

## **Biotechnology**

### **New Program Performance Item**

#### **Program/Unit:**

Biotechnology

#### **Data Trend Summary:**

Enrollment in the biotechnology program peaked in 2017-2018. Although there was a decline from 2017-18 to 2018-19, enrollments in lower division have been increasing over the past three years. After falling from 53 in 2017-18, FTES rebounded and increased from 50 to 59 over the three-year time span. Efficiency over this period also increased from 259 to 305. These increases were a result of higher fill rates (growing from 77% to 84%) since the department has offered the same number of sections for the past four years. Despite the pandemic, the biotechnology program continued to see robust enrollments with wait lists of 12-19 students for various online courses (BTEC 120, BTEC 180, BTEC 210, and BTEC 211) in 2020-21.

In upper division, the department has seen fluctuating enrollments. For Cohort 2 in Fall 2018, we welcomed 23 students to the program. We then hit the maximum enrollment of 30 students for Cohort 3 in Fall 2019. Following disruptions in learning and work due to the pandemic, we welcomed 22 students for Cohort 4 in Fall 2020. We have seen that upper division enrollments have been impacted in two ways:

1. Students struggling with pandemic-related stressors are not able to complete the program pre-requisites in time to start the program. Students have dropped key courses after conditional acceptance that makes them ineligible to enter the cohort on time.
2. Students are benefiting from a strong labor market with many well-paying entry-level opportunities available in the local industry. The department sees this as a win for our students although we have lost students between the acceptance period and their program start date.

Student demographics have remained relatively stable in lower division with an average age between 27-28. Our participation by female students has ranged from 55-61%. The LatinX/Hispanic population has ranged from 34-40%. The percentage of students in lower division that already have a bachelor's degree continues to hover around 15% with about a quarter of our lower division population being first-generation college students. About half of our lower division students are enrolled full-time and the same proportion are economically disadvantaged. In Fall 2020, 14% indicated that they were food insecure, and 18% reported being housing insecure. By contrast, 19% of the upper division students in Fall 2020 reported food insecurity and 25% indicated that they faced housing insecurity. This correlates with the much higher rate of economically disadvantaged students in the upper division program, ranging from 57-82% over the three year period. The % of first-generation college students in the bachelor's degree program is also higher than in lower division, increasing from 17% to 36% over the three years. Finally, it is notable that the participation by female and LatinX/Hispanic students in the bachelor's program has grown significantly over the three year period. The % female students grew from 39% to 73%, and the rate of participation of LatinX/Hispanic students increased from 35% to 46% over the same period. It appears that efforts to recruit diverse

students have been particularly successful with Latina students, who are extremely underrepresented in the life sciences industry.

The biotechnology programs consistently exhibit higher than average rates for success and retention. In lower division, retention rates have hovered around the 80-84% over the past three years with rates lowest during the pandemic. One of courses hardest hit by the pandemic was BTEC 110, which is our foundational lab skills course. Before the pandemic, retention rates were around 84%, while the rate dropped to 65% in 2020-21. Success rates in this course were also impacted dropping from around 75% pre-pandemic to 55% in 2020-21. Faculty for this course have observed a higher number of students dropping the course due to time conflicts with family and work obligations. This course takes significant time and effort, and many students have struggled to complete the extensive at-home lab activities. Biostatistics (BTEC 180) is another course that was negatively impacted by the pandemic. Retention rates went from 73% pre-pandemic to 60% in 2020-21. Although course success rates were always lower than average for this course (~65%), they dropped further to 47% in 2020-21. This lecture for this course was previously taught fully on-ground, but has been offered in live Zoom and asynchronous formats during the pandemic. Faculty are examining how these modalities may be impacting student learning. We have not observed significant changes to success and retention rates in other courses due to the pandemic.

Overall for lower division, success rates overall range from 74-77% (compared to the college average of 72%). When examining disproportionate impact by ethnicity, there was a slight impact on success for LatinX/Hispanic students in 2017-18, which has not been observed in the last three years. Unfortunately, we saw a large gap for success rates of Black/African-American students in 2019-20 of 41 percentage points that has been reduced to 24 percentage points in 2020-2021. The department will take time to examine how we can better serve Black/African-American students and empower them to succeed in the STEM workforce. Retention and success data disaggregated by all other metrics do not display any disproportionate impacts. In upper division, we have 100% retention in the program although a few students have taken a short break and then returned to continue their studies with a subsequent cohort. Our upper division course success rates range from 96-99% across the three-year period. No disproportionate impacts are observed in upper division per any metric tracked by the college.

In terms of certificate and degree completions, we saw an increase from 62 to 79 graduates followed by a decline to 72 graduates over the three-year time period. Before the pandemic, faculty reminded students in the classroom to apply for degrees and certificates. Since the pandemic began, it has been more difficult to stay on top of these reminders. We observed a drop in associate degrees awarded from a high of 26 in 2019-20 to only 9 awards in 2020-21. Certificate completions also decreased from 118 in 2019-20 to 70 awards in 2020-21. We will continue to work with counseling to help students identify and apply for certificates and degrees.

#### **Data Analysis and Use for Improvement:**