

## Course Outcomes Guide (COG)

**Course Title:** MAT164 (3 Credits) CALCULUS W/APPLICATIONS

**Date:** 6/25/14

**Course Team:** Tom Crawford

### STUDENT LEARNING OUTCOMES:

#### General Education/Program/Course Outcomes:

##### Upon successful completion of this course, students will learn how to:

- G1. Apply mathematical methods involving arithmetic, algebra, geometry, and graphs to solve problems.
- G2. Represent mathematical information and communicate mathematical reasoning symbolically and verbally.
- G3. Interpret and analyze numerical data, mathematical concepts, and identify patterns to formulate and validate reasoning.
- P/C1. Use computational techniques and algebraic skills essential for success in an academic, personal, or workplace setting. (Computational and Algebraic Skills)
- P/C2. Use visualization, special reasoning, as well as geometric properties and strategies to model and solve problems. (Geometric Skills)
- P/C3. Collect, organize, and display data as well as use appropriate statistical methods to analyze data and make inferences and predictions. (Statistical Skills)
- P/C4. Critically analyze and construct mathematical arguments. (Proof and Reasoning)
- P/C5. Use technology, where appropriate, to enhance and facilitate mathematical understanding, as well as an aid in solving problems and presenting solutions. (Technological Skills)
- P/C6. Communicate and Understand mathematical statements, ideas and results, both verbally and in writing, with the correct use of mathematical definitions, terminology and symbolism. (Communication Skills)
- P/C7. Work collaboratively with peers and instructors to acquire mathematical understanding and to formulate and solve problems and present solutions. (Collaborative Skills)

#### Assessment:

1. A common assessment (comprehensive final exam) for this course has been in place since SP2010 semester and data has been collected.
2. All historical data has been uploaded into the “Mathy” database.
3. The common assessment consists of a small number of skills questions and several application problems on a continuum of depth/breadth.
4. All application questions are consistent with specific class examples and semester exam questions.

#### Validation:

1. Common assessment results are evaluated only after final course grades are assigned by the instructor.
2. Correlation between student composite score on the common assessment and the student’s course average is evaluated each semester.
3. Assessment question results that differ dramatically from historical values will establish content areas in need of corrective action and those where previous efforts to affect improvement have been successful.

**Results:**

1. Historical course averages are well correlated ( $n=93$  and  $r=.69$ ) with SLOA results.
2. The SP14 results for SLOA item 5 (related rates) appear to be lower than the historical mean for this item.
3. SLOA items 1, 2, and 7 (differentiation skills, integration skills, and integration application) are strengths and item 4 (Optimal Order Quantity Application) is an area for improvement.
4. There appears to be a difference in the mean SLOA scores for students taking the course in lecture, hybrid, and web formats.

**Follow-up:**

1. Determine if the lower than expected result on SLOA item #5 is significantly lower. If so, investigate cause and incorporate a remediation plan at the first opportunity.
2. At the next opportunity a supplemental exam question will be given to determine if the reason for weak performance on item #4 is conceptual or modeling difficulty.
3. Determine if the difference in mean SLOA scores of students taking the course in lecture, hybrid, and web formats is significant. If so, propose a remediation plan to improve results among the affected group(s).

**Budget Justification:**

1. No funding is required at this time for this course.

**Course: MAT 164**

**Lead Faculty: T. Crawford**

	FA10	SP11	SU11	FA11	SP12	SU12	SP13	FA13	SP14
# Active students	13	15	9	17	21	9	16	8	12
# Withdraw % Withdraw	15.4 %	33.3 %	11.1 %	5.9%	23.8 %		2 13%	1 12.5%	1 8.3%
# Walkaway Fs % Walk-Away Fs*						33.3 %	3 19%	0 0%	2 16.7%
# Success (A,B,C) % Success (A,B,C)	76.9 %	46.7 %	87.5 %	82.4 %	61.9 %	66.7 %	9 57%	7 87.5%	8 66.7%
Gen Ed SLOA	N/A	N/A	N/A	N/A	N/A	N/A	79%	N/A WEB	82%
Course SLOA	71.5 %	56%	57%	60.4 %	42%	65%	56%	57%	56%
SLOA Item Analysis							S - #1,#2 W - #3	S - #7 W - #4	S - #2 W - #5
Mean Course Grade	2.91	2.40	2.57	2.81	2.38	2.0	2.21	3.29	2.27

\*Did not take the final exam and received a grade of F.