

SULTAN QABOOS UNIVERSITY COURSE OUTLINE

PROGRAM:

	a a 1		2.60			
1.	Course Code	MATH3360				
2.	Course Title	Discrete Mathematics				
3.	Credits	Credits: 3				
		Workloa	d: 9 hours (4 contact hours in classro	om and 5 hours self-study)		
4.	Pre-requisite Course(s)	(LANC2	058,MA1H2350) or (LANC2051,MA	1H2350))		
5.	Co-requisite Course(s)					
6.	Equivalent Course(s)					
7.	Incompatible Course(s)					
8.	Course Category	Unive	rsity Requirement	University Elective		
			ge Requirement	College Elective		
		Depar	tment Requirement	Department Elective		
			alization Requirement	SpecializationElective		
		Other	(specify):			
9.	Course Owner	College:		Department:		
10.	Course Type	Lectu	re	Lecture/Lab		
		Lectu	re/Seminar	Lecture/Studio		
		⊠Lectu	re/Tutorial	Lecture/Lab/Tutorial or Seminar		
		Tutorial				
		Field or Work Placement Studio				
		Seminar Internship				
		Work	shop	Project		
11. Language of Instruction English						
12.	Course Description					
Thi	s course builds upon the math	nematical p	rinciples studied in Math2350 (Founda	tion of Mathematics), through applications		
to s	simple discrete configuration	s. The cou	rse includes topics in: recursion, relat	ions, counting, cardinality and graphs and		
13.	Teaching/Learning Strate	gies				
• 1	Problem solving and practice	exercises.				
• 1	Lecture-Discussion method.					
• I	Peer tutoring.					
• (Cooperative learning.	native asse	essment			
• /	Analyze students' performan	ce and pro	vide feedback.			
14. Assessment Components and Weight [%]						
Quizzes 20%				Other (specify):		
Homework assignments 5%			Project			
	□ In-term examination(s) 25% □ Final examination 50%					
15.	15. Grading Method					
	A-F Scale Pas	ss/Not pass	ed			
16.	16. Textbook(s) and Supplemental Material					
Discrete Mathematics with Applications, 5th Edition, (2019), by Susanna S. Epp., Published by Cengage						

17.	7. Matching Course Objectives with Program Outcomes and SQU Graduate Attributes						
	SQU Graduate Attributes						
A.	SQU graduates should be able to:	B.	SQU graduates possess	C.	SQU graduates should		
1. 2. 3.	apply the knowledge and skills relevant to the specialization communicate effectively and use information and communication technologies critically analyze complex information and present it in simple clear manner	 1. 2. 3. 4. 	interpersonal communication skills and alignment with culture of international labour market to assist them in practical life and in living successfully skills and motivation for independent learning and engagement in lifelong learning and research work ethics and positive values, and intellectual independence and autonomy teamwork skills and display potential leadership qualities		relishgoodcitizenship qualities, be conscious of their national identity and be socially responsible, engage in community affairs and be mindful of contemporary issues.		

#	Intended Student Learning Outcome	Relevant Program Outcome(s)	Applicable
	/Course Learning Objective		Attribute(s)
1.	a) Define and Compute sequences, sets and functions recursively.	To identify and apply recursive nature of sequesnces if possible.	A1,A3
2.	b) Deduce and prove recurrence relations for Fibonacci numbers, Compound Interest and Stirling numbers.	Apply Fibonacci sequence, compond interest problem in real situations.	A1,A3,B2
3.	c) Solve recurrence relations by iteration.	Apply solution methods to solve recursives	A1,A3
4.	d) Solve Second and higher order linear recurrence relations with constant coefficients.	Identify ordrs of recurrence relations.	A1,A3
5.	e) Determine if a given relation is an equivalence relation.	Identify and apply equvalence relations in mathematical problems.	A1,A3
6.	f) Describe the relation induced by a partition, equivalence relations and equivalence classes.	Understand partitioning by equivalence relatuions and its properties.	A1,A3
7.	g) Describe and Identify different kinds of partial orders.	Identify partial orderings in various problems.	A1,A3
8.	h) Define and find the greatest, least, maximal and minimal elements of a poset.	Apply rules of maximal, minimal, least and greatest elements in partial orderings	A1,A3
9.	i) Solve some counting problems using basic principles of counting like Multiplication and Additions Rules and the Inclusion/Exclusion Rule.	Apply counting techniques in real life problems.	A1,A3,B2
10.	j) Compute combinations and permutations with or without repetition with distinguishable or indistinguishable objects.	Apply combination rules to count various real life problems.	A1,A3,B2
11.	k) Use the Pigeonhole Principle to deduce results.	Understand pigeonhole principle and apply it to various problems.	A1,A3,B2
12.	1) State and prove basic identities involving the binomial coefficients.	Apply combinatorial arguments to prove results on binomial coeficient and theorem.	A1,A3
13.	m) State basic definitions of Graph Theory, Identify different types of graphs and represent them using matrices.	Identify real life problems that can be describe by graphs.	A1,A3
14.	n) Identify graphs with Euler or Hamiltonian circuits and paths.	Apply graph paths to solve puzzles in real situation	A1,A3,B2
15.	o) Show understanding of definitions and basic properties of trees. Also find spanning trees and minimal spanning trees in graphs and apply Krushkal's and Prim's algorithms to get the minimal spanning trees.	Understand and Apply trees in various problems arising from science and real life situations.	A1,A3,B2
16.	p) Find shortest path between two vertices in a weighted graph.	Apply shortest path algorithms to solve real life optimization problems.	A1,A3,B2
17.			

