

Annual Assessment: B.S. in Mathematics - Applied Mathematics Option
M 441 - Numerical Linear Algebra and Optimization
AY 2013-2014

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This report summarizes an assessment of M441 with regard to the Applied Mathematics Option. The learning outcome and rubric are listed below.

- (Outcome 3) Select and implement an appropriate mathematical technique needed to analyze and validate a mathematical model.

Data Collection:

In Fall 2013, M 441 had a total of 31 students enrolled. Of these, six were pursuing an Applied Mathematics Option. For the assessment, student performance on Lab #2 - “Linear and Nonlinear Least Squares” was used.

Rubric:

Unacceptable - The work is not correct and complete because either there are fundamental gaps in understanding of the underlying mathematical assumptions or in the understanding of the appropriate technique and its implementation.

Marginal - The work is not correct and complete because one or two significant components of the analysis or of the implementation are missing, but the majority of the ingredients are present.

Acceptable - The work is almost correct with relevant assumptions addressed and the correct algorithm chosen with an implementation that could work, but is implemented with a minor misunderstanding of a technique or a minor error in other elements of the computations.

Exceptional - The work is fully correct and complete, with a full understanding of the underlying mathematical assumptions that deem a particular mathematical technique applicable to a given model and with an appropriate knowledge of the main principles and techniques related to the implementation of a particular form of analysis, mathematical or numerical.

Scores:

Acceptable - 5 students achieved this level of performance

Exceptional - 1 student achieved this level of performance

Recommendation:

The course focuses on mathematical foundations of computation and the use of technological tools needed to solve problems from applied mathematics. The course does not focus on the development of and the analysis of mathematical models. Consequently, there is only a very limited number of opportunities to assess Outcome 3. I recommend that Outcome 1 and/or Outcome 4 be assessed for M 441 in the future.