



Prince Sultan University
College of Computer and Info Sciences / Department of Computer Science
Term 251
1st Semester 2025 - 2026

COURSE SYLLABUS

Mission Statement of the Bachelor of Computer Science Program(s): Provide high quality, computer science education to prepare top graduates through an environment that promotes innovative thinking, ethical behavior, lifelong learning, research, and service to the community.

1. **Course number and name:** CS285 - DISCRETE MATH FOR COMPUTING
2. **Credits and contact hours:** 3 credits and 4 contact hours (Lectures: 3 Tutorials:1 Lab:0)
3. **Instructor's or course coordinator's name:** Jalila Zouhair
 - a. **Scheduled Office Hours:** On Moodle
 - b. **Office Location:** R306, Building 101
 - c. **Email:** jzouhair@psu.edu.sa
The best way to reach me is via this email. You can expect a response within 24 business hours.
4. **Textbook, title, author, and year**
 - a. **Primary Text:** Discrete Mathematics and its Applications, 7th edition, by Kenneth H. Rosen Published, McGraw-Hill International, 2007.
 - b. **Other References:** Discrete Mathematics, 7th edition, by Richard Johnsonbaugh, McGraw-Hill International.
 - c. **Course Website [Optional]:** N/A
 - d. **Learning Management System:** Moodle available at <https://lms.psu.edu.sa/>
5. **Specific course information**
 - a. **Brief description of the content of the course (catalog description):**

The course introduces the students to mathematical logic, fundamental discrete structures, such as: sets, functions, relations and graphs. Mathematical reasoning and various counting techniques are also covered in the course. Throughout the course students apply the techniques they learn to simplified practical problems. This course prepares the students for higher level computing courses where these concepts are of fundamental importance

- b. **Prerequisites or co-requisites:** CS101
- c. **Indicate whether a required, elective, or selected elective (as per Table 5-1) course in the program:** Required as a Core course in CS/SE/IS programs



6. Specific goals for the course

a. Specific outcomes of instruction. The student will be able to:

- CLO1: Describe the basic concepts of propositional logic, sets, sequences, functions, sums, number theory, recurrences, and counting.
- CLO2: Apply different proving techniques, such as proofing using proposition logic, rules of inference and induction.
- CLO3: Apply terminology and perform various operations on integers, matrices, sets, functions, sequences, sums, number theory, relations, propositional logic, and proof techniques related to computing.
- CLO4: Apply counting principles and recurrence relations to counting problems.
- CLO5: Use different basic cryptography algorithms.
- CLO6: Demonstrate effective collaboration with peers to develop cryptographic solutions, uphold ethical responsibility in the application of cryptographic algorithms, and ensure clear and responsible communication of project outcomes.

b. Explicitly indicate which of the student outcomes listed in Criterion 3 or any other outcomes are addressed by the course.

Course LOs #	Program Learning Outcomes		
	Computer Science	Information Systems	Software Engineering
1	SO1	SO1	SO1
2	SO1	SO1	SO1
3	SO1	SO1	SO1
4	SO1	SO1	SO1
5	SO1	SO1	SO1
6	SO5	SO5	SO5

7. Brief list of topics to be covered

Week No.	Topics	CLO(s) alignment	Assessments
Week 1,2,3	1 The Foundations: Logic, Sets, and Functions 1.1 Propositional Logic 1.2 Applications of Propositional Logic 1.3 Propositional equivalences 1.4 Predicates and quantifiers 1.5 Rules of Inference	CLO #1	Quiz1, HW
Week 4,5,6	2 Basic Structures: Set, Functions, Sequences and Sum 2.1 Sets 2.2 Set operations	CLO #3	Quiz2, HW

	2.3 Functions 2.4 Sequences and Summations 2.6 Matrices		
Week 7,8	3 Number Theory and Cryptography 4.1 The integers and division 4.3 Primes and greatest common divisor 4.6 Cryptography	CLO #3 CLO #6	Mid-Exam, HW Project
Week 9	4 Induction and Recursion 5.1 Mathematical induction 5.3 Recursive definitions and structural induction	CLO #2	HW Project
Week 10, 11	5 Counting 6.1 The basics of counting 6.3 Permutations and combinations 6.4 Binomial coefficients	CLO #4	HW
Week 12,13	6 Advanced Counting Techniques 8.1 Recurrence relations 8.2 Solving Recurrence relations	CLO #4	Quiz 3, HW
Week 14,15	7 Relations 9.1 Relations and their properties 9.3 Representing relations 9.4 Closures of relations 9.5 Equivalence relations	CLO #5	Final

8. Weight of Assessments

- Major Exam: 20 % (October 1, 2025, 12 to 1)
- Project: 10%
- Assignments: 5%
- Attendance: 5%
- Quizzes: 20%
 - Quiz # 1: 5% (September 3, 2025)
 - Quiz # 2: 7.5% (September 24, 2025)
 - Quiz # 3: 7.5% (November 5, 2025)
- Final Exam: 40% (Dec 1, 2025)