INSTRUCTOR: Dr. Van Nguyen

CONTACT INFO: E-mail: v.nguyen@neu.edu  
Office Phone: 617-373-5232  
Office: 536 Nightingale Hall

OFFICE HOURS: Mondays, 10:30-11:30am;  
Wednesdays, 4:00-6:00pm; also by appointment.

I am here to facilitate your learning. Do not hesitate to email me or come to my office hours if you have any question or concern.

COURSE INFO: CRN: 37070  
MWR 9:15-10:20am  
109 Robinson Hall


COURSE OBJECTIVES: This course is to provide students with quantitative and problem-solving skills of differential equations,  
with a main focus on first and second order linear differential equations with constant coefficients-both homogeneous and non-homogeneous. At the end of this course, students should be able to:

• Solve basic first order ODE.
• Solve higher order linear ODE and systems of linear ODEs, using various methods including undetermined coefficients and the Laplace transform.
• Be familiar with applications in electrical and mechanical systems, forced oscillation, and resonance (such as: cooling problems, velocity problems, mixing problems and spring problems).
• Be able to construct simple ODE models (linear and non-linear)
• Be able to apply basic tools from linear algebra (matrices, row-reduction, vector spaces, and eigenvalues/eigenvectors) to  
obtain the solution to systems of equations and systems of linear differential equations.

TEXTBOOKS: Worldwide Differential Equations and Linear Algebra, by Robert McOwen, available in PDF and printed format  
from the website: http://www.centerofmath.org/textbooks/diffeq/index.html . The PDF version costs $9.95 and contains free links to  
videos and online resources. You can alternately order a printed version for $29.95.

CLASS MATERIALS: are posted on Northeastern Blackboard at https://blackboard.neu.edu/ . Check it regularly for updates!

HOMEWORK: Homework will be assigned daily, but will not be collected. It is your responsibility to work on these HW problems  
immediately after the corresponding material is taught in order to keep up and perform well in this course. We will not be able to go  
over all HW problems in class. Thus, I encourage you to work on the HW exercises on your own or in groups, come to see me during  
my office hours or make special appointments, and go to tutoring in the Math Department.

QUIZZES: At the beginning of class each Thursday (other than the initial Thursday and the Thursdays of the midterm exams), there  
will be a short quiz taken verbatim from HW exercises and in-class activities from the previous Wednesday, Thursday, Monday. The  
two lowest quiz grades will be dropped. There will be no make-ups. If you miss a quiz for any reason, the next quiz in the sequence  
will be counted an extra time to replace the missing grade.

MIDTERM EXAMS: There will be TWO 65-minute in-class midterm exams, on the material indicated on pages 2-3 of this syllabus.  
There are no make-ups. If you miss an exam, your final exam grade will be counted an extra time to replace the missing grade.

FINAL EXAM: The two-hour final exam is a comprehensive and common examination for all sections in this course. The final exam  
date is to be determined. Check for exam schedule conflicts as soon as possible. Do not make travel plans that conflict with the  
final exam. See http://www.northeastern.edu/registrar/finexsched.html for details of your final exams and Final Exam Conflict policy.

NOTES: On the midterms exams and on the final exam you will be allowed one side of an 8.5 x 11in. sheet of notes. You may not use  
a sheet of notes on the quizzes.

CLASS CANCELATION: If classes should be cancelled due to snow days, instructor illness, or for other official reasons, any  
scheduled quiz or midterm exam will occur on the next class meeting.

GRADING: Your course grade will be determined as follows: Final exam: 40%
Midterms: 40% (20% each)
Quizzes: 20% (two lowest quiz grades are dropped).

Letter grades are determined according to the following scale. Border line grades are determined by class participation and progress.

A: 93-100; A--: 90-92; B+: 87-89; B: 83-86; B--: 80-82; C+: 77-79; C: 73-76; C--: 70-72; D+: 67-69; D: 63-66; D--: 60-62; F: 0-59.
ADDITIONAL RESOURCES:
In addition to my office hours, there is the Math Department Tutoring Center in 540B Nightingale Hall. Tutoring begins a week after the start of classes. The tentative schedule is Monday-Wednesday 11am-7pm and Thursdays 11am-5pm. You must sign up on line through MyNEU, under Tutoring. For more information, see [http://www.northeastern.edu/csastutoring/setting-up-appointments/](http://www.northeastern.edu/csastutoring/setting-up-appointments/).

The College of Engineering also provides tutoring. See [http://www.coe.neu.edu/undergraduate-support/tutoring](http://www.coe.neu.edu/undergraduate-support/tutoring).

ISSUES WITH THE COURSE/INSTRUCTOR: If you have a concern about the course and/or instructor, I will be happy to discuss it with you. If the issue cannot be resolved, you should then contact the course coordinator, Robert Lupi, at r.lupi@neu.edu. For any matters that remain unsolved, contact the Teaching Director, Prof. Massey, at d.massey@neu.edu.

ACADEMIC HONESTY: Cheating will not be tolerated. All incidents of cheating will be reported to the Office of Judicial Affairs. The University's policy on cheating and related disciplinary actions is detailed in the Student Handbook and at the following web site [http://www.northeastern.edu/osccr/academic-integrity-policy/](http://www.northeastern.edu/osccr/academic-integrity-policy/).

USE OF TECHNOLOGY: Computers and calculators may be referenced during class only with my explicit permission. Cell phones must be silent during class, especially during quizzes and exams.

