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Success in BIOSCI-100 by Major  
RB #216

**College of the Canyons**

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Institutional Research, Planning, and  
Institutional Effectiveness

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## ***Introduction & Background***

At the request of the Biology Department and following up on analyses conducted by Data Coaches assisting the Biology Department, the Office of Institutional Research, Planning, and Institutional Effectiveness examined course success data and grade distribution for General Biology (BIOSCI-100) disaggregated by the student Program Major. Specifically, Biology Majors, Allied Health Sciences, versus “Other”. The purpose of this analysis is to examine whether there should be two tracks/paths to BIOSCI-100; one for Biology majors/Allied Health Sciences majors and one for students taking BIOSCI-100 purely as part of GE (general education) requirements.

Specifically, this brief is intended to address the following research questions:

- What is the trend in rate of success in students’ first-attempts in BIOSCI-100 across the last 3 Fall terms 2017-2019?
- What is the rate of success in students’ first-attempts in BIOSCI-100, disaggregated by student Program Major (e.g., Biology, Allied Health Sciences or “All Others”)?

- Do the grade distributions, specifically letter grades As and Bs differ, disaggregated by student Program Major (e.g., Biology, Allied Health Sciences, or “All Others”)?

## Method

To conduct the analyses, Informer was used to access grade reports for Biological Science 100 (BIOSCI-100) for the 3-year fall terms 2017, 2018, and 2019. This was limited to students’ first-attempts at BIOSCI-100.

These data were merged with the Active Programs Majors Informer report to identify the declared majors of all students within the terms they completed BIOSCI-100. Students with a Biology as their declared major during the term they were enrolled in the BIOSCI-100 course were coded as “Biology”. Students with majors that were all those included in the Health Professions while they were enrolled in the BIOSCI-100 course were coded as “Health Professions”. Health Professions includes MLT, Nursing, EMT, Health Sciences and Public Health. All other majors on file were coded into “Other”.

## Results

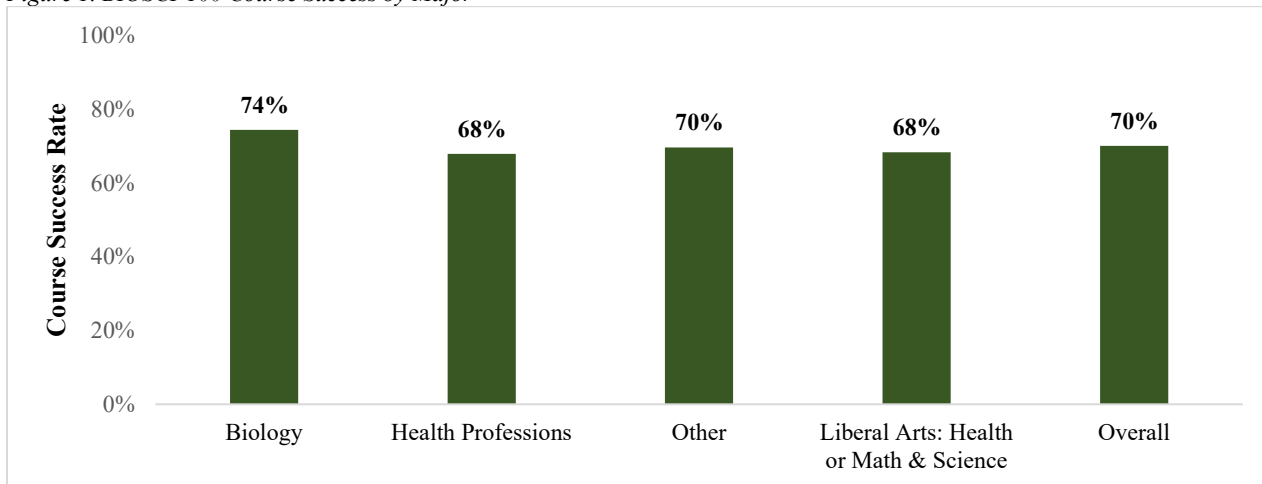
There were a total of 2,178 first-time takers of BIOSCI-100 in the respective fall terms (2017-19). Of those a total of 402 (18%) were Biology majors, 446 (20%) were Health Professions majors and a majority 1,188 (55%) were “Other” majors. A fourth category distinct from the initial research question proposed majors was created for Liberal Arts & Sciences Health Sciences and Liberal Arts & Sciences Math & Sciences (n = 142) and these would comprise 7% of the total 2,178 if assessed as their own category (*See Table 1*).

