Course Objective and Outcome Form
Department of Electrical and Computer Engineering
School of Engineering and Physical Sciences
North South University, Bashundhara, Dhaka-1229, Bangladesh

1. **Course Number and Title:** CSE173 Discrete Mathematics

2. **Number of Credits:** 3

3. **Type:** Core

4. **Prerequisites:** CSE 115 (Programming Language I)

5. **Contact Hours:** 3 hours (theory)

6. **Course Summary:** This course introduces the students to discrete mathematical structures. Topics include sets, relations, functions, propositional and predicate logic, rules of inference, proof methods, number theoretic concepts such as mod, congruence, GCD, LCM, etc., mathematical induction, basic counting techniques such as product rule, sum rule, principles of inclusion and exclusion, division rule, permutation, combination, pigeon-hole principle, etc., as well as introduction to graphs, trees, sequences, summations, and recurrence relations.

7. **Course Objectives:** The objectives of this course are to

   a. construct mathematical arguments using propositions, predicates, logical connectives, quantifiers, and rules of inference as well as verify them,

   b. select appropriate proof methods (e.g. direct proof, proof by contradiction, proof by contraposition, existence proof, etc) to build simple mathematical proofs,

   c. identify the types and properties of sets, relations, functions, graphs, and trees and prove simple mathematical properties of them

   d. describe recursive function, sequence, or the sum of a series using recurrence relation and solve that using forward/backward substitution method,

   e. prove basic properties of number theoretic operations (e.g. congruence, mod, GCD, and LCM) and apply those to solve simple related problems

   f. apply mathematical induction to prove properties of mathematical objects, series, etc.,

   g. apply the knowledge of summation notation and basic counting techniques to solve simple mathematical problems.

8. **Course Outcomes (COs):**

Upon Successful completion of this course, students will be able to:

Sl.	CO Description	Weightage (%)
CO1	demonstrate valid arguments using propositions, predicates, logical connectives, quantifiers, and rules of inference	25%
CO2	**identify** basic types and properties of the following mathematical objects: sets, functions, relations, sequences, and graphs	25%
CO3	**prove** properties of number theoretic operations and mathematical objects using mathematical induction or other appropriate proof methods	25%
CO4	**apply** counting techniques, summation notation, and substitution method to solve simple mathematical problems .	25%

9. **Mapping of CO-PO:**

Sl.	CO Description	POs	Bloom's taxonomy domain/level	Delivery methods and activities	Assessment tools
CO1	demonstrate valid arguments using propositions, predicates, logical connectives, quantifiers, and rules of inference	a	Cognitive/ Understand	Lectures, Notes	Quiz/Exam
CO2	**identify** basic types and properties of the following mathematical objects: sets, functions, relations, sequences, and graphs	a	Cognitive/ Understand	Lectures, Notes	Quiz/Exam
CO3	**prove** properties of number theoretic operations and mathematical objects using mathematical induction or other appropriate proof methods	a	Cognitive/ Evaluate	Lectures, Notes	Quiz/Exam
CO4	**apply** counting techniques, summation notation, and substitution method to solve simple mathematical problems.	a	Cognitive/ Apply	Lectures, Notes	Quiz/Exam

10. **Resources**

Text books:

No	Name of Author(s)	Year of Publication	Title of Book	Edition	Publisher's Name	ISBN
1	Susanna S. Epp	2010	Discrete Mathematics with Applications	4th	Cengage Learning	ISBN-13: 978-0-495-39132-6
2	Kenneth Rosen	2018	Discrete Mathematics and Its Applications	8th	McGraw-Hill Education	ISBN-13: 978-1259676512

Reference books:

No	Name of Author(s)	Year of Publication	Title of Book	Edition	Publisher's Name	ISBN
1						
2						

Online resources:

11. **Weightage Distribution among Assessment Tools**

Assessment Tools	Weightage (%)
Quizzes	20
Assignment	20
Midterm	25
Final Exam	35

12. **Grading policy:** As per NSU grading policy available in

   http://www.northsouth.edu/academic/grading-policy.html