آغا خان یونیورسٹی ایگزامینیشن بورڈ

AGA KHAN UNIVERSITY EXAMINATION BOARD

Pacing Guide for Teachers

Computer Science

Grade XII

Theory and Practical

Number of weeks: 28

Number of periods per week: 6 (4 Theory + 2 Practical)

Key Textbook: Textbook of Computer Science Grade 12, National Book Foundation, Islamabad

Teacher Developer(s): Syed Manzoor Mehmood and Riffat Jahan

Institution(s): Aga Khan Higher Secondary School, Karachi and Nasra Higher Secondary School (Malir Campus), Karachi

Topic	Total Periods
9. Operating System (OS)	13

Sub-Topic	Range of SLOs	Periods (40 mins)
9.1 Introduction to Operating System	9.1.1-9.1.2	1
	9.1.3	1
	9.1.4	1
	9.1.5	2
9.2 Functions of Operating System	9.2.1	3
9.3 Process Management	9.3.1	2
	9.3.2	1
	9.3.3	1
	9.3.4	1

Learning Resource

- Book: Cambridge IGCSE Information and Communication Technology 3rd by Graham Brown | David Watson

Web Resource

https://edu.gcfglobal.org/en/computerbasics/understanding-operating-systems/1/

Suggested Activities and/or Formative Assessment

Activity 1:

Group activity: Engage students to find out the commonly used operating system.

Activity 2

Group activity: Make groups of students and ask them to identify pros and cons of each interface.

Activity 3

Class Activity: Identify the environment where both the OS can be useful.

Activity 4

Class Activity: Identify the fields where these OS are being used.

Activity 5

As a class, discuss the significance of functions performed by OS.

Activity 6

As a class, discuss the steps and significance of the execution process.

Activity 7

Group Activity: Assign one feature to each group and ask them to identify the advantages of it.

Topic	Total Periods
System Development Life Cycle (SDLC)	5

Sub-Topic	Range of SLOs	Periods (40 mins)
10.1 System Development Life Cycle (SDLC)	10.1.1-10.1.2	1
	10.1.3	3
	10.1.4	1

Web Resource

https://aws.amazon.com/what-is/sdlc/

Suggested Activities and/or Formative Assessment

Activity 1

Class Activity: Brainstorm the significance of SDLC in system development.

Activity 2

Group Activity: Create a project proposal that outlines the project's purpose, requirements, timelines, and budget. Create a survey form to gather information about different projects.

Topic	Total Periods
Introduction to C++ Programming	32

Sub-Topic	Range of SLOs	Periods (40 mins)
11.1 Programming Basics	11.1.1	1
	11.1.2	1
	11.1.3-11.1.4	1
11.2 Constants and Variables in C++ Programming	11.2.1	1
	11.2.2	1
	11.2.3	1
	11.2.4-1.2.5	2
	11.2.6	2
	11.2.7	1
11.3 Input Output Handling	11.3.1	1

	11.3.2	1
	11.3.3	2
	11.3.4	2
	11.3.5	1
11.4 Operators in C++ Programming	11.4.1	1
	11.4.2	1
	11.4.3	1
	11.4.4	1
	11.4.5	1
	11.4.6	1
	11.4.7	1
	11.4.8	1

	11.4.9	1
	11.4.10	2
	11.4.11	1
	11.4.12	1
	11.4.13	1

Learning Resource

- Book: Object Oriented Programming In C++ 4th Edition by Robert Lafore

Web Resources

https://www.w3schools.com/cpp/

https://cplusplus.com/doc/tutorial/

Suggested Activities and/or Formative Assessment

Activity 1

Class Activity: Brainstorm the significance of programming language and header files.

Activity 2

Home Assignment: Write a program to demonstrate the use of comments.

Activity 3

Class Activity: In groups, identify the significance of variables and constants in programming.

Activity 4

Class Activity: Write valid and invalid variable names.

Activity 5

Programming Task: Declaration and initialisation of variable using different data types.

Activity 6

Programming Task Convert from one data type into another using implicit and explicit type casting.

Activity 7

Class Activity: Discuss the scope of local and global variables.

Activity 8

Programming Task: Printing the values of variable in program.

Activity 9

Programming Task: Taking input in different type of variables using in statement.

Activity 10

Programming Task: Using different escape sequences in program.

Activity 11

Programming Task: Programming exercise related to the topic.

Activity 12

Programming Task: Taking input and performing calculations using arithmetic operators.

Activity 13

Programming Task: Demonstrating Postfix and Prefix operator.

Activity 14

Class Activity: Brainstorm the significance of using relational and logical operators while programming.

Activity 15

Class Activity: Discuss the limitations of ternary operator.

Activity 16

Programming Task: Demonstrating Precedence of arithmetic operators.

Activity 17

Programming Task: Demonstrating Compound Expression.

Topic	Total Periods
12.Control Structures	32

Sub-Topic	Range of SLOs	Periods (40 mins)
12.1 Selection Statements in C++ Programming	12.1.1	1
	12.1.2	5
	12.1.3	2
	12.1.4-12.1.5	2
	12.1.6	1
	12.1.7	1
	12.1.8	1
	12.1.9	4
12.2 Repetition (Loop) in C++ Programming	12.2.1	1
	12.2.2	3

	12.2.3	2
	12.2.4	3
	12.2.5	1
	12.2.6-12.2.7	2
	12.2.8	1
	12.2.9	2

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Suggested Activities and/or Formative Assessment

Activity 1

Programming Task: Complete task given in Annex C (Selection statements) of computer science AKU-EB syllabus.

