

Course Outcomes Guide (COG)

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

Date: 6/27/19

Course Team: Tom Crawford

STUDENT LEARNING OUTCOMES:

General Education: Upon successful completion of this course, students will have demonstrated the capacity to effectively...

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.

Course: Upon successful completion of this course, students will have demonstrated Calculus Literacy (CL), and Calculus Reasoning (CR).

CL - Calculus Literacy involves understanding and using the basic language and tools of calculus: knowing what calculus terms mean, understanding the use of calculus symbols, and being able to express (in calculus terms) graphical representations, and perform basic calculus computations.

CR - Calculus Reasoning is the way people process with calculus ideas, make sense of calculus applications, and interpret calculus solutions. Calculus reasoning may involve connecting one concept to another (e.g., derivative and relative min/max) or may combine ideas about rate of change and practical implication. Reasoning means understanding and being able to explain calculus processes, and being able to fully interpret calculus results.

These skills/abilities will be applied to the follow course concepts generating 6 distinct course outcomes: CL1, CR1, CL2, CR2, CL3, CR3.

1 – Functions

2 – Derivatives

3 – Integrals

Assessment:

1. A common assessment (comprehensive final exam) for this course has been in place since the SP10 semester.
2. CA data is added to the “Mathy” database at the conclusion of each semester.

3. The common assessment (CA) 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 class examples and semester exam questions.
5. Course did not run in 18/19

Validation:

1. CA results are evaluated only after final course grades are assigned by the instructor.
2. Correlation between students' course average and CA composite score is evaluated each semester.
3. CA 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 un/successful

Results:

1. Course did not run in 18/19

Follow-up:

1. Course will be offered again after full D2L roll-out.
2. Newton/Alta (low cost CMS w/OER text and adaptive learning technology) will be used to simultaneously maintain appropriate rigor, low student costs, and provide additional/remedial instruction to at risk students.

Budget Justification:

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

Course: MAT 164

Lead Faculty: T. Crawford

	SU12	SP13	FA13	SP14	FA14	SP15	SP16	FA17	SP18	FA18	SP19
# Active students	9	16	8	12	9	10	11	9	9	0	0
# Withdraw % Withdraw		2 13%	1 12.5%	1 8.3%	2 22.2%	2 20%	2 18.2%	3 33.3%	2 22.2%		
# Walkaway Fs % Walk-Away Fs*	33.3%	3 19%	0 0%	2 16.7%	1 11.1%	1 10%	1 9.1%	1 11.1%	1 11.1%		
# Success (A,B,C) % Success (A,B,C)	66.7%	9 57%	7 87.5%	8 66.7%	5 55.6%	5 50%	7 63.6%	3 33.3%	6 66.7%		
Gen Ed SLOA	N/A	79%	N/A	82%	73%	67%	75%	69%	77%		
Course SLOA	65%	56%	57%	56%	54%	43%	61%**	72%**	69.7%**		
SLOA Item Analysis		S-1,2 W-3	S-7 W-4	S-2 W-5	S-7 W-4	S-2 W-3	S-1 W-4	S-1,3,4,5	S-1,3,4,5		
Mean Course Grade	2.0	2.21	3.29	2.27	2.29	2.38	2.78	1.17	2.00		

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

**Not all questions were included. Course content was removed to accommodate algebra weakness.

***Course revision - CA being revised

MAT164 COURSE SLOA RESULTS

	Format/#	Course SLOA		Q1	Q2	Q3	Q4	Q5	Q6	Q7
SU11	Web/6	22.75	57%	0.65	0.74	0.43	0.00	0.10	0.90	0.67
FA11	Lec/16	24.16	60%	0.61	0.52	0.61	0.44	0.73	0.46	0.51
SP12	Web/14	16.86	42%	0.48	0.44	0.33	0.26	0.44	0.26	0.41
SU12	Hyb/6	25.92	65%	0.75	0.75	0.70	0.07	0.38	0.63	0.70
SP13	Lec/11	22.23	56%	0.70	0.60	0.45	0.18	0.27	0.50	0.64
FA13	Web/7	22.71	57%	0.64	0.51	0.61	0.19	0.4	0.49	0.71
SP14	Hyb/8	22.44	56%	0.61	0.7	0.46	0.28	0.23	0.63	0.60
FA14	Hyb/6	23.42	54%	0.63	0.64	0.47	0.23	0.37	0.53	0.8
SP15	Hyb/7	18.57	43%	0.48	0.61	0.27	0.29	0.43	0.46	0.39
SP16*	Hyb/8	18.25	61%	0.71	N/A	0.53	0.09	0.83	0.50	N/A
FA17*	Lec/5	17.9	71.6%	0.92	N/A	0.72	0.48	0.56	N/A	N/A
SP18*	Lec/6	18.83	75.3%	0.92	N/A	0.60	0.55	0.63	N/A	N/A
FA18	NA									
SP19	NA									
Overall	All	22.48*	56%	0.65	0.63	0.48	0.24	0.44	0.51	0.61

*Not all questions were included. Course content was removed to accommodate algebra weakness.