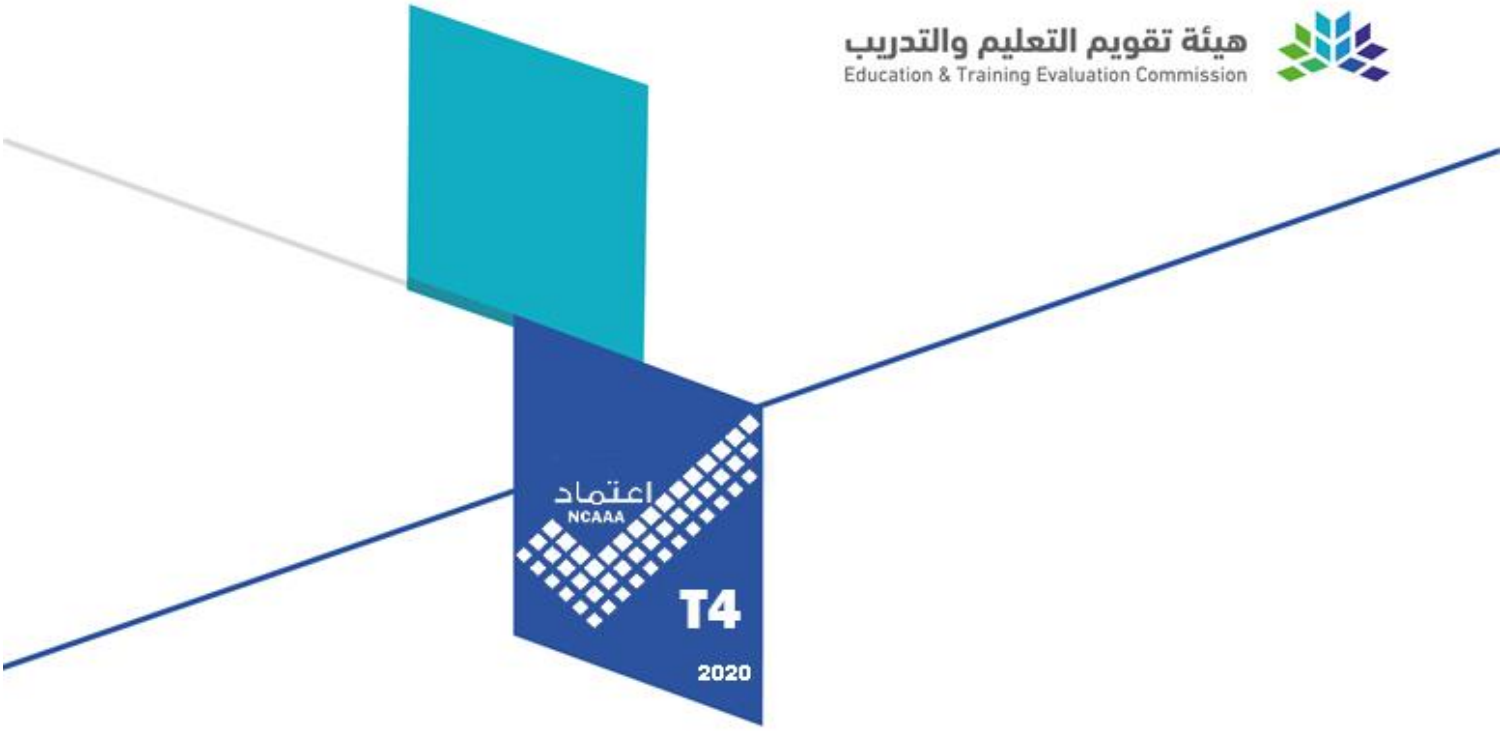
هيئة تقويم التعليم والتدريب
Education & Training Evaluation Commission



Course Specifications

Course Title:	Discrete Mathematics for Computer Science 1
Course Code:	CSI 212
Program:	Computer Science &Information
Department:	Computer Science and Information
College:	College of Science at Az Zulfi
Institution:	Majmaah university

