

# Ordinary Differential Equations and Strengthening STEM

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# Main Goal

- The main goal of this proposal is to better serve the STEM students by restructuring math 2530 using applications and terminology found in the STEM courses which have math 2530, Ordinary Differential Equations, as a prerequisite.

# Rationale

- Mathematical deficiencies in STEM courses have been discussed in SERG meetings
- A course required for many STEM degrees:
  - Chemistry ACS, Chemistry Dual Degree in Chemical Engineering
  - Physics, Physics Dual Degree Engineering
  - Computer Science Dual Degree Engineering
  - Mathematics

# Plan – Components

- Solicitation of input from faculty in the STEM courses (MAPS)
  - Done
- Development of a WebAssign course
  - E-book
  - Scored practice tests and Quizzes
  - Graded homework
  - Other Resources
  - Done

# Plan – Components

- STEM discipline related presentations
  - Input from STEM faculty (completed)
  - Discipline specific (completed)
  - Conceptual understanding of course concepts (completed)
  - Ability to convey findings to others (in progress)



# Plan – Components

- Assessment
  - Student performance in subsequent STEM courses (in progress)
  - Student surveys (in progress)
  - Passing rates:
    - Spring 2016 82%
    - Spring 2017 86%

# Problems Encountered

## ■ Spring 2016:

Based on comments from a number of students, the students wanted more online homework than WebAssign had to offer for our textbook. I also was not happy with the lack of problems available. This seems to be the case with all online homework systems for this course.

# Problems Encountered

## ■ Spring 2017:

I no longer used WebAssign or a traditional textbook for the course. Instead, I used online lecture notes for a professor at Lamar University, Paul Dawkins, and “Advanced engineering Mathematics” by Kreyszig. I chose topics that were more beneficial to students, providing students with real models and solutions which they have encountered or will encounter in discipline specific courses.



# Future Plans

- I plan on continuing to refine the course to be more applied and significant to the majority of students taking the course.
- I will require student presentations to enhance their ability to communicate real world problems and solutions to others.
- I will continue to monitor students comments and passing rates.