Zarqa University
Faculty: Information Technology
Department: Computer Science
Course title: Discrete Mathematics(1501220)

Instructor:
Lecture's time:
Semester:
Office Hours:

Course description:

This course introduces the mathematical elements of computer science including propositional logic, predicate logic, sets, functions and relations, proof techniques, mathematical induction, algorithms, recursion and complexity of algorithms.

Aims of the course:

Students are expected to:

- Understand theorems, techniques and applications of discrete mathematics.
- Acquire the mathematical maturity needed to undertake more advanced courses of computer
- Translate statements into symbolic form using logical connectives and quantifiers.
- Use symbolic logic and truth tables to prove the equivalence of statements and determine the validity of an argument,
- Prove simple arguments, perform operations with sets, relations and design and analyze simple algorithms.

Intended Learning Outcomes (ILOs):

Upon successful completion of this course, students will be able to:

A. Knowledge and Understanding	
A1	**Concepts and Theories:** • Understand and construct mathematical arguments. • Understand proofing techniques • Understand the basic properties of relations • Understand the notion of algorithms and its analysis
A2	**Contemporary Trends, Problems and Research:** Propose mathematical ideas that can help solving real life problems

B. Subject-specific skills	
B1	**Problem solving skills:** Be able to prove, design and analysis logically.
B2	**Modeling and Design:** • Be able to construct mathematical arguments. • Be able to design simple algorithms and its analysis.
B3	**Application of Methods and Tools**: Learn How to use the different relation properties in mathematical models.

C. Critical-Thinking Skills	
C1	**Analytic skills:** Distinguish between the different techniques of proofs.
C2	**Strategic Thinking:** Plan to construct logical proofs.
C3	**Creative thinking and innovation**: Plan how to explain different ideas mathematically.

D. General and Transferable Skills (other skills relevant to employability and personal development)	
D1	**Communication:** Express and communicate ideas in written and oral forms.
D2	**Teamwork and Leadership:** Be cooperative members of a team
D3	**Organizational and Developmental Skills:** plan, prioritize, and achieve defined goals

Course Structure:

Week	Hours	ILOs	Topics	Teaching Procedure	Assessment methods
1, 2	6	A1,A2	• Introduction • Sets	Lecturing with Active participations. Problem solving. Cooperative Learning Discussions. Activities.	Class Participation and/or quiz or homework
3, 4	6	A1, B1	• Logic axioms	=	=
5	3	A1, A2, B1, B2	• Rules of inference	=	=
6	3	A1, B1, B2, D1	• Quantifiers	=	=
7, 8	6	A1, A2, B1, C1, C2, C3	• Direct and indirect Proofs	=	=
9, 10	4	A1, C1, C2, C3	• Induction and Recursion	=	=
10, 11	6	A1, B1, C1, C2, C3	• Relations and Functions	=	=
12	6	A1, C3, D1, D2, D3	• Algorithms	=	=
13, 14	5	B1, C1, D1, D2, D3	• Analysis of algorithms	=	=

References:

A. Main Textbook:

Discrete Mathematics" by Richard Johnson Baugh, Macmillan, 2007

B. Supplementary Textbook(s):

Discrete Mathematics and its Applications (6th Edition) by Kenneth H. Rosen (McGraw-Hill, Inc., New York, 2007).
http://www.mhhe.com/math/advmath/rosen/r5/

Assessment Methods:

Methods	Grade	Date
First Exam	20%	
Second Exam	20%	
Assignments (Reports /Quizzes/ Seminar / Tutorials ….)	10%	
Final Examination	50%	