



AMERICAN INTERNATIONAL UNIVERSITY-BANGLADESH (AIUB)

Faculty of Science and Technology (FST)

Department of Computer Science (CS)

Undergraduate Program

COURSE PLAN

Summer 2018-2019 SEMESTER

I. Course Core and Title

CSC 1204: Discrete Mathematics

II. Credit

3 credit hours (3 hours of theory per week)

III. Nature

Core Course for CS, CSE, CSSE, SE, CIS

IV. Prerequisite

CSC 1102 (Programming Language 1)

V. Vision:

Our vision is to be the preeminent Department of Computer Science through creating recognized professionals who will provide innovative solutions by leveraging contemporary research methods and development techniques of computing that is in line with the national and global context.

VI. Mission:

The mission of the Department of Computer Science of AIUB is to educate students in a student-centric dynamic learning environment; to provide advanced facilities for conducting innovative research and development to meet the challenges of the modern era of computing, and to motivate them towards a life-long learning process.

VII - Course Description:

- Explain propositional logic and propositional equivalences
- Explain different types of sets and set operations
- Determine whether two compound propositions are logically equivalent using different techniques
- Describe different types of functions
- Discuss different representations of graphs
- Describe different types of tree traversal algorithms such as Preorder, Inorder, Postorder
- Explain Euler and Hamilton paths and circuits
- Discuss Relations and their properties

VIII – Course outcomes (CO) Matrix:

By the end of this course, students should be able to:

CO	CO Definition	Blooms Level	Blooms Learning Level			PO Map	Assessment Method
			C	P	A		
CO1	Explain propositional logic and propositional equivalences.	2	C			1.1	Quiz-1
CO2	Determine whether a function is one-to-one, onto, and/or one-to-one correspondence.	3		P		1.2	Quiz-2
CO3	Determine whether a graph contains Euler or Hamilton circuit or path.	3		P		2.1	Quiz-4
CO4	Analyze a Relation to verify whether it contains certain property.	4		P		2.2	Final Term Exam

C: Cognitive; P: Psychomotor; A: Affective; S: Soft-skills (CT: Critical Thinking, TS: Teamwork)

*The numbers under the 'Level of Domain' columns represent the level of Bloom's Taxonomy each CO corresponds to.

*** The numbers under the 'PO Assessed' column represent the PO each CO corresponds to.*

PO1	1.1 Apply the knowledge of mathematics, science, engineering fundamentals to the solution of complex engineering problems.
	1.2 Apply the knowledge of an engineering specialization to the solution of complex engineering problems.
PO2	2.1 Identify, Research and Formulate complex engineering problems.
	2.2 Analyze and Reach substantiated conclusions using the principle of mathematics, the natural sciences and the engineering sciences.

IX – Topics to be covered in the class:

TOPICS	Specific Objective(s)	Time Frame	Suggested Activities	Teaching Strategy(s)	
Logic	Knowing Mission & Vision of AIUB. To present an overview of the course and discuss the course contents, Propositional Logic, Propositional Equivalences, Predicates and Quantifiers	Week 1 & 2	Justifying, Group study, solving exercises	Lecture, Student reporting and Board work	CO1
Sets Functions	Sets, Set Operations, bit string as a set operation, Functions, different types of functions – One-to-one, Onto, One-to-one correspondence, Inverse function, Composite function.	Week 3 & 4	Justifying, Group study, solving exercises	Quiz 1 Lecture, Student reporting and Board work	CO2
Integers and Matrices	The Integers and Division, Fundamental Theorem of Arithmetic, Division Algorithm, Primes and Greatest common divisors, Least common multiples, Primality, Relative Primality, Modular arithmetic, Congruence, Caesar's	Week 5	Justifying, Group study, solving exercises	Quiz 2 Lecture, Student reporting and Board work	

