Department of Computer & Information Sciences
Pakistan Institute of Engineering and Applied Sciences

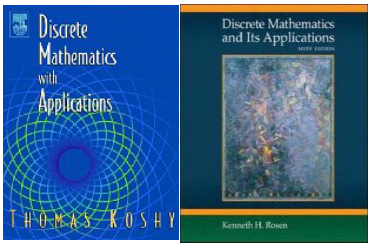
Syllabus

Course Profile

- Discrete Mathematics (CIS-143)
- Course Breakdown
  - Quizzes+Assignments (20%)
  - Sessional I + Sessional II (30%)
  - Final (50%)
- Academic Integrity
  - No Plagiarism Allowed
  - Course Material
    - (\\dataserver\learningmaterial\Umar Faiz)

Recommended Text

- Discrete Mathematics with Application by Thomas Koshy
- Discrete Mathematics and Its Applications by Kenneth H. Rosen. 6th edition, McGraw Hill Publisher.



3

What is Discrete Mathematics?

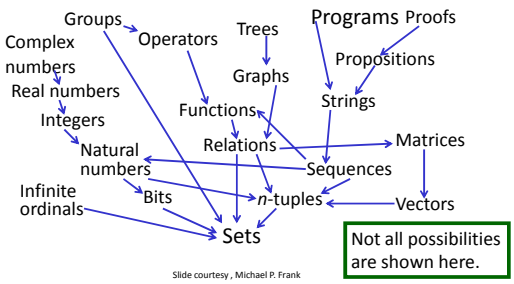
- Discrete Mathematics deals with the 'discrete structures'
- "Discrete" (≠ "discreet"!) - Composed of distinct, separable parts. (Opposite of continuous.)
- "Structures" - objects built up from simpler objects according to a definite pattern.
- Discrete Mathematics is
  - Study of discrete, mathematical objects and structures.
  - Discrete manipulations of discrete structures
  - Conceptual foundation and formulation of all of computer science.

Discrete Structures/Concepts

- Propositions
- Predicates
- Proofs
- Sets/Functions
- Growth of Functions
- Algorithms
- Integers
- Series/Summations
- Permutations
- Combinations
- Relations
- Graphs
- Trees

Relationships Between Structures

- "→" :≡ "Can be defined in terms of"



Slide courtesy , Michael P. Frank

Uses for Discrete Math in Computer Science

- Advanced algorithms
- Data structures
- Programming
- Compilers & Interpreters
- Computer networks
- Operating systems
- Computer architecture
- Formal Languages
- Complexity and Computability
- Cryptography
- Graphics & animation
- Graph Theory
- Natural Language Processing