

Course Outcomes Guide (COG)

Course Title: MAT 206 – Differential Equations

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Course Team: Jennifer Szczesniak

Expected Learning Outcomes

GENERAL EDUCATION

Upon successful completion of this course, a student should be able to:

1. Apply mathematical methods involving arithmetic, algebra, geometry, and graphs to solve problems.
2. Represent mathematical information and communicate mathematical reasoning symbolically and verbally.
3. Interpret and analyze numerical data, mathematical concepts, and identify patterns to formulate and validate reasoning.

STUDENT LEARNING OUTCOMES:

Upon successful completion of this course, students will learn:

1. To solve linear differential equations.
2. To solve given types of non-linear differential equations.
3. To use Laplace transformations to solve differential equations.
4. To use differential equations to solve application problems.
5. To classify a given equation and determine a method to use to solve that equation.
6. To work effectively in groups.
7. To use technology, in the form of a computer algebra package, the graphing calculator and other programs, to assist in the problem-solving process.
8. To effectively communicate results and the thought process that led to those results.

Assessment

- In Spring 2014 we revised the assessment tool to use all data that can be compared to a national benchmark. This assessment is generally given as part of the final exam for the course. During the 17/SP we tried a non-cumulative final, so the assessment was given as a bonus activity during the scheduled final exam time.

Validation

- All of our new questions come from sources with national data available such as retired Praxis, AP Calculus, GRE subject, and SAT subject tests. This will allow us to benchmark our students' results against a national average.

SLOA Data

	14/SP	15/SP	16/SP	17/SP
# Active students	16	26	30	21
% W	0	3.8	0	0
% walk-away Fs No final exam/grade = F	12.5	7.7	0	4.8
% Success (A,B,C)	87.5	80.8	96.7	90.5
Common Assessment Average Score	10.43	10.48	12.40	5.56
Benchmark Score	8.38	8.38	8.38	8.38
Mean course grade	2.9	3.04	3.50	3.19
Item Analysis Weakest Outcome	SLO 7	SLO 7	SLO 7	SLO 7

Results

- While things were looking good, I think the idea of having a non-cumulative final exam effected the SLOA results. Due to the nature of our assessment question sources, many of the assessment questions are from material from the beginning of the course, material that was not on the non-cumulative exam.

Follow-up

- I will not let students talk me into a non-cumulative final exam.
- An attempt was made at developing a group project to assess Outcome 6. This went well, but has yet to be included in the results. This project will be refined and added to the assessment procedure for 18/SP. This outcome will not have a benchmark for comparison purposes.

Budget Justification

- The cost of the Symbolic Math Toolbox, an extension to the MATLAB program we already use in the engineering program, is necessary to ensure that the students will be able to transfer the course to UMD.