Program Assessment Report (PAR)

Statistics (STA) Baccalaureate Degree

REPORT PREPARED by: Pedersen, Steen

ACADEMIC YEAR COVERED BY THIS REPORT: 2020-2021

I. PROGRAM LEARNING OUTCOMES

1. Graduates will be able to solve problems in a broad range of significant Mathematics and Statistics. 2. Graduates will be able to produce and judge the validity of rigorous theoretical arguments. 3. Graduates will be able to communicate mathematical/theoretical ideas and arguments.

II. PROCEDURES USED FOR ASSESSMENT

A. Direct Assessment

An assessment plan containing learning outcomes was designed in the spring of 2019. The 2020-2021 assessment focused on the second learning outcome. The data were collected in December 2021 and was analyzed during the spring 2022 semester. The course selected was STT 4610 Theory of Statistics I. The final exam was used to assess students' mastery of the learning outcome 2. Graduates will be able to produce and judge the validity of rigorous theoretical arguments. For statistics majors this translated to every graduating statistics major should demonstrate the ability to use appropriate theoretical tools and statistical software to conduct sophisticated data analysis. Students were expected to do seven problems from the assessment set. The rubric described below was used to assess students' papers. Students' papers were first graded using the usual scale of 0%-100% which is associated with the rubric below as follows Excellent 96 - 100%; Very good 90 - 95%; Satisfactory 70 – 89%; Questionable 60 - 69%; Unacceptable 0 - 59%. Excellent 1. Examplary solution which demonstrates full comprehension of the skill. 2. Student presents solution in highly articulate statistical and English language. 3. No errors. Very good 1. Cogent solution which demonstrates good comprehension of the skill. 2. Student presents solution in understandable statistical and English language. 3. Errors are insignificant. Satisfactory 1. Understandable solution which demonstrates reasonable comprehension of the skill. 2. Student presents solution in decipherable statistical and English language. 3. Errors are minor

Questionable 1. Incomplete solution which demonstrates partial comprehension of the skill. 2. Student presents solution incompletely or misused statistical and English language. 3. Errors are significant Unacceptable 1. Poor solution which demonstrates little or no comprehension of the skill 2. Student presents completely incorrect solution. 3. Errors are striking

B. Scoring of Student Work

The instructor scored the exam using the rubric described. The rubric and analysis was shared with, and approved by, the Undergraduate Committee.

C. Indirect Assessment

We have started conducting exit interviews during which we have asked students what we could have done differently. Starting with the Spring 2022 graduating class we will add questions asking students to rate their learning of each learning outcome and also the suggested questions.

III. ASSESSMENT RESULTS/INFORMATION:

There were only 6 students in the assessment group. Of those 4 obtained a score of 3 (Satisfactory) or higher. This is on the boundary of the expected outcome.

According to the assessment plan we expect 75% of our graduates to meet the learning outcome. Score 1 2 3 4 5 Fequency 1 1 3 0 1 We note that the small number of students in the course makes this assesment outcome difficult to interpret.

The difference in how well students' met the benchmark may be due to differences in the pre-requisites for the courses assessed. MTH 4460 students take a sequence of courses designed for future elementary and middle school teachers where the focus is to explain their reasoning. The pre-requisite courses for MTH 3320 and STT 3600 have been identified by program faculty as focusing exclusively on computational skills at the expense of developing mathematical reasoning and communication skills.

IV. ACTIONS TO IMPROVE STUDENT LEARNING

The Undergraduate Committee conducted and analyzed these results. In the Fall 2022 semester the department will focus a meeting on undergraduate program assessment. 1. We will discuss using this year's assessment of the Math BS and BA as a model of how to design a special assessment to target a learning objective vs using standard course assessments as in this one. 2. We will discuss outcomes of exit interviews from Spring 2022. 3. We will discuss the difficulties of using many of our listed classes for program learning outcome measurement when we have so few students in some of our programs.

V. SUPPORTING DOCUMENTS

Additional documentation, when provided, is stored in the internal Academic Program Assessment of Student Learning SharePoint site.