COURSE SYLLABUS FORM

American University of Beirut
Faculty of Arts and Sciences
Department Mathematics

Course Number and Title: Math 211, Discrete Structures

1. Course Learning Outcomes

- Describe set operations
- Define a function
- Determine the equivalence classes of an equivalence relation
- Describe certain methods of proof
- Construct truth tables
- Verify logical equivalences without truth tables
- Use the principle of mathematical induction in certain proofs
- Describe recursive definitions
- Develop methods for counting large finite sets without actually listing their elements
- Distinguish between countable and uncountable sets
- Describe maximal elements in a partially ordered set
- Define graphs and trees

2. Resources Available to Students

Textbook: Discrete Mathematics, 4th Edition, Ross and Wright

3. Grading Criteria

Two quizzes, 25% each
Comprehensive final exam, 50%

4. Schedule

Week	Topics	Section	Suggested Problems
1	Some special sets	1.3	3,4,5,6,7,8,9,10,13,14
	Set operations	1.4	3,4,6,7,10,11,12
2	Functions	1.5	3, 4,5,7,8,9,10,11,13,14,15
	Properties of functions	1.7	1,2,3,4,6,7,9,11,10,12,13,14
3	Sequences	1.6	2,3,4,5,6,7,9,8,10
	Informal introduction(Logic)	2.1	1,2,4,6,7,11,12,13,14
4	Propositional calculus	2.2	1,3,5,6,8,9,10,13,18,20
	Getting started with proofs	2.3	1,5,6,9,11,15
5	Methods of proof	2.4	1,2,3,4,7,9,13
6	Relations	3.1	1,2,4,5,7,10,12,13,14,15,16,19
	Equivalence Relations	3.5	4,7,9,10,11,13,15,16
7	Division Algorithm	3.6	l(a,c),3,4,6,7,8,9,10,11,12,13,14,17,22
8	Mathematical induction	4.2	3,4,5,6,9,12,13,17,18,19,21,22
	Big-Oh notation	4.3	1,3,4,5,8,11,12,14,16,23
9	Big-Oh notation	4.3	1,3,4,5,8,11,12,14,16,23
	Recursive definitions	4.4	1,2,3,7,8,9,16,20,21
10	Recursive relations	4.5	1,3,4,7,9,12,15,17
	Basic counting techniques	5.1	1,4,6,7,8,9,10,11,12,14,16
11	Inclusion-exclusion	5.3	1,2,4,7,89,10,11,12,14,15
12	Counting and partitions	5.4	1,3,6,7,9,12,13,15
	Infinite sets (Countability)	11.3	1,2,3,4,5,6,7,9,11,12,14
13	Infinite sets (Countability)	11.3	8,9,11,13,15
14	Partially ordered sets	10.1	1,3,4,5,7,9,13,16,18
	special orderings	10.2	1,2,3,5, 7,9,10,11,14,15,18
15	Graphs, trees	6.1, 6.3	1,9,10,12 1,3