

**Syllabus: Discrete Mathematics (2010042101)****Second Semester 2021/2022****COURSE INFORMATION**

Course Name: Discrete Mathematics Semester: Second Semester 2021 /202 Department: Department of Information Technology Faculty: Prince Al-Hussein bin Abdullah II Faculty for Information Technology	Course Code: 2010042101 Section: 3 Core Curriculum:
Day(s) and Time(s): Sunday: 10-11 Tuesday: 10-11 Classroom: IT: 303	Credit Hours: 3 Prerequisites: None

COURSE DESCRIPTION

This course is intended to provide a thorough understanding of discrete mathematics and its application in computer science. This course focuses on teaching a specific set of mathematical facts and how to apply them in real-life situations. In addition to logical and mathematical reasoning. This course explains combinatorial analysis, discrete structures, algorithmic thinking, computers, and applications in order to achieve these goals.

DELIVERY METHODS

The course will be delivered through a combination of active learning strategies. These will include:

- PowerPoint lectures and active classroom-based discussion
- Weekly Take-Home notes and exercises
- E-learning resources: e-reading assignments and practice quizzes through Model and Microsoft Team

FACULTY INFORMATION

Name	Emad Eddien Awad Abdallah
Academic Title:	Professor
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Email Address:	Emad@hu.edu.jo
Office Hours:	Sunday 1.00-2.00 / Tuesday 2.00-3.00 <i>Please send an e-mail (Emad@hu.edu.jo) to meet at any other time.</i>

REFERENCES AND LEARNING RESOURCES

Required Textbook:

- Discrete Mathematics and Its Applications, Kenneth H. Rosen, McGraw Hill, 8th edition, 2019

Suggested Additional Resources:

- Discrete Mathematics with Applications, Susanna S. Epp, Brooks Cole, 11th Edition, 2014.
- J. Dossey, Discrete mathematics, Pearson education, 2006.

Useful Web Resources:

<https://www.youtube.com/watch?v=A3Ffwsnad0k&list=PLI-gb0E4MII28GykmtuBXNUNoej-vY5Rz>

STUDENT LEARNING OUTCOMES MATRIX*

Core Curriculum Learning Outcomes	Program Learning Outcomes	Course Student Learning Outcomes	Assessment Method
CC-LO-3 Preparing the competitiveness of graduates at a level capable of supplying the Jordanian and international market with qualified scientific competencies	PLO-1: Demonstrate proficiency in different data analytics algorithms and techniques	Write an argument using logical notation and determine if the argument is or is not valid.	<ul style="list-style-type: none"> • Exams • Homework
		Write an argument using logical notation and determine if the argument is or is not valid.	<ul style="list-style-type: none"> • Exams • Assignments
		Be able to apply Induction and Recursion: Mathematical Induction, Strong Induction, and Well-Ordering, Recursive Definitions, Structural Induction and Recursive Algorithm	<ul style="list-style-type: none"> • Exams • Homework
		Apply counting principles to determine the probabilities: The Pigeonhole Principle, Permutations, Combinations, Binomial Coefficients, Generalized Permutations, and Combinations.	<ul style="list-style-type: none"> • Exams • homework
		Understanding basic discrete structures: Sets, Sets Operations, Functions, Sequences, and summations.	<ul style="list-style-type: none"> • Exams • homework

ACADEMIC SUPPORT

It is The Hashemite University policy to provide educational opportunities that ensure fair, appropriate and reasonable accommodation to students who have disabilities that may affect their ability to participate in course activities or meet course requirements. Students with disabilities are encouraged to contact their Instructor to ensure that their individual needs are met. The University through its Special Need section will exert all efforts to accommodate for individual's needs.

Special Needs Section:

Tel: 053903333 EXT 5023/4583

Location: (<https://hu.edu.jo/facnew/index.aspx?typ=68&unitid=70000000>)

Email: (huniv@hu.edu.jo)

COURSE REGULATIONS

Participation

Class participation and attendance are important elements of every student's learning experience at The Hashemite University, and the student is expected to attend all classes. A student should not miss more than 15% of the classes during a semester. *Those exceeding this limit of 15% will receive a failing grade regardless of their performance.* It is a student's responsibility to monitor the frequency of their own absences. **Attendance record begins on the first day of class irrespective of the period allotted to drop/add and late registration. It is a student's responsibility to sign-in; failure to do so will result in a non-attendance being recorded.**

In exceptional cases, the student, with the instructor's prior permission, could be exempted from attending a class provided that the number of such occasions does not exceed the limit allowed by the University. The instructor will determine the acceptability of an absence for being absent. A student who misses more than 25% of classes and has a valid excuse for being absent will be allowed to withdraw from the course.

Plagiarism

Plagiarism is considered a serious academic offence and can result in your work losing marks or being failed. HU expects its students to adopt and abide by the highest standards of conduct in their interaction with their professors, peers, and the wider University community. As such, a student is expected not to engage in behaviours that compromise his/her own integrity as well as that of the Hashemite University.

Plagiarism includes the following examples and it applies to all student assignments or submitted work:

- **Use of the work, ideas, images or words of someone else without his/her permission or reference to them.**
- **Use of someone else's wording, name, phrase, sentence, paragraph or essay without using quotation marks.**
- **Misrepresentation of the sources that were used.**

The instructor has the right to fail the coursework or deduct marks where plagiarism is detected

Late or Missed Assignments

In all cases of assessment, students who fails to attend an exam, class project or deliver a presentation on the scheduled date without prior permission, and/or are unable to provide a medical note, will automatically receive a fail grade for this part of the assessment.