18.		
19.		
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16. Student Responsibilities

It is the student's responsibility to know and comply with all University Academic Regulations relevant to participation in this course. These regulations specifically include attendance requirement and students` academic code of conduct.

For attendance, it is the student's responsibility to be punctual and to attend all classes.

Students are expected to perform their work with honesty and avoid any academic misconduct, which is defined as the use of any dishonest or deceitful means to gain some academic advantage or benefit. This can take many forms, including but not limited to, the following: copying, plagiarism, collusion and forging documents. For full details, please refer to the Undergraduate Academic Regulations and to the Student Academic Misconduct Policy.

Additionally, this course requires that you:

1) are responsible for getting help. If you have questions or problems, ask the instructor either in the classroom or during the office hours. Alternatively, make an appointment with your instructor.

2) read the solved examples and do the suggested exercises. Because of time constraint, all solved examples or suggested exercises cannot be discussed by the instructor(s) in the classroom.

3) There will be no makeup quiz or exam if the student misses without valid excuse and the mark on that assessment will be ZERO.

4) If the student misses only one quiz with the valid excuse supported by proper document that proves the reason of the absence then his/ her grade will be based on the remaining part of the assessment components.

5) In case if the student misses more than one quiz or midterm or final exam and he/she provides valid excuse(s) supported by proper document(s) that proves the reason of absence then a make up will be given.

6) should check the Moodle regularily for new announcements and postings related to the course updates and for additional useful course materials such as the previous semester Tests and Final exams. To enroll in the Moodle page do the following steps in the SQU website.

➤ Choose "Online Services", then "E-Learning".

> Choose "E-Learning (Academic)", then login using your SQU user name and password.

> From the available courses under "College of Science", "Mathematics ", choose "Discrete Mathematics- Spring2020

➤ The Enrolment key: m3360

See more on assessment in the Appendix B last page of the outline.

COURSE INFORMATION						
Course Code MATH3360 Course Title Discrete Mathematics						
Semester/Year	Spring2020	Section(s)	10			
Day, Time, and Place Sunday 10:00-11:50 (D17), Thursday 10:00-11:50 (D17)						
Course Coordinator NADIA ALDHAMRI						
Office Location	0122	Office Hours	Monday (11:00-11:50), Wednesday (10:00-11:50)			
Office Tel. Ext. 1416 Email nadias@squ.edu.om						

