هيئة تقويم التعليم
Education Evaluation Commission
المركز الوطني للتقويم والاعتماد الأكاديمي
National Center for Academic Accreditation and Evaluation

ATTACHMENT 5.

T6. COURSE SPECIFICATIONS (CS)

هيئة تقويم التعليم
Education Evaluation Commission

Course Specifications

Institution: Al Yamamah University	Date: November 19, 2018
College/Department : Computer and Information Systems / Mathematics and Natural Sciences	

A. Course Identification and General Information

1. Course title and code: Discrete Mathematics / MTH 105
2. Credit hours: 4
3. Program(s) in which the course is offered.
(If general elective available in many programs indicate this rather than list programs)
   1. Bachelor of Engineering in Network Engineering and Security
   2. Bachelor of Science in Software Engineering
   3. Bachelor of Science in Information Systems
4. Name of faculty member responsible for the course: Ms. Njwd Albishi
5. Level/year at which this course is offered: Level 1/ First Year
6. Pre-requisites for this course (if any): MTH001
7. Co-requisites for this course (if any): MTH104
8. Location if not on main campus: Main Campus
9. Mode of Instruction (mark all that apply):

a. traditional classroom	√	What percentage?	100
b. blended (traditional and online)		What percentage?	
c. e-learning		What percentage?	
d. correspondence		What percentage?	
f. other		What percentage?	

Comments: It is orientation course.

B Objectives

1. What is the main purpose for this course?

The main purpose of this course is to provide the student the ability to formulate problems in a logical manner , give the problem-solving capabilities along with a formal way of thinking, relates structures in real life with the structures in computer science. The theoretical topics of discrete mathematics will be used in different other practical aspects in computer sciences (e.g. data structures, high performance computing, analysis of algorithms etc.).

2. Briefly describe any plans for developing and improving the course that are being implemented. (e.g. increased use of IT or web based reference material, changes in content as a result of new research in the field)

- We use LMS (Learning Management System). -
Refer students to related web sites.

C. Course Description (Note: General description in the form used in Bulletin or handbook)

Course Description:

The course provides an overview of the branch of mathematics commonly known as discrete mathematics. It covers the mathematical topics most directly related to computer science: Propositional logic, Logic Gates; Algebra and operation of Sets, Relations, Functions and Proofs; Applications of Graph Theory; Trees Applications. Emphasis will be placed on providing a context for the application of the mathematics within computer science such as Digital Logic, Software Engineering, AI, Cryptography etc.

1. Topics to be Covered

List of Topics	No. of Weeks	Contact Hours
- Propositional Logic: Atomic propositions. Truth values. Logical Connectives and their truth tables: Negation, Conjunction, Disjunction, De Morgan's Laws, Implication, Equivalence. Logical Circuits. Logical Quantifiers and Predicates.	3	12
- Set Theory: Basic Set Concepts. Venn Diagrams and Set Operations.	1	4
- Inclusion and Exclusion, The principle of Inclusion and Exclusion, An alternative form of Inclusion and Exclusion.	1.5	6
- Induction, Mathematical Induction. - Recursion. Recursive Definitions, Recursive Algorithms	2.5	10
- Functions, Sequences, and Relations: Domain, Codomain, Range. Equivalence Relations, Sequences and Summation.	1.5	6
- Counting, Permutations and Combinations. - Relations, Recurrence Relations, Non- Homogeneous Relations, Binary Relations and Combining Relations, Closure, Reflexive and Equivalence Relations.	2	8
- Graph Theory and Introduction to Trees: Basic Concepts and Definitions. Connectivity. Simple and non-simple Graphs, Multi Graphs, Multiple Edges, loops. Direct and Un-Direct Graphs, Degree of Vertex. - Trees. Application: Tree, Root, Level of Tree, Sub-Tree, Internal Vertex. Binary and Ordered Binary Trees, Parent.	3.5	14
Total	15	60

2. Course components (total contact hours and credits per semester):

		Lecture	Tutorial	Laboratory / Studio	Practical	Other:	Total
Contact Hours	Planed	60					60
	Actual	60					60
Credit	Planed	4					4
	Actual	4					4

3. Additional private study/learning hours expected for students per week. 6

4. Course Learning Outcomes in NQF Domains of Learning and Alignment with Assessment Methods and Teaching Strategy

On the table below are the five NQF Learning Domains, numbered in the left column.

First, insert the suitable and measurable course learning outcomes required in the appropriate learning domains (see suggestions below the table). **Second**, insert supporting teaching strategies that fit and align with the assessment methods and intended learning outcomes. **Third**, insert appropriate assessment methods that accurately measure and evaluate the learning outcome. Each course learning outcomes, assessment method, and teaching strategy ought to reasonably fit and flow together as an integrated learning and teaching process. (Courses are not required to include learning outcomes from each domain.)

Code #	NQF Learning Domains And Course Learning Outcomes	Course Teaching Strategies	Course Assessment Methods
1.0	**Knowledge** After successful completion of the course students will be able to		
1.1	Describe the problem in a formal manner.	Formal lectures Group discussion Exercises Class room activities	Home works Quizzes Exams Class participation
1.2	Recognize different methods to attack a problem.		
2.0	**Cognitive Skills** After successful completion of the course students will be able to		
2.1	Analyze problem and explain how to be solved.	Formal lectures Group discussion Exercises Class room activities	Home works Quizzes Exams Class participation
2.2	Assess the different alternative solutions of a problem to select the optimal one.		
3.0	**Interpersonal Skills & Responsibility** After successful completion of the course students will be able to		
3.1	Demonstrate the feasibility of an applied solution/plan	• Small group discussions • Whole group discussions • Brainstorming • Presentations.	• Written Exam • Web search and writing reports. • Class Activities • Quizzes
3.2	Use the available commercial software systems/packages in application to the suggested solution/plan.		

