



Course Specifications

Course Title:	Discrete Structures
Course Code:	ICS 123
Program:	Information and computer sciences
Department:	Computer science and information
College:	Science at Al-Zulfi
Institution:	Majmaah

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A. Course Identification

1. Credit hours:
2. Course type
a. University <input type="checkbox"/> College <input type="checkbox"/> Department <input checked="" type="checkbox"/> Others <input type="checkbox"/>
b. Required <input checked="" type="checkbox"/> <input type="checkbox"/>
3. Level/year at which this course is offered: 2
4. Pre-requisites for this course (if any): MATH 231
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	*	%80
2	Blended	*	%10
3	E-learning	*	
4	Correspondence	*	
5	Other	*	%10

7. Actual Learning Hours (based on academic semester)

No	Activity	Learning Hours
Contact Hours		
1	Lecture	30
2	Laboratory/Studio	
3	Tutorial	30
4	Others (specify)	
	Total	60
Other Learning Hours*		
1	Study	
2	Assignments	
3	Library	
4	Projects/Research Essays/Theses	
5	Others (specify)	
	Total	

* The length of time that a learner takes to complete learning activities that lead to achievement of course learning outcomes, such as study time, homework assignments, projects, preparing presentations, library times

B. Course Objectives and Learning Outcomes

1. Course Description

This course has been designed to provide you with a clear, accessible introduction to discrete mathematics. The principal topics presented in this course are logic and proof, induction and recursion, discrete probability, and finite state machines. You will develop the mathematical

foundations necessary for more specialized subjects in computer science, including data structures and algorithms.

2. Course Main Objective

- The Logic of Compound Statements. The basics of logic to be introduced.
- To understand the logic of Quantified Statements. The universal, existential quantifiers and also the negation of quantifier stamen are to be introduced.
- Introduction to Number Theory and Proof Methods.
- Mathematical Induction and Introduction to Sequences
- Set Theory
- Introduction to Counting and Probability
- Recursion: Solve recursive problems by applying knowledge of recursive sequences
- Graphs and Trees: Create graphs and trees to represent and help prove or disprove statements, to make decisions

3. Course Learning Outcomes

CLOs		Aligned PLOs
1	Knowledge:	
1.1	Create compound statements, expressed in mathematical symbols or in English, to determine the truth or falseness of compound statements and to use the rules of inference to prove a conclusion statement from hypothesis statements	a1
1.2	Prove mathematical statements involving numbers by applying various proof methods, which are based on the rules of inference from logic;	ICS-a2
1.3	Prove the validity of sequences and series and the correctness of repeated processes by applying mathematical induction;	a1
1.4	Define the terms, rules, and properties of set theory and use these as tools to support problem solving and reasoning in applications of logic, functions, number theory, sequences.	ICS-a2
1.5	Calculate probabilities and apply counting rules;	ICS-a2
1.6	Solve recursive problems by applying knowledge of recursive sequences	a1
1.7	Create graphs and trees to represent and help prove or disprove statements, to make decisions	ICS-a2
		ICS-a2
2	Skills :	
2.1	Analyze, and reconstruct problem and explain how to solving it.	b1
3	Competence:	
3.1	Demonstrate the feasibility of an applied solution/plan	c1
3.2	Use the available commercial software systems/packages in application to the suggested solution/plan.	c3

C. Course Content

No	List of Topics	Contact Hours
1	The Logic of Compound Statements	6
2	The Logic of Quantified Statements	3
3	Introduction to Number Theory and Proof Methods	6
4	Mathematical Induction and Introduction to Sequences	6

5	Set Theory: Define the terms, rules, and properties of set theory.	6
6	Introduction to Counting and Probability	6
7	Recursion	3
8	Graphs and Trees	6
Total		

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		
1.1		Developing basic communicative ability through: - Lecturing, - Team work, - Oral Discus	-Quizzes, -Web search, -Graded homework, -Class Participation, -Midterms and Final Exams,
1.2			
...			
2.0	Skills		
2.1		<input type="checkbox"/> Lectures <input type="checkbox"/> Exercises demonstrations <input type="checkbox"/> Case studies <input type="checkbox"/> Individual <input type="checkbox"/> Presentations <input type="checkbox"/> Brainstorming	<input type="checkbox"/> Class Participation <input type="checkbox"/> Essay Question <input type="checkbox"/> Presentation <input type="checkbox"/> Research
2.2			
...			
3.0	Competence		
3.1		<input type="checkbox"/> Small group discussions <input type="checkbox"/> Whole group discussions <input type="checkbox"/> Brainstorming <input type="checkbox"/> Presentations.	<input type="checkbox"/> Written Exam <input type="checkbox"/> Web search and writing re-ports. <input type="checkbox"/> Lab assignments <input type="checkbox"/> Class Activities <input type="checkbox"/> Quizzes
3.2			
...			

2. Assessment Tasks for Students

#	Assessment task*	Week Due	Percentage of Total Assessment Score
1	Homework assignments, Oral discussions	Weekly	30%
2	Written summary reports through web search	3, 7, 9, 13	
3	Class participation in solving problems	Weekly	
4	Take-home-exams	5, 11	
5	Project groups	5, 10	
6	Quizzes	2, 4, 8, 14	
7	First Exam	6	15 %
8	Second Exam	12	15 %
9	Final 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 :

Arrangements for availability of faculty and teaching staff for individual student consultations and academic advice. (include amount of time teaching staff are expected to be available each week)

Office hours: Mon: 10-12, Wed: 8-10

Email: m.jemmali@mu.edu.sa

F. Learning Resources and Facilities

1. Learning Resources

Required Textbooks	Discrete Mathematics and Its Applications Kenneth H. Rosen 7th Edition, McGraw Hill, 2012 ISBN-13: 978-0130188304
Essential References Materials	Discrete Mathematics and Its Applications Kenneth H. Rosen 7th Edition, McGraw Hill, 2012 ISBN-13: 978-0130188304
Electronic Materials	http://www.freebookcentre.net/Mathematics/Discrete-Mathematics-Books.html
Other Learning Materials	

2. Facilities Required

Item	Resources
Accommodation (Classrooms, laboratories, demonstration rooms/labs, etc.)	<ul style="list-style-type: none"> Classrooms with required digital aids and to support traditional method of teaching using blackboard. Classrooms with proper lighting and air conditioning system integrated with the sound System /audio system. Classroom with smart board interface, display screen and a computer to aid the sessions
Technology Resources (AV, data show, Smart Board, software, etc.)	Smart Board with supporting software / computers with updated versions of software as required to understand the subject concepts.
Other Resources (Specify, e.g. if specific laboratory equipment is required, list requirements or attach a list)	

G. Course Quality Evaluation

Evaluation Areas/Issues	Evaluators	Evaluation Methods
Student-faculty management meetings.	Program Leaders	Direct
Discussion within the staff members teaching the course	Peer Reviewer	Direct
Departmental internal review of the course.	Peer Reviewer	Direct

Evaluation Areas/Issues	Evaluators	Evaluation Methods
Reviewing the final exam questions and a sample of the answers of the students by others.	Peer Reviewer	Direct
Visiting the other institutions that introduce the same course one time per semester.	Faculty	Indirect
Student-faculty management meetings.	Program Leaders	Direct
Discussion within the staff members teaching the course	Peer Reviewer	Direct

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	Program plan committee
Reference No.	
Date	08/09/2019