Math 331.2 Differential Equations **Syllabus** **Fall 2016**

Lecture	M, W	2:30-3:45 Goessmann Lab Rm 151	Office LGRT 1542	**Franz Pedit**
TAs	M, W	2:30-4:00 LGRT 146	Office LGRT 1323E	**Tangxin Jin**
	Tu, Th	4:00-5:30 LGRT 146	Office LGRT 1323P	**Arie Stern**
	Tu, Th	12:00-1:30 LGRT 146	Office LGRT 1423N	**Georgios Tsolias**
Grader		jihunhwang@umass.edu	LGRT 1535	**Jimmy Hwang**

Website people.math.umass.edu/~franz

Course chair website: http://www.math.umass.edu/~qchen/331.html

Text

Advanced Engineering Mathematics, Author: Erwin Kreyszig, Publisher: Wiley, 10th Edition, 2010

Prerequisite

Calculus I and II, some Linear Algebra, some basic Physics

Grading

Each of the following makes up $1/3$ of the grade:

- **Midterm Exam**
  Monday, October 17
- **Final Exam**
  Monday, December 19, 10:30-12:30, Mahar room 108
- **Homework** assigned weekly and graded

The course letter-grade scale is:

A	A−	B+	B	B−	C+	C	C−	D+	D	F
86	82	78	75	72	68	62	59	55	50	< 50

Drop, Withdrawal, and Incomplete

The last day to drop/add with no record is Monday, September 19. The last day to drop with a W is Thursday, October 20.

An incomplete is possible only if all of the following apply: (1) you have a compelling personal reason, e.g., serious illness; (2) your work so far would receive a passing grade; and (3) there is a good chance you will complete the course with a passing grade within the allotted time. Thus, *expecting to fail the class is no reason to ask for an incomplete.*

Topics List

Week 1 How do ODEs arise, modeling, examples of ODEs from applications: Ch. 1.1, 1.2, 1.3
Week 2 Solving ODEs, linear 1st order ODEs, discussion of existence and uniqueness: Ch. 1.4, 1.5, 1.7
Week 3 2nd order linear ODE, characteristic equation: Ch. 2.1, 2.2, 2.5
Week 4 Harmonic oscillator: Ch. 2.4, 2.6
Week 5 Inhomogeneous linear ODEs, undetermined coefficients, variation of constants, : Ch. 2.7, 2.10
Week 6 Forced oscillation, electric circuits, resonance: Ch. 2.8, 2.9
Week 7 Higher order ODEs, elasticity examples: Ch. 3.1, 3.2, 3.3
Week 8 Laplace transforms: Ch. 6.1, 6.2, 6.3
Week 9 Laplace transforms; Reduction of order, systems of ODEs: : Ch. 6.4, 6.5; Ch. 4.1, 4.2
Week 10 Linear 2-dim systems: Ch. 4.3, 4.4
Week 11 Non-linear 2-dim systems, predator-prey models, attractors: 4.5, 4.6
Week 12 Power series solutions: Ch. 5
Week 13 Wrapping things up and outlook to PDEs