



The University of Jordan

Accreditation & Quality Assurance Center

COURSE Syllabus

1	Course title	Discrete Mathematics
2	Course number	1901101
3	Credit hours (theory, practical)	3
	Contact hours (theory, practical)	3
4	Prerequisites/corequisites	None
5	Program title	Computer Science
6	Program code	1901
7	Awarding institution	The University of Jordan
8	Faculty	King Abdullah II School for Information Technology
9	Department	Computer Science Department
10	Level of course	First year
11	Year of study and semester (s)	2015/2016 – First Semester
12	Final Qualification	Bachelor degree
13	Other department (s) involved in teaching the course	N/A
14	Language of Instruction	English
15	Date of production/revision	
16	Required/ Elective	Required

16. Course Coordinator:

Dr. Khair Eddin Sabri

Office numbers: KASIT 122

Office hours:

Sunday: 12-1

Monday: 2:00 – 3:00

Tuesday: 10:00 – 11:00

Wednesday: 8:00-9:90

Phone number: 22557

Email addresses: k.sabri@ju.edu.jo

17. Other instructors:

N/A

18. Course Description:

This course studies the mathematical elements of computer science. Topics include propositional logic; predicate logic; mathematical reasoning; techniques of proof; mathematical induction; set theory; number theory; matrices; sequences and summations; functions, relations and their properties, elementary graph theory, and tree.

19. Course aims and outcomes:**A- Aims:**

The main goal of this course is to equip students with required mathematical knowledge and its applications in computer science.

B- Intended Learning Outcomes (ILOs): Upon successful completion of this course students will be able to ...*A-Knowledge and understanding: with the ability to ...*

- A1) Understand basic concepts of logic and proofs.*
- A2) Understand basic structures: sets, functions, sequences, and summations.*
- A3) Understand basic concepts of integers and matrices.*
- A4) Understand basic concepts of relations, graphs, and trees.*

B- Intellectual skills: with the ability to ...

- B1) Use propositional and predicate calculus in reasoning.*
- B2) Prove equivalences.*
- B3) Identify set identities*
- B4) Distinguish between geometric and arithmetic progression*
- B5) Find a result of a summation*
- B6) Identify operations and properties of sets, functions, relations, matrices, graphs, and trees*
- B7) Recognize the relationship between graphs, relations, and matrices*

C- Subject specific skills – with ability to ...

- C1) Use proper proof method for a given problem.*
- C2) Model situations in a mathematical way and find their properties.*

D- Transferable skills – with ability to

- D1) Work in a group in order to represent mathematically specific subject.*
- D2) Communicate effectively by oral and written means.*

20. Topic Outline and Schedule:

Topic	Week	Instructor	Achieved ILOs	Evaluation Methods	Reference
Propositional Logic: logical operators, truth table.	1	Dr. Khair Eddin Sabri	A1	Quiz, Midterm, Final	Sections 1.1

