

Math 341-01: Differential Equations

TTh 9:50 – 11:30 AM; DA 304

Spring 2020

Professor: Dr. Catherine Crawford

Contact Information: DA 209C, 630-617-3479, crawford@elmhurst.edu

Office Hours: Monday 9:30 – 10:30 AM; Tuesday 1:30 – 3:00 PM; Wednesday 2:00 – 3:00 PM; or by appointment

Webpage: <http://crawford.elmhurst.edu>

Course Description: This is a basic course in techniques for solving ordinary differential equations and in their applications. Topics include first order differential equations, linear differential equations, Laplace transforms, and power series methods. Prerequisite: *Math 251 Multivariate Calculus*.

Student Learning Outcomes: Upon successful completion of this course, students should be able to:

1. Classify differential equations according to type, order, linearity, homogeneity, and coefficients.
2. Use qualitative techniques such as slope fields and the phase line to determine the behavior of solutions to first-order differential equations.
3. Understand and apply existence and uniqueness theorems to ordinary differential equations.
4. Solve first-order differential equations using techniques appropriate for linear, separable, or exact equations.
5. Solve higher-order differential equations using techniques appropriate for homogeneous and nonhomogeneous equations.
6. Understand the basic components of developing an ordinary differential equation model and solving it for applications to exponential growth and decay, falling objects, mixing, and mass-spring motion problems.

Required Text: *Elementary Differential Equations and Boundary Value Problems, 11th Edition*, by Boyce, DiPrima, and Meade. We will be covering material taken from chapters 1-9.

Grading: Your final letter grade for the course will be based on the percentage of total points earned.

Homework/Seminar/Projects	100 pts	<i>Homework each week typically due Thursday of the following week</i>
2 Exams (100 pts each)	200 pts	Tentative Dates*: 3/5, 4/16
Final Exam (cumulative)	150 pts	Thursday, May 21, 10:30 AM – 12:30 PM
	450 pts	

Excessive and consistent disruptions (e.g. tardiness, leaving class for drinks or the restroom, cell phones, etc.) may result in lowering your grade up to one full letter grade. **All cell phones and earbuds/headphones must be turned completely off and put away.** Having a cell phone out during an exam or quiz will result in an automatic 0 grade for the exam or quiz.

Seminar: You are required to attend one of the math seminars typically held Wednesdays 4:00-5:00 PM in CS 213 and hand in a 1-2 page Summary/Evaluation Paper. See the guidelines on the next page for details.

Homework and Projects: Typically, homework will be assigned each class and due Thursday of the following week. However, it is expected that you will work on the homework before the next class and come with questions. **So you must be disciplined to keep up with the assigned homework on a daily basis.** You may turn in the homework by 1:00 PM the *day* after it is due (unless otherwise noted) without penalty. You may turn in homework in-person, under my door, or via email (*pdf file*) by the given deadline. You will be docked 10% for each *day* late thereafter. **Late homework will not be accepted after the assignment has been graded.** If you are submitting homework Friday after 1:00 pm through the weekend, it must be submitted via email. Each assignment is worth 10 points. Homework scores will be based on solutions to a few of the problems and overall completeness. For every 3 graded homework assignments, I will drop 1. **Projects** may be assigned periodically throughout the semester. You will **not** be allowed to drop any of these project scores. The total remaining homework scores, project scores, and seminar paper will be scaled to 100 points.

* Dates subject to change at my discretion. Advance notice will be given.

Exams and Exam Replacement Policy: You must take all exams in class on the announced dates (*subject to change at my discretion*). **No make-up exams will be allowed.** You will have the option of replacing your lowest exam score with your final exam percentage (if this is to your benefit), *so there is no need for make-up tests. You will not be allowed to take an exam early or late for any reason.* If you miss any exam(s), your final percentage will serve as the score for the missed exam(s). Only the missed exam score(s) will be replaced. The final exam score cannot be replaced.

Policies and Academic Integrity: You are expected to adhere to the Elmhurst College Code of Academic Integrity as found in the Student Handbook available on the College website. For example, *obtaining or attempting to use unauthorized materials or information or unauthorized help from another person or source is considered cheating.*

- Test and quizzes, whether take-home or in-class, are to be your own work unless otherwise stated.
- Calculators and notes are not allowed on quizzes and tests unless otherwise stated. If calculators are allowed, you may not store any notes or unauthorized programs on the calculator.
- Having a cell phone out during an exam or quiz will result in an automatic 0 grade for the exam or quiz.
- **You may work with others on your homework and are encouraged to do so.** But you must turn in your own homework unless specifically stated as group work requiring one submission.
- Individual projects should be your own work. All group members should make quality contributions to group projects.

Learning Center: Academic Support: The Learning Center offers services to support the academic performance of all Elmhurst College students. Sessions are structured to promote principles of self-regulated learning and academic management. Areas of peer tutoring include math, statistics, writing, biology, kinesiology, and psychology. Additionally, assistance with special test preparation (e.g., ACT, SAT, GRE, and TAP) and academic reading/study strategies is available. For more information, contact Emmi McAdams, Tutoring Coordinator, at emmim@elmhurst.edu, 630-617-5376, or Susan Roach, Learning Center Director, at susan.roach@elmhurst.edu, 630-617-3155. The Learning Center is located on the main floor of the A.C. Buehler Library.

Access and Disability Services: Elmhurst College will make reasonable accommodations for students with disabilities based on the presentation of appropriate documentation. If you believe that you have a disability that may impact your work in this course, contact Linda Harrell, ADS Coordinator, at disability.services@elmhurst.edu or 630-617-6448 **and then contact me.** The ADS office is located on the main floor of the A.C. Buehler Library. *Classroom accommodations must be renewed each term.*

Seminar Summary/Evaluation Paper Guidelines:		
Attendance:	Attendance and written paper	~60%
Content:	<p>Clear summary of the main point(s) and some details of the talk [Note: You will often not understand everything in the talk, nor are you expected to. But you should be able to explain the main point(s)/some details clearly (e.g. Imagine trying to explain what you did understand of the talk to another math/science major who was not in attendance..)]</p> <p>Evaluation of the topic [Note: The evaluation is not a critique of how well the speaker presented the material, but more about the ideas presented and their potential impact on you and to the broader science or education community. You should also consider any limitations or questions you have about the talk along with possible extensions for further work.]</p>	~20%
Mechanics & Format:	1-2 pages, double-spaced, 1-inch margins; Clear and skillful organization and writing; Error-free; Neat and professional presentation	~20%