

**BRONX COMMUNITY COLLEGE**  
of the City University of New York  
**DEPARTMENT OF MATHEMATICS AND COMPUTER SCIENCE**

Syllabus: **MTH 34** *Differential Equations and Selected Topics in Advanced Calculus* (4 credits/4 hours)

Prerequisite: **MTH 33**

Textbook: *Elementary Differential Equations and Boundary Value Problems*, 10th ed., W.E. Boyce and R.C. DiPrima,  
John Wiley Publ. (2012).

<b>Day</b>	<b>Section/Topic</b>	<b>Suggested Problems</b>
1	<b>Ch. 1: Introduction</b>	
	1.1 Mathematical models, direction fields	p7/ 1,3,11, 21, 23
	1.2 Solutions to some DEs	p15/ 1,7,9,12, 13
	1.3 Classification of DEs	p24/ 7, 9, 13, 25
2	<b>Ch. 2: First Order DEs</b>	
	2.1 Linear equations; integrating factors	p39/ 5,9,15, 17, 38, 39
	2.2 Separable equations	p48/ 1,3,5,13, 17, 23, 27, 30, 31, 33
3	2.3 Modeling with first order DEs	p60/ 1,3,,5,10, 12, 21, 23, 32
4	2.4 Linear vs. nonlinear DEs	p76/ 3,9,13, 15, 23, 27, 29
	2.5 Autonomous DEs and population dynamics	p88/ 1,3,5,9, 13, 21, 25
5	2.6 Exact equations	p101/ 1- 13 odd
6	Exam	
7	<b>Ch. 3: Second Order Linear Equations</b>	
	3.1 Homogenous equations with constant coefficients	p144/ 1-15 odd, 25
	3.2 Solutions to homogenous equations; the Wronskian	p155/1-9 odd, 13, 14, 23, 25, 31
8	3.2 The Wronskian (cont.)	
9	3.3 Complex roots of the characteristic equation	p164/1-6, 7-21 odd, 34, 35
	3.4 Repeated roots; reduction of order	p172/ 1-15 odd, 23-29 odd, 32, 33, 41
10	3.5 Nonhomogenous equations; undetermined coefficients	p184/1-19 odd, 35, 37
11	3.6 Variation of parameters	p190/1,3,5,9,15, 22, 23
12	3.7 Mechanical and electrical vibrations	p203/ 1,3, 7, 11, 12, 28, 29
	3.8 Forced vibrations	p217/ 1,5,7,11,18,19
13	<b>Ch. 4: Higher Order Linear Equations</b>	
	4.1 $n$ th order linear equations	p226/ 3,7,8-10, 11, 13, 18
14	4.2 Homogenous equations with constant coefficients	p233/ 1-6, 9, 11-31 odd, 39
15	Exam	
16	<b>Ch. 5 Series Solutions of Second Order Linear Equations</b>	
	5.1 Review of power series	p253/1-15 odd, 21-27 odd
17	5.2 Series solutions near and ordinary point I	p263/1-13 odd, 15, 17, 21
18	5.4 Euler equations; regular singular points	p280/1-33 odd
19	5.5 Series solutions near a regular singular point I	p286/1-11 odd, 12, 14
20	<b>Ch. 6: The Laplace Transform</b>	
	6.1 Definition of the Laplace transform	p315/ 1,5,7,11, 15-23 odd, 25, 30
21	6.2 Solution of IVPs	p324/1-27 odd, 29, 31
22	6.3 Step functions	p333/5, 7, 11, 13, 17, 19, 23,27
	6.4 Discontinuous forcing functions	p340/ 1-11 odd

<b>Day</b>	<b>Section/Topic</b>	<b>Suggested Problems</b>
23	<b>Ch. 10: Partial Differential Equations and Fourier Series</b>	
	10.1 Two-point BVPs	p595/1-21 odd
	10.2 Fourier series	p605/ 1,7,9,13-23 odd
24	10.2 Fourier series (cont.)	
	10.3 The Fourier convergence theorem	p612/ 1-11 odd, 13, 15
25	10.4 Even and odd functions	p620/1-7, 15-21 odd, 29, 33
26	10.5 Separation of variables	p630/ 1-13
27	Exam	
28	Review	

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