University of Asia Pacific (UAP)

Department of Computer Science and Engineering (CSE)

BSc in CSE Program

Course Outline – Computer Fundamentals and Programming

Part A – Introduction

1. **Course No. / Course Code:** CSE 101
2. **Course Title:** Computer Fundamentals and Programming
3. **Course Type:** Core Course
4. **Level/Term and Section:** 1st Semester (1st Year/1st Semester)
5. **Academic Session:** Fall 2024
6. **Course Instructor:** Faria Zarin Subah, Asma Mariam, Noor Mairukh Khan Arnob
7. **Prerequisite (If any):** N/A
8. **Credit Value:** 3.0
9. **Contact Hours:** 3.0
10. **Total Marks:** 100
11. **Course Objectives and Course Summary:**

    The objectives of this course are to:

    1. **Introduce** computer hardware, software, and functionalities.
    2. **Provide** a thorough understanding of the number system, base conversion, and Boolean algebra.
    3. **Introduce** basic programming and different program planning tools

This is a core course in the Bachelor of Computer Science and Engineering Program, which will help students understand the fundamentals of computer and programming. Students will gain basic knowledge of computer hardware and software, Boolean algebra, number system, planning a program solution, and writing the code of a program.

12. Course Learning Outcomes: at the end of the Course, the Students will be able to –

CLO 1	**Describe** fundamentals of Computer Systems, Software, and Hardware
CLO 2	**Understand** the fundamentals of Boolean algebra and number systems
CLO 3	**Design** flowcharts, algorithms and pseudocodes of problem solutions
CLO 4	**Develop** simple programs using conditionals, loops, and arrays

13. Mapping / Alignment of CLOs with Program Learning Outcomes (PLO) (Optional):

CLO No.	Corresponding PLOs (Appendix-1)	Bloom's taxonomy domain/level (Appendix-2)	Delivery methods and activities	Assessment Tools
CLO1	a	1/Understand	Lecture, classwork, Assignment	Presentation, Written exam
CLO2	a	1/Apply	Lecture, Classwork,Problem Solving.	Written exam, Class Test
CLO3	c	1/Apply	Lecture, Classwork	Written exam,Class Test
CLO4	c	1/Analyze	Lecture, Classwork, Assignments	Written exam, Class Test

Part B – Content of the Course

14. Course Content: Computer Hardware: mouse, keyboard, monitor, CPU, printer, scanner, router, modem; Computer Software: application software, system software; Boolean Algebra: logic gates, Boolean addition, and multiplication, Number Systems: binary, decimal, octal, hexadecimal number systems and their conversions, addition, subtraction; Program Planning Tools: flowcharts, algorithms, pseudocodes; Introduction to Programming: basic input-output, data types, constants and variables; operators and expressions; type conversion; Decision making: branching and selection structures; if-else and switch statements, conditional operators; Repetition and Loop Statements: for loop, while loop, do-while loop, branching and looping, loop nesting; Arrays: introduction to arrays

15. Alignment of topics of the courses with CLOs:

SL. No	Topics / Content	Course Learning Outcome (CLO)
1	Looking Inside the Computer System, Using the Keyboard and Mouse, Inputting Data in Other Ways, Video and Sound, Transforming Data into Information	**CLO1**
2	Number system, Boolean algebra	**CLO2**
3	Programming planning tools	**CLO3**
4.	Introduction to programming, Decision Making, Repetition and Loop Statements, Array	**CLO4**

16. Class Schedule/Lesson Plan/Weekly plan:

Topics	**Specific Outcome(s)**	**Time Frame**	**Suggested Activities**	**Teaching Strategy(s)**	**Alignment with CLO**
Chap 1B - Looking Inside the Computer System ● Parts of the Computer System ● Computer Hardware and Software ● Information Processing Cycle	• gain the basic idea of hardware and software	Week 1	Assignment on basic hardware and software	Lecture, multimedia	CLO1
Chap 3A - Using the Keyboard and Mouse Keyboard, mouse and variants of mouse,Ergonomics Chap 3B - Inputting Data in Other Ways	• gain basic idea of fundamental input devices	Week 2	assignment/ quiz on the primary functionalities of keyboards, mouse and	Lecture, multimedia	CLO1

