Lahore University of Management Sciences

CS 210 – Discrete Mathematics

Fall 2015-16

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Course URL (if any)	TBA

Course Basics				
Credit Hours	4			
Lecture(s)	Nbr of Lec(s) Per Week	2	Duration	1 hour and 50 minutes
Recitation/Lab (per week)	Nbr of Lec(s) Per Week		Duration	
Tutorial (per week)	Nbr of Lec(s) Per Week		Duration	

Course Distribution	
Core	
Elective	
Open for Student Category	
Close for Student Category	

COURSE DESCRIPTION
The course covers the mathematical foundations of computer science. The aim is to introduce the students to the fundamental techniques of discrete mathematics which may be employed in a variety of mathematical disciplines, including fields in theoretical computer science, such as, for instance, algorithms. An introduction to logic, proof techniques, sets, functions, and relations is made, along with an initiation to

combinatorics, basic graph and tree structures. A very brief introduction to number theory and discrete probability is made. Problems are formed mathematically and solved using available tools and techniques.

COURSE PREREQUISITE(S)	
• • •	Calculus-I, or Calculus with Theory

COURSE OBJECTIVES	
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Learning Outcomes	
• • •	The students will understand the basic principles of discrete mathematics and will be able to apply these principles in subsequent courses such as algorithms, theory of computing, and networks. The students will be able to reason mathematically about the basic discrete structures and data types such as numbers, sets, relations, graphs and trees. The students will be able to understand and synthesize elementary proofs

Grading Breakup and Policy	
Assignments /Homework:	15%
Midterm Examination:	30%
Quizzes:	15%
Final Examination:	40%

Examination Detail	
Midterm Exam	Open five two sided A4 sheets, Calculator Not Allowed; pencil required
Final Exam	Open five two sided A4 sheets, Calculator Not Allowed; pencil required

COURSE OVERVIEW	
Week/ Lecture / Module	Topics
1.	Logic, Logical Equivalence, Predicate
2.	Logic, Sets
3.	Sets, Functions
4.	Functions, Sequence and Sums
5.	Sequence and Sums,
6.	Proofs, Induction
7.	Induction, Cardinality
8.	Counting
9.	Counting, Binomial theorem and Pascal triangle
10.	Discrete Probability
11.	Discrete Probability
12.	Graphs and Trees

13.	Graphs and Trees
14.	Graphs and Trees

Textbook(s)/Supplementary Readings
1. R. H. Rosen, Discrete Mathematics and its Applications, 6th Edition, McGraw-Hill 2. Matousek&Nevestril, Invitation to Discrete Mathematics 3. Laszlo Lovasz&JozsefPelikan, Discrete Mathematics: Elementary and Beyond.