CALIFORNIA STATE UNIVERSITY EAST BAY

ACADEMIC SENATE
Committee on Academic Planning and Review

ANNUAL PROGRAM REPORT

College	College of Science
Department	Chemistry and Biochemistry
Programs	BS/BA Chemistry, MS Chemistry & BS/BA Biochemistry
Reporting for Academic Year	2017-2018 – Partial Report - Data/Section III-B only)
Last 5-Year Review	2017-2018
Next 5-Year Review	2022-2023.
Department Chair	Ann McPartland
Date Submitted	Oct. 15, 2018

ABBREVIATED ANNUAL PROGRAM REVIEW – Explanation

Since we submitted a Five Year Program Review in May of 2018, we are not required to provide an Annual Review for 2017-2018. However, **we would like to change the request for a tenure track (TT) faculty position submitted with the 2016-2017 Annual Report and the Five Year Review document.** In those reports we requested a new TT faculty member with a specialization in Organic Chemistry. While we do need a new Organic Chemist, our curricular demands have shifted with the move to semesters and the need for an Analytical Chemist who can teach General Chemistry and Analytical Chemistry courses is now greater. Therefore, we are submitting an abbreviated Annual Report for 2017-2018 in which only an abbreviated Discussion of Program Data and Section III-B (Request for Resources) is provided. We are following the guidelines for departments that desire to modify their Requests for Resources outlined by Michele Korb, CAPR chair, in an Oct. 5, 2018 e-mail.

III. DISCUSSION OF PROGRAM DATA AND RESOURSE REQUESTS

Selected supplemental APR data provided through Pioneer Insights relating to the request for a tenure track faculty position can be found in the Appendix. The web address for Pioneer Insights is https://data.csueastbay.edu/#/apr/program_data. That data is summarized below.

The Department of Chemistry and Biochemistry offers Bachelor of Science (BS) and Bachelor of Arts (BA) degrees in both Chemistry and Biochemistry as well as a Master of Science degree in Chemistry. The undergraduate degrees include a BS Chemistry degree with a Concentration in Bioanalytical and Forensic Instrumentation and BA programs in both disciplines with Concentrations in Chemistry Educaton.

Notable Trends. As of Fall 2017 there were 166 students majoring in one of the Chemistry or

Biochemistry degree programs and 21 students in the Master of Science program in Chemistry, giving a total of 187 majors in the department. The number of majors was down in Fall 2017 compared with the years 2013 through 2016 when the numbers were nearer 200 (204-193). However, this may be partially accounted for by the relatively high number of students who completed a Bachelor's degree during 2016-2017 compared with the two previous years (53 versus 45 in 2015-16 and 40 in 2014-15).

The number of majors matriculating in the Master's program has been trending downward since 2013. This may be because of stricter admission requirements introduced by the Chemistry faculty several years ago and could also reflect an improved economy. The department faculty are now working to reverse the trend and attract more high quality students to the MS degree program. The consensus is that the 51 graduate students in the program in 2013 was too many for a faculty of nine but that the 2017 number of 21 is too low. We are hoping to increase the number of MS students to about 40.

The department FTES was 357.9 in Fall 2017, down just slightly from a peak of 375.1 in Fall 2015. As a percentage of students taught, the chemistry and biochemistry majors constitute about one-third of the students taking courses in the department. We have a large service component for students in other majors as well as GE offerings. The number of tenured or tenure track faculty increased from 9 in 2013 to 10 in 2017, with a dip to 8 in 2015 after a Chemistry facuty member left the university. The increase to 10 was due to new hires in 2016 and 2017. Although not yet reflected in the APR data, a new Computational Chemist joined our faculty in Fall 2018.

The instructional FTEF data show a decrease in the percentage of course sections taught by lecturers and teaching associates between 2015 and 2017, from 68% to 55%, as would be expected with the hiring of new faculty. However, the data are still dismal and indicate that only 45% of the course sections were taught by tenured or tenure track faculty in 2017. Department Student Faculty Ratios (SFR) remained relatively constant at about 24 over the last three years. The SFR for chemistry and biochemistry lecture classes was much higher over this period, but the SFR for the lab sections is necessarily lower because of low laboratory classroom capacities and safety considerations. The lab SFRs decrease the overall SFR. Even though our department SFR is lower than the campus average, it is fairly typical or even high for a Chemistry program. The SFR at UC San Diego is 19 and the SFR for the Chemistry program at UC Berkeley is 17.

