University of Sri Jayewardenepura
Department of Mathematics
Semester 2 - 2018
AMT 223 1.0 Discrete Mathematics

Lecturer	Email	Lecture Room	Time
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Course Objectives

To give an introductory treatment of discrete mathematics and to prepare students in this course become independent, careful thinkers and self-directed learners having a lot of interest in discrete mathematics.

Course Syllabus

1. Tools of Discrete Mathematics

    1.1. Algorithms

        1.1.1. The idea of an algorithm
        1.1.2. Pseudocode description of algorithms
        1.1.3. Efficiency of algorithms
        1.1.4. Intractable and unsolvable problems
        1.1.5. Algorithms for arithmetic and algebra

    1.2. Induction and Recursion

        1.2.1. Recursive definitions
        1.2.2. Recursive algorithms

        1.2.3. Proof by mathematical induction

2. Elementary Counting Techniques

    2.1. Fundamental principles of counting

    2.2. Permutations and combinations

    2.3. Combinatorial problems involving repetitions

    3.4. The pigeonhole principle

3. Additional Topics in Combinatorics

    3.1. Combinatorial identities

    3.2. Modeling combinatorial problems with recurrence relations

    3.3. Solving recurrence relations

    3.4. The inclusion-exclusion principle

    3.5. Generating functions

Learning Outcomes

At the end of the course unit, students should be able to demonstrate their abilities in the wide array of topics in the tools of discrete mathematics and combinatorics. In addition, this provides concepts that can be served as building blocks for higher level mathematical and theoretical computer science courses.

References

- Joe L. Matt, Abraham Kandel, Theodore P. Barker, *Discrete Mathematics for Computer Scientists and Mathematicians*, Second Edition, Pearson Education, 1986.

- Jerrold W. Grossman, *Discrete Mathematics (An Introduction to Concepts, Methods, and Applications)*, First Edition, Macmillan Publishing Company, 1990.

- Any introductory Discrete Mathematics book.

Assessment Criterion

Assignments and Quizzes	30%
End of Semester Examination	70%

Method of Continuous Assessment

1. Assignments will be assigned frequently and will always be evaluated.

2. Unannounced quizzes will be given at the end of randomly selected lectures. The quizzes are open-ended, and all will be done individually or as group activities.

$$*****End*****$$