	Cipher, Matrices, Matrix arithmetic and Boolean operations, Zero-one matrix				
Mathematical Induction	Methods of Proof, Proof by Mathematical Induction	Week 6	Justifying, Group study, solving exercises.	Lecture, Student reporting and Board work	
Midterm Exam					Week 7
Counting Technique	The Basics of Counting, Sum Rule, Product Rule, The Pigeonhole Principle.	Week 8	Justifying, Group study, solving exercises	Lecture, Student reporting and Board work	
Relations	Relations and Their Properties, Representing Relations using matrix and directed graph	Week 8 & 9	Justifying, Group study, solving exercises	Quiz 1 Lecture, Student reporting and Board work	CO4
Graphs	Introduction to Graphs, Graph Terminology, Representing Graphs and Graph Isomorphism, Connectivity. Euler and Hamilton Paths & circuits, Planar Graphs, Graph Coloring.	Week 10, 11 & 12	Justifying, Group study, solving exercises	Lecture, Student reporting and Board work	CO3
Trees	Introduction to Trees, Applications of Trees, Binary Search Tree, Tree Traversal.	Week 13	Justifying, Group study, solving exercises	Quiz 2 Lecture, Student reporting and Board work	
Final Exam					Week 14

* The faculty reserves the right to change, amend, add or delete any of the contents.

XI- Course Requirements

At least 80% class attendance is mandatory to pass the course. All students are expected to attend all scheduled classes as well as counselling, and to read all assigned chapters/materials before coming to class. If there is any assignment given to the students, they have to submit it before the deadline decided by the course teacher.

XII – Evaluation & Grading System

The following grading system will be strictly followed in this class.

Marking system for Theory Classes (Midterm and Final term)	
Quizzes	40%
Attendance	10%
Midterm/Final term exam	50%
Total	100%
Final Grade/ Grand Total	
Midterm:	40%
Final Term:	60%

Letter	Grade Point	Numerical %
A+	4.00	90-100
A	3.75	85-89
B+	3.50	80-84
B	3.25	75-79
C+	3.00	70-74
C	2.75	65-69
D+	2.50	60-64
D	2.25	50-59
F	0.00	<50(Failed)

The evaluation system will be strictly followed as par the AIUB grading policy.

XIII – Teaching Methods

Most of the topics will be covered from the textbook. For the rest of the topics, reference books will be followed. Class lectures will be uploaded on the web on a regular basis. White board will be used for most of the time.

Multimedia projector will be used for the convenience of the students. Students must study up to the last lecture before coming to the class and it is suggested that they should go through the relevant topics before coming to the class. Just being present in the class is not enough- students must participate in classroom discussion and classwork actively.

XIV – Textbook/ References

Text Book:

1. *Discrete Mathematics and its applications with combinatorics and graph theory (7th edition)* by Kenneth H. Rosen [Indian Adaptation by KAMALA KRITHIVASAN], published by McGraw-Hill

Reference Books and Study Materials:

1. Discrete Mathematics, *Richard Johnsonbaugh*, Pearson education, Inc.
2. Discrete Mathematical Structures, *Bernard Kolman, Robert C. Busby, Sharon Ross*, Prentice-Hall, Inc.
3. Discrete and Combinatorial Mathematics, *R. P. Grimaldi*, 3rd Edition, Addison-Wesley
4. *SCHAUM'S outlines Discrete Mathematics(2nd edition)*, by *Seymour Lipschutz, Marc Lipson*
5. Discrete Mathematics Models, *F. S. Roberts*, Prentice Hall
6. Lecture notes

XV - List of Faculties Teaching the Course

1. Dr. Afroza Nahar
2. Farzana Alam
3. Sameena Hossain
4. Mahmudul Hasan
5. Fahad Ahmed
6. A.G.M.Zaman
7. S. M. Abdur Rouf Bhuiyan

XVI – Verification:

<p>Prepared by :</p> <p>-----</p> <p>S.M. Abdur Rouf Bhuiyan <i>Course Convener</i></p> <p>Date:.....</p>	<p>Moderated by :</p> <p>-----</p> <p>Dr. M.M. Mahbubul Syeed <i>Point Of Contact</i> <i>OBE Implementation Committee for CS</i></p> <p>Date:.....</p>
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Checked by:	Certified by:	Approved by:
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Dr. M. M. Mahbubul Syeed <i>Head, Department of Computer Science</i>	Dr. Dip Nandi <i>Director, Faculty of Science & Technology</i>	Mr. Mashiour Rahman <i>Associate Dean, Faculty of Science & Technology</i>
Date:.....	Date:.....	Date:.....