	<i>Biology</i>	<i>Health Professions</i>	<i>Other</i>	<i>LibArts HealthMathSci</i>	<i>Total</i>
<i>Total N</i>	402	446	1188	142	2178
<i>%</i>	18%	20%	55%	7%	100.0%

	<b>Biology</b>	<b>Health Professions</b>	<b>Other</b>	<b>Liberal Arts: Health or Math &amp; Sciences</b>	<b>Total</b>
<b><i>Total N</i></b>	402	446	1188	142	2178
<b><i>%</i></b>	18%	20%	55%	7%	100%

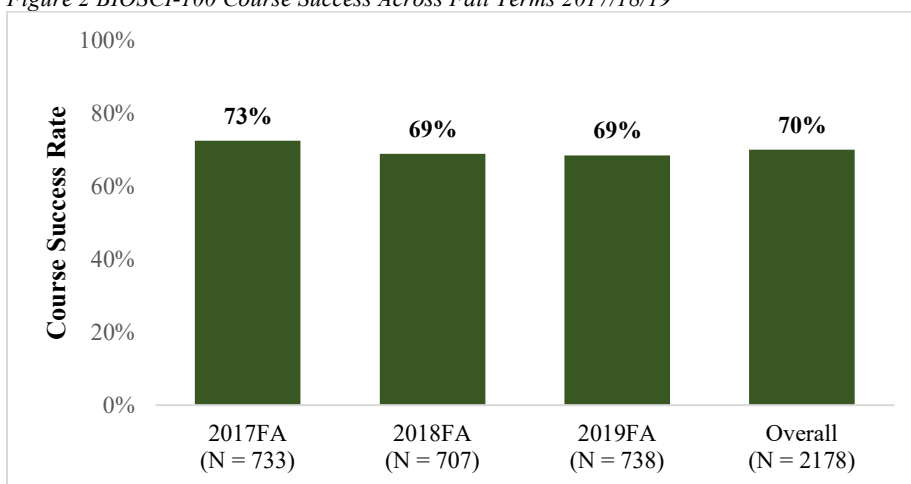
These Liberal Arts students are students who may be interested in a science like Biology or in Health Professions in the future and thus, we did an initial assessment of course success rates with them disaggregated (*Figure 1*) however, in all analyses thereafter in this report Liberal Arts is subsumed into the “Other” majors category as chi-square ( $X^2$ ) tests for significance did not illustrate significant differences ( $p = .18$ ). They are Liberal Arts & Sciences majors not traditional Biology or Health Professions majors as was pertinent to the original research questions.

Figure 1. BIOSCI-100 Course Success by Major



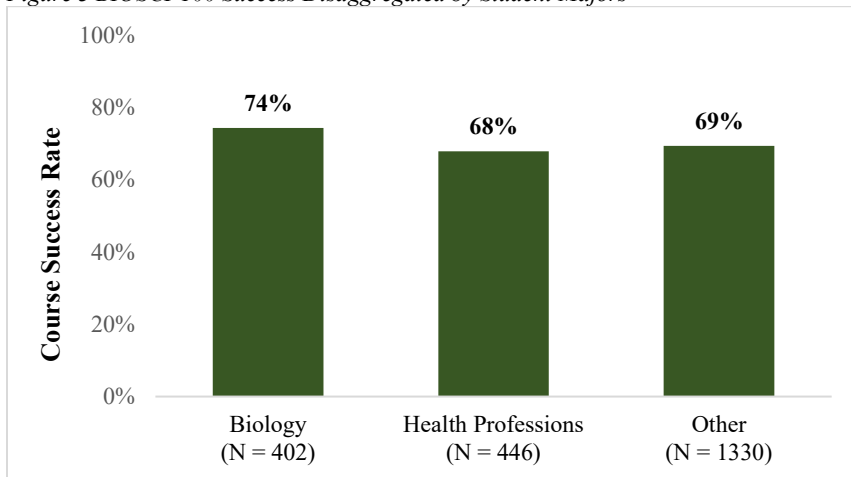
To address the first research question, an assessment of course success rates was conducted over the last three fall terms. The average overall success rate for BIOSCI-100 was 70% among students who were first-time takers of BIOSCI-100. The highest rate of success was in fall of 2017 (73%) and in fall of 2018 and 2019 the success rates were 69% (see Figure 2).