Propositional Logic: propositional equivalences, Translation.	2	Dr. Khair Eddin Sabri	A1, B2, C2, D2	Quiz, Midterm, Final	Sections 1.2, 1.3
Predicate logic: predicate, quantification, nested quantifiers, equivalences, translation.	3	Dr. Khair Eddin Sabri	A1, B2	Quiz, Midterm, Final	Section 1.4, 1.5
Inference rules	4	Dr. Khair Eddin Sabri	A1, B1, C2, D1, D2	Quiz, Midterm, Final	Sections 1.6
Introduction to proofs: direct proof, proof by contraposition, proof by contradiction, proof by cases.	5	Dr. Khair Eddin Sabri	A1, C1	Quiz, Midterm, Final	Sections 1.7, 1.8
Set theory: set builder notation, subset, Cartesian product, power set, union, intersection, complements, set identities.	6	Dr. Khair Eddin Sabri	A2, B3, C2, D2	Quiz, Midterm, Final	Section 2.1, 2.2
Midterm exam	7	Dr. Khair Eddin Sabri			
Functions: definition, types of functions, inverse, composition, ceil and floor functions. Sequence and Summation: arithmetic progression, geometric progression, special integer sequences, summations	8	Dr. Khair Eddin Sabri	A2, B4, B5	Quiz and Final	Sections 2.3-2.4
Matrices: Introduction, matrix arithmetic, matrix multiplication, transpose, powers of matrices, zero one matrices.	9	Dr. Khair Eddin Sabri	A3, B6	Quiz and Final	Sections 2.6
Integers: integers, division, division algorithm, modular arithmetic, primes, GCD, LCM	10	Dr. Khair Eddin Sabri	A3	Quiz and Final	Sections 4.1, 4.3
Mathematical Induction	11	Dr. Khair Eddin Sabri	A1	Quiz and Final	Sections 5.1
Relations: definitions, properties, combining relations, representation, equivalence relation. Circuit	12	Dr. Khair Eddin Sabri	A4, B6, B7, C2, D2	Quiz and Final	Chapter 9
Graph: definition, type, terminology, special simple graphs, representation, connectivity	13	Dr. Khair Eddin Sabri	A4, B6, B7, C2, D2	Quiz and Final	Chapter 10
Tree: definition, properties, binary tree, tree traversal, infix, prefix and postfix notations.	14	Dr. Khair Eddin Sabri	A4, B6, C2, D2	Quiz and Final	Chapter 11
Final	15	Dr. Khair Eddin Sabri			

21. Teaching Methods and Assignments:

Development of ILOs is promoted through the following teaching and learning methods:

Teaching (T) Strategies: The Course will be delivered using different means like lecture, discussion and presentation of applications.

Learning (L) Methods: Students attend classes, ask questions and participate in discussions, do the home works, solve suggested questions. Students will access the e-learning platform for more instruction and supported learning materials.

22. Evaluation Methods and Course Requirements:

Opportunities to demonstrate achievement of the ILOs are provided through the following assessment methods and requirements:

There will be several assessment methods of evaluation the performance of the students such as attending and class participation, grading the quizzes; assignments; conducting the Midterm and the Final Exams.

23. Course Policies:

A- Attendance policies:

Deliberate abstention from attending 1901101 classes and any other similar acts will lead to student deprivation from the course according to the UJ regulations

B- Absences from exams and handing in assignments on time:

If you miss the midterm, then a makeup exam will not be provided unless you submit a valid absence excuse, within three days from the midterm, to your lecturer. This excuse must be signed and stamped from the UJ hospital in order to be valid. If your lecturer accepts the excuse then you will be able to take the midterm makeup. You need to follow up the departmental announcements regarding the makeup date and time. Please note that the lecturer may either accept or reject your excuse based on UJ regulations

C- Health and safety procedures:

N/A

D- Honesty policy regarding cheating, plagiarism, misbehavior:

All students in this course must read the University policies on plagiarism and academic honesty

E- Grading policy:

- Midterm Exam: 30%
- Quizzes and assignments 20%
- Final Exam: 50%

F- Available university services that support achievement in the course:

N/A

24. Required equipment:

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25. References:

<p>A- Required book (s), assigned reading and audio-visuals:</p> <p style="padding-left: 40px;"><i>Discrete Mathematics and Its Applications, Kenneth H. Rosen, McGraw Hill, 7th edition, 2012.</i></p> <p>B- Recommended books, materials, and media:</p> <ul style="list-style-type: none"> - <i>Logic and Discrete Mathematics A Computer Science Perspective, Winfried K. Grassman and Jean Paul Tremblay, Prentice Hall, 1996.</i> - <i>Discrete and Combinatorial Mathematics: An Applied Introduction, Ralph P. Grimaldi, 5th edition, Addison Wesley, 2003.</i>

26. Additional information:

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Name of Course Coordinator: -----Signature: ----- Date: -----

Head of curriculum committee/Department: ----- Signature: -----

Head of Department: ----- Signature: -----

Head of curriculum committee/Faculty: ----- Signature: -----

Dean: ----- -Signature: -----

Copy to:
 Head of Department
 Assistant Dean for Quality Assurance
 Course File