SOME IMPORTANT DATES:

1. **Monday, February 1:** Last day to drop a Spring class without a “W” grade
2. **Wednesday, February 3:** Last day to file a Final Exam Conflict Form for spring classes
3. **Thursday, April 21:** Last day to drop a Spring class with a “W” grade

1) Any student with a disability is encouraged to meet with me during the first week of class to discuss accommodations. The student must bring a current Memorandum of Accommodations from the Disability Resource Center (DRC).

2) If you are an athlete and have conflicts with an important class activity (quiz, midterm exam, or final exam), you should let me know before the end of second week of classes. You should also bring an official letter from the Office of Athletics.

3) At the end of the semester, every student is expected to complete the online TRACE survey evaluations of the course as well as the Math Department’s evaluation form. Please do not make travel plans prior to April 29th.

4) The instructor reserves the right to make changes in the syllabus. It is the responsibility of each student to be aware of all assignments, any syllabus changes announced in class or on Blackboard, and to be aware of information given when absent.

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Schedule of Topics and Suggested Homework Exercises

<table>
<thead>
<tr>
<th>TOPIC</th>
<th>HOMEWORK</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Week 1: January 11 - 15</strong></td>
<td></td>
</tr>
<tr>
<td>Chapter One: First-Order Differential Equations</td>
<td></td>
</tr>
<tr>
<td>1.3 Separable Equations &amp; Applications</td>
<td>#1(a,b,c,e,f), 2(a,c), 8, 9</td>
</tr>
<tr>
<td>1.4 Linear Equations &amp; Applications</td>
<td>#1(b,c,d,f), 2(a,b), 3, 5</td>
</tr>
<tr>
<td><strong>Week 2: January 18 - 22</strong></td>
<td></td>
</tr>
<tr>
<td>Monday, January 18, Martin Luther King Jr’s Birthday, no classes</td>
<td></td>
</tr>
<tr>
<td>Chapter Two: Second-Order Differential Equations</td>
<td></td>
</tr>
<tr>
<td>2.1 Introduction</td>
<td>#1(a,b)</td>
</tr>
<tr>
<td>2.2 General Solutions</td>
<td>#2, 3, 5-8</td>
</tr>
<tr>
<td><strong>Week 3: January 25 - 29</strong></td>
<td></td>
</tr>
<tr>
<td>2.3 Homogeneous Equations</td>
<td>#1(a,b), 2, 3</td>
</tr>
<tr>
<td>2.4 Free Mechanical Vibrations</td>
<td>#1-7</td>
</tr>
<tr>
<td><strong>Week 4: February 1 - 5</strong></td>
<td></td>
</tr>
<tr>
<td>2.5 Nonhomogeneous Equations</td>
<td>#1, 2</td>
</tr>
<tr>
<td>2.6 Forced Mechanical Vibrations</td>
<td>#1, 2, 3 (resonance only), 6(a,b), 7a</td>
</tr>
<tr>
<td><strong>Week 5: February 8 - 12</strong></td>
<td></td>
</tr>
<tr>
<td>Chapter Three: The Laplace Transform</td>
<td></td>
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<tr>
<td>3.1 Laplace Transform &amp; Its Inverse</td>
<td>#4(a,d), 5(b,c,f,g), 6(a,b), 7, 8(a, c)</td>
</tr>
<tr>
<td>3.2 Transforms of Derivatives and IVPs</td>
<td>#2(b,c), 3(b,c,d), 4</td>
</tr>
</tbody>
</table>
Week 6: February 15 - 19

Monday, February 15, Presidents Day, no classes
3.3 Shifting Theorems #1(a,b,c,d), 3, 4, 5, 6
3.4 Discontinuous Inputs #1, 2b, 3(b,c), 4b, 5(b,c), 6, 8

Week 7: February 22 - 26

3.4 (continued)
Review Exam 1

EXAM ONE (February 25, tentative)

Week 8: February 29 - March 4

Chapter Four: Systems of Linear Equations and Matrices
4.1 Introduction to Systems and Matrices #2, 3, 4
4.2 Gaussian Elimination #1-4

Sat March 5-Sun March 13, Spring Break, no classes

Week 9: March 14 - 18

4.3 Reduced Row-Echelon Form and Rank #1, 2(a,b,d,e), 3(a,b,d,e), 4(a,d), 5
4.4 Inverse of a Square Matrix #4, 5(a,c), 6(a,c)

Week 10: March 21 - 25

4.6 Cofactor Expansions #1(a-e)
Chapter Five: Vector Spaces
5.2 General Vector Spaces #3

Week 11: March 28 - April 1

5.3 Subspaces #1(a,b), 2(a,b), 3(a,b,c), 4(a,b), 5(a,b), 6(a,c), 7b
5.4 Linear Independence #1, 2(b,c), 3(a,c), 4a

Week 12: April 4 - 8

5.5 Bases and Dimension #1, 3(a,b,c), 4(a,c)
Review Exam 2

EXAM TWO (April 7, tentative)

Week 13: April 11 - 15

Chapter Six: Linear Transformations and Eigenvalues
6.1 Eigenvalues and Eigenvectors #1(a,c,d,e,f), 2(a,b)
Chapter Seven: Systems of First-Order Equations
7.2 First Order Linear Systems #1(a,b,c), 2(a,b,c,d), 5(a,c)
7.3 Eigenvalue Method for Homogeneous Systems #1(a,b,c,d), 2(a,b,d), 4(a,b)

Week 14: April 18 - 22

Monday, April 18, Patriot’s Day, no classes
Review Final Exam
Thursday, April 21, Reading Day, Last day to drop a Spring class with a “W” grade

April 22 - 29 FINAL EXAM