Assessment Report: B.S. in Mathematics- Mathematics Option
Learning Outcomes Academic Year 2015-2016

Fall 2015 Assessment Results

M 383 – Introduction to Analysis I

Assessment Coordinator: Lukas Geyer

According to the below description of Mathematics Program Learning Outcomes and Assessment, 12 students were assessed for Outcome 1 in M 383.

Outcome 1: Students should demonstrate the ability to prove basic mathematical propositions and generate computations related to Sets and sequences of real numbers, and functions and derivatives of real-valued functions of one real variable.

There were 23 students enrolled in the beginning of the semester. Two of these students withdrew with a W before the end of the semester. Of the remaining 21 students, 12 were majoring in Mathematics – Mathematics (non-applied option.) The problems on the final exam were used to assess the learning outcomes. Results were as follows:

Excellent	Acceptable	Marginal	Unacceptable
5	2	3	2

Recommendations: None at this time

Spring 2016 Assessment Results

M 384 – Introduction to Analysis II

Assessment Coordinator: Lukas Geyer

According to the below description of Mathematics Program Learning Outcomes and Assessment, 12 students were assessed for Outcome 2 in M 384.

Outcome 2: Students should demonstrate the ability to prove basic mathematical propositions and generate computations related to Series of real numbers, sequences of real-valued functions of one real variable and their Riemann integrals.

There were 16 students enrolled in the beginning of the semester. Two of these students withdrew with a W before the end of the semester. Of the remaining 14 students, 12 were majoring in Mathematics – Mathematics (non-applied option.) Problems 1-6 on the final exam were used to assess the learning outcomes. Results were as follows:

Excellent	Acceptable	Marginal	Unacceptable
2	6	1	3

Recommendations: The department should possibly add basic multivariable calculus to the learning outcomes, since it is the major focus of the second half of this course.

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Program Learning Outcomes

Students should demonstrate the ability to prove basic mathematical propositions and generate computations related to (1)-(4) and at least two of (5A)-(5C):

1. Sets and sequences of real numbers, and functions and derivatives of real-valued functions of one real variable
2. Series of real numbers, sequences of real-valued functions of one real variable and their Riemann integrals
3. Linear transformations, their matrix representations and their eigenspaces
4. Abstract algebraic structures
    a. Applied mathematics
    b. Numerical analysis
    c. Dynamical systems

Curriculum Map and Assessment Schedule

	Outcomes							Assessment Schedule
	1	2	3	4	5A	5B	5C	
M 333, Linear Algebra			X					Even fall semesters
M 383, Introduction to Analysis I	X							Odd fall semesters
M 384, Introduction to Analysis II		X						Even spring semesters
M 431, Abstract Algebra I				X				Odd spring semesters
M 441, Numerical Linear Algebra and Optimization						X		Odd fall semesters
M 442, Numerical Solution of Differential Equations						X		Even spring semesters
M 450, Applied Mathematics I					X			Every 4th fall, begins F13
M 451, Applied Mathematics II					X			Every 4th spring, begins S14
M 454, Introduction to Dynamical Systems I							X	Every 4th fall, begins F14
M 455, Introduction to Dynamical Systems II							X	Every 4th spring, begins S15

Learning Outcome	Unacceptable	Marginal	Acceptable	Excellent
(1)-(5C) Prove basic mathematical propositions.	The work is not logical and complete because either terms are used improperly or key ideas are missing or organization is unlikely to result in a correct proof even if a few more ideas are inserted.	The work is not correct and complete because key ideas are missing, but the terms are properly used and the work shows a type of organization that might work if the right ideas were inserted in the proper places. Also, the work is "marginal" if most of it leads toward a correct proof, but a false statement is inserted.	The work is almost correct with relevant terms used and ideas that work, but not well-organized; for example, with some steps out of order, or with something relatively minor incomplete.	The work is fully correct and complete, with the relevant terms properly employed and ideas that work, and the steps well-organized into a logical sequence.
(1)-(5C) Generate computations.	If the work is not correct and complete because either there are fundamental gaps in understanding the underlying mathematical methods or there are two or more significant errors in the computations.	The work is not correct and complete because a significant component of the analysis is missing or incorrect, but most of the components are present.	The work is almost correct with the appropriate methods employed but with a minor error or misunderstanding of one part of the computations.	The work is fully correct and complete and displays full understanding of the appropriate mathematical methods.

Threshold

At least half of the majors in each of the courses are assessed as “excellent” or “acceptable” for all the learning outcomes.