COLLEGE OF STATEN ISLAND
Department of Mathematics
Course Outline: MTH 337, Spring 2025 Raychaudhuri
Applied Combinatorics & Graph Theory

Text: *Applied Combinatorics* by Alan Tucker, 6th Ed., John Wiley & Sons Publisher.
Students are required to submit HW problems included in 5 HW sets to be assigned, due dates will be announced in class. They will be graded and will count towards 15% of the total grade
The problems listed here are additional and optional. The ones that are bolded and underlined are included in the five HW sets.

LESSON	SECTION	TOPICS	Additional/optional HOMEWORK PROBLEMS
1	5.1 5.2	Two basic counting principles; Simple arrangements & selections	Problems included in HW 1 1, 5, 7, **9**, **13**, 32 1, 2, 3, 7, 9, **21**a, b, **c,** d, **25**, 34, 54
2	5.3	Arrangement and selections with repetitions	Problems included in HW 1 **2**, 5, **7**, **12**, 30, 33
3	5.4	Distributions	Problems included in HW 1 **1**, **2**, **7**, 9, **12a, b**, 18, 23, 24, 27, 48, 56
4	5.5	Binomial coefficients	Problems included in HW 2 1, 3a, **3c**, **4c**, 9a, 13, **14 a, b**
5		Problem session	
6	6.1	Generating function models	Problems included in HW 2 1b, **2c**, 3 b, c, **4a**, 5, 8a, b, c, 13, 17
7	6.2	Calculating coefficients of generating functions	Problems included in HW2

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			1, 4, **5**, 13, 14, 17, **20**, 22
8	6.4	Exponential Generating Functions	Problems included in HW 2 1, **6** **7**, 13, 14, 17
9		Problem session	
10		REVIEW for EXAM 1	
11		EXAM 1	
12	7.1 7.3	Recurrence relations models Solution of linear recurrence relations	Problems included in HW 3 2a, 6a, b, 7, *9*, 12, **22**, 23,24 1,2, 3a**,** c
13	7.4	Solution of inhomogeneous recurrence relations	Problems included in HW 3 1a ,c,9a, b, c, d,10,12
14	7.5	Solutions with generating functions	Problems included in HW 3 **1**a, **b, c**, d
15	1.1	Graph Models	Problems included in HW 4 1,2,7a, b,13, 16, 20a, 22, 23

16	1.2 1.3	Isomorphism Edge Counting	Problems included in HW 4 1, 3a, **5c**, e, f, 6a, b, **f**, 14 1a, b, c, 3, 6, 7, 8, 9, 11, 15, **16**
17	1.4	Planar graphs	Problems included in HW 4 1a, b, 2,a, b, i, 3a,e, 5, **7,a**, c, d, h, 8,16,**17**, 18a, **19**, 20, 21
18		Problem session	
19		Review for Exam 2	

20		**Exam 2**	
21	2.2	Hamiltonian circuits & applications	Problems included in HW 5 **1**, 2, 3,**4**a, b, **c**, i, 7a, b, 9
22	2.3	Graph Coloring	Problems included in HW 5 **1**a, **b**, d, **e,** ,**f**, l, **p**, **r**, 4a, 12, 13, 14
23	2.4	Coloring theorems	Problems included in HW 5 1,2,3,4,8a,12,13,**14c**,16,**18**
24 & 25	3.1	Properties of trees	Problems included in HW 5 1, 2, 3, 4, 5, 6, 7, 16, 20, 24, 26**,** 31b
26		Problem session	
27 & 28		Review for Final	
Date TBA		**FINAL EXAM**	