

Miami Dade College
InterAmerican Campus
Mathematics Department

**MAP 2302 - INTRODUCTION TO DIFFERENTIAL EQUATIONS.
SYLLABUS AND COURSE OUTLINE**

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Meeting Days: TR 12:50 – 02:00 pm
Room: 3312

Textbook: Differential Equations 10th edition, by Dennis G. Zill

Prerequisite: MAC2312 with a grade of “C” or better

Catalog Description: Introduction to Differential Equations includes: equations of order one and degree one. Orthogonal trajectories, linear equations and constant coefficients, non-homogeneous equations, inverse differential operators, solutions using Laplace Transforms, elementary existence theorems, series solutions, and applications to physics and chemistry.

Credit: 3 semester hours

Instructional Method: Lecture

TESTING AND GRADING POLICY: There will be three tests worth 100 points each, and a cumulative final exam. The lowest grade among the three tests will be dropped. The Final Exam is never dropped. **THERE ARE NO MAKEUPS.** See me if you know you are going to miss a test. I may assign the seating during any of the tests or the Final Exam. **Your Final Grade will be based on the average of your Final Exam and the best two scores on tests 1-3.**

COURSE GRADE FORMULA: (sum of 2 best test scores and Final Exam) / 3

GRADING SCALE: A: 90-100, B: 80-89, C: 70-79, D: 60-69, F: below 60

INCOMPLETES: Incompletes will be given in very limited situations. In order to qualify for an “I” grade, the student must be passing the course at the time the “I” grade is negotiated; be so near the end of the course that he/she requires no further instruction; and have a justifiable and documented reason for not being able to finish the course on schedule.

HOMEWORK: Homework is due the same day of the corresponding test. HW is worth up to 10 points added to the score on the test.

ATTENDANCE: Attendance is highly encouraged. Students are responsible for all material covered and/or distributed in class.

MATH LAB: Available on Campus, Room 1214

WITHDRAWAL POLICY: If you decide to withdraw from this course it is your responsibility to do so in order to receive a grade of “W”. Drop/withdrawals should be conducted through the office of the registrar.

CLASSROOM BEHAVIOR:

Beepers, cellular phones and any electronic devices must be turned off before class.

Please, be prompt. Late arrivals are very disturbing for the instructor and disruptive to fellow students. You should plan to leave enough time to allow for traffic, parking, inclement weather, etc.

Cheating: Cheating will not be tolerated in this course. Any student caught will receive an automatic **F** in the course

I reserve the right to make changes in this syllabus as needed. Any changes will be announced in class as early as possible

Week	Sections / Tests
1	1.1
2	1.2, 2.1
3	2.2, 2.3
4	2.4, 2.5
5	Review, Test 1
6	3.1,3.2
7	4.1, 4.2
8	4.3, 4.4
9	Review
10	4.5, 4.6
11	Review, Test 2
12	7.1, 7.2
13	7.3, 7.4
14	8.1, 8.2
15	Review, Test 3
16	Review
17	Final exam

COURSE COMPETENCIES

Course Description: Topics include: Equations of first order; linear equations with constant coefficients; non-homogeneous equations; variation of parameters; solution using Laplace Transforms; elementary existence theorems; series solutions; applications. (3 hrs. lecture)

Pre-requisite: MAC 2312 with a grade of C or better or equivalent.

Course Competencies:

- Competency 1:** The Student will identify, and classify,
- ordinary differential equations (ODE) by order and linearity.
 - first order ODE as separable, exact, linear, homogeneous or Bernoulli.
 - higher order ODE as homogeneous or nonhomogeneous.
- Competency 2:** The Student will establish the analogies and differences between
- solution of an ODE,
 - particular solution,
 - general solution,
 - n-parameter family of solutions.
- Competency 3:** The Student will construct ODE models and solve them in situations such as,
- elementary population dynamic
 - mixture problems
 - harmonic oscillator (free undamped, free damped, and forced motion)
- Competency 4:** The Student will demonstrate knowledge of the initial value problem (IVP) and boundary value problems (BVP) by,
- recognizing initial value problems,
 - recognizing boundary value problems,
 - applying the Existence and Uniqueness Theorem for first-order IVP,
 - applying the Existence and Uniqueness Theorem for an n-th order IVP for linear equations,
 - recognizing that Existence and Uniqueness Theorem does not apply to BVP.
- Competency 5:** The Student will demonstrate proficiency obtaining solutions of ODE by,
- solving first order ODE of various types (separable, exact, linear, homogeneous, and Bernoulli),
 - solving second order ODE applying the reduction of order method,
 - higher order linear ODE with constant coefficients applying the annihilator approach and variation of parameters
 - second order ODE with polynomials coefficients applying series solutions.

Competency 6: The Student will demonstrate knowledge of the Laplace Transform method by,
a. solving IVP for linear ODE with constant coefficients,
b. solving integral and integrodifferential equations.

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How do the course objectives relate to the Miami-Dade Learning Outcomes?

What follows below is a list of the ten learning outcomes that have recently been prepared by Miami Dade faculty and administrators.

As graduates of Miami Dade College, students will be able to:

1. Communicate effectively using listening, speaking, reading, and writing skills.
2. Use quantitative analytical skills to evaluate and process numerical data.
3. Solve problems using critical and creative thinking and scientific reasoning.
4. Formulate strategies to locate, evaluate, and apply information.
5. Demonstrate knowledge of diverse cultures, including global and historical perspectives.
6. Create strategies that can be used to fulfill personal, civic, and social responsibilities.
7. Demonstrate knowledge of ethical thinking and its application to issues in society.
8. Use computer and emerging technologies effectively.
9. Demonstrate an appreciation for aesthetics and creative activities.
10. Describe how natural systems function and recognize the impact of humans on the environment.

Each course taken at the college addresses some of these learning outcomes. MAP2302 addresses outcomes 1, 2, 3, 4, 8, 9.