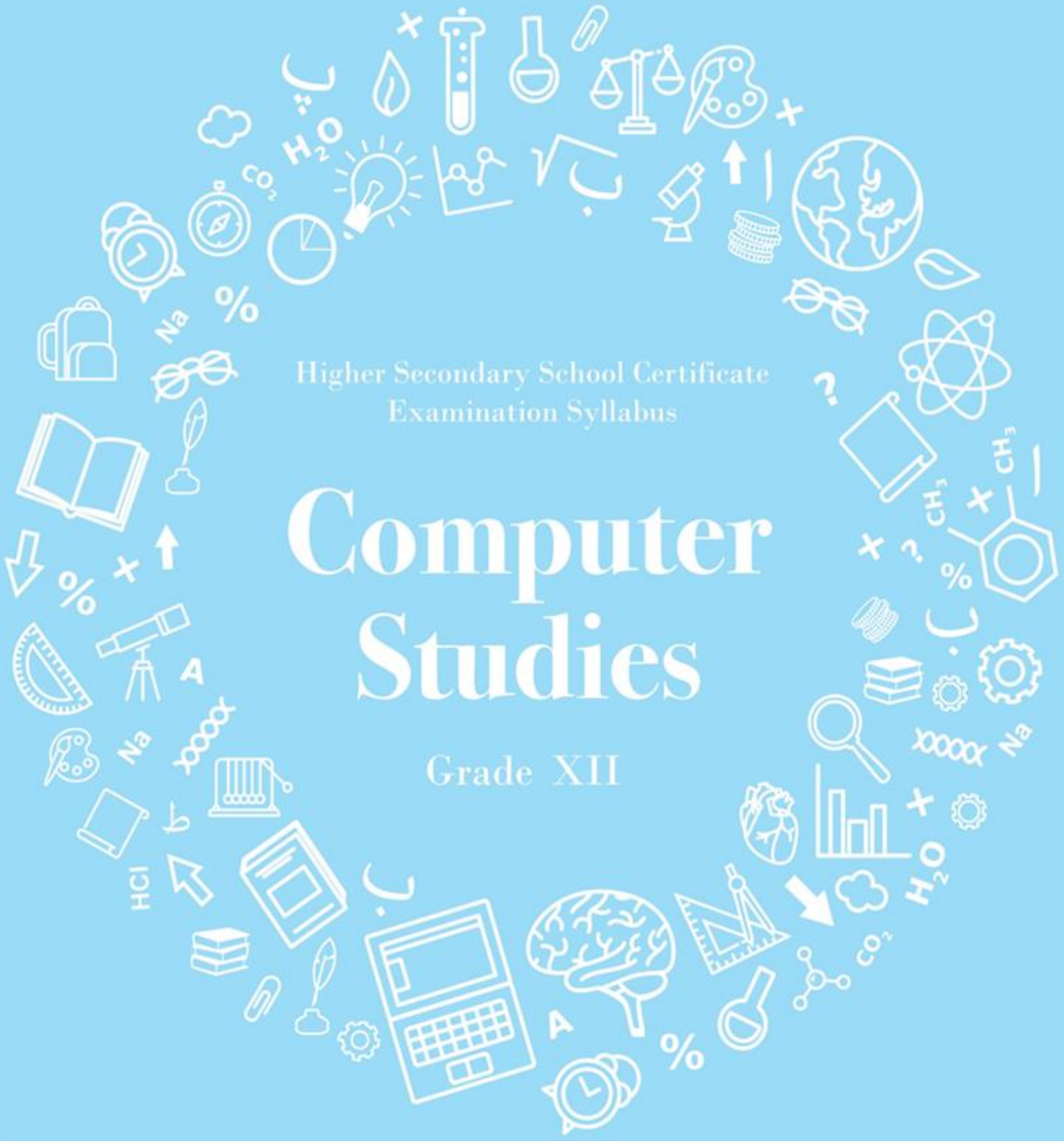
آغا خان یونیورسٹی ایگزامینیشن بورڈ

AGA KHAN UNIVERSITY EXAMINATION BOARD



Higher Secondary School Certificate
Examination Syllabus

Computer Studies

Grade XII

Published by
Aga Khan University Examination Board
Block - C, IED - PDC, 1-5/B-VII
Federal B. Area, Karimabad, Karachi, Pakistan.

