Sub.	Course Syllabus (منهج المادة (البرنامج الدراسي	الموضوع	كلية المعرفة ALMAAREFA COLLEGE
Year	1436/1437 - 2015/2016	العام	

College	**AlMAAREFA COLLEGE**
Department	**COMPUTER SCIENCE AND IS**

Course Code	**MATH 251**
Course Name	**Discrete Mathematics**
Credit Hours	**3 (3 + 0 + 0)**
Instructor	**Farhana Yasmin**
Office & Office Hours	**Sunday – 1:00 to 3:00** **Tuesday – 2:00 to 3:00**
Email	fyasmin@mcst.edu.sa

Course Description	The course will introduce the students to the basic language and ideas of discrete mathematics that occur in all branches of information technology. It will also begin the process of training the students to argue correctly, both informally and formally, about these structures. The students will begin to learn the use of abstract analysis to solve concrete problems. The topics include: Foundations (logic, sets, and functions); Algorithms, integers, and matrices; Mathematical reasoning (methods of proof, mathematical induction, recursive definitions and algorithms); Combinatorics (counting techniques, permutations and combinations); discrete probability and probability theory; Discrete structures (sets, relations, graphs and trees).
Prerequisite(s)	**MATH 102, COMP 112**
Textbook(s) & Supplementary Materials	***Primary:*** Kenneth H. Rosen, ***Discrete Mathematics And Its Applications***, 7th edition, 2012. McGraw Hill . ***Optional:*** Ralph P Grimaldi , ***Discrete and Combinatorial Mathematics*** (5th Edition) 2003 McGraw Hill
Student Outcomes (SO) Addressed by the Course	• Be familiar with the idea of a discrete structure, and the notions of formal language and parse tree. • Have an understanding of the basic ideas of sets and functions, including Boolean combination of sets, and be able to manipulate such expressions • Have an understanding of the standard propositional logic connectives and be able to convert logical expressions into conjunctive and disjunctive normal form. • Have an understanding of the universal and existential quantifiers • Be familiar with the general concept of binary relation, equivalence and order relations and methods of combining relations; be familiar with the standard graphical representations of relations, • Be familiar with the principle of mathematical induction and be able to perform proofs using this principle, also be aware of simple examples of structural induction on lists. • Be able to apply the inclusion-exclusion principle in simple counting examples

	• Be familiar with the basic ideas of probability, and be able to calculate probabilities in simple experiments • Enhance his problem-solving skills through modeling. • Develop a logical, mathematical approach to solving problems and will be able to solve problems and present solutions relevant to discrete structures and their applications to IT communications. • Further their ability to work with relatively little guidance on the subject matter and exercises associated with the course. • Obtain the basic mathematical background necessary to follow the rapidly changing developments in IT communications. • Improve their key skills in written communication, numeric and problem solving.
Major Topics Covered	1) **The Foundations: Logic and Proof, Quantifiers** ○ Logic ○ Methods of Proving Theorems ○ Mathematical induction ○ Predicates & Quantifiers 2) **Set Theory** ○ Set and set notation ○ Union and intersection 3) **Relations** ○ Relations and Their Properties ○ n-ary Relations and Their Applications ○ Representing Relations ○ Equivalence Relations 4) **Counting** ○ The Basics of Counting ○ Permutations ○ Combinations 5) **Matrices** ○ Matrices & operation on matrices ○ Matrix multiplication ○ Determinant & properties of determinant ○ Inverse matrix ○ Solving linear equation using matrix

	6) **Discrete Probability** ○ Probability distributions ○ Binomial Probability distributions ○ Poisson Probability distributions	
Assessment & Evaluation Plan for the Course*	***Homework Assignments and attendance***	5 points
	Project	5 points
	Quizzes	5 points for each
	Two Midterm Exams	20 points each
	Final	40 points
Policies*	1. Type all homework, you may use some tools e.g., MS Office, Visio, etc. 2. Students can discuss homework, but no copying!, according to the college by laws the minimum penalty of plagiarism is failing the course. 3. Late Submission Penalty …….	

CALENDAR & OUTLINE OF TOPICS

WEEK	DATE	TOPICS	DUTIES/TASKS DUE DATES
1	23/08/2015	The Foundations: Logic and Proof, Quantifiers	
2	30/08/2015	Methods of Proving Theorems	HW 1
3	6/09/2015	Predicates & Quantifiers	QUIZ 1
4	13/09/2015	Predicates & Quantifiers	HW 2
5	4/10/2015	Set Theory	
6	11/10/2015	Set Theory	HW 3
7	18/10/2015	Relations	MIDTERM 1
8	25/10/2015	Relations	
9	1/11/2015	Relations	Project
10	8/11/2015	Counting	QUIZ 2
11	15/11/2015	Matrices	
12	22/11/2015	Matrices	MIDTERM 2
13	29/11/2015	Matrices	
14	6/12/2015	Discrete Probability	HW 4
15	13/12/2015	**Revision**	
16	20/12/2015	**Revision**	
17 & 18	27 / 12/2015	**Final Exam**	FINAL EXAMS

* According to the department council approval