Ordinary Differential Equations with Linear Algebra

Lecture: Spaulding 120	MWF 1:10-2:00pm	Website: Blackboard	
Instructor: John Gibson	Office Hrs: MWF 2:10-3:00pm	N309E Kingsbury Hall	john.gibson@unh.edu
Teaching Assistants:	Eric Laflamme (1-3)	Tianjiao Dai (4-6)	John McClain (7-9)
	eml@cisunix.unh.edu	tnn4@unh.edu	jfi46@unh.edu
Prerequisite: MATH 426	TA office hours to be determined and posted on Blackboard.		

Syllabus

1. Introduction to Ordinary Differential Equations (ODEs) (1 day)
2. Classification (ongoing)
   - ordinary / partial
   - linear / nonlinear
   - 1st-order / higher-order
   - autonomous / nonautonomous
   - homogeneous / nonhomogeneous
   - constant / nonconstant coefficients
3. First-order ODEs (3 weeks: Feb 1–18)
   - Separable equations
   - Linear first-order ODEs
   - Exact equations
   - Solution by substitution
   - Modeling

   Exam 1: Mon Feb 21, 1:10-2:00pm, Spaulding 120 (in lecture)
4. Higher-order ODEs (3 weeks: Feb 21–Mar 11)
   - Homogeneous linear equations with constant coefficients
   - Method of undetermined coefficients
   - Variation of parameters
   - Cauchy-Euler equation
   - Modeling

   Exam 2: Fri Mar 11, 1:10-2:00pm, Spaulding 120 (in lecture)
5. Power series solutions (2 weeks: Mar 21–Apr 1)
6. Laplace transforms (2 weeks: Apr 4–Apr 15)

   Exam 3: Tue Apr 19, 12:40-2:00pm, Parson N108
7. Linear algebra, a.k.a matrices (1 week: Apr 18–22)
8. Systems of linear first-order ODEs (2 weeks: Apr 25–May 6)
9. Numerical methods (1 day: May 9)

   Final exam (cumulative, to be scheduled)

   Exams cover new material since last exam. Dates on topics are estimates.

Grading

10% homework (due Wednesdays at 1:10pm in lecture)
20% midterm exam 1
20% midterm exam 2
20% midterm exam 3
30% final exam

The final letter grade will be determined by the instructor but they will fall approximately these ranges

100% A 93% A- 89% B+ 85% B 80% B- 75% C+ 70% C 65% C- 60% D 50% F

Calculators are not necessary for this material and will not be allowed during exams.

Problem sets will be on posted on Blackboard on Wednesdays and are due the following Wednesday at the beginning of lecture, 1:10pm precisely. **Please write your name in the upper right hand corner and staple multiple pages together.** No late homeworks will be accepted. The lowest homework grade will be replaced by the average of the others. Collaboration (but not copying) is allowed, but each person must turn in a solution set comprised of his or her own work. Only a few of the problems on each homework set will be graded in detail. You must show your work for credit, and the work must be clear and neat. Although homework counts for only 10% of your grade, it is invaluable as preparation for the exams, so you should take it quite seriously.

Exam conflicts: If you have a legitimate, University-sanctioned reason for missing an exam, arrangements will be made for an alternate exam. Please let the instructor know about such conflicts as soon as possible, and at least one week prior to the exam. Alternate exams for unplanned absences will be given only in the most extreme circumstances.

Academic misconduct on homework will result in a minimum of a reduced grade in the course and a letter to the Dean's Office detailing the infraction. The letter will be retained in the student's file. Academic misconduct on an exam will result in a failing grade for the course in addition to the letter. The Dean's Office has the discretion to take further action including expulsion from the University.

Required Textbook

A First Course in Differential Equations with Modeling Applications by Dennis G. Zill, 9th Edition

Additional References

Elementary Differential Equations by Boyce and DiPrima
Differential Equations and Linear Algebra by Edwards and Penney
Advanced Mathematical Methods for Scientists and Engineers by Bender and Orszag
Numerical Methods for Ordinary Differential Equations by Butcher
Nonlinear Dynamics and Chaos by Strogatz

UNH Statement on Disability

The University is committed to providing students with documented disabilities equal access to all University programs and facilities. If you think you have a disability requiring accommodations, you must register with Disability Services for Students (DSS). Contact DSS at (603) 862-2607 or visit them in MUB 118. If you have received Accommodation Letters for this course from DSS, please provide me with that information privately so that we can review those accommodations.