M321 Differential Equations
Syllabus and Course Information
Spring 2010
9:00 - 9:50 MWF, MRC 444

Instructor: Sheldon Lee
Email: shlee@viterbo.edu
Office: MRC 530
Office Hours: M 10 – 12, 1 – 2, T 11 – 12, W 10 – 1, R 10 – 11, 12 – 1, F 10 – 11
Textbook: *Fundamentals of Differential Equations*, Nagle, Saff, Snider
Web site: http://viterbomath.x10hosting.com/M321

Catalog Course Description: Ordinary differential equations; series solutions for linear differential equations; linear operators. Offered as needed. Prerequisite: grade of C or higher in 221.

Grading scale

90% and above - A 80 – 89.9% - B 70 – 79.9% - C 60 – 69.9% - D

Graded item	**Percent of overall grade**
Two midterm exams	30%
Homework	25%
Participation and board work	5%
Computer labs and projects	15%
Final Exam	25%

Exams
There will be two in-class exams and a final
Exam 1: Friday, 2/12
Exam 2: Monday, 4/12
Final Exam:. Tuesday, 5/11, 7:40 a.m. - 9:40 a.m.

Homework
Homework will be posted on the web site listed above and will be collected at the beginning of class. No late homework will be accepted without prior approval. If you cannot be in class you can place your solutions on my desk or email them to me before the time they are due. The lowest two homework scores will be dropped.

Participation and board work
You are expected to attend class on a regular basis, and keep me informed if you cannot attend. You are also expected to work several problems on the board during the semester.

Labs and projects
You will be assigned several computer labs and a project. The labs will be done in Excel and Matlab. No prior knowledge of the programs is assumed or required.

Americans with Disabilities Act: If you have a disability and require auxiliary aids, services, or accommodations for this class, please inform me and Jane Eddy, the disabilities (ADA) coordinator (MRC 332; 796-3194) within 10 days to discuss your needs for the semester.

Tentative schedule – subject to change

Week	Date	Topic Started
1	M 1/18	1.1 Background
	W 1/20	1.2 Solutions and Initial Value Problems
	F 1/22	1.3 Direction Fields
2	M 1/25	1.4 Euler's Method
	W 1/27	2.2 Separable Equations
	F 1/29	2.3 Linear Equations
3	M 2/1	2.4 Exact Equations
	W 2/3	2.6 Substitutions and Transformations
	F 2/5	
4	M 2/8	3.2 Compartmental Analysis
	W 2/10	3.4 Newtonian Mechanics
	F 2/12	**Test 1**
5	M 2/15	4.1 Introduction: The Mass-Spring Oscillator
	W 2/17	4.2 Homogeneous Linear Equations: The General Solution
	F 2/19	4.3 Auxiliary Equations with Complex Roots
6	M 2/22	4.4 Nonhomogeneous Equations: The Method of Undetermined Coefficients
	W 2/24	4.5 The Superposition Principle and Undetermined Coefficients Revisited
	F 2/26	4.6 Variation of Parameters
7	M 3/1	
	W 3/3	4.7 Variable-Coefficient Equations
	F 3/5	5.1 Interconnected Fluid Tanks
	3/8 - 3/12	**Spring Break**
8	M 3/15	5.2 Elimination Method for Systems with Constant Coefficients
	W 3/17	5.3 Solving Systems and Higher-Order Equations Numerically
	F 3/19	5.4 Introduction to the Phase Plane
9	M 3/22	
	W 3/24	5.5 Applications to Biomathematics: Epidemic and Tumor Growth Models
	F 3/26	5.8 Dynamical Systems, Poincare Maps, and Chaos
11	M 3/29	6.1 Basic theory of Linear Differential Equations
	W 3/31	6.2 Homogeneous Linear Equations with Constant Coefficients
	4/1 - 4/5	**Easter Break**
12	W 4/7	6.3 Undetermined Coefficients and the Annihilator Method
	F 4/9	6.4 Method of Variation fo Parameters
13	M 4/12	**Test 2**
	W 4/14	7.2 Definition of the Laplace Transform
	F 4/16	7.3 Properties of the Laplace Transform
14	M 4/19	7.4 Inverse Laplace Transform
	W 4/21	7.5 Solving Initial Value Problems
	F 4/23	7.6 Transforms of Discontinuous and Periodic Functions
15	M 4/26	
	W 4/28	7.7 Convolution
	F 4/30	8.1 Introduction: The Taylor Polynomial Approximation
16	M 5/3	8.2 Power Series and Analytic Functions
	W 5/5	8.3 Power Series Solutions to Linear Differential Equations
	F 5/7	8.4 Equations with Analytic Coefficients