Table of Contents

A. Course Identification

1. Credit hours:
2. Course type **a.** University ☐ College ☐ Department ☑ Others ☐ **b.** Required ☐ Elective ☐
3. Level/year at which this course is offered: **level 3**
4. Pre-requisites for this course (if any)**:** NA
5. Co-requisites for this course (if any)**:**

6. Mode of Instruction (mark all that apply)

No	Mode of Instruction	Contact Hours	Percentage
1	**Traditional classroom**	48	80%
2	**Blended**	6	10%
3	**E-learning**	6	10%
4	**Distance learning**		
5	**Other**		

7. Contact Hours (based on academic semester)

No	Activity	Contact Hours
1	**Lecture**	30
2	**Laboratory/Studio**	
3	**Tutorial**	30
4	**Others** (specify)	
	Total	60

B. Course Objectives and Learning Outcomes

1. Course Description

. Four-fifth of the course is introduced mainly inside well equipped traditional class- rooms. So the student will be taught, in a tidy robust way, the main core of the course.

One-tenth of the course is conducted with a video conference. This mode will allow the student to skip the fear-threshold of scientific interaction.

One-tenth of the course is presented orally in free discussion, within workgroups, at the traditional classrooms or/and library. This will upgrade the students skills in presentations of his ideas and scientific thoughts, and encourage him for continuous looking of new up-to-date information.

The 2nd and 3rd modes of instructions makes the students feel "involved" in the dis-cussions, rather than simply being outside spectators.

2. Course Main Objective

The current course introduces the basic concepts of logic and its tools. The student will study Propositional Logic. He will recognize and be familiar with the logic connec- tives, their truth tables, and use them to form complicated statements including condi- tions and equivalence. This will be a robust start to understand the IF-statement in programming languages. He will be able to transform the complicated statements to symbols and vice versa and modeling logic expressions as electronic circuits depending on the series and parallel properties of the AND and OR connectives/gates respective- ly. Also, he will learn effectively to perform the negation processes especially in pres- ence of quantifiers. In Set Theory the student will study the set operations analytical- ly and using Venn Diagrams. In the Theory of Proofs he will be able to apply direct and indirect proofs, e.g. mathematical induction and contradiction. Moreover, the student will learn the basic concepts of Functions, Sequences, and Relations; The remaining of the course, which is the most important part is concerned with Graph and Trees Theo- ries. The student will be capable of achieving Graph Models, Manipulating Graph Termi- nology, representing graphs in Lists and Matrices, understanding Euler and Hamilton Paths and efficiently applying them in important applications as Shortest-Path- Problems and Graph Coloring. Handling Trees topics, the student will be able to con- struct Spanning Trees, find The Minimum Spanning Tree/Network from a given weighted Graph. Finally, the student, in a complete easy and Clarified efficient algo- rithm, will be able to construct the Huffman Code.

3. Course Learning Outcomes

	CLOs	Aligned PLOs
1	**Knowledge and Understanding**	
1.1	Describe the problem in a formal manner.	K1
1.2	Recognize different methods to attack a problem.	K2
2	**Skills :**	
2.1	Analyze, and reconstruct problem and explain how to solving it.	S1
2.2	Demonstrate the feasibility of an applied solution/plan	S2
2.3	Use the available commercial software systems/packages in application to the suggested solution/plan.	S2
3	**Values:**	
3.1	cooperative working in groups inside the class, or/and efficient participation in take-home- assignments.	C1

C. Course Content

No	List of Topics	Contact Hours
1	Propositional Logic: Atomic propositions. Truth values. Logical Connectives and their truth tables: Negation, Conjunction, Dis- junction, De Morgan's Laws, Implication, Equivalence. Logical Cir- cuits. Logical Quantifiers and their negation. Priority and Prece- dence. Tautologies, Contradictions, and contingencies.	16
2	Set Theory: Basic Set Concepts. Venn Diagrams and Set Oper- ations. Cardinal Numbers and Surveys. Infinite Sets and Their Cardinalities.	4
3	Proofs: Direct Proofs, and Counterexamples. Mathematical In- duction.	8

