



## Program Assessment Report (PAR)

Mathematics, BA (MTH) Baccalaureate Degree

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ACADEMIC YEAR COVERED BY THIS REPORT: 2021-2022

### 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 2021-2022 assessment focused on the third learning outcome. The data were collected in Spring 2022 and was analyzed during the fall 2022 semester. The course selected was MTH 4820. A special assessment was designed to address the learning outcome 3. Graduates will be able to communicate mathematical/theoretical ideas and arguments. For math majors this is clarified to state at a minimum, each graduating Math major should demonstrate an ability to present a short, expository writing on a small body of mathematics included in the course. The following criteria was used in the evaluation of students' solutions 1. Correctness: Are all of the statements made in the writing valid? 2. Clarity: Is the topic well motivated and can it be read without undue difficulty? 3. Conciseness: Is the exposition to the point? 4. Is the exposition in good English? We will expect a 75% success rate for the evaluation based on the above criteria. One question was selected by the instructor of the course, which was part of the final exam for the course, counting towards their course grade. All students' submissions were assessed by the instructor for the course, whose grading rubrics was approved by the Department Undergraduate Committee (DUC) members. The DUC met to analyze each student's writing based on the instructor's rubrics, as well as to evaluate the use of English language. The assessment is available upon request.

## **B. Scoring of Student Work**

The instructor used a rubric (attached) for grading. The rubric was shared with, and approved by, the Undergraduate Committee. The Undergraduate Committee met to evaluate each student's writing to see whether the writing is in good English, in addition to the mathematical correctness of the writing.

## **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 the learning outcome being assessed in that year's cycle.

## **III. ASSESSMENT RESULTS/INFORMATION:**

2 students completed the course. Both students' writings scored above the passing grade of the selected problem, and both writings were in good usage of English language.

According to the assessment plan we expect 75% of our graduates to meet the learning outcome. We actually have 100% of graduates who met the goal. We have met and exceeded this goal.

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 2023 semester the department will focus a meeting on undergraduate program assessment. 1. We will discuss using this year's assessment as a model of how to design a special assessment to target a learning objective vs using standard

course assessments. 2. We will discuss outcomes of exit interviews from Spring 2023. 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.