

Math 244-F7: Differential Equations for Engineering and Physics Summer 2016

Instructor

Anthony Zaleski

<http://math.rutgers.edu/~az202>

Office hours: TTh 1-2PM, Hill Center 512

Meeting times

MTWTh 2-3:50PM, Hill Center 005

Course description

Welcome to Math 244! In this course, we will study ordinary differential equations (ODEs), which are equations involving a single-variable function and its derivatives. In addition to learning lots of methods to solve ODEs and systems of ODEs, we will also look into their many applications. Prerequisites: Calc I-III.

Learning goals

This course fulfills both the Quantitative Information (QQ) and Mathematical or Formal Reasoning (QR) learning goals of the SAS Core Curriculum:

- QQ: Formulate, evaluate, and communicate conclusions and inferences from quantitative information.
- QR: Apply effective and efficient mathematical or other formal processes to reason and to solve problems.

Course webpage

I will post quiz solutions and homework to <http://math.rutgers.edu/~az202/teaching/su16>.

Textbook

Elementary Differential Equations by William Boyce and Richard DiPrima, 10th edition, ISBN: 978-0-470-45832-7.

Grading breakdown

Quizzes	10%
Maple labs	10%
Exam 1	20%
Exam 2	20%
Final Exam	40%

- A short attendance quiz will be given at the start of most classes. Quiz problems will resemble those of the homework.
- Maple labs may be found at <http://math.rutgers.edu/courses/244/BySemester/244-su10/maple/>. Lab 0 is an optional warmup, but the other three will be graded. See last page for due dates.
- The two 80-minute in-class midterms will not be cumulative. The final will be cumulative. It will start at the beginning of the last class period and continue for three hours. See last page for dates.
- Homework problems will be posted in class and on the course site. Homework will not be collected.

Make-up policy

There will be absolutely no make-up quizzes or midterm exams, and late Maple labs will not be accepted. However, I will drop your two lowest quiz grades. If you have a serious, verifiable excuse for missing a midterm (e.g., a doctor's note), I will weight your final exam score more heavily to compensate.

If you have a final exam conflict with another class, let me know as soon as possible!

Academic integrity policy

For policies regarding cheating, plagiarism, etc., see <http://academicintegrity.rutgers.edu/policy-on-academic-integrity>.

Special accommodations

For disability policies and procedures, see <http://disabilityservices.rutgers.edu/>.

Tentative calendar

Date	Topics	Sections
M 6/27	Intro to ODEs	1.1-3
T 6/28	Integrating factors, separation of variables	2.1-2
W 6/29	Modeling, linear vs nonlinear	2.3-4
Th 6/30	Autonomous DEs, exact DEs	2.5-6
M 7/4	<i>Independence Day (no class)</i>	
T 7/5	Numerical methods	8.1-3
W 7/6	Second order linear DEs	3.1-2
Th 7/7	Complex & repeated roots; LAB 1 DUE	3.3-4
M 7/11	Euler equations; <i>review for Exam 1</i>	5.4
T 7/12	EXAM 1 (80 minutes)	1.1-3.4
W 7/13	Series; <i>go over Exam 1</i>	5.1
Th 7/14	Series	5.2-3
M 7/18	Undetermined coefficients	3.5
T 7/19	Variation of parameters, springs	3.6-7
W 7/20	Springs	3.7-8
Th 7/21	Higher order linear DEs	4.1-3
M 7/25	Systems of DEs, matrices; LAB 2 DUE	7.1-2
T 7/26	First order linear systems	7.3-4
W 7/27	$\dot{\mathbf{x}} = \mathbf{Ax}$, complex eigenvalues	7.5-6
Th 7/28	Repeated eigenvalues; <i>review for Exam 2</i>	7.8
M 8/1	EXAM 2 (80 minutes)	3.5-7.6
T 8/2	Autonomous systems; <i>go over Exam 2</i>	9.1-2
W 8/3	Locally linear systems	9.3
Th 8/4	Competing species	9.4
M 8/8	Predator-prey; LAB 3 DUE	9.5
T 8/9	Lyapunov's method, periodic orbits	9.7-8
W 8/10	Catch-up and additional topics	
Th 8/11	" "	
M 8/15	" "	
T 8/16	Review for Final Exam	
W 8/17	FINAL EXAM (3 hours)	1.1-9.5