Hand-held device, embedded computers, touchscreen Optical input devices Audio visual input devices			other input-output devices		
Chap 4A - Video and Sound ● Monitor and printer, its type, and working principle ● Other output devices - data projectors, sound system	• gain basic ideas of fundamental output devices	Week 3	assignment/ Class test on the primary functionalities of different output devices	Lecture, multimedia	CLO1
Chap 5A - Transforming Data into Information ● How computers represent and process data ● Factors affecting processing speed CT1: Class Test 1	• understand the transformation process of data	Week 4	ClassTest	Lecture, multimedia	CLO1

Number System ● binary, decimal, octal, hexadecimal, etc. number systems and their conversions. ● addition, subtraction, and multiplication using different number systems ● Complements in the number system	● understand the conversion system among different number systems	Week 5	Practice different problems on number conversions with interchanging number bases	Lecture, multimedia	CLO2
Boolean Algebra ● logic gates, truth tables, Boolean expression simplification, Boolean addition, and multiplication CT2: Class Test 2	● relate boolean expressions with logic gates and truth tables and simplify them	Week 6	Practice different exercises on Boolean expression Simplification, Class Test	Lecture, multimedia	CLO2
Review Class		Week 7			
MID-TERM EXAMINATION					

Program Planning Tools: ● flowcharts, algorithms, pseudocodes	● apply flowcharts, algorithm and pseudocodes to plan program solutions	Week 8	Practice different problems on flowcharts, algorithms and pseudocodes	Lecture, multimedia	CLO3
Introduction to Programming: ● basic input-output, ● data types, constants, and variables. ● operators and expressions. ● type conversion;	● understand fundamentals of programming	Week 9	Practice problems/ exercises on fundamentals of programming	Lecture, multimedia	CLO4
Decision Making: ● branching and selection structures. ● if-else ● switch statements, ● conditional Operators CT3: Class Test 3	● understand the concept of branching and conditional statements	Week 10-11	Problem solving on if-else, switch statements, conditional Operators, Class Test	Lecture, multimedia	CLO4

Repetition and Loop Statements: ● branching and looping, ● for loop, while loop, do-while loop, ● loop nesting;	● understand the concept of repetition, looping and nesting		Problem solving on repetitions, looping and nesting	Lecture, multimedia	CLO4
Arrays: ● introduction to arrays; ● 1D array, 2D array	● understand the basic concept of array	Week 13-14	Class Test	Lecture, multimedia	CLO4
FINAL EXAMINATION					

17. Teaching-Learning Strategies: Interactive Lectures, Google Classroom

18. Assessment Techniques of each topic of the course:

SL. No	Topics / Content	Assessment Techniques
1	**Computer Hardware and Software Basics**	Presentation, Class Test, Written Exam
2	**Boolean Algebra and Number System**	Class Test, Problem Solving
3	**Programming Planning Tools**	Class Test, Written Exam
4.	**Introduction to programming, Decision Making, Repetition and Loop Statements, Array**	Class Test, Written Exam

Part C – Assessment and Evaluation

19. Assessment Strategy

Class Tests: Altogether 4 class tests may be taken during the semester,2 class tests will be taken for midterm and 2 class tests will be taken for final term. 3 out of 4 class tests will be considered. Best must be chosen from the same CLO. No makeup class tests will be taken. Students are strongly recommended not to miss any class tests.

CIE- Continuous Internal Evaluation (30 Marks)

Bloom's Category Marks (out of 30)	**Tests (30)**
Remember	
Understand	10
Apply	20
Analyze	
Evaluate	
Create	

SMEB- Semester Mid & End Examination (70 Marks)

Bloom's Category	**Test**
Remember	2
Understand	19
Apply	49
Analyze	
Evaluate	
Create	

Weighting COs with Assessment methods:

Assessment Type		Marks Distribution (%)	CLO1	CLO2	CLO3	CLO4
			PLO1	PLO1	PLO3	PLO3
Final Exam (50%)	**Written Exam**	**50**		20	10	20
Mid Term (20%)	**Written Exam**	**20**	5	15		
Assessment (30%)	**Class Test**	**30**	10	10		10
Total		**100%**	15	45	10	30

20. Evaluation Policy

Grades will be calculated as per the university grading structure and individual students will be evaluated based on the following criteria with respective weights.

1. Assessment 30%
2. Term Examination 50%
3. Mid-Term Examination 20%

UAP 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

Part D – Learning Resources

21. Text Book

1. Introduction to Computers - Peter Norton
2. Teach Yourself C - Herbet Schildt
3. Structured C/C Plus Plus Programming - Dr. Mohammad Kaykobad
4. Esho Programming Shikhi - Tamim Shariar Subeen