Our chemistry and biochemistry majors were fairly evenly divided with respect to gender from 2013 through 2015, but noticable increases in the percent females occurred in Fall 2016 (to 57 %) and Fall 2017 (to 63 %). Our students represent a very diverse group in terms of race and ethnicity. In Fall 2016 Asians accounted for 35.8% of the biochemistry majors and Hispanics comprised 29.2%; the other large groups were African Americans at 11.3% and whites, also at 11.3%. Asians and Hispanics were also the largest groups among the chemistry majors, but there were 22.7% whites and only 12.7% African Americans. The APR data indicate that the Chemistry and Biochemistry faculty included 25% Asian members, 8% Latino and 54% Whites in Fall 2017. Since 25% of 10 faculty would be 2.5 and since we have three Asian faculty, that percentage should actully be 30%. The data indicate one individual of unknown ethnicity. The department has successfully increased the diversity of the tenured/TT faculty with some of the recent hires.

Reflections on Trends and Program Statistics: We continue to be concerned that such a high percentage of our courses are taught by part-time lecturers and teaching associates. We are especially unhappy because we still have majors courses being taught by part-time lecturers. The accrediting agency for our BS Chemistry degree (the American Chemical Society) requires major courses to be taught by tenured or TT faculty. Because of recent hires we now have at least one section for each of the courses required for the BS Chemistry degree taught by regular faculty. However, since students can take any section some do not have a tenured or TT instructor for their required major courses for our accredited degree.

B. Request for Resources

1. Request for a Tenure Track Hire with a Specialization in Analytical Chemistry

This is a request for a tenure track faculty position in Analytical Chemistry at the Assistant Professor level. Areas of sub-specialization might include environmental chemistry, spectroscopy, forensic chemistry, nanotechnology, materials science, polymer chemistry or others. The new faculty member is needed to teach analytical chemistry courses, to maintain department currency in chemical instrumentation, to participate in the General Chemistry teaching program and to teach other chemistry courses now taught by part-time lecturers.

Analytical chemists are trained in the use of instruments and other methods to separate, identify, and quantify chemicals. Most chemists use some type of instrumentation in their research work but analytical chemists specialize in the use and understanding of all modern types. Currently there is just one Analytical Chemist in the department. A new faculty member with expertise in this area would strengthen the department's ability to maintain currency in instrumentation, which is covered throughout the curriculum, and provide the critical mass for revamping several analytical courses. Hands-on experience with chemical instrumentation is essential for our students, who will be expected to be familiar with modern equipment when they enter the workforce or go on for advanced study in chemistry, biochemistry or a medical field. Additionally, a new Analytical Chemist would have the expertise to work with other faculty to acquire newer instruments through federal grant opportunities. The granting agencies look closely at the backgrounds of faculty applying for instrumentation funding.

A new Analytical Chemist would also bring the expertise to teach General Chemistry and help modernize the experiments in the General Chemistry Laboratory program. **This is a critical need in the department.** The department offers the year-long General Chemistry series (CHEM 111-Chem 112) twice a year and a new General Chemistry for Engineering course (CHEM 110), also twice a year. The courses in the General Chemistry series have always had large enrollments since they are requirements for multiple science majors (Chemistry, Biochemistry, Biological Sciences, Physics, Health Science, Earth and Environmental Science. Engineering,). Over the years enrollments have been increasing (680 students in 2007-2008, 877 students in 2013-2014, 996 students in 2017-2018). The Fall 2017 enrollment for the quarter system General Chemistry course CHEM 1101 was 315 students and the combined CHEM 111, CHEM 110 and transitional General Chemistry enrollment for Fall 2018 was 318, so we expect the high demand for General Chemistry to continue on the semester system.

Despite the importance of General Chemistry as a first chemistry course for so many science majors, half of the lectures are currently taught by lecturers. There are not enough regular faculty to cover even very large lecture sections of General Chemistry, compromising the quality of the education provided for the science majors. The situation with the lab instructors is even more appalling. Approximately 80% of the laboratory sections for General Chemistry are being taught by part-time lecturers or teaching associates. Many students complete a year of General Chemistry without ever having a tenured or tenure track faculty member as a instructor, either for lecture or lab.

