

Home	E-mail	Homework
Dr. Quintanilla	Math Department	University of North Texas

Math 3410.001: Fall 2011

Meets: TR 11:00-12:20 in Language Building, Room 202.

Instructor: [Professor John Quintanilla](#)

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Web page: <http://www.math.unt.edu/~johnq/Courses/2011fall/3410/>

Office Hours: TR 12:30-2:30, or by appointment. I'm fairly easy to find, and you're welcome to drop by outside of office hours without an appointment. However, there will be occasions when I'll be busy, and I may ask you to wait or come back later.

Required Text: *Elementary Differential Equations and Boundary Value Problems* by W. E. Boyce and R. C. DiPrima.

Strongly Recommended: Lecture notes for the semester are available at the UNT Copy Center for approximately \$18.

Course Description: Descriptive statistics, elements of probability, random variables, confidence intervals, hypothesis testing, regression, contingency tables.

Prerequisite: Math 1720 and Math 2700.

Course Topics

The following chapters and sections of the textbook will be covered according to the projected schedule below. Dates may change as events warrant.

- Chapter 1 Introduction
 - 1.1 Some Basic Mathematical Models;

	August 25: 1.1,
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Direction Fields

- 1.2 Solutions of Some Differential Equations
- 1.3 Classification of Differential Equations
- 1.4 Historical Remarks

Chapter 2 First Order Differential Equations

- 2.1 Linear Equations; Method of Integrating Factors
- 2.2 Separable Equations
- 2.3 Modeling with First Order Equations
- 2.4 Differences Between Linear and Nonlinear Equations
- 2.5 Autonomous Equations and Population Dynamics

Chapter 3 Second Order Linear Equations

- 3.1 Homogeneous Equations with Constant Coefficients
- 3.2 Fundamental Solutions of Linear Homogeneous Equations; The Wronskian
- 3.3 Complex Roots of the Characteristic Equation
- 3.4 Repeated Roots; Reduction of Order
- 3.5 Nonhomogeneous Equations; Method of Undetermined Coefficients
- 3.6 Variation of Parameters
- 3.7 Mechanical and Electrical Vibrations
- 3.8 Forced Vibrations

Chapter 4 Higher Order Linear Equations

- 4.1 General Theory of nth Order Linear Equations
- 4.2 Homogeneous Equations with Constant Coefficients
- 4.3 The Method of Undetermined Coefficients

Chapter 5 Series Solutions of Second Order Linear Equations

- 5.1 Review of Power Series
- 5.2 Series Solutions Near an Ordinary Point, Part I
- 5.3 Series Solutions Near an Ordinary Point, Part II

Chapter 7 Systems of First Order Linear Equations

- 7.1 Introduction

	1.2
August 31: 2.1, 2.3	September 1: 2.2
September 6: 2.2	September 8: 2.4
September 13: 2.5	September 15: 3.1
September 20: 3.2	September 22: 3.3
September 27: Review	September 29: Exam #1
October 4: 3.4	October 6: 3.5
October 11: 3.6	October 13: 3.7, 3.8
October 18: 5.1	October 20: 4.1, 4.2, 4.3
October 25: 5.2	October 27: 5.2, 5.3
November 1: Review	November 3: Exam #2
November 8: 7.1, 7.2	November 10: 7.3
November 15: 7.4, 7.5	November 17: 7.5, 7.6
November 22: 8.1	November 24: Thanksgiving
November 29: Review	December 1: Exam #3
December 6: 8.2, 8.6	December 8: Review
	December 15:

- 7.2 Review of Matrices
- 7.3 Systems of Linear Algebraic Equations; Linear Independence, Eigenvalues, Eigenvectors
- 7.4 Basic Theory of Systems of First Order Linear Equations
- 7.5 Homogeneous Linear Systems with Constant Coefficients?
- 7.6 Complex Eigenvalues

	Final
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Chapter 8 Numerical Methods

- 8.1 The Euler or Tangent Line Method
- 8.2 Improvements on the Euler Method
- 8.3 The Runge-Kutta Method
- 8.6 Systems of First Order Equations

Student Responsibilities

- Student behavior that interferes with an instructor's ability to conduct a class or other students' opportunity to learn is unacceptable and disruptive and will not be tolerated in any instructional forum at UNT. Students engaging in unacceptable behavior will be directed to leave the classroom and the instructor may refer the student to the Center for Student Rights and Responsibilities to consider whether the student's conduct violated the [Code of Student Conduct](#). The university's expectations for student conduct apply to all instructional forums, including university and electronic classroom, labs, discussion groups, field trips, etc.
- You should read over this syllabus carefully, as I will hold you responsible for the information herein.
- Students will be expected to read the chapters carefully, including the examples in the book.
- Students will be responsible for obtaining any and all handouts. If you are not in class when handouts are given, it is **your** responsibility to obtain copies.
- **You should begin working now.** Frequent practice is crucial to the successful completion of a mathematics course. Cramming at the last minute will certainly lead to failure.
- **WARNING:** If you are in academic trouble, or are in danger of losing your financial support, or if your parent or guardian is expecting a certain grade at the end of the semester... start working today. I will refuse to listen to any pleas at the end of the semester. You will receive precisely the grade that you *earn*.