Give maximum programming tasks related to if/ if else/ if else if.

Activity 2

Programming Task: Using switch operator.

Activity 3

Group Activity: Compare if, if-else, else-if and switch statement.

Activity 4

Programming Task: Conversion of the programs used if else if to switch statement.

Activity 5

Programming Task: Complete task given in Annex C of AKU-EB syllabus (Loops) of computer science examination syllabus.

Give maximum programming task related to while, do. While and for loop.

Activity 6

Assignment: Write the difference between the mentioned loops in SLO # 12.2.5

Activity 7

Programming Task: Conversion of the programs used if else if to switch statement.

Activity 8

Programming Task: Complete task given in Annex C (Loops) of computer science examination syllabus.

Topic	Total Periods
13. Arrays and Strings	25

Sub-Topic	Range of SLOs	Periods (40 mins)
13.1 Introduction to Arrays	13.1.1	1
	13.1.2	2
	13.1.3	2
	13.1.4	1
	13.1.5	3
	13.1.6	1
	13.1.7	3
13.2 Two Dimensional Arrays	13.2.1	1
	13.2.2	2
	13.2.3	1

	13.2.4	1
	13.2.5	2
13.3 C++ Strings	13.3.1	1
	13.3.2	1
	13.3.3	3

Learning Resource

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Suggested Activities and/or Formative Assessment

Activity 1

Programming Task: Complete task given in Annex D of AKU-EB syllabus (Array and String) of computer science.

Give maximum programming tasks related to arrays.

Activity 2

Programming Task: Demonstrate the use of size of ()

Activity 3

Programming Task: Complete task given in Annex D (Array and String) of AKU-EB syllabus computer science.

Topic	Total Periods
14. Function	20

Sub-Topic	Range of SLOs	Periods (40 mins)
14.1 Introduction to Function in C++ Programming	14.1.1-14.1.2	1
	14.1.3	2
	14.1.4-14.1.5	5
	14.1.9	2
	14.1.6	2
	14.1.8	1
	14.1.7	1
14.2 Passing Arguments and Returning Values	14.2.1	3
	14.2.2-14.2.3	2
14.3 Functions Overloading	14.3.1-14.3.2	1

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Suggested Activities and/or Formative Assessment

Activity 1

Assignment: Write the significance of using User Define Function.

Activity 2

Programming Task: Complete task given in Annex C and D (Function) of computer science examination syllabus.

Activity 3

Programming Task: Demonstrate inline function.

Activity 4

Programming Task: Demonstrate local, global, and static variables.

Activity 5

Programming Task: Demonstrate local and global functions.

Activity 6

Programming Task: Rewrite the programs given in Annex C and D (Function) by passing arguments of computer science AKU-EB syllabus.

Activity 7

Programming Task: Demonstrate function overloading.

Topic	Total Periods
15. Pointers	7

Sub-Topic	Range of SLOs	Periods (40 mins)
15.1 Use of Pointers	15.1.1	1
	15.1.2-15.1.3	2
	15.1.4	1
	15.1.5	1
	15.1.6	2

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Suggested Activities and/or Formative Assessment

Activity 1

Class Activity: Discuss the significance of pointers.

Activity 2

Programming Task: Complete given task given in Annex D (Pointer) from computer science AKU-EB syllabus.

Topic	Total Periods
16. Object Oriented Programming (OOP)	28

Sub-Topic	Range of SLOs	Periods (40 mins)
16.1 Classes and Objects in OOP	16.1.1	1
	16.1.2	2
16.2 Access Modifiers (Public, Private, Protected and Sealed)	16.2.1	2
	16.2.2	1
	16.2.3	1
	16.2.4	1
16.3 Pillars of OOP (Inheritance, Encapsulation, Abstraction and Polymorphism)	16.3.1	1
	16.3.2	2
	16.3.3	3
	16.3.4	1

	16.3.5	2
	16.3.6	1
	16.3.7	1
	16.3.8	3
	16.3.9	2
	16.3.10	2
	16.3.11	2

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Suggested Activities and/or Formative Assessment

Activity 1

Programming Task

Complete given task given in Annex D (Object Oriented Programming) from computer science AKU-EB syllabus.

Activity 2

Programming Task

Demonstrate the concept of constructor and destructor.

Activity 3

Programming Task

Demonstrate the concept of inheritance.

Activity 4

Programming Task

Demonstrate the concept of Polymorphism.

Activity 5

Programming Task

Demonstrate the concept of Abstraction.

Activity 6

Programming Task

Demonstrate the concept of overloading and overriding.

Topic	Total Periods
17. File Handling	6

Sub-Topic	Range of SLOs	Periods (40 mins)
17.1 File Handling in C++ Programming	17.1.1	1
	17.1.2	1
	17.1.3	1
	17.1.4	1
	17.1.5	1
	17.1.6	1

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Suggested Activities and/or Formative Assessment

Activity 1

Programming Task: Illustrate opening, closing, reading and writing of data in a file.

Note: This teacher-led pacing guide has been developed for AKU-EB affiliated schools to facilitate them by

- ensuring smooth transition of a school's academic year.
- ensuring curricular continuity in schools.
- predicting the time and pace of syllabi implementation.

This document also contains **suggested activities and/or formative assessments** that may enhance the learning experience. Please note that these activities are meant to serve as suggestions. As educators, you have the flexibility and autonomy to adapt and modify them to best suit the needs of your students and the dynamics of your classroom.

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