4	Functions, Sequences, and Relations: Domain, Codomain, Range. Hash Functions. Sequences and Strings. Binary relations. Domain and Range. Equivalence Relations.	8
5	Graph Theory and Introduction to Trees: Basic Concepts and Definitions. Representations of Graph using the Lists and the Matrices. Euler's Path and Circuit. Hamilton's Path and Circuit. Weighted Graph and Travelling Sale's Man Problem. Applications: Coloring Theorem. Trees: Definitions. Spanning Trees. Application: Huffman's Code	24
Total		60

D. Teaching and Assessment

1. Alignment of Course Learning Outcomes with Teaching Strategies and Assessment Methods

Code	Course Learning Outcomes	Teaching Strategies	Assessment Methods
1.0	**Knowledge and Understanding**		
1.1	Recall the basic data structures and their relative advantages and disadvantages.	-Developing basic communicative - Ability through short and varied situated discourse. - Lecturing - Team work - Exercises	-Homework. - Group Discussion - Presentation - Mid-term exam - Final exam
1.2	Describe data structure types and their process (insertion, deletion , and search).		
1.3	Describe the common search algorithms techniques.		
2.0	**Skills**		
2.1	An ability to implement and use common data structures	Problem solving - Class discussion - presentation -Individual meeting with the instructor (encouraging students to discuss different topics outside the classroom)	-Class Participation - Presentation - Essay Question - Research - Mid-term exam - Final exam
2.2	An ability to implement and use data structure types (linked list, tree , stack, and queue) in storing , insertion, deletion , and searching data on a disk file		
2.3	Apply the common search algorithms techniques on data structures types (linked list, tree , stack, and queue) .		
2.4	Present a short report in a written form and orally using appropriate scientific language		
3.0	**Values**		
3.1	Communicate with teacher, ask questions, solve problems, and use computers	-Exercises - Problem solving - oral quizzes - Essay questions - Encourage students to use programming by C++ or C#	-Write reports - Exercises related to -specific topics -Mid-term exam - Final exam
3.2	Illustrate deal with confidence with differential equations, integrations, and differentials		
3.3…	Operate questions during the lecture, work in groups, and communicate with each other and with me electronically,		

Code	Course Learning Outcomes	Teaching Strategies	Assessment Methods
	and periodically visit the sites I recommended.		

2. Assessment Tasks for Students

#	Assessment task*	Week Due	Percentage of Total Assessment Score
1	First written mid-term exam	6	15%
2	Second written mid-term exam	12	15%
3	Presentation, class activities, and group discussion	Every week	10%
4	Homework assignments	After Every chapter	10%
5	Implementation of presented programs	Every two weeks	10%
6	Final written exam	16	40%

***Assessment task** (i.e., written test, oral test, oral presentation, group project, essay, etc.)

E. Student Academic Counseling and Support

Arrangements for availability of faculty and teaching staff for individual student consultations and academic advice :
Office hours - Office call – BLACK BOARD-Email - Mobile

F. Learning Resources and Facilities

1.Learning Resources

Required Textbooks	Richard Johnsonbaugh; "Discrete Mathematics"; 7th Edition; Prentice Hall; 2009	
Essential References Materials	Robert Blitzer; Thinking Mathematically; 4th Edition; Prentice Hall; 2008.	
Electronic Materials	Determines as the course is going on	
Other Learning Materials	Video and presentation	

2. Facilities Required

Item	Resources
Accommodation (Classrooms, laboratories, demonstration rooms/labs, etc.)	Classroom and Lab, as those that are available at college of science at AzZulfi.

Item	Resources
Technology Resources (AV, data show, Smart Board, software, etc.)	Smart Board - data show
Other Resources (Specify, e.g. if specific laboratory equipment is required, list requirements or attach a list)	A/N

G. Course Quality Evaluation

Evaluation Areas/Issues	Evaluators	Evaluation Methods
course evaluation	Student-faculty management meeting	Questionnaires
Evaluation of Teaching	Program/Department Instructor	Discussion within the staff members teaching the course Departmental internal review of the course.

Evaluation areas (e.g., Effectiveness of teaching and assessment, Extent of achievement of course learning outcomes, Quality of learning resources, etc.)
Evaluators (Students, Faculty, Program Leaders, Peer Reviewer, Others (specify)
Assessment Methods (Direct, Indirect)

H. Specification Approval Data

Council / Committee	
Reference No.	
Date	