Math 254 Section 001
Introduction to Ordinary Differential Equations
Course Policy - Summer Session II 2021

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Office Hours: Monday, Wednesday, Friday 10:30-11:30 or by appointment (in the same Zoom room as the class)

Catalog Course Description

Solution methods for ordinary differential equations, qualitative techniques; includes matrix methods approach to systems of linear equations and series solutions

Course Prerequisites

MATH 129, 223 or 250A with C or better.

Expected Learning Outcomes

Students who complete the course will be able to solve linear differential equations (both scalar equations and systems of equations) exactly and approximately using a variety of techniques.

Course Requirements

You are required to have a scientific calculator for this course. Exams are created with the expectation that you are using one. You may use a graphing calculator, but calculators that perform symbolic manipulations (such as the TI-89, TI-92, or TI-Nspire CAS) may not be used during exams. During each exam, you will be asked to show your calculator.

You will need the following in order to take exams for this course:

- Access to a desktop computer or laptop
- A private location in which to take the exam
- A working webcam and microphone (built-in or external)

The textbook for this course is *Fundamentals of Differential Equations, 9th Edition* by Nagle, Saff, and Sider. This textbook is offered as an inclusive access text in D2L. You may choose to opt out of inclusive access if you acquire the textbook somewhere else, but you must do so by July 10th, 2021. An older edition of this textbook may suffice, but there is no guarantee that the content will match.

Communication with Students

Announcements and important course information may be sent out via official University email or through D2L. It is the student's responsibility to check for messages and announcements regularly.

Accessibility and Accommodations

It is the University's goal that learning experiences be as accessible as possible. If you anticipate or experience physical or academic barriers based on disability or pregnancy, please meet with your instructor to discuss ways to ensure your full participation in the course. If you determine that formal, disability-related accommodations are necessary, it is very important that you be registered with Disability Resources (621-3268; drc.arizona.edu) and notify your instructor of your eligibility for reasonable accommodations as soon as possible.

Academic Integrity

Students are responsible to inform themselves of University policies regarding the Code of Academic Integrity. Students found to be in violation of the Code are subject to penalties ranging from a loss of credit for work involved to a grade of E in the course, and risk possible suspension or probation. The Code of Academic Integrity will be enforced in all areas of the course, including, but not limited to, homework, quizzes, and tests. For more information about the Code of Academic Integrity policies and procedures, including information about your rights and responsibilities as a student, see the following website: http://deanofstudents.arizona.edu/academic-integrity/students/academic-integrity

Attendance/Administrative Drops

Daily attendance is expected from every student. Students are responsible for the material covered in their absence (excused or otherwise). Students who miss the first two class meeting may be administratively dropped unless they have made other arrangements. In addition, students with more than 3 unexcused absences may be administratively dropped from the course. (See Administrative Drop Policy at http://catalog.arizona.edu/policy/class-attendance-participation-and-administrative-drop) Other actions that may result in an administrative drop from this course include missing more than 5 assignments. If you need to miss class for unavoidable circumstances, see your instructor as soon as possible.

- All holidays or special events observed by organized religions will be honored for those students who show affiliation with that particular religion.
- Absences pre-approved by the UA Dean of Students (or Dean's designee) will be honored.

It is the student's responsibility to notify the instructor in advance of an absence related to religious observation or an activity for which a Dean's excuse has been granted, and to arrange for how any missed work will be handled.

Student Code of Conduct

Students at The University of Arizona are expected to conform to the standards of conduct established in the Student Code of Conduct. Prohibited conduct includes:

1. All forms of student academic dishonesty, including cheating, fabrication, facilitating academic dishonesty, and plagiarism.
2. Interfering with University or University-sponsored activities, including but not limited to classroom related activities, studying, teaching, research, intellectual or creative endeavor, administration, service or the provision of communication, computing or emergency services.
3. Endangering, threatening, or causing physical harm to any member of the University community or to oneself or causing reasonable apprehension of such harm.
4. Engaging in harassment or unlawful discriminatory activities on the basis of age, ethnicity, gender, handicapping condition, national origin, race, religion, sexual orientation, or veteran status, or violating University rules governing harassment or discrimination.

Students found to be in violation of the Student Code of Conduct are subject to disciplinary action. For more information about the Student Code of Conduct, including a complete list of prohibited conduct, see the following website: http://deanofstudents.arizona.edu/accountability/students/student-accountability

Other Relevant University Policies Relating to Conduct

Please take note of the following University policies:

- Policy on Threatening Behavior by Students: http://policy.web.arizona.edu/education-and-student-affairs/threatening-behavior-students
- Nondiscrimination and Anti-Harassment Policy: http://policy.arizona.edu/human-resources/nondiscrimination-and-anti-harassment-policy

Expected Classroom Behavior

It is important for students to consider how their actions/behavior impact the rest of the class. Any behavior that could be disruptive to other students needs to be avoided. Class and office hours will be held virtually in Zoom via D2L, and students will be able to hear (and possibly see) each other during these. Students also may work together in breakout rooms in Zoom, and it is imperative that everyone conducts themselves appropriately in this setting.

