University of Asia Pacific (UAP)
Department of Computer Science and Engineering (CSE)

Course Outline

Program:	Computer Science and Engineering (CSE)
Course Title:	Discrete Mathematics
Course Code:	CSE 105
Semester:	Fall 2020
Level:	1st Year 2nd Semester
Credit Hour:	3.0
Name & Designation of Teacher:	A S Zaforullah Momtaz, Assistant Professor
Office/Room:	702, 7th Floor, teacher's compound
Class Hours:	Monday 11:00AM ~ 12:20PM, Wednesday 11:00AM ~ 12:20PM
Consultation Hours:	Saturday 11:00AM ~ 12:00PM
e-mail:	zaforullah@uap-bd.edu
Contact:	01723722788
Rationale:	Required course and a pre-requisite to Data Structure, and Digital Logic & System Design, Algorithm and other courses in the CSE program.
Pre-requisite	N/A
Course Synopsis:	Introduction: Purpose of Discrete mathematics and its applications, computer logic, relationship, functions, domain and ranges, graph theory, tree, algorithm, structured English, probability, Bayes theorem.

Course Objectives (CO): The objectives of this course are:

- To **provide** knowledge and understanding on principles of Discrete Mathemetics, and applications.
- To **introduce** how to manipulate discrete data set.
- To **Learn** conceptual mathematical relationships and their representations.
- To **enable** the student to acquire skills in solving Discrete math problems.
- To **emphasize** on efficient mathematical modelling and problem solving.

Course Outcomes (CO) and their mapping with Program outcomes (PO) and Teaching-Learning Assessment methods:

CO No.	CO Statements: Upon successful completion of the course, students should be able to:	Corresponding POs (Appendix-1)	Bloom's taxonomy domain/level (Appendix-2)	Delivery methods and activities	Assessment Tools
CO1	**Describe** the objective of Discrete Mathematics.	1	1	Lecture, multimedia,	Quiz, Written exam
CO2	**Explain** terms related to the relationship of different variables.	1	1	Lecture, Group discussion	Assignment
CO3	**Understand** various types of computer theories.	4	2	Lecture, Problem Solving, Group discussion	Quiz, Written exam, Assignment

Weighting COs with Assessment methods:

Assessment Type	% weight	CO1	CO2	CO3
Final Exam	**50%**	15	15	20
Mid Term	**20%**	5	5	10
Class performance, Quizzes, Presentation, case study, exam, Assignment, Project, Others.	**30%**	5	10	15
Total	**100%**	25	30	45

Course Content Outline and mapping with COs

Weeks	Topics / Contents	Course Outcome	Delivery methods and activities	Reading Materials
1	**Set Theory:** Introduction to sets and set elements.	CO1	Class Lecture, Problem Solving	To be assigned during lecture.
2	**Set Theory:** Set operations, Algebra of sets, Quiz 1.	CO2	Class Lecture, Problem Solving	To be assigned during lecture.
3 & 4	**Relations**: Product sets, relations, composition of relations, Quiz 2.	CO1, CO2	Lecture, Problem Solving	To be assigned during lecture.
5	**Functions**: Introduction to functions, dimension & types.	CO1	Lecture, Problem Solving	To be assigned during lecture.
6 & 7	**Logic and propositional calculus**: Computer Logics, operations, arguments, logical implications, Quiz 3	CO1, CO2, CO3	Lecture, Group discussion	To be assigned during lecture.
8 & 9	**Graph theory**: Graphs, types of graphs, different approaches, Quiz 4	CO2, CO3	Lecture, Group discussion	To be assigned during lecture.
10	**Directed graphs**: Basic definitions, rooted trees, memory representation of directed graphs.	CO1, CO2	Lecture, Problem Solving	To be assigned during lecture.
11-12	**Binary trees**: Introduction, basic definitions, types of trees, binary trees and others, Quiz 5	CO1, CO2, CO3	Lecture, Group discussion	To be assigned during lecture.
13	**Counting Principle**: Basic counting principle, factorial notation, binomial coefficient, permutations, combinations, the pigeonhole principle, the inclusion-exclusion principle.	CO2, CO3	Lecture, multimedia	To be assigned during lecture.
14	**Boolean Algebra**: Basic definitions, Basic theorems, Representation theorem, Sum-of-Product Form for Boolean Algebra, Minimal Boolean expressions, Quiz 6	CO1, CO2, CO3	Lecture, multimedia	To be assigned during lecture.

Required References:	Seymour Lipschutz, Discrete Mathematics, Last Edition, 2020, Schaum's outline Series.
Recommended References:	Kenneth H. Rosen, Discrete Mathematics and its Application, Last Edition, 2020, McGraw-Hill.
Special Instructions:	Students must come to the class prepared for the course material covered in the previous class(es). They must submit their assignments on time. No late or partial assignments will be acceptable. There will be no make-up quizzes.

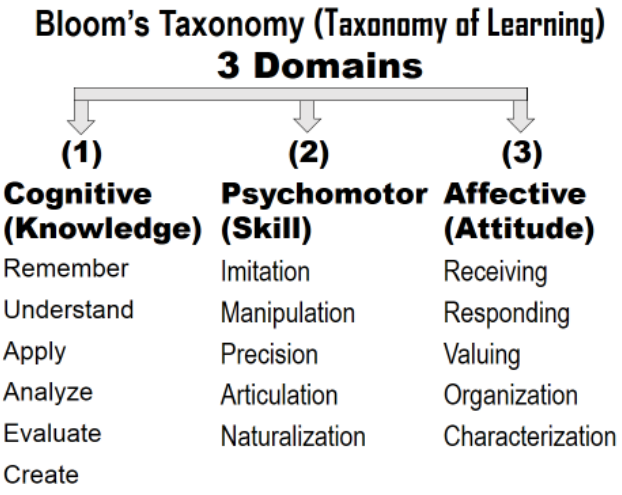
Prepared by	Checked by	Approved by
Course Teacher	Chairman, PSAC committee	Head of the Department

Appendix-1:

Washington Accord Program Outcomes (PO) for engineering programs:

No.	PO	Differentiating Characteristic
1	Engineering Knowledge	Breadth and depth of education and type of knowledge, both theoretical and practical
2	Problem Analysis	Complexity of analysis
3	Design/ development of solutions	Breadth and uniqueness of engineering problems i.e. the extent to which problems are original and to which solutions have previously been identified or codified
4	Investigation	Breadth and depth of investigation and experimentation
5	Modern Tool Usage	Level of understanding of the appropriateness of the tool
6	The Engineer and Society	Level of knowledge and responsibility
7	Environment and Sustainability	Type of solutions.
8	Ethics	Understanding and level of practice
9	Individual and Team work	Role in and diversity of team
10	Communication	Level of communication according to type of activities performed
11	Project Management and Finance	Level of management required for differing types of activity
12	Lifelong learning	Preparation for and depth of Continuing learning.

Appendix-2



Appendix-3: Grading Policy

Numeric Grade	Letter Grade	Grade Point
80% and above	A+	4.00
75% to less than 80%	A	3.75
70% to less than 75%	A-	3.50
65% to less than 70%	B+	3.25
60% to less than 65%	B	3.00
55% to less than 60%	B-	2.75
50% to less than 55%	C+	2.50
45% to less than 50%	C	2.25
40% to less than 45%	D	2.00
Less than 40%	F	0.00