Individuals with expertise in analytical (or physical chemistry) have traditionally taught General Chemistry. A new tenure track Analytical Chemist would allow the department to better serve the students who take General Chemistry as a major requirement, both by providing quality instruction in the lecture sections and by providing the necessary expertise to upgrade the experiments for the laboratory components. Since course development and improvement are not part of the mandate for part-time lecturers, the department has relied on a few tenured or tenure track faculty members to keep the technology up-to-date for General Chemistry. These faculty have introduced some new equipment and experiments but the task is large, with over 300 students taking General Chemistry each semester and two laboratory sessions meeting per week for each course. We hope a new faculty member with a major focus on General Chemistry will be able to work with the other tenure track instructors to continue to introduce innovative experiments involving modern technology into the General Chemistry laboratory curriculum.

A new tenure track faculty member is also needed to better meet the demand for research supervision from undergraduate and Master's degree candidates and to help improve the chemistry General Education curriculum.

The latest FTEF data from the Pioneer Insight web site indicate that in Fall 2017 only 45% of the Chemistry and Biochemistry instruction was by tenured or tenure-track faculty (See Appendix). A similar percentage (46%) was observed in Fall 2016. These values were up from 32% in Fall of 2015; the increase is due to the hiring of new faculty members in 2016 and 2017. However, we have still not have recovered from the severe faculty shortage we experienced during the 2006-2010 period which resulted from a combination of retirements, increasing enrollments and faculty separations. Eleven years ago, in 2006, our FTES was 245.3, lecturers accounted for 30.3% of the FTEF and there were 8.5 TT faculty. Eleven years later, in Fall 2017, our FTES was 359.9, lecturers and TAs accounted for 55% of the instructional FTEF, and there were 10 tenure track faculty. Another new faculty member joined our faculty in Fall 2018. However, at eleven TT faculty corresponding to a 34 % increase since 2006, we have not yet matched the 46% increase in FTES that has taken place over the same period. Thus our ability to properly fulfill our department mission of a quality education for all chemistry students remains in jeopardy.

In practical terms, the current higher FTEF for lecturers and TAs translates to a significant number of important courses being taught by part-time lecturers. For example during 2017-2018, fourteen majors-level lecture course sections were taught by lecturers. For some of these courses the clientele included not just Chemistry and Biochemistry majors but also other science majors, including students matriculating in Biological Sciences, Environmental Science, Physics,

Engineering, and Heath Sciences. Additionally, six lecture sections for service courses and three General Education lecture courses for non-majors were taught by part-time lecturers. Moreover, 78 of the 97 laboratory sections offered were taught by part-time lecturers or TAs. This heavy reliance on lecturers is negatively affecting our program. A new Analytical Chemist will be able to not only teach majors-level and graduate analytical courses, but also cover some of the other types of chemistry courses currently taught by lecturers. We hope to be able to improve the chemistry experience not only for chemistry and biochemistry majors but also for students from other disciplines taking chemistry as a major requirement or for general education credit. We think it is essential to provide all students taking chemistry courses with a quality learning experience. We hope a new hire will bring us closer to this goal.

2. Request for Other Resources

We have been fortunate to obtain much needed space in the Science building over the last year or so as the result of the move of some Science departments to the SF building and the renovation of the west wing of the first floor of the Science building. We have no additional request for space at this time.

We do urge the university to consider increasing funding to the colleges for staff positions. The staff was cut severely during the recession of 2008-2011 and the lost positions have not been restored. In our case a staff shortage in the department office is compromising our ability to serve our students effectively. We have a very strong need for a half-time position for an Administrative Support Assistant (ASA).

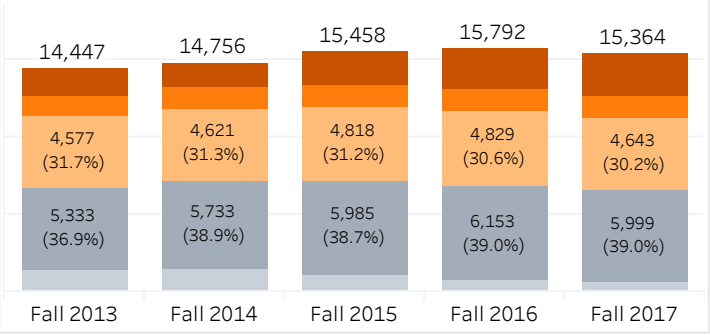
APPENDIX

APR Data from Pioneer Insights - https://data.csueastbay.edu/#/apr/program_data

See downloaded pages of APR Data that follow.

