW rates for the past five Fall terms, broken out by course modality

In-person | Hybrid | Online



- The chart to the left illustrates the five-year trend of DFW rates for selected courses by modality.