Department Of Computer Science, CUI Lahore Campus

CSC102 - Discrete Structures

By

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Lecture Outline

- Introduction to Course

Welcome in the Course

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Course Objectives

- Deep understanding of **discrete structures** used in **Computer Science**
- Developing **problem solving** and **analytical skills**
- Ability to understand **mathematical arguments** and their **design**
- **Understanding of logic**
- **Proofing techniques**

Course Outline

- Propositional Logic
- Predicate Logic
- Set Theory
- Functions
- Relations
- Inference rules and Proof Techniques
- Sequences and Summations
- Induction and Recursion
- Counting Techniques
- Graphs
- Trees

Text Books

- Discrete Mathematics and its Applications 7th Ed. by Kenneth H. Rosen, McGraw Hill Publisher.

- Discrete Mathematics with Applications 4th Ed. by Susanna S., Thomson Learning, Inc.

Course Website

- Visit the following link:
  https://sites.google.com/cuilahore.edu.pk/csc102-ds

- Course Handbook
- Deadlines & Important Information
- Course Material
- Assignments
- Quiz Solutions

Course Assessment/Grading

Component	Weightage
Mid term	25%
Terminal	50%
Quizzes	15%
Assignments	10%

- For all assignments, do follow the formatting guidelines given in course handbook.
- Submit all assignments in hard copy.
- No credit for copied or late submissions.
- No relaxation for students found cheating in any quiz or exam.
- To get good grade you must attend all lectures and perform good in all course assessments.

Reasons to Study Discrete Structures

- Proof

  Ability to understand and create mathematical argument

- Gateway to more advanced CS courses

  Data structures, algorithms, automata theory, formal languages, Database, networks, operating system, security etc.

Reasons to Study Discrete Structures

- It is the **mathematics underlying almost all of computer science**:
- Program verification
  - Analyzing algorithms for **correctness** and **efficiency**
- Finding **efficient algorithms**
  - (for sorting, searching, etc.)
- **Formalizing** security requirements
- Designing **cryptographic protocols** for enhanced security
- **Graph Theory** (Networks – both physical & social)

Logic

Logic is the study of the principles and methods that distinguishes between a valid and an invalid argument.

Logic deals with general reasoning laws, which you can trust.

Applications

- Applied in proving **program correctness** and **verification**
- Databases (Relational Algebra and calculus)
- Artificial Intelligence