MATH 266: Introduction to Ordinary Differential Equations: 3 credits

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Lecture hours	MWF 10:00pm–10:50pm (Sugihara Bldg, Rm 118)
Office hours	MWF 11:00am–11:50am (or by appointment)
Textbook	Detailed lecture notes will be provided on the course web page. As a supplement students may use a (free) book Elementary Differential Equations by Trench, link: http://ramanujan.math.trinity.edu/wtrench/texts/TRENCH_DIFF_EQNS_I.PDF
Prerequisites	MATH 259 or 265. Corequisites: MATH 128, 129, or 329.
Course Description	Solution of elementary differential equations by elementary techniques. Laplace transforms, systems of equations, matrix methods, numerical techniques, and applications.
Course Objectives	Ordinary differential equations (ODE) are the main tool of applied mathematics that are used to model various processes in physics, engineering, economics, natural and social sciences. The purpose of the course is to learn the basics of the theory of ODE, get familiar with various methods of exact, numerical, and qualitative solutions of ODE, and to learn how to apply mathematical skills to various fields of study. The students will be exposed to both theoretical and applied points of view.
Class Attendance	Class attendance is expected. The students are solely responsible for missed handouts or announcements made during the lectures.
Homework	There will be a regular weekly homework starting week 2 of the course.
Quizzes	Except for the first week of classes, there will be usually a quiz once a week covering the material from the previous one to three lectures. There will be no make-up for the quizzes, and two lowest results will be dropped before the final grading.
Exams	There will be two in-class exams and a comprehensive final exam at the end of the semester. The final exam is scheduled for Wednesday, May 7th, 8:00am. Make-ups for the exams are possible in case of a legitimate (documented) excuse. Please contact me well in advance to arrange for a make-up.
Calculators	Calculators and/or cell phones will not be allowed during the quizzes and exams. For the exams the students are allowed to use a one side of the standard letter size paper with their own notes.

Grading

The weighting of grades will be the following:

- Homework.....15%
- Quizzes.....15%
- Exam 1.....20%
- Exam 2.....20%
- Final Exam.....30%

The student will get A/B/C/D/F with the thresholds 90/80/70/60.

Academic Responsibility and Conduct

The academic community is operated on the basis of honesty, integrity, and fair play. NDSU Policy 335: Code of Academic Responsibility and Conduct applies to cases in which cheating, plagiarism, or other academic misconduct have occurred in an instructional context. Students found guilty of academic misconduct are subject to penalties, up to and possibly including suspension and/or expulsion. Student academic misconduct records are maintained by the Office of Registration and Records. Informational resources about academic honesty for students and instructional staff members can be found at `www.ndsu.edu/academichonesty`.

Any student found guilty of academic dishonesty will receive a grade of 0 for the homework assignment, or quiz, or exam in question. In addition, every such student will be reported to the Chair of Mathematics, the Dean of their major college, the Dean of the College of Science and Mathematics, the Provost, and the Registrar. The Registrar will add any such student to NDSU's Student Academic Misconduct Database. (Multiple entries in this database may result in additional sanctions from NDSU.)

Special Needs

Any students with disabilities or other special needs, who need special accommodations in this course are invited to share these concerns or requests with the instructor and contact the Disability Services Office as soon as possible.

Schedule

Note: This is a tentative schedule and subject to a change. Week 1 starts January 8th.

Week 1. Introduction. What are ODE.

Week 2. Separable equations. Direction field.

Week 3. Linear, exact equations. Substitutions.

Week 4. Substitutions (cont.) Autonomous equations. Qualitative analysis.

Week 5. Autonomous equations (cont.) First midterm test.

Week 6. Complex numbers. Linear ODE.

Week 7. Linear ODE with constant coefficients.

Week 8. Applications of linear ODE.

Week 9. Spring break, no classes.

Week 10. Laplace transform method.

Week 11. Laplace transform method. Second midterm test.

Week 12. Systems of ODE with constant coefficients. Elements of linear algebra.

Week 13. Solving systems.

Week 14. Solving systems.

Week 15. Matrix exponent and phase portraits.

Week 16. Solving nonhomogeneous systems.

Week 17. Review classes. Dead week.

Week 18. Final exam (May 7th, Wednesday, 8:00am).