- Submitting a term paper on time is a key part of the assessment process. Students who fail to submit their work by the deadline specified will automatically receive a 10% penalty. Assignments handed in more than 24 hours late will receive a further 10% penalty. Each subsequent 24 hours will result in a further 10% penalty.
- In cases where a student misses an assessment on account of a medical reason or with prior permission; in line with University regulations an incomplete grade for the specific assessment will be awarded and an alternative assessment or extension can be arranged.

Student Complaints Policy

Students at Hashemite University have the right to pursue complaints related to faculty, staff, and other students. The nature of the complaints may be either academic or non-academic. For more information about the policy and processes related to this policy, you may refer to the students' handbook.

COURSE ASSESSMENT

Course Calendar and Assessment

Students will be graded through the following means of assessment and their final grade will be calculated from the forms of assessment as listed below with their grade weighting taken into account.

Assessment	Grade Weighting	Deadline Assessment
Exam 1	30%	To be announced
Exam 2	30%	To be announced
Homework	Zero	Weekly
Final Exam 3	40%	To be announced

Description of Exams:

Test questions will predominately come from the material presented in the lectures. Semester exams will be conducted during the regularly scheduled lecture period. Exam will consist of a combination of multiple-choice, short answer, match, true and false and/or descriptive questions.

Homework:

Will be given for each chapter, while the chapter in progress you are supposed to work on them continuously and submit in next lecture when I finish the chapter.

You are also expected to work on in-chapter examples, self-tests and representative number of end of chapter problems. The answers of self-tests and end of chapter exercises are given at the end of the book.

Quizzes: Unannounced quizzes will be given during or/and at the end of each chapter based upon the previous lectures. It will enforce that you come prepared to the class.

No make-up exams, homework, or quizzes will be given. Only documented absences will be considered as per HU guidelines.

Grades are not negotiable and are awarded according to the following criteria*:

Letter Grade	Description	Grade Points
A+	Excellent	4.00
A		3.75
A-		3.50
B+	Very Good	3.25
B		3.00
B-		2.75
C+	Good	2.50
C		2.25
C-		2.00
D+	Pass	1.75
D	Pass	1.50
F	Fail	0.00
I	Incomplete	-

WEEKLY LECTURE SCHEDULE AND CONTENT DISTRIBUTION

Topics Discussed in Depth					
Topic	Chapter in Text	Week #	Lecture	Content	Delivery Method
The Foundations: Logic and Proofs	Ch1	Week1	Lect. 1	Propositional Logic	Face to face
			Lect. 2	Propositional Equivalences	Face to face
			Lect. 3	Book Exercises (page15- Ex. 33) + Page (24- Ex. 40,41)	
		Week2	Lect. 1	Predicates and Quantifiers,	Face to face
			Lect. 2	Nested Quantifiers	Face to face
			Lect. 3	Exercises	Take-Home Note
		Week3	Lect. 1	Rules of Inference,	Face to face
			Lect. 2	Introduction to Proof and its Methods and Strategies	Face to face
			Lect. 3	Exercises	Take-Home Note
Basic Structures: Sets, Functions, Sequences, Sums, and Matrices	Ch2	Week4	Lect. 1	Sets	Face to face
			Lect. 2		Face to face
			Lect. 3		Take-Home Note
		Week5	Lect. 1	Sets Operations + Sequences and Summations	Face to face
			Lect. 2		Face to face
			Lect. 3		Take-Home Note
Algorithms	Ch3	Week6	Lect. 1	Algorithms	Face to face
			Lect. 2		Face to face
			Lect. 3		Take-Home Note
		Week7	Lect. 1	The Growth of Functions	Face to face
			Lect. 2		Face to face
			Lect. 3		Take-Home Note
Induction and Recursion	Ch5	Week8	Lect. 1	Mathematical Induction, Strong Induction	Face to face
			Lect. 2		Face to face
			Lect. 3		Take-Home Note
		Week9	Lect. 1	Recursive Definitions, Structural Induction	Face to face
			Lect. 2		Face to face
			Lect. 3		Take-Home Note
Counting	Ch6+8	Week10	Lect. 1	Pigeonhole Principle, Permutations, Combinations.	Face to face
			Lect. 2		Face to face
			Lect. 3		Take-Home Note
		Week11	Lect. 1	Binomial, Generalized Permutations and Combinations	Face to face
			Lect. 2		Face to face
			Lect. 3		Take-Home Note
Relations	Ch 9	Week12	Lect. 1	Representing relations, Closures of Relations	Face to face
			Lect. 2		Face to face
			Lect. 3		Take-Home Note
		Week13	Lect. 1	Equivalence Relations and Topological Sort	Face to face
			Lect. 2		Face to face
			Lect. 3		Take-Home Note
Graphs	Ch 10	Week14	Lect. 1	Graph models	Face to face
			Lect. 2	Graph Terminology	Face to face
			Lect. 3	Exercises	Take-Home Note
		Week15	Lect. 1	Representing Graphs	Face to face
			Lect. 2		Face to face
			Lect. 3		Exercises