

## ANNUAL PROGRAM REPORT

College	Science
Department	Statistics and Biostatistics
Program	BS Statistics
Reporting for Academic Year	2019-2020
Last 5-Year Review	2018-2019
Next 5-Year Review	2023-2024
Department Chair	Joshua Kerr
Author of Review	Joshua Kerr
Date Submitted	01 October 2020

### I. SELF-STUDY

#### A. Five-Year Review Planning Goals

The five-year review includes planning goals for curriculum (3.1), students (3.3), faculty (3.4), and resources (3.5).

To summarize, the curriculum plans (3.1) include:

1. Develop online courses at the undergraduate level
2. Continue to develop curriculum that addresses cloud computing and big data, beyond what we already have.

The student plans (3.3) include:

1. Enhance and grow our BS program
2. Recruit community college students into our BS program
3. Increase the use and diversity of computation in courses
4. Raise f

Regarding 3.1 (Curriculum):

**Curriculum:** With the implementation of EO 1110, the department now hires graduate students as TAs to teach newly developed support courses, beginning Fall 2018. With semester conversion, the department now offers a concentration in Data Science at the undergraduate level.

**Students:** Nothing to add.

**Faculty:** Nothing to add.

**Staff:** With the implementation of EO 1110, an already strained staff has had a significant increase in workload. Additional support is needed.

**Resources:** Our Department's programs would greatly benefit from a dedicated computer lab and/or funds so that every graduate student has his/her own laptop computer or accounts on cloud sites that would enable running and utilizing statistical software and solutions.

**Assessment:** The department continues to carefully monitor the assessment of its programs, proposing curricular and advising changes, as necessary.

**Other:** No significant program modifications were made last year.

## II. SUMMARY OF ASSESSMENT

### A. Program Learning Outcomes (PLO)

Students graduating with a BS in Statistics will be able to:	
<i>PLO 1</i>	Apply basic computational skills in descriptive statistics and data visualization, hypothesis testing, confidence intervals, modeling and error analysis, including the use of large data sets.
<i>PLO 2</i>	Analyze data using appropriate software, including cloud-based software, and to interpret results covering descriptive statistics and data visualization, hypothesis testing, confidence intervals, modeling and error analysis, including the use of large data sets.
<i>PLO 3</i>	Communicate to others results involving descriptive statistics and data visualization, hypothesis testing, confidence intervals, modeling and error analysis using reproducible research best practices.
<i>PLO 4</i>	Generate data sets using methods of design of experiments, survey sampling, or observational data, including data scraping and data wrangling from open source data and free data sources.

### Program Learning Outcome(S) Assessed

Year : 2019-2020	
<i>Which PLO(s) to assess</i>	PLO 4
<i>Is it aligned to an ILO?</i>	No
<i>History</i>	Assessed annually in the Spring Semester.

**B. Summary of Assessment Process**

**Instrument(s):**

For the Statistics BS program STAT 432 “Regression” was formally identified as the course to use for end-of-program assessment. Majors usually take this in their last semester.

**Sampling Procedure:** We sample by gathering data from all students attempting to complete our capstone experience. Specifically, the capstone experience for the BS Statistics is the regression course, STAT 432.

**Sample Characteristics:** All undergraduate majors completing STAT 432 were sampled.

**Data Collection:** STAT 432 is given every Spring for which the SLO’s identified are assessed by the instructor on record.

**Data Analysis:** The instructor creates a rubric 1-5 (5 mastered) for the project assigned.

<i>Course name and number</i>	STAT 432 – Introduction to Linear and Logistics Regression
<i>SLO from course</i>	Upon successful completion of this course, students will be able to communicate statistical concepts clearly and appropriately to others.
<i>Assessment activity</i>	Data Analysis and Project
<i>Assessment Instrument</i>	Departmental Rubric
<i>How data will be reported</i>	Quantitative, report to include proportion of students in each level 1-5 (5 mastered)
<i>Responsible person(s)</i>	Instructor for STAT 432, Assessment Rep

**Summary of Assessment Results**

Main Findings: **Main Findings:**

Percentages of Rubric-Scores for Statistics BS 2019-2020


**Recommendations for Program Improvement:**

Due to semester conversion, much of existing course content and course sequences have been altered. This has resulted in a drastic increase of student advising.

**Next Step(s) for Closing the Loop:**

We will continue to monitor the evaluation of our SLO's to determine if additional advising or curricular changes need to be addressed.

**Other Reflections:** We have no additional reflections on assessment currently.

**C. Assessment Plans for Next Year**

Most PLOs are the same and assessment will be for comparable courses.

1. Which PLO(s) to assess	PLO 1
2. Is it aligned to an ILO?	Yes
3. If yes, list ILO.	Thinking and Reasoning
4. Course name and number	STAT 432 – Introduction to Linear and Logistics Regression
5. SLO from course	Apply statistical methodologies, including (a) simple and multiple linear regression, (b) model diagnostics and transformations, and (c) logistic regression. Communicate statistical concepts clearly and appropriately to others.
6. Assessment activity	Data Analysis and Project
7. Assessment Instrument	Departmental Rubric
8. How data will be reported	Quantitative, report to include proportion of students in each level 1-5 (5 mastered)
9. Responsible person(s)	Instructor for STAT 432, Assessment Rep
10. Time (which semester(s))	Spring 2019
11. Ways of closing the loop	Internal assessment of assignment and rubric

**III. DISCUSSION OF PROGRAM DATA & RESOURCE REQUESTS**

**A. Discussion of Trends & Reflections**

**Notable Trends;**

Please see Appendix A for graphs and tables supporting the following information. Our BS Statistics program is on the rise. We have seen a 130% increase in undergraduate majors over the past 5 years, 18 in 2015 and 42 as of the writing of this report. The Department of Statistics and Biostatistics continues to have one of the highest SFR in the College of Science. The department's FTEF % grew slightly for tenured / tenure track while decreasing slightly for non-tenure / tenure track.

**Reflections on Trends and Program Statistics:**

The Department of Statistics and Biostatistics is a huge service department for the College

and University with a high SFR. We have always had a large graduate program, but now that our undergraduate program is taking off, primarily due to the concentration in Data Science, our tenure track faculty are being spread even thinner throughout our three programs.

Also not reflected in this data is the huge impact of EO 1110 on our department. Our commitment to providing service courses for the university is larger than ever. There has been considerable investment by the faculty in development of the new support-course model to accommodate the new freshmen who are no longer able to take remedial course

## Appendix A

### III A. Discussion of Trends & Reflections

#### Notable Trends:

Tables of enrollment for Fall 2019 are broken down by race/ethnicity and sex.

<b>Fall 2019</b>	<b>Statistics BS (%)</b>
Asian	10 (28)
Black/African	

ADD Collaborative Data Summary Fall Term 2016 of Courses

Faculty (Instruction) and Student's side coursework

Term & Year

College-Department	FTEC	PTEC	STC	STC	STC	STC	STC	STC	STC	
	149	242	2903	146	199	303.8	14.9	20.4	CHEM	359.9

