

University of Bahrain Quality Assurance and Accreditation Center

Course Syllabus Form							
1. <u>Course code</u> :	ITCS252- 254	2. <u>Course</u>	<u>title</u> :	Discrete Structu	res l		
3. <u>College:</u> Information Technology							
4. <u>Department</u> : Computer Science							
5. <u>Program</u> : B.Sc. in: Computer Science/Computer Engineering/Information Systems							
6. <u>Course credits</u> : 3	6. <u>Course credits</u> : 3-2-3						
7. Course NQF Lev	el: 6						
8. NQF Credits: 12	8. NQF Credits: 12						
9. <u>Prerequisite:</u> ITC	S113 & MAT	THS 101					
10. Lectures Timing	& Location	:					
11. Course web page	: <u>http://bb</u>	.uob.edu.bh/					
12. <u>Course Instructor:</u>							
13. Office Hours and	Location:						
14. <u>Course coordinat</u>	or: Dr. An	nine Mahjoub					
15. Academic year: 2	023-2024						
16. Semester		First	X	Second	Summer		
17. <u>Textbook(s):</u> Rosen Kenneth H. Discrete Mathematics and its Applications 7th Edition McGraw-Hill 2012							
18. References:							
19. Other learning resources used (e.g. e-Learning, field visits, periodicals, software,							
etc.): Blackboard (a Learning)							
20. Course description (as published):							
1 University of Bahrain – Quality Assurance& Accreditation Center - Course Syllabus Form							
Policies)							
Note: Items shown <u>underlined</u> cannot be changed without the department consent.							
QF-20-rev.a.	4						

This course covers basic discrete structures that are backbones of computer science. Topics include logic, predicate calculus, proofs, sets, relations, functions.

21. Course Intended Learning Outcomes (CILOs):								
	CILOs	1	2	3	4	5	6	
1.	Use proposition logic to represent knowledge. Prove Propositional Equivalences and tautology						1	
2.	Use predicate logic to represent knowledge						1	
3.	Validate the correctness of an argument using truth tables or inference rules.						1	
4.	Use proof techniques such as direct, contraposition, and contradiction proofs.						1	
5.	Use week, strong and structural induction to prove mathematical problems with natural number						1	
6.	Apply set operations and proof techniques to solve problems involving sets.						1	
7.	Determine properties of relations and inspect various types of relations such as equivalence and partial order relations						1	
8.	Interpret a function and its operations; one-to-one, onto and inverse and composite functions						1	

22. Course assessment:						
Assessment Type	Details/ Explanation of Assessment in relation to CILOs	Number	Weight	Date(s)		
Quizzes As shown in table 24/ CILOs:1-8		4	10%			
Test 1	Covers Chapter 1.1,1.2, 1.4, 1.5/CILOs:1,2,3	1	20%	TBA		
Test 2	Covers chapters 1.6,1.7,1.8, 5.1,5.2,5.3/ CILOs:4,5,6	1	20%	TBA		
Laboratory/Practical						
Home Assignments	As shown in table 24/ CILOs:1-8		10 %			
Projects/Case Studies						
Final ExaminationCovers chapters1,2,5,9/ CILOs:1-8		1	40%	10/01/2024		
Total			100%			

23. Description of Topics Covered				
Topic Title	Description			
(e.g. chapter/experiment title)				
Propositional Logic and Logic of Predicate	In the first, the propositional logic and its properties and applications are studied. Then the predicate calculus is introduced with many applications.			
Arguments, proofs, and inductions proofs	Introduce the rules of inferences and its application to prove the correctness of the arguments. Then study proofs techniques such as direct, contraposition, contradiction proofs and proofs by induction.			
Sets and its properties	The fundamental discrete structure on which all other discrete structures are built, namely, the set is introduced. Then the different application of the sets is presented.			
Functions and its properties	Interpret a function and its operations; one-to-one, onto, inverse and composite functions			
Relations	Determine properties of relations and inspect various types of relations such as equivalence and partial order relations			

24. Weekly Schedule							
Week	Date	Topics covered	CILOs	Teaching Method	Assessment		
1	17-9	Chapter 1: Logic and Proofs 1.1: Propositional Logic	1				
2	24-9	Chapter 1 Logic and Proofs 1.1: inverse, converse, contrapositive.	1	Tutorial 0: Basic Math. Intro to Latex			
3	1-10	Chapter 1 Logic and Proofs 1.3: Propositional Equivalences: Truth table and identities.	1	Tutorial 1			
4	8-10	Chapter 1 Logic and Proofs 1.4: Quantifiers and Predicate logic.	2	Tutorial 2			
5	15-10	Chapter 1 Logic and Proofs 1.5: Nested Quantifiers.	2	Tutorial 2 and Hw1			
6	22-10	Chapter 1 Logic and Proofs 1.6: Arguments validation: truth table, Inference Rules.	3	HW 1 Solution and Discussion	Quiz#1: sec 1.115		
7	29-10	Chapter 1 Logic and Proofs 1.7: Proofs Direct, contrapositive, counter example.	4	Tutorial 3 and Hw2			
8		Mid Semester Break					
9	12-11	Chapter 1 Logic and Proofs 1.7, 1.8: contradiction, proof by cases, existence proof.	4	HW 2 Solution and Discussion	Quiz#2: sec 1.6-1.7		
10	19-11	Chapter 2 Basic Structures: Sets 2.1, 2.2, and 2.5: Set Notation, Set Operations and cardinality.	6	Tutorial 4			
11	26-11	Chapter 2 Basic Structures: Sets 2.2: Prove set equivalence and subset.	6	Tutorial 5 and Hw3			
12	3-12	Chapter 2 Basic Structures: functions 2.3: Function properties, inverse and composite.	8	HW 3 Solution and Discussion	Quiz#3: sec 2.1-2.2		
13	10-12	Chapter 2 Basic Structures: functions 2.3: Function properties, inverse and composite.	8				
14	17-12	Chapter 5 Induction and Recursion 5.1, 5.2, 5.3: Week and strong. Induction and Well ordering principle	5	Tutorial 6 and Hw4			
15	24-12	Chapter 9 Relations 9.1, 9.3: Relations properties and representation.	7	HW 4 Solution and Discussion	Quiz#4: sec 5.1-5.3		
16	31-12	Chapter 9 Relations 9.5, 9.6: Equivalence and Partial Order Relations.	7	Tutorial 7			

⁴ University of Bahrain – Quality Assurance& Accreditation Center - Course Syllabus Form QF-20-rev.a.4

25. Academic Integrity Statement

Honesty and integrity are integral components of the academic process. Students are expected to be honest and ethical at all times in their pursuit of academic goals in accordance with the Regulations of Professional Conduct Violations for University of Bahrain Students, the UOB Plagiarism Policy and the UOB Guide to Students Rights and Duties. Any breach of academic integrity will be dealt according to the University Regulations for Professionalm Conduct Violations.

Prepared by: Dr. Amine Mahjoub

Date: 10-9-2023

