

# Mathematics Program and Course Changes

January 27, 2015

# The Problem

Learning Outcome: “Demonstrate the ability to make rigorous mathematical arguments and work with axiomatic systems.”

## The Problem

Benchmark (80% of students scored at C- or above on final exams) met in only two of six classes assessed

In particular *not met* in critical courses

MTH 344 (Group Theory) & MTH 345 (Ring Thy.)

MTH 311/2 (Advanced Calculus I & II)

## The Solution

Give students more opportunity to develop theorem-proving skills!

In particular, we propose to increase the emphasis on theorem-proving, or proofs, in MTH 341 (Linear Algebra I) and MTH 355 (Discrete Mathematics).

To make this possible, we make MTH 280 (Introduction to Proof) a prerequisite for MTH 341 and MTH 355.

## The Solution

Students need time to develop proofs skills. Generally speaking, proofs in MTH 311 are a bit more elaborate than those in MTH 344, so we have made MTH 344 prerequisite to MTH 311.

## The Solution

“  $\longrightarrow$  ” means “is a prerequisite to”

Currently: 253, recomb. 280  $\longrightarrow$  355

Currently: 280, 341  $\longrightarrow$  344

Currently: 253, 254, 280  $\longrightarrow$  311

Proposed: 280  $\longrightarrow$  355

Proposed: 280  $\longrightarrow$  341

Proposed: 341, choice of 337, 346, 355, 441  $\longrightarrow$   
344  $\longrightarrow$  311

# The Mathematics Minor

This impacts the Mathematics minor, so we propose to include MTH 280 as a minor requirement, and lower the upper-division minor requirement from four courses to three.

## Other Course Changes - MTH 337/338

We have consolidated MTH 337 ((Euclidean) Geometry) and MTH 338 (Axiomatic (Non-Euclidean) Geometry) into a single MTH 337 and changed the course description to allow for instructor choice regarding the Euclidean-ness of the content.



## Other Course Changes - MTH 354

Will now have sufficiently rigorous and targeted content to be an appropriate free elective for the Mathematics major, and a required course the Applied track.

## Changes to Mathematics major, Applied track

In “Choose three of ...” we change MTH 355 to MTH 354

Add “Choose one of 337, 346, 355, 441”

Reduce the number of upper-division free electives from two to one.

# Changes to Mathematics Teacher Education major

MTH 337 added as requirement; choice of MTH 337 or MTH 338 deleted.

## Course Changes Germane to Computer Science, CS/Math, and Information Systems Majors

Currently: 231  $\longrightarrow$  354

Currently: MTH 354 does not count toward a math major.

Proposed: 231  $\longrightarrow$  232  $\longrightarrow$  354, or

253  $\longrightarrow$  354, or

254  $\longrightarrow$  354

Proposed: MTH 354 counts as an upper-division mathematics elective.

# Summary

We are confident that these changes will strengthen our majors and minor!

# Thank You!