Course Syllabus

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Ways to Connect with Me

Instructor: Suzana Serboi **Email:** serboisuzana@fhda.edu (mailto:serboisuzana@fhda.edu)

Office Hours: Tuesdays and Thursdays 9:00 AM-10:00 AM online via Zoom. Go to the Zoom tab in Canvas to join my office hours. If those hours don't work for you please contact me for an appointment on Zoom.

Piazza: We will use the Piazza Q&A platform for class communication and announcements. This platform is designed to provide quick and efficient assistance from both your classmates and me. If you have a general question about the course or a math-related topic, posting it on Piazza is the best way to receive a response. You can access Piazza via the course Canvas page or directly at the following URL: https://piazza.com/fhda/spring2025/math2a51z53z/home (https://piazza.com/fhda/spring2025/math2a51z53z/home)

However, for private or personal matters, please contact me via email or see me during office hours. I prefer that you do not message me through Canvas.

Ways You Will Hear From Me

During this course, I will post announcements that will be **sent out through Piazza**. You will receive an email notification when a new announcement is posted. **Be sure that you have set your notifications for the course, so you don't miss out on an important message.**

At the end of each week, if you haven't submitted work or have not logged in, you will be hearing from me. I will send a group message to all students who haven't submitted an assignment. This is a warm nudge to remind you or figure out if you need additional support. This isn't about being "in trouble"; rather it is a reminder of the support you have.

I will grade and provide feedback on your submitted coursework within one week of all work submitted by the due date, All grades will be posted in the Canvas gradebook.

Course Materials

Textbook: *Elementary Differential Equations with Boundary Value Problem*s by William F. Trench

- (Web Version) Elementary Equations with Boundary Value Problems by William Trench (https://math.libretexts.org/Bookshelves/Differential_Equations/Book%3A_Elementary_Differential_Equa

- **Downloadable PDF** (https://digitalcommons.trinity.edu/mono/9/) of the above text (possibly not as updated as the above link).
- **Solution manual that goes with the downloadable pdf** (https://digitalcommons.trinity.edu/mono/10/)
- Alternate texts used for some sections:
  - **Differential Equations for Engineers by Lebl** (https://math.libretexts.org/Bookshelves/Differential_Equations/Differential_Equations_for_Engineer
  - **https://web.uvic.ca/~tbazett/diffyqs/** (https://web.uvic.ca/~tbazett/diffyqs/)

Lecture Schedule: This is an online class and the instructional method is **asynchronous**. Go to the **Modules** (https://deanza.instructure.com/courses/39807/modules) tab to see the lecture schedule, along with assigned readings and videos. Each week, you'll be responsible for completing one Canvas module. For instance, during the first week of the course, you'll complete the module labeled ***Week 1*** (https://deanza.instructure.com/courses/39807/modules/433782) .

Here's a tentative lecture schedule:

Week 1: 1.2 Basic Concepts, 2.2 Separable Equations, 2.1 Linear First Order Equations

Week 2: 2.3 Existence and Uniqueness of Solutions of Nonlinear Equations, 2.4 Transformation of Nonlinear equations into Separable Equations, 2.5 Exact Equations

Week 3: 2.6 Integrating Factors, 4.1 Growth and Decay, 4.2 Cooling and Mixing

Week 4: 5.1 & 9.1 Homogeneous Linear Equations all orders, 5.2 & 9.2 Constant Coefficient Homogeneous Equations, Midterm 1

Week 5: 5.3 Nonhomogeneous Linear Equations (Undetermined Coefficients - Polynomials), 5.4 The Method of Undetermined Coefficients I (Exponentials), 5.5 The Method of Undetermined Coefficients II (Trig + combinations)

Week 6: 9.3 Undetermined Coefficients for Higher Order Equations, 5.6 Reduction of Order, 5.7 & 9.4 Variation of Parameters

Week 7: 6.1 Spring Problems 1 (undamped motion), 6.2 Spring Problems 2 (damped motion), 8.1 Introduction to the Laplace Transform

Week 8: 8.2 The Inverse Laplace Transform, 8.3 Solution of Initial Value Problems, Midterm 2

Week 9: 8.4 The Unit Step Function, 8.5 Constant Coefficient Equations with Piecewise Continuous Forcing Functions, 8.6 Convolution

Week 10: 8.7 Constant Coefficient Equations with Impulses, 7.2 Review of Power Series, 7.3 & 7.4 Series Solutions near an Ordinary Point

Week 11: 7.5 - 7.7 Regular Singular Points and Euler Equations (using a different book, Jiri Lebl's *Differential Equations for Engineers*), 11.2 Fourier Series I (on [-L, L]), 11.3 Fourier Series II (on

[0,L])

Week 12: Final Exam

Assessments and Grading Policy

Your score will be the weighted average of the following assessments.

