



SCIENCE, TECHNOLOGY, ENGINEERING AND MATHEMATICS (STEM) DIVISION
1400 TANYARD ROAD, SEWELL, NJ 08080
856-468-5000

MAT 205-01: DIFFERENTIAL EQUATIONS Spring 2016 SYLLABUS 15 WEEKS LECTURE HOURS/CREDITS: 4/4 Greg Buthusiem, Instructor Email: gbuthusi@rcgc.edu Website: profb.yolasite.com Office: CC 157; Phone: 856-415-2175 Office Hours: Posted	INSTRUCTIONAL METHOD: Lecture
--	--------------------------------------

It is the responsibility of the student to review the RCGC Information and Policies, as well as the Online Syllabus at www.rcgc.edu/syllabi

TEXTBOOK AND COURSE MATERIALS

- First Course in Differential Equations by Zill, 5th Edition, ISBN #9780534373887, Publisher: Cengage
Please see current textbook prices at www.rcgc.bncollege.com

PREREQUISITE

MAT 221 is the co-requisite for MAT 205.

GENERAL COURSE OBJECTIVE

Upon completion of the course, the students should be able to solve differential equations of first order and higher order, solve initial value problems, solve boundary value problems, find series solutions of linear equations, and apply Laplace transforms. This includes, but is not limited to separable equations, exact equations, homogeneous equations, non-homogeneous equations, nonlinear equations, etc. Also, students will be able to model engineering situations with higher-order differential equations.

MAT 205 CORE COMPETENCIES

This course focuses on one of RCGC’s Core Competencies:

- Quantitative Knowledge and Skills

STUDENT LEARNING OUTCOMES: MAT 205 - DIFFERENTIAL EQUATIONS

Successful completion of MAT 205 will help students:	RCGC Core Competencies	Evaluation / Assessment
1. Classify differential equations.	- Quantitative Knowledge and Skills	- Assignments and Exams
2. Understand and apply first-order differential equations.	- Quantitative Knowledge and Skills	- Assignments and Exams
3. Understand and apply higher-order differential equations.	- Quantitative Knowledge and Skills	- Assignments and Exams
4. Understand and apply series solutions of linear differential equations.	- Quantitative Knowledge and Skills	- Assignments and Exams
5. Understand and apply Laplace Transforms.	- Quantitative Knowledge and Skills	- Assignments and Exams

EVALUATION AND ASSESSMENT

Grading Distribution

Category	Percent of Final Grade
Test #1	25%
Test #2	25%
Test #3	25%
Final Exam	25%

The Final Exam can replace you lowest test grade. Periodically problems will be assigned and are optional to be turned in as extra credit. There are NO makeup tests!

Grading Scale

The following grading scale will be used in this course:

93% - 100% = A	73% - 77.9% = C
90% - 92.9% = A-	70% - 72.9% = C-
88% - 89.9% = B+	68% - 69.9% = D+
83% - 87.9% = B	63% - 67.9% = D
80% - 82.9% = B-	60% - 62.9% = D-
78% - 79.9% = C+	Below 60% = F

CLASS POLICIES

Attendance – Students attain maximum academic benefit through regular attendance. Therefore, students are expected to attend all class sessions that they are scheduled. Students are advised that attendance at each class is expected and will be recorded. Failure to attend each class could jeopardize the student's successful completion of the course. Absence will not be considered a valid excuse for not being prepared for the next class. If an unexpected emergency preventing attendance arises, the instructor should be notified on the day of the missed class.

Tests/Make-up Tests – No make-up tests or quizzes will be given in MAT 205, however the final exam can replace your lowest test grade.

Homework – Students should expect to spend at least two hours working outside of class for every hour spent in class. Specific assignments will be given in class.

Electronics – Cell phone and texting devices detract from active learning time in the classroom and therefore, are not permitted during class time

Academic Integrity – In its most elementary form, academic integrity encompasses the principles of an honest, fair and continuing pursuit of the truth, and means that students are expected to do and be responsible for their own work. Therefore, cheating, plagiarism, fabrication, collusion or any other violation of academic integrity is not acceptable and the instructor will impose an academic sanction which is reasonable and commensurate with the violation.

MAT 205 TOPICAL OUTLINE

Introduction to Differential Equations

- Definitions and Terminology
- Initial-Value Problems
- Differential Equations as Mathematical Models

First-Order Differential Equations

- Solution Curves without a Solution
- Separable Variables
- Linear Equations
- Exact Equations
- Solutions by Substitutions
- A Numerical Method
-

Modeling With First-order Differential Equations

- Linear Models
- Nonlinear Models
- Modeling with Systems of Differential Equations

Higher-order Differential Equations

- Linear Differential Equations: Basic Theory
- Reduction of Order
- Homogeneous Linear Equations with Constant Coefficients
- Undetermined Coefficients – Superposition Approach
- Undetermined Coefficients – Annihilator Approach
- Variation of Parameters
- Cauchy-Euler Equation
- Solving Systems of Linear Differential Equations
- Nonlinear Differential Equations
-

Modeling with Higher-order Differential Equations

- Linear Models: Initial-Value Problems
- Linear Models: Boundary I -Value Problems
- Nonlinear Models
-
- Solutions about Ordinary Points
- Solutions about Singular Points
- Special Functions

The Laplace Transform

- Definition of Laplace Transform
- Inverse Transforms and Transforms of Derivatives
- Operational Properties I
- Operational Properties II
- The Dirac Delta Function