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 or equivalent; and CUNY English Proficiency, or ENG 100 or 110, if required**
Textbook: *Elementary Differential Equations and Boundary Value Problems*, 10th ed., W.E. Boyce and R.C. DiPrima, John Wiley Publ. (2012). ISBN 978-1118157381

Day	Section/Topic	Suggested Problems
1	**Ch. 1: Introduction**	
	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	**Ch. 2: First Order DEs**	
	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	**Ch. 3: Second Order Linear Equations**	
	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	**Ch. 4: Higher Order Linear Equations**	
	4.1 nth 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	**Ch. 5 Series Solutions of Second Order Linear Equations**	
	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	**Ch. 6: The Laplace Transform**	
	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

Day	Section/Topic	Suggested Problems
23	**Ch. 10: Partial Differential Equations and Fourier Series**	
	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	

Academic Integrity

Academic dishonesty (such as plagiarism and cheating) is prohibited at Bronx Community College and is punishable by penalties, including failing grades, dismissal and expulsion. For additional information and the full policy on Academic Integrity, please consult the BCC College Catalog.

Accommodations/Disabilities

Bronx Community College respects and welcomes students of all backgrounds and abilities. In the event you encounter any barrier(s) to full participation in this course due to the impact of a disability, please contact the disAbility Services Office as soon as possible this semester. The disAbility Services specialists will meet with you to discuss the barriers you are experiencing and explain the eligibility process for establishing academic accommodations for this course. You can reach the disAbility Services Office at: **disability.services@bcc.cuny.edu**, Loew Hall, Room 211, (718) 289-5874.

If you test positive for COVID while taking an in-person/hybrid course:

- Using your BCC email account, please email all your in-person and/or hybrid professors of your status.
  - Please include your emplid # and current phone number in your email.
  - Please also email us at healthservices@bcc.cuny.edu .
  - Your professor will work with you to complete class work while you are in quarantine.
- You will be called by a Health Services staffer. It is critical that you connect in a timely matter with this staff member for contact tracing information.
- You will need to submit a negative COVID test to Health Services (**healthservices@bcc.cuny.edu**) before you are allowed access to the campus.
- Your negative test result must come from your doctor or a medical provider (e.g. CityMD, Urgent Care, etc.). We will not accept a negative home test result.

AW/AM Fall 2018
updated 01/14/2019
updated EA 8/22 for Prereq
updated EA 01/23 for COVID