

**BRONX COMMUNITY COLLEGE  
Of the City University of New York**

**DEPARTMENT OF MATHEMATICS AND COMPUTER SCIENCE**

**SYLLABUS: CSI 35 DISCRETE MATHEMATICS II**

**3 credits 4 hours**

**SYLLABUS:** CSI 35 Discrete Mathematics II

**PREREQUISITE:** CSI 30 & MTH 31 and ENG 02 and RDL 02, if required.

**TEXT:** *Discrete Mathematics and its Applications* Seventh Edition, by  
Kenneth H. Rosen, McGraw Hill, 2012

**Objectives:** A successful student in this course will learn to

1. classify basic discrete structures,
2. use graphs and trees as models and tools for studying computational complexity,
3. analyze finite and infinite structures using mathematical reasoning and tools of first order logic,
4. design and analyze algorithms, in particular those based on recursion and iteration,
5. prove formal statements using mathematical induction,
6. use mathematical induction in verification of program correctness.

**Suggested in-class  
examples**

**Suggested Homework**

**Chapter 5: Induction and Recursion (4 weeks)**

5.1	Mathematical Induction	Examples 1-6, 8, 10, 13-15	p. 329	1, 3, 4, 5, 7, 8, 9, 10, 18, 49, 56
5.2	Strong Induction and Well-Ordering	Examples 1-4	p. 341	1, 3, 4, 12,
5.3	Recursive definitions and structural induction	Examples 1-10, 12	p. 308	1-9 odd, 18, 23, 25, 34- 36, 44, 47, 48
5.4	Recursive Algorithms	Examples 1, 2, 3, 5-10	p. 370	1, 2, 3, 7, 21, 44, 45
	Computer projects		p. 382	1, 4, 5, 8, 9, 11, 12, 13, 15
	Computations and explorations		p. 383	1, 2, 3, 4, 7

### Chapter 9 Relations (3 weeks)

9.1	Relations and their properties	Examples 1-22	p. 581	1, 3, 5, 10, 27, 33, 35, 42, 43, 44
9.2	n-ary relations and their applications	Examples 1-11	p. 589	1-9 odd, 19
9.3	Representing relations	All	p. 596	1, 3, 13, 18, 20, 31, 32
9.5	Equivalence relations	All	p. 615	1, 3, 9, 11-16, 21-24, 43, 46, 47
9.6	Partial orderings	Examples 1-20	p. 630	1, 3, 4, 5, 9, 11, 13, 15, 19-21, 32, 36
	Computer projects		p. 638	1, 2, 3, 4
	Computations and explorations		p. 638	1, 2, 3, 6, 7

### Chapter 10 Graphs (3 weeks)

10.1	Graphs and graph models	All	p. 649	1, 3-12 all
10.2	Graph terminology	Examples 1-13	p. 665	1, 2, 3, 5, 7, 8, 9, 18-26 all
10.3	Representing Graphs and Graph Isomorphism	Examples 1-11	p. 675	1-15 odd, 35-43, odd, 57
10.4	Connectivity	Examples 1, 2, 3, 5, 6, 7, 13, 14	p. 689	1-6, 20, 21
10.5	Euler and Hamilton paths	All	p. 703	1-15 odd, 19-23 odd, 31, 33, 35
10.6	Shortest path problems	All	p. 707	1-13 all
10.8	Graph Coloring	Examples 1-4	p. 732	1-11 all, 13, 15
	Computer projects		p. 742	1, 2, 3, 4, 5, 17
	Computations and explorations		p. 743	1, 2, 3, 4, 8, 9, 10, 11

### Chapter 11 Trees (4 weeks)

11.1	Introduction to Trees	All	p. 755	1-11 odd, 21, 23
11.2	Applications of Trees	All	p. 769	1, 3, 5, 19, 21, 23, 25, 37, 40, 42
11.3	Tree Traversal	All	p. 783	1-5, 7-15 all
11.4	Spanning Trees	All	p. 795	1-9 all, 13, 15, 23
11.5	Minimum spanning Trees	All	p. 802	1-9 all

**Computer projects, computations and explorations for chapter 11:** there are many relevant projects listed on page 808; choose those that correspond to the material covered and emphasized in class.