# Discrete Structures (Monsoon 2022)

## Instructors:

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# Course Overview

- Sets, relations and functions. Applications to relations.
- Permutations, combinations.
- Logic, Propositional Equivalences, Predicates and Quantifiers Sets, Proof Techniques, Contradiction.
- Mathematical induction
- Pigeonhole principle.
- Cardinality of sets, finite and infinite sets, countable and uncountable sets, Cantors numbering.
- Group, subgroup/normal subgroup, homorphism/ automorphism/isomorphism/ eipmorphism, kernel, cosets, quotient group, product set ina group, center of a group, order/conjugate of an element, commutator.

# Course Overview (Continued...)

- Ring, Field, Finite field over a prime. Applications to finite fields.
- Recurrence relations, generating functions, numeric functions. Applications to recurrence relations.
- Coding theory (Application to group theory).
- Basics of probability theory, birthday attacks. Applications on hash functions.
- Graphs, Adjacency, Special Graphs, Isomorphic Graphs, Paths, Cycles and Circuits, Connected Graphs, Eulerian Graphs, Hamiltonian Graphs and Planar Graphs.

# Text Books/References

- Thomas Koshy, "Discrete Mathematics with Applications", Elsevier Press.
- C. L. Liu and D. P.Mohapatra, "Elements of Discrete Mathematics: A Computer Oriented Approach," Tata McGraw-Hill Edition.
- D. S. Malik and M. K. Sen, "Discrete Mathematical Structures: Theory and Applications," Thomson.
- J. P. Tremblay and R. Manohar, "Discrete Mathematical Structures with applications to Computer Science," Tata McGraw-Hill Publishing Company Pvt. Ltd.

# Lecture and Tutorial Hours

- **Lecture (Section A):**
  - ▶ Monday: 9:35 AM-10:30 AM (Section A)
  - ▶ Wednesday: 9:35 AM-10:30 AM (Section A)
  - ▶ Friday: 9:35 AM-10:30 AM (Section A)
- **Tutorial:**
  - ▶ To be fixed soon and venue will be declared by the TAs

# Lecture and Tutorial Hours

- **Lecture (Section B):**
  - Monday: 11:45 AM-12:40 PM (Section B)
  - Wednesday: 11:45 AM-12:40 PM (Section B)
  - Friday: 11:45 AM-12:40 PM (Section B)
- **Tutorial:**
  - To be fixed soon and venue will be declared by the TAs

# Grading Plan

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- Grading method: Relative

| Letter Grade | Value | Description |
|:---:|:---:|:---:|
| A | 10 | Excellent |
| A- | 9 | Excellent |
| B | 8 | Good |
| B- | 7 | Good |
| C | 6 | Fair |
| C- | 5 | Fair |
| D | 4 | Poor |
| F | 0 | Fail |

# Grading Plan

## Grading Method: Relative

- Assignments: 20%
- Quiz-1: 10%
- Quiz-2: 10%
- Mid Semester Examination: 20%
- End Semester Examination (whole syllabus): 40%

# Questions?