Figure 2 BIOSCI-100 Course Success Across Fall Terms 2017/18/19



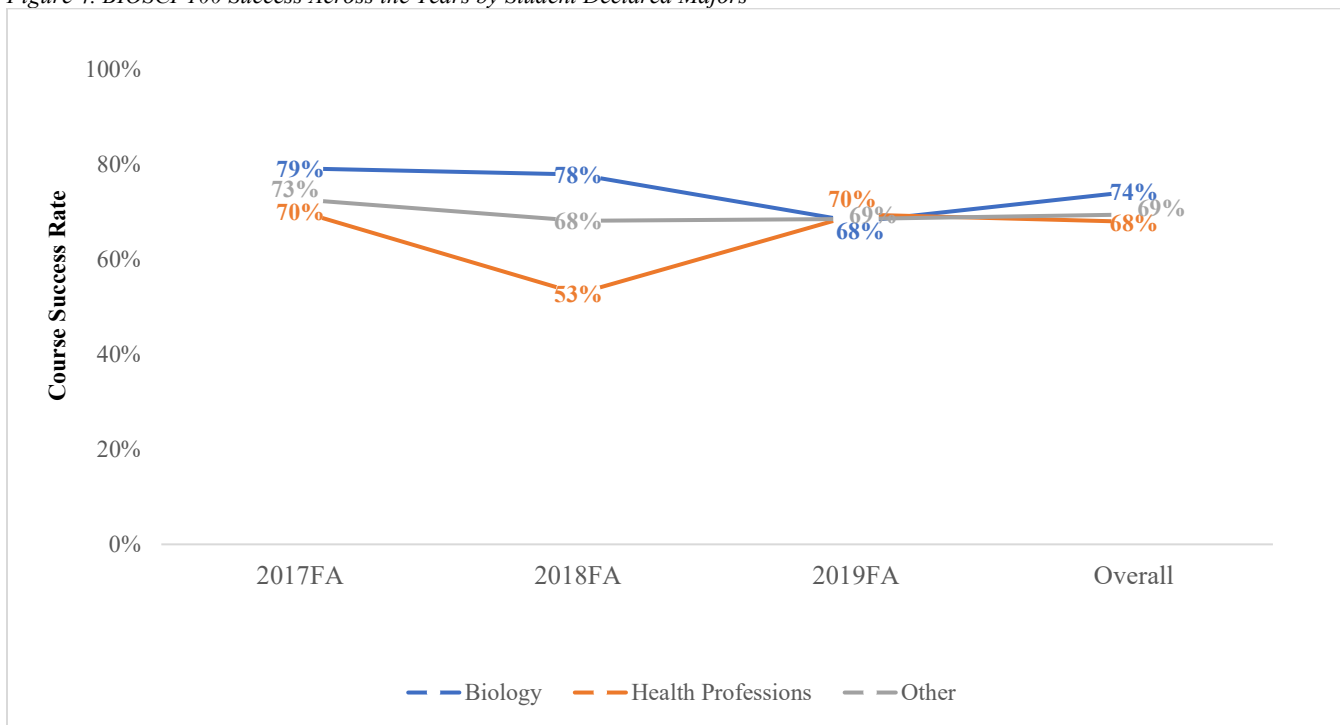
To address the second research question, the success rates across these last three fall terms were disaggregated by student declared major (Biology, Health Professions, and “Other”). The majors with the highest course success rate were students with a declared major of Biology (74%). Students with declared majors of Health Professions or “Other” had similar success rates at 68% and 69% respectively (see Figure 3). We assessed if these success rates by major were significantly different from each other. Specifically, if Biology majors had significantly higher BIOSCI-100 course success rates than each of the other declared majors, a chi-square test for significance was conducted. Results illustrated a non-significant difference of declared major on course success rates at the  $p > .05$  level for the three majors [ $\chi^2(2, N = 2,178) = 4.75, p = .093$ ].