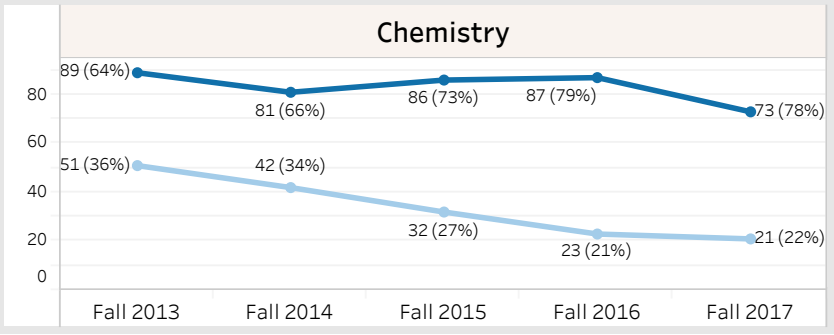
Enrollment

College



Program Major

Chemistry



Chemistry: Sex

		Fall 2013		Fall 2014		Fall 2015		Fall 2016		Fall 2017	
		n	%	n	%	n	%	n	%	n	%
Undergraduate	Female	48	54%	42	52%	45	52%	50	57%	46	63%
	Male	41	46%	39	48%	41	48%	37	43%	27	37%
	Total	**89**	**100%**	**81**	**100%**	**86**	**100%**	**87**	**100%**	**73**	**100%**
Graduate	Female	26	51%	21	50%	18	56%	12	52%	12	57%
	Male	25	49%	21	50%	14	44%	11	48%	9	43%
	Total	**51**	**100%**	**42**	**100%**	**32**	**100%**	**23**	**100%**	**21**	**100%**
Grand Total		140	100%	123	100%	118	100%	110	100%	94	100%

College All

Program M.. Chemistry

Term & Year Multiple values

Student Le.. All

Full-/Part T.. All

Select a Group

- (●) Sex
- ( ) Race/Ethnicity
- ( ) URM
- ( ) Pell Eligibility

College

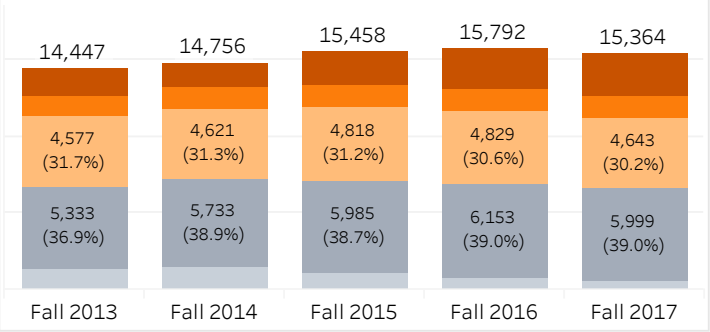
- CBE
- CEAS
- CLASS

Student Level

- Undergraduate
- Graduate

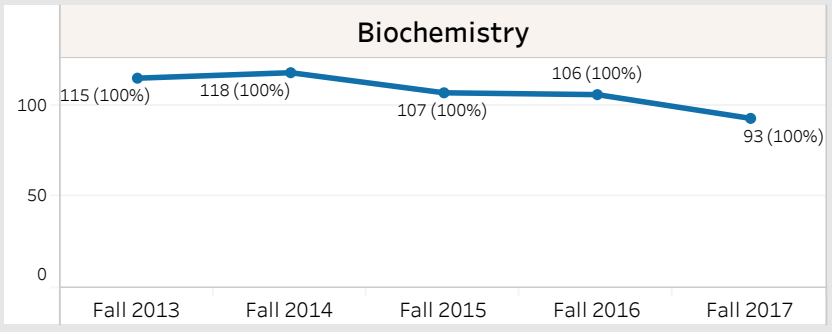
Enrollment

College



Program Major

Biochemistry



Biochemistry: Sex

		Fall 2013		Fall 2014		Fall 2015		Fall 2016		Fall 2017	
		n	%	n	%	n	%	n	%	n	%
Undergraduate	Female	63	55%	66	56%	61	57%	56	53%	53	57%
	Male	52	45%	52	44%	46	43%	50	47%	40	43%
	Total	115	100%	118	100%	107	100%	106	100%	93	100%
Grand Total		115	100%	118	100%	107	100%	106	100%	93	100%

