

CAP 4 Year Review Mathematics Courses

Wiebke Diestelkamp, Mathematics
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About the courses

- MTH 114 Contemporary Mathematics (2017-2018): Course for majors who do not need any specific background in mathematics. Topics include voting methods, power in weighted voting systems, fair division, apportionment, descriptive statistics, basic probability, normal distribution.
- MTH 168 Analytic Geometry & Calculus I (2017-2018): Mainstream first-semester calculus for physical sciences, mathematics, engineers.
- (MTH 137 Calculus with Review went through the review in 2016-2017, before the implementation of the current process.)

Difficulties

- No concrete assessment plan in place
- Original ILGs not necessarily appropriate for the respective courses (MTH 137, 168)
- Many course learning objectives that were very vague
- Courses are routinely taught by adjunct faculty

Result of CAP review – MTH 137

- Removed practical wisdom from institutional learning goals
- Streamlined course learning objectives (now three concisely articulated objectives: algebra & trig knowledge; basic differentiation; limits) and created specific sample problems for each objective
- Assessment procedure (implemented Fall 2017):
 - Use the cumulative final exam for some sections
 - Instructors will keep track of student performance on these questions as they grade the final
 - Categories in the rubric will correspond to certain point totals for each problem
- Conditional reapproval for 2 years

Result of CAP review – MTH 168

- Removed practical wisdom from institutional learning goals (now only scholarship)
- Streamlined course learning objectives (now five concisely articulated objectives)
- Assessment procedure (implemented Fall 2018)
 - Select two sections each fall for assessment
 - Use mandatory skills tests to assess CLOs 1 – 3 (limits; basic derivatives; advanced derivatives).
 - Use prescribed problems on the cumulative final exam to assess CLOs 4 and 5 (basic indefinite integrals; Fundamental Theorem of Calculus) – instructors will keep track of student performance on these questions as they grade the final
- Gained reapproval from CAPC

- **CLO1:** Students will be able to find limits of functions.
Assessed through Skills Test #1
- **CLO2:** Students will be able to find basic derivatives.
Assessed through Skills Test #2
- **CLO3:** Students will be able to find advanced derivatives.
Assessed through Skills Test #3
- **CLO4:** Students will be able to find basic indefinite integrals.
Assessed through problems on final exam
- **CLO5:** Students will be able to apply the Fundamental Theorem of Calculus.
Assessed through problems on final exam

Rubric (common to all courses)

Assuming a 10-point scale for each problem:

- Minimal understanding: 1-3 points
- Approaching standards: 4-6 points
- Meets standard: 7-8 points
- Meets standard at high level: 9-10 points

Result of CAP review – MTH 114

- Articulated 6 concise course learning objectives
- Each CLO relates to both ILGs (practical wisdom; scholarship)
- Assessment procedure (implemented Fall 2018):
 - Select two sections each fall for assessment
 - Use problems on the cumulative final exam to assess CLOs 1 – 6. Instructors will keep track of student performance on these questions as they grade the final
- Gained reapproval from CAPC

- **CLO1:** Students will be able to demonstrate that they know that different winners are possible with the same ballots, and they will be able to determine the winner of an election using different methods that might produce different results.
- **CLO2:** Students will be able to demonstrate that they understand that the power of an individual in a weighted voting system is not necessarily proportional to the player's weight in that system.
- **CLO3:** Students will be able to apply various methods to effect a fair division, both in the case of a discrete collection of items (such as items in an estate, or chores among room-mates) or a continuous item (such as a parcel of land).

- **CLO4:** Students will be able to use various methods to apportion the seats of a legislature.
- **CLO5:** Students will be able to compute the number of ways an event can happen and/or determine an event's likelihood of happening.
- **CLO6:** Students will be able to describe data using various summary statistics.

All CLOs are assessed through problems on the final exam.

Questions?