Course content

The course is a fundamental branch of mathematics that studies discrete elements and their structures. It provides the theoretical foundation for computer science, underpinning many areas such as algorithms, data structures, programming languages, and computer networks.

The following topics are covered in the course:

1. Set Theory, including naive set theory, relations and functions.
2. Graph Theory, covers fundamental concepts, theories, and applications of graph theory, including graph representations, traversals, and algorithms for solving graph problems.
3. Combinatorics, exploring basic counting techniques, such as permutations and combinations.

Course Objectives

Knowleage

1. Demonstrate a solid understanding of fundamental concepts in set theory, graph theory, and combinatorics.
2. Grasp the theoretical underpinnings of discrete mathematics and their applications in computer science.

Skills

1. Analyze and solve problems related to sets, graphs, and combinatorial structures using appropriate mathematical techniques.
2. Think abstractly and model real-world problems using discrete mathematical concepts.
3. Construct and evaluate mathematical proofs to justify claims and solutions.

Competencies

1. Apply mathematical knowledge to solve practical problems in computer science, such as algorithm design and analysis.
2. Evaluate the validity of mathematical arguments and make informed judgments based on evidence.
3. Effectively communicate mathematical ideas and solutions, both orally and in writing.