College All

Program M.. Biochemistry

Term & Year Multiple values

Student Le.. All

Full-/Part T.. All

Select a Group

- (●) Sex
- ( ) Race/Ethnicity
- ( ) URM
- ( ) Pell Eligibility

College

- CBE
- CEAS

Student Level

- Undergraduate

Degrees Awarded

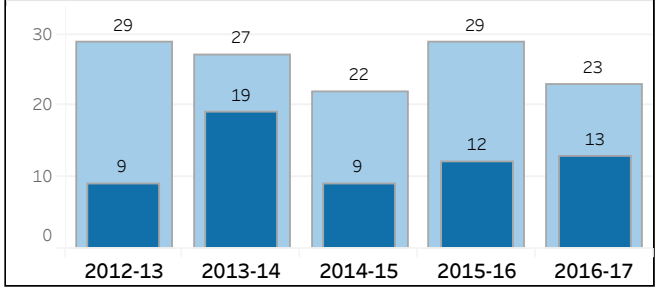
Program Major: AY 2016-2017

(Select a Program Major below to view 5 years trend in the right chart)

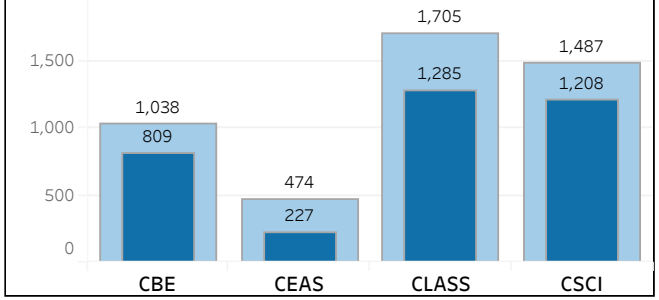
		Bachelor's	Master's	Ed.D	Total
CBE	Business Administration	771	159	0	930
	Economics	38	12	0	50
	Accountancy	0	29	0	29
	Business Analytics	0	28	0	28
	Taxation	0	1	0	1
	Total	809	229	0	1,038
CEAS	Kinesiology	147	14	0	161
	Recreation & Tourism	51	16	0	67
	Recreation	29	0	0	29
	Counseling and Guidance	0	42	0	42
	Education	0	89	0	89
	Educational Administration and Le..	0	67	0	67
	Educational Leadership Ed.D.	0	0	9	9
	Special Education	0	10	0	10
	Total	227	238	9	474
CLASS	Sociology	217	0	0	217
	Criminal Justice	314	0	0	314

5 Year Trend: Chemistry

(This chart changes based on College or Program Major selection)



College: AY 2016-2017



College
All

Program Major
All

Bachelor's
Total

Note

AY (Academic Year): A 12-month period beginning with the fall term and ending with a trailing summer. The AY 2016-2017 includes Fall 2016, Winter 2017, Spring 2017, and Summer 2017.

For graduate programs, the "Total" number of degrees awarded shown only reflect gra..

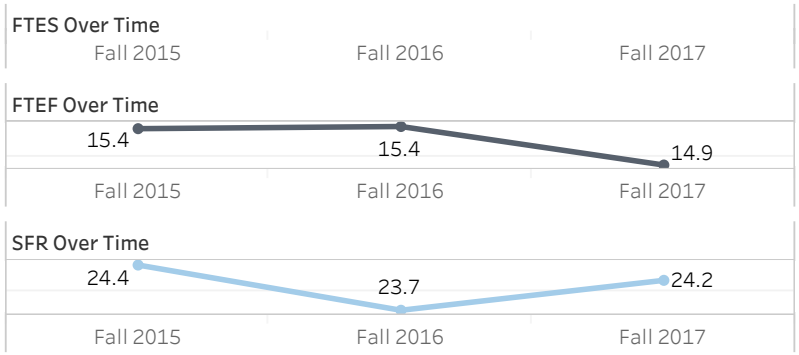
APR Coursework Data: Summary: Fall Term as of Census

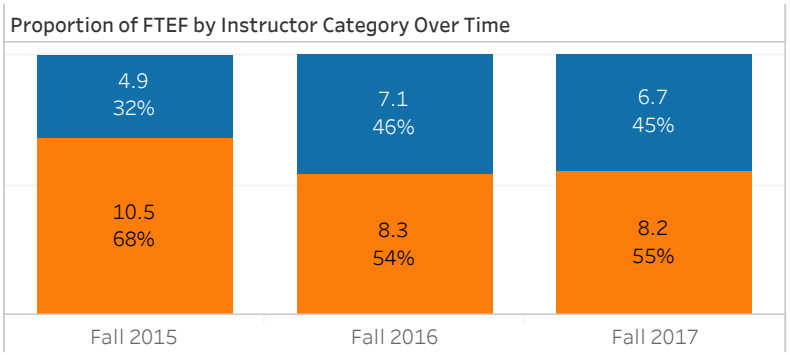
FTES, FTEF (instruction), and SFR of all state-side coursework

