# MATH 112 Calculus II
Calculus for Scientists and Engineers

## BACKGROUND
- Course units:
  - Applications & Techniques of Integration
  - Sequences & Series
  - Vectors & Introduction to Vector Calculus
- 20 sections of 35 - 45 students in 2015-2016
- Recent DFW rates: 15-25% (C or better needed for Calculus III)
- Primarily lecture based
- Instructional Team: Teaching Faculty, Adjunct Faculty, and Graduate Teaching Fellows

## WHAT IS CHANGING
- Moving from Calculus as a list of procedures to Calculus as a tool for solving applied problems
- **Partial Flip**: Moving information transfer out of class via readings and videos
- Students actively engaging in problem-solving activities in groups
- Greater focus on written communication
- Focusing on content that directly supports learning outcomes
- Engineered learning!

## INTENDED OUTCOMES
- Students will be able to meet the course outcomes and apply calculus in novel situations.
- Students will improve reasoning and communication skills.
- We will develop curriculum resources that are easily implemented by other instructors.
- We anticipate improved performance and persistence by underrepresented groups (including women).

## WHY ARE WE MAKING THESE CHANGES?
- Failure rates under traditional lecture are 55 percent higher than rates observed under more active approaches to instruction.
  ~Freeman et al, 2014
- Primary instruction of Mainstream Calculus
  ~MAA Calculus study, 2015

Between 40% and 60% of students who enter college with a STEM major leave STEM. 90% of students who leave STEM cite poor teaching by STEM faculty as their reason for leaving.
  ~Seymour & Hewitt 1997

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Debra Carney, Ph.D., Teaching Associate Professor, Applied Mathematics & Statistics
Rebecca Swanson, Ph.D., Teaching Associate Professor, Applied Mathematics & Statistics

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