- **Homework (30%):** Homework assignments for this course will be completed through the free online system MyOpenMath. If you don't already have an account, please register at **www.myopenmath.com (http://www.myopenmath.com)**. Once registered, you will be able to access all MyOpenMath assignments directly through Canvas - just click on the assignment links provided. Be sure to complete each assignment by the posted deadline to stay on track in the course. Most homework assignments are due on Sunday. Follow the Canvas and MyOpenMath for deadlines. You will have **10 MyOpenMath late passes**, each of which will give you a **24-hour extension** for a particular homework set.
  - If an assignment is past due (but within the redemption period), you can redeem a late pass to continue working on it. To do this, start the assignment, go to the settings on the right, and choose "More Options". Select "Redeem a Late Pass". For assignments not yet past due, you can also redeem a late pass, but you must first open the assignment and then follow the same steps. This **video (https://youtu.be/LedYbsqXSZ8?si=LGpYk9wGfrF-sGiy)** demonstrates the process of redeeming a late pass.
  - If you encounter any technical issues or you need help on the homework, you are strongly encouraged to post on our discussion forum Piazza.
- **Midterms (40%):** There will be **two** midterm exams. Each exam will include a handwritten portion that you must upload to Canvas. Each midterm will cover material introduced since the previous exam. Details about exam content and procedures will be posted on Canvas. Late submissions will not be accepted under any circumstances.
  - To accommodate any issues or unforeseen events, including illness, your lowest midterm score will be dropped. No make-up exams will be offered.
  - Midterm Exam 1 is due at the end of Week 4, and Midterm Exam 2 is due at the end of Week 8. Each exam will be available for a three-day window, from Friday morning through Sunday night. Once you begin an exam, you will have **1 hour and 30 minutes** to complete it.
- **Final (30%):** The final exam will be comprehensive, covering all material from the entire term. Additional information about the final exam will be provided on Canvas.

De Anza College Default Grading Scheme

The table below contains the grading scheme data. Each row contains a name, a maximum percentage, and a minimum percentage.

Letter Grade	Range
A	100% to 94.5%
A-	< 94.5% to 89.5%
B+	< 89.5% to 86.5%
B	< 86.5% to 83.5%
B-	< 83.5% to 79.5%
C+	< 79.5% to 74.5%
C	< 74.5% to 69.5%
D+	< 69.5% to 66.5%
D	< 66.5% to 63.5%
D-	< 63.5% to 59.5%
F	< 59.5% to 0%

General Policies

Academic Integrity: Students are expected to abide by the **DeAnza College Code of Conduct (https://www.deanza.edu/policies/academic_integrity.html)** and not participate in academic dishonesty. If a student is caught cheating on an exam, they will receive a score of 0 for that exam. This score cannot be dropped when calculating the final grade, even if students are otherwise allowed to drop a low exam score. Academic dishonesty includes, but is not limited to, using unauthorized materials or references during an exam, receiving assistance from another student, copying another student's work, or helping someone else engage in any of these actions.

Calculators: You may use a graphing calculator such as the TI-83 PLUS, TI-84, or TI-84 PLUS, as well as the online calculators **Desmos (https://www.desmos.com/)** or **GeoGebra (https://www.geogebra.org/)**, for both homework and exams. No additional online tools may be used during exams unless explicitly approved by the instructor.

Dropping the class: Students will **not** be automatically dropped for non-attendance. Although I do reserve the right to drop students for non-attendance, it is the student's responsibility to drop or withdraw from this course by the college deadlines – if you fail to do so and your name appears on the final roster, you will receive an F for the term. Do not assume that I will drop you if you stop participating in the class.

Additional Resources

- **De Anza's Dates and Deadlines (https://www.deanza.edu/calendar/dates-and-deadlines.html)**
- **Student Success Center (https://www.deanza.edu/studentsuccess/)** for academic support services, tutoring and workshops!

- **SSC Peer Tutoring on Zoom and Additional Tutoring via NetTutor (https://deanza.edu/studentsuccess/onlinetutoring/)**
- **Disability Support Services (https://www.deanza.edu/dsps/dss/applynow.html)**
- **De Anza Village Centers (https://www.deanza.edu/villages/centers.html)**: places on campus where you'll find a community of people who share your interests, along with services and resources that are relevant to your major.
- **De Anza's Resources for Basic Needs (https://www.deanza.edu/resources/)** includes Food Assistance, Housing Resources, Mental Health Services, Transportation Options, Computers and Internet Access.

Learning Outcomes

By the end of the course, students will be able to:

1. **Classify and solve first-order differential equations**, including separable, linear, exact equations, and equations solvable by integrating factors or transformation methods.
2. **Apply existence and uniqueness theorems** to assess whether a differential equation has a well-defined solution under given initial conditions.
3. **Model and solve real-world problems** involving exponential growth and decay, Newton's law of cooling, and mixing processes.
4. **Solve higher-order linear differential equations**, both homogeneous and nonhomogeneous, using methods such as undetermined coefficients, reduction of order, and variation of parameters.
5. **Analyze mechanical systems** such as spring-mass oscillators, including undamped, damped, and forced motion scenarios.
6. **Use the Laplace transform and its inverse** to solve initial value problems, including those involving piecewise and impulsive forcing functions and convolution integrals.
7. **Construct solutions to second-order linear equations** using power series, including solutions near ordinary points and regular singular points.
8. **Understand and apply Fourier series** to represent periodic functions and solve boundary value problems on standard intervals.
9. **Interpret the behavior of differential equation solutions** graphically and qualitatively, using direction fields and characteristic equations where appropriate.
10. **Effectively communicate mathematical reasoning**, including clearly written solutions and interpretations of differential equation models.

Student Learning Outcome(s):

- Construct and evaluate differential equation models to solve application problems.
- Classify, solve and analyze differential equation problems by applying appropriate techniques and theory.

Office Hours:

Zoom,By Appointment	T,TH	9:00 AM - 10:00 AM