		Term & Year								
		Fall 2015			Fall 2016			Fall 2017		
College	Department	Ftes	Ftef	SFR	Ftes	Ftef	SFR	Ftes	Ftef	SFR
CSCI	CHEM	375.1	15.4	24.4	365.8	15.4	23.7	359.9	14.9	24.2
	Total	**375.1**	**15.4**	**24.4**	**365.8**	**15.4**	**23.7**	**359.9**	**14.9**	**24.2**
Grand Total		**375.1**	**15.4**	**24.4**	**365.8**	**15.4**	**23.7**	**359.9**	**14.9**	**24.2**

Academic Ye..	Multiple values
Term	Fall
Academic Org	All
College	All
Department	CHEM
Instructor C..	All

Make a selection in the table above to filter charts further

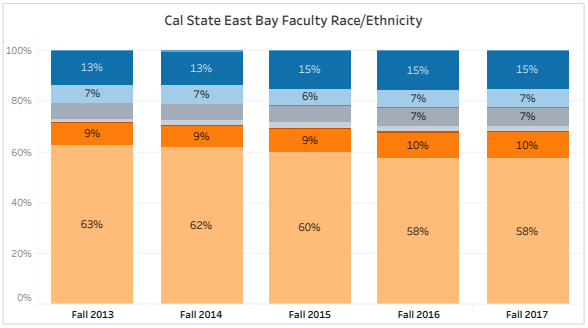


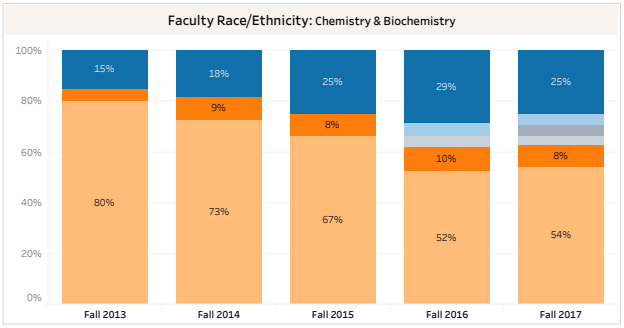


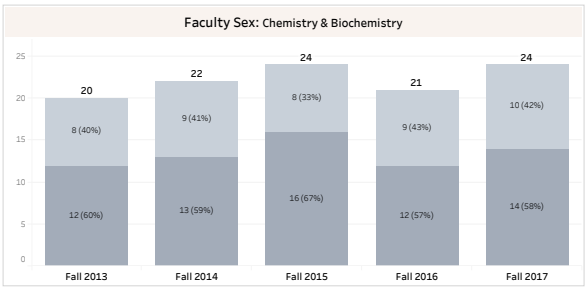
Instructor Category

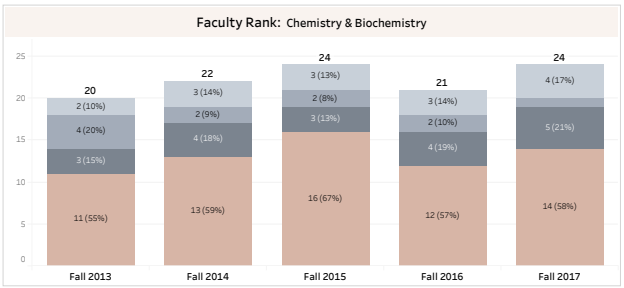
- Tenured, Tenure-track
- Non-tenured, Non-TT

Faculty Diversity









Department
Chemistry & Biochemistry

Term & Year
Multiple values

IPEDS Race/Ethnicity
- American Indian
- Asian
- African American/Black
- Hawaiian/PI
- Hispanic/Latino
- International
- Multiple races
- Unknown
- White

Faculty Sex
- Female
- Male

Faculty Rank
- Full Professor
- Associate Professor
- Assistant Professor
- Lecturer

Select a specific race/ethnicity subgroup in the faculty race/ethnicity chart for additional information.