Grading Policies

The following schedule is tentative and is subject to capricious changes in case of extracurricular events deemed sufficiently important to the upper administration.

Final Exam	Thursday, December 15 8:00-10:00 am	27%
Exam 1	c. Week 4	21%
Exam 2	c. Week 8	21%
Exam 3	c. Week 13	21%
Homework		10%

A	90% and above
B	80% and below 90%
C	70% and below 80%
D	60% and below 70%
F	below 60%

Cooperation is encouraged in doing the homework assignments. However, **cheating will not be tolerated on the exams**. If you are caught cheating, you will be subject to any penalty the instructor deems appropriate, **up to and including an automatic F for the course**.

Attendance is not required for this class. However, you will be responsible for everything that I cover in class, even if you are absent. It is my experience that students who skip class frequently make poorer grades than students who attend class regularly. You should consider this if you don't think you'll be able to wake up in time for class consistently.

The grade of "I" is designed for students who are unable to complete work in a course but who are currently passing the course. The guidelines are clearly spelled out in the *Student Handbook*. Before you ask, you should read these requirements.

Exam Policies

- Unless announced otherwise, calculators will **not** be permitted for use on exams.
- I expect to give exams during the weeks above. However, these are tentative dates. I will announce the exact date of each exam in class.
- After exams are returned in class, you have 48 hours to appeal your grade. I will not listen to any appeals after this 48-hour period.
- I will not drop the lowest exam score; all will count toward the final grade.
- No make up exams will be given. For those students who miss an exam due to an **Authorized Absence** (see the *Student Handbook*), the final grade will be computed based only on those exams taken, together with homework/quiz scores and the final exam. Such students will be required to provide *official written* verification of such an absence.
- Students missing an exam for unauthorized reasons will receive 0 (zero) points on the exam.

- The Final Examination will be comprehensive in the sense that problems may come from any of the sections that will be covered during the semester.
 - The grade of A signifies *consistent* excellence over the course of the semester. In particular, an A on the final is not equivalent to an A for the course.
 - I reserve the right to test and quiz you on problems which are generalizations of material covered in the class and/or in the text. In short, the problems may not look exactly like the ones in the book.
 - Everything that I say in class is fair game for exam material. You will be responsible for everything unless I advise you to the contrary.
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Homework Policies

- Homework will be assigned every Thursday and will be due the following Thursday.
 - I expect the assignments that you turn in to be [written up carefully and neatly](#), with the answers clearly marked. You must show all of your work. **Messy homework will not be accepted.**
 - Entire homework assignments will **not** be graded. Instead, only two or three representative problems will be graded per assignment. As a consequence, it will be possible to not do the entire assignment and still receive a perfect score on that particular assignment. **Deliberately leaving homework uncompleted is highly unrecommended**, however, as the law of averages will surely catch up with you as the semester progresses.
 - When computing grades, I will drop the **two** lowest homework grades before computing the homework average. Therefore, in principle, you could get a 100% homework score and also not turn in two assignments during the semester. I have this policy in case you get sick, a family emergency arises, etc., during the semester. You will still be responsible for the material in such assignments during the examinations.
 - Because of this policy, I will **not** give extensions on homework assignments, nor will I accept late assignments.
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Note to TNT Students

- If you're pursuing secondary teacher certification through Teach North Texas, then you may be aware that you will be required to construct a preliminary teaching portfolio in EDSE 4500 (Project-Based Instruction) and a final portfolio during your final semester of student teaching. Section 2 of this portfolio will ask you to demonstrate your knowledge of your content field. You may find that some of the assignments may naturally become artifacts toward part of this task, and so I encourage you to keep your work after the semester is over to make the eventual construction of your portfolio easier. You may even want to write (and save for later) a brief reflection on the artifact you select, rather than try to remember why the artifact you chose was important once you reach EDSE 4500.
- The specific indicators in the portfolio related to knowledge of mathematical content are as follows:

- Reflect on one or more artifacts in which you state a mathematical theorem or conjecture and apply both formal and informal mathematical reasoning to the same conjecture.
 - Reflect on one or more artifacts that show your ability to describe a mathematical concept that can be represented in multiple ways and articulate the connections between its representations in clear, expository prose. Where relevant, identify appropriate technology for exploring the concept and explain limits the technology may place on the knowledge acquired.
 - Reflect on one or more artifacts that show your ability to generate a model of a natural phenomenon or describe an already existing model and evaluate how well the model represents the situation, including consideration of the risks, costs, and benefits of the alternatives.
 - Reflect on one or more artifacts that show your ability to identify a topic in your subject area and describe its connection with prerequisite topics, future topics, and other subjects.
 - Reflect on one or more artifacts that show how you bring out the historical and cultural importance of your subject material, its contribution to large ideas, and its significance in today's society. Include a specific lesson plan that incorporates the general history and cultural context of modern science or of mathematics as these fields have evolved.
- Just to be clear: the above is a suggestion for TNT students. This is NOT a course requirement for Math 3410.
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Final Note

In compliance with the Americans with Disabilities Act, I mention the following: It is the responsibility of students with certified disabilities to provide the instructor with appropriate documentation from the Dean of Students Office.

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