Course Grading Policy

Tests

A "Pretest" (worth 40 points) will be assigned covering "prerequisite" calculus material. Three tests, worth 80 points each, and a comprehensive Final Exam, worth 120 points will be given during the semester. There will be parts of every test that require a graphing calculator. The dates of the tests are:

Pretest: Completed by Sunday, July 11th at midnight
Test #1: Friday, July 16th
Test #2: Friday, July 30th
Test #3: Thursday, August 12th
Final Exam: Friday, August 20th

The University's Exam regulations for final exam week will be strictly followed: https://registrar.arizona.edu/finals

Homework Assignments

There will be 12 homework assignments, for a total of 120 homework points. Assignments should be uploaded to Gradescope as a pdf, and are due by 11:00 p.m. on the due date. Assignments that are not in the correct pdf format may result in a grade of 0 for that assignment. **No assignments will be accepted after the due date.** At the end of the semester, the lowest two homework scores will be dropped, and your 10 highest homework grades will be counted for 12 points each. You are allowed to work together in doing homework assignments, however, copying someone's assignment will not be tolerated. If this occurs, all students involved will receive no credit on the assignment.

Attendance and Class Participation

An attendance/participation grade will be implemented in class using Zoom on a regular basis, for a total of 80 possible points. The grade will include participation in class, working on your own or with your classmates to solve problems, responding to Zoom poll questions, and submitting certain problems to be graded in Gradescope. Sometimes the assignments will be due during class, and sometimes they are due at 11:00 p.m. on Gradescope. There is no makeup for your attendance/participation grade, but the lowest three grades in this category will be dropped.

Points Summary

You will be accumulating a possible 600 points during the semester.

Pretest:	40 points	
Exams:	240 points	(3 at 80 points each)
Final Exam:	120 points	
Homework Assignments:	120 points	(2 lowest scores are dropped)
Attendance/Participation:	80 points	(3 lowest scores are dropped)
Total:	600 points	

Your final grade will be determined by the percentage of these points you have actually received. Your final grade will be no lower than A: 90% - 100%, B: 80% - 89%, C: 70% - 79%, D: 60% - 69%, E: Below 60%.

Please note that neither exam scores nor final grades will be curved. No extra credit or bonus points are offered in this course.

A grade of Incomplete will be given only at the instructor's discretion, according to University Policy as described at http://www.registrar.arizona.edu/gradepolicy/incomplete.htm

Withdrawal

A student may withdraw from the course with a deletion from record through July 11, 2021, using UAccess. A student may withdraw with a grade of "W" through August 3, 2021, using UAccess

Changes to the Course Policies

The information contained in the course policies, other than the grade and absence policies, may be subject to change with reasonable advance notice, as deemed appropriate by the instructor.

Tentative Daily Schedule

July						
Sunday	**Monday**	**Tuesday**	**Wednesday**	**Thursday**	**Friday**	**Saturday**
		6 First day of class 1.1: Background 1.2: Solutions and Initial Value Problems	7 1.3: Direction Fields	8 1.4: Approximation Methods (Euler's Method) HW#1 due: 1.1, 1.2, 1.3	9 2.2: Separable Equations	10
11 Last day to drop without a W Pretest due at 11:00 pm	12 2.1: Motion of a Falling Body	13 2.3: Linear Equations (Integrating Factor Method)	14 2.6: Substitutions and Transformations HW #2 due: 1.4, 2.1, 2.2	15 TBD (catch up as needed) Review	16 Exam 1	17
18 HW #3 due: 2.3, 2.6	19 3.2: Compartmental Analysis (Mathematical Modeling)	20 3.3: Heating and Cooling 3.5: Electrical Circuits	21 4.1: Mass-Spring Oscillator 4.9: A Closer Look at Free Mechanical Vibrations HW #4 due: 3.2, 3.3, 3.5	22 4.2: Homogenous Linear Equations	23 Complex Numbers	24
25 HW #5 due: 4.1, 4.2, complex numbers	26 4.3: Auxiliary Equations with Complex Roots	27 4.4: Nonhomogeneous Equations: Undetermined Coefficients	28 4.4: Nonhomogeneous Equations: Undetermined Coefficients, continued 4.5: Superposition Principle HW #6 due: 4.3	29 TBD (catch up as needed) Review	30 Exam #2	31

August						
Sunday	**Monday**	**Tuesday**	**Wednesday**	**Thursday**	**Friday**	**Saturday**
1 **HW #7 due: 4.4, 4.5**	**2** **4.6: Variation of Parameters** **4.7: Variable-Coefficient Equations**	**3** **Last day to withdraw (with a W)** **5.1: Interconnected Fluid Tanks**	**4** **5.2: Differential Operators and Elimination Method** **HW #8 due 4.6, 4.7, 5.1**	**5** **9.1: Introduction to Matrix Methods** **9.2: Review 1: Linear Algebraic Equations**	**6** **9.3: Review 2: Matrices and Vectors** **9.4: Linear Systems in Normal Form**	**7**
8 **HW #9 due: 5.2, 9.1-9.4**	**9** **9.5: Homogenous Linear Systems with Constant Coefficients**	**10** **9.6: Complex Eigenvalues**	**11** **TBD (catch up as needed)** **Review**	**12** **Exam #3**	**13** **5.4: Introduction to Phase Planes**	**14**
15 **HW #10 due: 9.5, 9.6**	**16** **5.4: Phase Planes, continued** **5.5: Applications to Bio-math (and Linearization near a fixed point)**	**17** **Linearization, continued** **8.1: The Taylor Polynomial Approximation** **8.2: Power Series and Analytic Functions**	**18** **8.3: Power Series Solutions to Linear Differential Equations** **HW #11 due: 5.4, 5.5**	**19** **Review** **HW #12 due: 8.1-8.3**	**20** **Final Exam**	**21**