		Tentative Schedule	
Week	Lecture #	Topic/Material to be covered	Assessment
1	Section	(5.6) : Defining Sequences Recursively	
	5.6	Exercises 1-15, 22-29, 33, 37-38.	
2	Section	(5.7) : Solving Recurrence Relations by Iteration.	
	5.7	Exercises 1-8, 10-13, 15, 18-26, 28-33, 35-38, 40, 43, 44, 46-48.	
	Section	(5.8) : Second-Order Linear Homogeneous Recurrence Relations with	
	5.8	Constant Coefficients	
		Exercises 1-16, 18-19, 24.	
3	Section	(5.9): General Recursive Definitions and Structural Induction.	
	5.9	Exercises 1, 2, 4-11, 13, 15-19, 21, 23-25.	
4	Section	(8.1): Relations on Sets.	Quiz 1
	8.1	Exercises 1,3-23.	Sections:5.65.9
	Section	(8.2) : Reflexivity, Symmetry and Transitivity.	In Tutorial Class.
	8.2	Exercises 1-29.	
	Section	(8.3) : Equivalence Relations.	
	8.3	Exercises 2-16, 19-21, 25, 32, 36-42.	
5	Section	(8.5) : Partial Order Relations.	
	8.5	Exercises 1-4, 6-11, 13, 14, 16-37, 42,43.	
6	Section	(9.1) : Introduction to Probability.	Quiz 2
	9.1	Exercises 2-9, 21-31.	Sections:8.1-8.5
	Section	(9.2): Possibility Trees and the Multiplication Rule.	In Tutorial Class
	9.2	Exercises 1-17, 18(a,b),19, 22, 24-28, 32-43, 47.	
7	Section	(9.3) : Counting Elements of Disjoint Sets: The Addition Rule.	
	9.3	Exercises 1-8, 11-14, 16-18, 20,23,24,31, 33-37.	
	Section	(9.4) : The Pigeonhole Principle.	
	9.4	Exercises 1-3, 5-19, 25-30.	
8	Section	(9.5) : Counting Subsets of a Set: Combinations.	Midterm 19 March
	9.5	Exercises 1-10, 12-20, 25-28.	2020, 5.6-9.3
	Section	(9.6) : r-Combination with Repetition Allowed.	In Tutorial
	9.6	Exercises 1-6, 8, 10-14, 16.	Class
9	Section	(9.7) : Pascal's Formula and The Binomial Theorem.	
	9.7	Exercises 1-27, 29-54.	
10	Section	1.4: The Language of Graphs	Quiz3
	1.4	Exercises 1-9.	Sections:9.4-9.6
	Section	4.9: Application: The handshake Theorem	In Tutorial Class
	10.1	Exercises 3-13, 16-24.	
		(10.1) : Trials, Paths and Circuits.	
		Exercises 1-35.	
11	Section	(10.2) : Matrix Representations of Graphs.	
	10.2	Exercises 2-7, 19-21.	
	Section	(10.3) : Isomorphism of Graphs.	
	10.3	Exercises 1-23, 30.	

12	Section	(10.4): Trees: Examples and Basic Propeeties.	Quiz 4
	10.4	Exercises 1,3, 7-25, 27, 30	Sections:9.7,10.1,
			10.2
			In Tutorial Class
13	Section	(10.5) : Rooted Trees.	
	10.5	Exercises 1,2, 4-19.	
14	Section	(10.6) : Spanning Trees and a Shortest Path Algorithm.	Homework Quiz and
	10.6	Exercises 1-17.	submission (9.4-
			10.4)
			In Tutorial Class
15		Revision	
16			
17			

APPENDIX A: INSTRUCTORS OF MULTIPLE SECTIONS							
Section	Instructor	Day, Time, and Place	Office Location and Extension	Email	Office Hours		
10	NADIA ALDHAMRI	Monday 11- 11:50	RM:122 Ext:1416	nadias@squ.edu.om	Monday (11:00- 11:50), Wednesday (10:00-11:50)		
11	NADIA ALDHAMRI	Wednesday 10- 11:50	RM:122 Ext:1416	nadias@squ.edu.om	Monday (11:00- 11:50), Wednesday (10:00-11:50)		

APPENDIX B: ADDITIONAL INFORMATION

1) During a class, all mobile phones must be switched OFF (or put on silent mode). Mobile phones are NOT allowed to be used as calculators during Quizzes or Tests.

2) Students must NOT share pencils, erasers, calculators, ... during Quizzes, Tests and Final exam.

3) There will be NO makeup quiz or exam if the student misses without valid excuse and the mark on that assessment will be ZERO.

4) If the student misses only one quiz and he/she provides within ONE week the valid excuse supported by proper document that proves the reason of the absence then his/ her grade will be based on the remaining part of the assessment components.

5) In case if the student misses more than one quiz or midterm or final exam and he/she provides within ONE week the valid excuse(s) supported by proper document(s) that proves the reason of absence then a make up will be given.

6) Model solutions for Test should will be posted on the Moodle when test papers are returned. Students should check their total marks and whether all their answers have been marked. Any requests to review the answers must be made immediately to their instructor while in the classroom. NO request will be accepted after you leave the classroom.

7) Final Exam is comprehensive and its date is scheduled on Wednesday, 15 May 2019 from 11:00 to 13:30.