Figure 3 BIOSCI-100 Success Disaggregated by Student Majors



To assess if there were any significant difference in BIOSCI-100 course success rate by student declared major across the three fall terms a longitudinal approach was taken. Course success rates for each of the majors was most similar in fall of 2019 and fall 2017. Chi-square tests revealed a non-significant difference in course success disaggregated by student majors for fall 2017 ( $p = .214$ ) and fall 2019 ( $p = .965$ ). It was only in fall 2018 where there was a significant difference in BIOSCI-100 course success based on student major [ $X^2 (2, N = 707) = 12.05, p = .002$ ]. Specifically, post-hoc analyses z-tests revealed that average course success rate for Biology majors (78%) was significantly different than Health Professions majors (53%). The success rate for “Other” majors (68%) was not significantly different from Health Professions (53%) or Biology (78%). In summary, assessing course success by fall terms, there was only a significant difference based on the student major for fall 2018 BIOSCI-100 course success rates specifically between Biology and Health Professions.

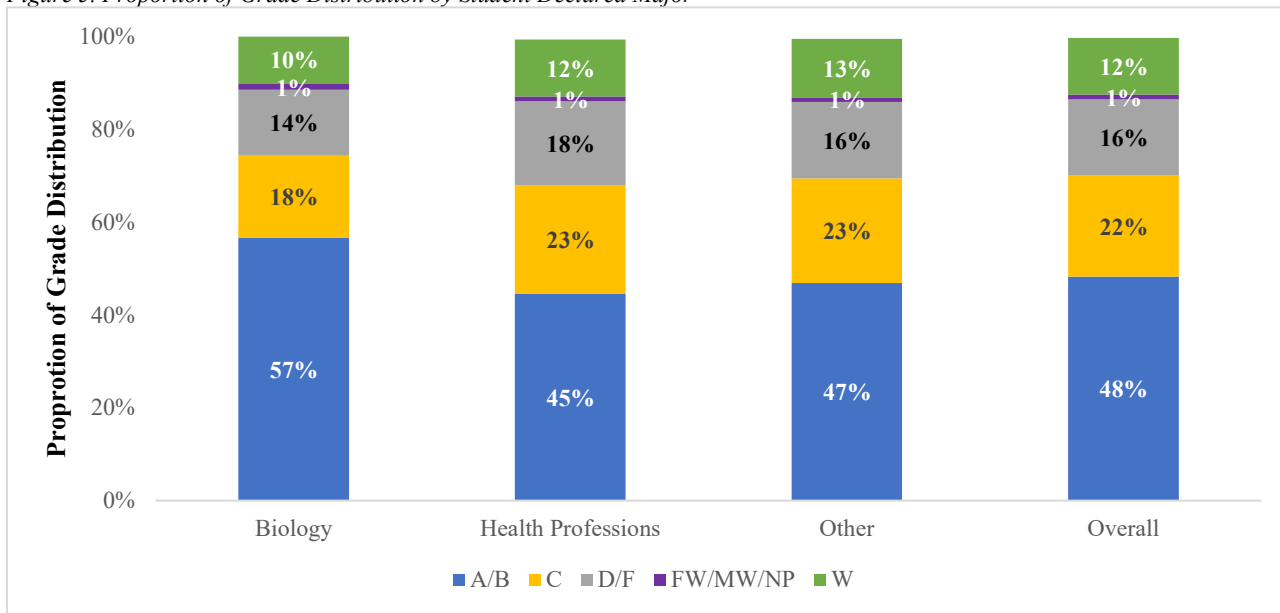
Figure 4. BIOSCI-100 Success Across the Years by Student Declared Majors



Due to the nature of the biology major and that all subsequent BIOSCI course work builds upon course 100 and becomes increasingly difficult thereafter, the biology department was interested in assessing grade distribution

by student declared majors. Specifically, they were interested in the distribution of students who receive grades of letter A or B by student major. The overall rate of A and B letter grades was 48% among all students who have taken BIOSCI-100 fall 2017-2019. The majors with the highest proportion of A or B letter grades was Biology majors (57%) followed by “Other” majors at 47% and Health Professions majors at 45% (see Figure 5).

Figure 5. Proportion of Grade Distribution by Student Declared Major



## Recommendations

Upon review of the results of the BIOSCI-100 course success rates, the following recommendations can be taken into consideration:

- Biology majors have most consistently had higher BIOSCI-100 course success rates with the most significant difference (statistically) being in Fall of 2018. Thus, suggesting that a different BIOSCI-100 pathway may be beneficial for students who are not Biology majors.

## References

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