

MAT 2680 - D671 (68879) Differential Eqns Fall 2013 v5

Class Meeting Times: TuTh 2:30PM-3:45PM

Location: Namm N-1105

Instructor: Ezra Halleck

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Text: Elementary Differential Equations 10th edition, Boyce and DiPrima, John Wiley & Sons, Inc.
(Boundary Value Problems version has additional chapters and will work as well).

Technology: Use graphing calculators (from calculus) for numerical work in class/exams. For homework, use previous tools you have learned such as MAPLE or MATLAB. The publisher has provided appropriate files for making use of such software. Alternatively, make use of JAVA applets presented in class such as DFIELD.

Credits: 3 (3 class hours)

Prerequisite: MAT 1575 (Calculus II)

Learning Objectives:

1. Classify differential equations.
2. Solve first and second order ordinary differential equations using various techniques.
3. Use numerical methods to approximate solutions, when appropriate.
4. Apply methods of solving diff. equations to answer questions about systems (e.g., mechanical and electrical).

Lateness/Absence: 2 (two) latenesses (this includes leaving early) **is equivalent to one absence.** A student who fails the course and is excessively absent (> 3) will receive WU grade (unofficial withdrawal), **possibly affecting financial aid.**

Academic honesty: You are encouraged to work in groups on homework, but be able to explain *anything* you turn in. During an exam, it is your responsibility to cover your work. Showing someone else your work is cheating; you will be treated in the same way as the person who copies.

Set enough time aside each week: You are expected to spend 6 hours outside the classroom each week reading the text, working on projects, doing homework and preparing for exams.

Grade components

Online participation (5%): You are expected to become members of the openlab and join the course by 9/10 (1 point) and to contribute 1 significant and interesting posting before each exam (1 point each):
<http://openlab.citytech.cuny.edu/halleckmat2680fa2013/>

Quizzes (5%): On occasion, a sometimes announced and sometimes unannounced quiz will be given.

Webwork (10%): Problems from each section are posted at <http://mathww.citytech.cuny.edu/webwork2>

Group Project (10%): Instructor will provide a list of topics, but each group of 3/4 students is encouraged to find own topic. To ensure an interesting selection, the instructor must personally approve your topic. Proposed topic (group) is due 10/29. Report of investigation (individual) is due 11/19. Draft of presentation (group) is due 12/6. You are encouraged to use technology including MS PowerPoint for your projects.

Exams (20% each, 40% total): There are 3 non-final exams. No makeups given. Best 2 scores will be selected. One week before each exam, a sample exam will be posted on the open lab. **Homework** (not webwork) from relevant sections will be submitted for each exam, contributing **20% of each exam score.**

Final Exam (30%): Sample exam questions will be posted 2 weeks prior to exam. If you miss final exam and have been failing the course, you will receive an F. Otherwise, if you have a documented illness or emergency, you will have opportunity to take a makeup final exam (small fee).

Grade scale:

93 – 100	A	77 – 79.9	C+
90 – 92.9	A-	70 – 76.9	C
87 – 89.9	B+	60 – 69.9	D
83 – 86.9	B	0 – 59.9	F
80 – 82.9	B-		

Date	MAT 2680 Differential Equations: Boyce & DiPrima 10th Ed	Pages	Homework	
8/29	1.1 Some Basic Mathematical Models; Direction Fields	1-7	P.7: 3,15-20	
	1.2 Solutions of Some Differential Equations (include $y'=y+k$)	10-15	P.16: 1,2; use $y(0)=3$	
9/3	1.3 Classification of Differential Equations	14-24	P. 24: 1-19 odd	
9/10	2.1 Linear Equations; Method of Integrating Factors	31-39	P. 40: 1, 3, 13-19 odd	
9/12	2.2 Separable Equations	42-48	P. 48: 1-19 odd	
9/17	2.2 Separable Equations (Homogeneous)		P. 47: 30-37 all	
9/19	2.4 Difference between Linear and Nonlinear Equations (Existence and Uniqueness)	68-76	P. 75: 1, 3	
9/24	2.4 Difference between Linear and Nonlinear Equations (Bernoulli Equations)		P. 75: 27-31 all	
9/26	2.6 Exact Equations and Integrating Factors	95-100	P. 100: 1-15 odd, 18	
10/1	2.6 (part II)			
10/3	2.7 Numerical Approximations: Euler's Method	101-109	P. 110: 1, 3, 11, 13	
10/8	3.1 Homogeneous Equations with Constant Coefficients (second order linear)	137-143	P. 144: 1-17 odd	
10/10	First Examination (Chapters 1 and 2)			
10/17	3.3 Complex Roots (of the Characteristic Equation)	158-164	P. 164: 1-21 odd	
10/22	3.4 Repeated Roots; Reduction of Order	167-172	P. 172: 1-13 odd	
10/24	3.5 Non-homogeneous Equations; Method of Undetermined Coefficients	175-184	P. 184: 1-19 odd	
10/29	3.7 Mechanical and Electrical Vibrations	192-203	P. 203: 1-7 odd, 12	
10/31	3.8 Forced Vibrations	207-216	p. 217: 1-11 odd,	
11/5	Midterm Examination (Sections 3.1-7)			
11/7	5.2 Series Solutions Near an Ordinary Point, Part I	254-263	P. 263: 1, 2, 3, 5	
11/12	5.2 Series Solutions Near an Ordinary Point, Part II		P. 263: 7, 9, 11, 15	
11/14	6.1 Definition of the Laplace Transform	309-314	P. 315: 1, 5	
11/19	6.2 Solution of Initial Value Problems (Inverse Transform), Part I	317-324	P. 324: 1-9 odd	
11/21	6.2 Solution of Initial Value Problems (Inverse Transform), Part II	317-324	P. 324: 11-17 odd	
11/26	Third Examination (Sections 3.8, 5.2, 6.1 and 6.2 problems 1-9)		↓every 4th	
12/3	6.3 Step Function	327-332	P. 333: 1-21	
12/5	8.1 The Euler or Tangent Line Method	451-459	P. 460: 1-7 odd	
12/10	6.4 Application of Step Functions to Discontinuous Forcing IVP's	335-340	P. 340: 1, 3, 5	
12/12	8.2 Improvements on the Euler Method	462-466	P. 466: 1, 3, 5	
12/17	Review			
12/19	Final Examination (60% Chapters 6 & 8, 40% Chapters 1-5)			