# MA 3025 — LOGIC AND DISCRETE MATHEMATICS (4-1)

**Prerequisite:**  MA 2025 (MA 1025 can possibly be used as well).

**Text:** Discrete Mathematics and Its Applications, 7th Edition, K.H. Rosen, WCB/McGraw-Hill 2012.

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| HOURS | TOPIC | SECTION |
| 2-2 | Propositional Logic, quantifiers, rules of inference | 1.1-1.6 |
| 1-3 | Proof Methods and Strategy; Sets, Set Operations | 1.7; 1.8; 2.1; 2.2 |
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| 1-4 | Divisibility and Modular Arithmetic; Primes and Greatest Common Divisors ; Solving Congruences | 4.1- 4.5 |
| 1-5 | The Basics of Counting, The Pigeonhole Principle; Permutations and Combinations | 6.1- 6.3 |
| 2-7 | Binomial Coefficients | 6.4 |
| 1-8 | Mathematical Induction | 5.1 |
| 3-11 | Strong Induction | 5.2 |
| 2-13 | Recursive Definition and Structural Induction | 5.3 |
| 2-15 | Recurrence Relations | 8.1 |
| 2-17 | Solving Recurrence Relations | 8.2 |
| 1-18 | Inclusion Exclusion | 8.5 |
| 2-20 | Applications of Inclusion Exclusion | 8.6 |
| 1-21 | Matrices | 2.6 |
| 2-23 | Relations and Their Properties | 9.1 |
| 2-25 | Representing Relations | 9.3 |
| 1-26 | Equivalence Relations | 9.5 |
| 2-28 | Functions | 2.3 |
| 1-29 | Graphs and Graph Models | 10.1 |
| 1-30 | Graph Terminology and Special Types of Graphs | 10.2 |
| 1-31 | Graph Isomorphism | 10.3 |
| 1-32 | Euler and Hamiltonian Path | 10.5 |
| 2-34 | Graph Coloring | 10.8 |
| 9-43 | Exams, Reviews, and Holidays |  |

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