



## Program Assessment Report (PAR)

### Mathematics (MTH) Masters Degree

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ACADEMIC YEAR COVERED BY THIS REPORT: 2021-2022

#### I. PROGRAM LEARNING OUTCOMES

Graduate students are able to communicate mathematical ideas and arguments. Graduate students are able to solve problems in a broad range of significant mathematics. Graduate students are able to produce and judge the validity of rigorous mathematical arguments.

#### II. PROCEDURES USED FOR ASSESSMENT

##### A. Direct Assessment

The Department of Mathematics and Statistics Graduate Committee (DMSGC) selected MTH7320 (Real Analysis II) offered in Spring 2022 for this assessment. MTH7320 (Real Analysis II) covers the basic theory of linear functional analysis, which is indispensable for most areas in mathematics. In consultation with the faculty member teaching the course, the DMSGC determined (i) problem #2 from Midterm II and (ii) presentation of reading project (instead of the final examination) to analyze the solutions and comprehensive math readings of all two students from the class. The selected Midterm II problem considered deep contrast of compactness concept between finitely dimensional spaces and infinitely dimensional spaces. Two reading projects assigned to two students were  $L^p$  spaces ( $p < 1$ ) and neat extension of continuous functions.

##### B. Scoring of Student Work

The exam problem outcomes were evaluated based on a rating scale (0 - 8), while the presentations of reading projects adopted another rating scale (0 - 100). The following criteria were used when the faculty member teaching the course and DMSGC evaluated solution and presentation 1. Correctness: Are all of statements

made valid and proved? 2. Clarity: Is the proof presented in a readable manner? 3. Conciseness: Is the exposition to the point? 4. Is the exposition in good English?

### **C. Indirect Assessment**

Classroom and out of classroom communications for indirect assessment.

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

For 2021-2022 assessment, MTH 7320 (Real Analysis II) offered in Spring 2022 was evaluated. Problem #2 from Midterm II was selected, and two reading projects were presented.

The selected Midterm II problem and two reading projects were found to adequately design for meeting the program learning outcomes. The two students taking MTH 7320 under evaluation scored 7 and 8 (out of full score 8) on the selected Midterm II problem. They scored 85 and 100 (out of full score 100) on their presentations of reading projects. All these indicated that the students were achieving the program learning outcomes.

[Analysis]

## **IV. ACTIONS TO IMPROVE STUDENT LEARNING**

The results from this assessment will be reported to math faculty for feedback and discussed in future DMSGC meetings for further student learning.

## **V. SUPPORTING DOCUMENTS**

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