LAGUARDIA COMMUNITY COLLEGE
CITY UNIVERSITY OF NEW YORK
DEPARTMENT OF MATHEMATICS, ENGINEERING, AND COMPUTER SCIENCE

MAT230 – INTRODUCTION TO DISCRETE MATHEMATICAL STRUCTURES

4 Lecture Hours, 4 Credits

Prerequisites: MAT201 - Calculus I
CIS101 or any programming language course
Pre- or Corequisite: MAT202 - Calculus II

Catalog Description:

This course covers mathematical concepts essential for continued study on computer science and related fields. The topics of study include: propositional logic, methods of proof, set theory, algorithm and its complexity, introduction to number theory and its applications, mathematical induction and recursion, basic of counting.

Text: *Discrete Mathematics and Its Applications* (Sixth Edition) by Kenneth H. Rosen
Published by McGraw-Hill (2006)
ISBN: 13 978-0-07-288008-3; ISBN: 10 0-07-288008-2

Evaluation:

Three Examinations	60%
Final Examination	40%

Comments:

The specific topics listed in the course outline and the principles of evaluation listed above are both subject to modification.

Each student is strongly encouraged to complete homework assignments to the best of his or her ability consistently throughout the semester. Generally speaking, the student that follows this recommendation will maximize his or her understanding of the subject matter and achieve optimal performance on examinations.

COURSE OUTLINE

LESSON	SECTION	TOPIC	HOMEWORK
1	1.1	Propositional Logic	
2	1.2	Propositional Equivalences	
3	1.3	Predicates and Quantifiers	
4	1.4	Nested Quantifiers	
5	1.5	Rules of Inference	
6 – 7	1.6	Introduction to Proofs	
8	1.7	Proof Methods and Strategy	
9		Chapter Review	
10		**Examination #1**	
11	2.1	Sets	
12	2.2	Set Operations	
13 – 14	2.3	Functions	
15 – 16	2.4	Sequences and Summations	
17 – 18	3.1	Algorithms	
19 – 20	3.2	The Growth of Functions	
21 – 22	3.3	Complexity of Algorithms	
23		Chapter Review	
24		**Examination #2**	
25 – 26	3.4	The Integers and Division	
27	3.5	Primes and Greatest Common Devisors	
28	3.6	Integers and Algorithms	
29 – 30	4.1 – 4.2	Mathematical Induction, Strong Induction and Well-Ordering	
31 – 32	4.3	Recursive Definitions and Structural Induction	
33	4.4	Recursive Algorithms (Optional)	
34		Chapter Review	
35		**Examination #3**	
36 – 37	5.1	The Basics of Counting	
38 – 39	5.2	The Pigeonhole Principle	
40 – 41	5.3	Permutations and Combinations	
42	5.4	Binomial Coefficients	
43 – 44	5.5	Generalized Permutations and Combinations	
45 – 46	7.1	Recurrence Relations	
47	7.2	Solving Linear Recurrence Relations (Optional)	
48		Course Review	
Week 13		**Final Examination**	