4.0	**Communication, Information Technology, Numerical** After successful completion of the course students will be able to		
4.1	Team working skills: cooperative working in groups inside the class, or/and efficient participation in take-home-assignments.	• Small group discussions • Whole group discussions • Brainstorming • Presentations	• Written Exam • Web search and writing reports. • Lab assignments • Class Activities • Quizzes
4.2	Oral Skills: free discussions save the students' time and allow them to feel "involved" in the discussion, rather than simply being outside spectators.		
5.0	**Psychomotor**		
5.1	NA	NA	NA

5. Map course LOs with the program LOs. (Place course LO #s in the left column and program LO #s across the top.)

Course LOs #	**Program Learning Outcomes (Use Program LO Code #s provided in the Program Specifications)**									
	1.1	**1.2**	**1.3**	**2.1**	**2.2**	**3.1**	**3.2**	**3.3**	**4.1**	**4.2**
1.1	-	-	-	-	-	-	-	-	-	-
1.2	-	-	-	-	-	-	-	-	-	-
2.1	-	-	-	-	X	-	-	-	-	-
2.2	-	-	-	-		-	-	-	-	-
3.1	-	-	-	-	-		-		-	-
4.1	-	-	-	-	-	-	-	-	**X**	-
4.2	-	-	-	-	-	-	-	-	X	-

5. Schedule of Assessment Tasks for Students During the Semester

	Assessment task (i.e., essay, test, quizzes, group project, examination, speech, oral presentation, etc.)	Week Due	Proportion of Total Assessment
1	Homework assignments, Oral discussions	Weekly	8%
2	Written summary reports through web search	3, 7, 11, 14	8%
3	Mid – Term Exam	8	20%
4	Class participation in solving problems	Weekly	8%
5	Project groups	5, 9,12	8%
6	Quizzes	4, 6, 10,13	8%
7	Final Exam	15	40%

D. Student Academic Counseling and Support

1. 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)

Faculty Members have around 10 office hours every week for student consultations.

E Learning Resources

1. List Required Textbooks

Discrete Mathematics and Its Applications, 7th edition, by Kenneth Rosen. McGraw-Hill, (2011).
2. List Essential References Materials (Journals, Reports, etc.) – Robert Blitzer; Thinking Mathematically; 4th Edition; Prentice Hall; 2008. – 2.Steven G. Krantz; The Elements of Advanced Mathematics; 2nd Edition; Chapman & Hall/CRC; 2002. – 3.Steven Roman; An Introduction to Discrete Mathematics; 2nd Edition; HBJ Publishers and its subsidiary, Academic Press;1989. – Susanna S. Epp, Discrete Mathematics with Applications , 4th Edition, Brooks Cole, 2010.
3. List Electronic Materials, Web Sites, Facebook, Twitter, etc. i. http://ocw.mit.edu/courses/mathematics/18-304-undergraduate-seminar-in-discrete-mathematics-spring-2006/ ii. http://www.freebookcentre.net/Mathematics/Discrete-Mathematics-Books.html iii. https://lms.yu.edu.sa/login/index.php
4. Other learning material such as computer-based programs/CD, professional standards or regulations and software. • CD is available for the book: Thinking Mathematically; Robert Blitzer; 4th Edition; Prentice Hall; 2008. • Video lectures, Presentations, and a complete electronic course are available.

F. Facilities Required

Indicate requirements for the course including size of classrooms and laboratories (i.e. number of seats in classrooms and laboratories, extent of computer access, etc.)
1. Accommodation (Classrooms, laboratories, demonstration rooms/labs, etc.) Classrooms
2. Technology resources (AV, data show, Smart Board, software, etc.) Data Show
3. Other resources (specify, e.g. if specific laboratory equipment is required, list requirements or attach list) NA

G Course Evaluation and Improvement Processes

1. Strategies for Obtaining Student Feedback on Effectiveness of Teaching At the end of the course, students receive feedback forms designed as per guidelines of NCAAA that are used to evaluate the effectiveness of teaching, besides: • Analysis of students' results. • Observation during class work. • Students' evaluations. & Colleagues' evaluations. • Evaluation questionnaire filled by the students. Interview a sample of students enrolled in the course to take their opinions.
2. Other Strategies for Evaluation of Teaching by the Instructor or by the Department Peer review visits are normally conducted among faculties wherever possible during academic year. During the lecture time Chair (Head)/ Dean of the department visits the classroom. At the end of each visit, faculties are usually set together to discuss related issues
3. Processes for Improvement of Teaching - Feedbacks from students using different types of survey including Student Experience Survey (SES), Program Evaluation Survey (PES), and Alumni Survey (AS) are shown and discussed with faculty members to improve the teaching. - Specialized workshops and seminars are conducted throughout academic year to address specific teaching strategies and improvements.

4. Processes for Verifying Standards of Student Achievement (e.g. check marking by an independent member teaching staff of a sample of student work, periodic exchange and remarking of tests or a sample of assignments with staff at another institution) Peer review and discussion with course coordinator. There should be a strong liaison with teacher from some external university/institute in order to exchange ideas related to marking/ evaluating quizzes and assignments
5. Describe the planning arrangements for periodically reviewing course effectiveness and planning for improvement. At the end of each semester, Curriculum committee conducts a meeting with all faculty members in which surveys filled by the students and other feedbacks from faculty members are discussed. Effectiveness of the courses, mistakes done and weaknesses are discussed. These points are made basis for the planning for improvements for next semester/year.

Date Specification Completed: February 11, 2019

Name of Course Instructor: Ms. Njwd Albishi Signature: _____
Program Coordinator: Dr. Sadiqah Al Marzooq Signature: _____
Date Received: _____