Last Revision June 2009
Latest Revision January 2022

Higher Secondary School Certificate Examination Syllabus

COMPUTER STUDIES

GRADE XII

This syllabus will be examined in Annual Examination sessions only from 2023 for Grade XII

Table of Contents	Page No.

For queries and feedback

Address: Aga Khan University Examination Board
Block - C, IED - PDC, 1-5/B-VII
Federal B. Area, Karimabad, Karachi, Pakistan.
Phone: (92-21) 3682-7011
Fax: (92-21) 3682-7019
E-mail: examination.board@aku.edu
Website: http://examinationboard.aku.edu
Facebook: www.facebook.com/akueb

Preface

Established in 2002 through the Pakistan government's ordinance, the Aga Khan University Examination Board (AKU-EB) is country's first private autonomous qualification awarding body for secondary (SSC) and higher secondary (HSSC) school certifications. Its vision is to be a model of excellence and innovation in education in Pakistan and the developing world.

AKU-EB achieves its vision by developing examination syllabi which inculcate conceptual thinking and higher order learning and are aligned with National/ trans-provincial curricula and international standards. AKU-EB revises its syllabi periodically to support the needs of students, teachers and examiners.

The aims of the syllabus review of SSC and HSSC are to:

- Ensure continued compatibility with the goals of the trans-provincial curricula of Pakistan.
- Review the content for inclusion of new knowledge and deletion of obsolete knowledge.
- Review the content for clarity and relevance as per the changing needs of students, teachers and examiners.
- Enhance and strengthen continuation and progression of content both within and across grades IX - XII (SCC and HSSC).
- Ensure the readiness of students for higher education.

During the syllabus review, the needs of all the stakeholders were identified through a needs-assessment survey. Students and teachers of AKU-EB affiliated schools from across Pakistan participated in the survey. Thereafter, a revision panel, which consisted of examiners, teachers of affiliated and non-affiliated schools, teacher trainers and university academicians, reviewed and revised the syllabus following a planned, meticulous and standardised syllabi review process.

The syllabus is organised into topics and subtopics. Each subtopic is further divided into achievable student learning outcomes (SLOs). The SLOs of the cognitive domain are each assigned a cognitive level on which they have to be achieved. These cognitive levels are 'Knowledge', 'Understanding' and 'Application', the latter also including other higher order skills. This is followed by the Exam Specification which gives clear guidance about the weightage of each topic and how the syllabus will be assessed.

The development of the revised syllabus has been made possible by the creativity and relentless hard work of Curriculum and Examination Development unit and the constant support provided by all the other units of AKU-EB. We are particularly thankful to Dr Sohail Qureshi for his very useful feedback on revising the syllabus review process, to Dr Naveed Yousuf for his continued guidance and support throughout the syllabus revision process and to Raabia Hirani for leading the syllabi revision. We are also thankful to all the students and teachers who took part in the needs-assessment survey and to the principals of AKU-EB affiliated schools who made this endeavour possible by facilitating and encouraging their teachers to be a part of the survey and the syllabus revision panel.

With your support and collective hard work, AKU-EB has been able to take the necessary steps to ensure effective implementation of the best international and trans-provincial standards through this syllabus. We are confident that this syllabus will continue to provide the support that is needed by students to progress to the next level of education and we wish the very best to our students and teachers in implementing this syllabus.

Dr Shehzad Jeeva
Chief Executive Officer (CEO), Aga Khan University Examination Board
Associate Professor of Practice, Faculty of Arts and Sciences, Aga Khan University

Understanding of AKU-EB Syllabi

1. The AKU-EB syllabi guide the students, teachers, parents and other stakeholders regarding the topics that will be taught and examined in each grade (IX, X, XI and XII). In each syllabus document, the content progresses from simple to complex, thereby, facilitating a gradual, conceptual learning of the content.

2. The topics of the syllabi are divided into subtopics and **student learning outcomes (SLOs)**. The subtopics and the SLOs define the depth and the breadth at which each topic will be taught, learnt and examined. The syllabi also provide enabling SLOs where needed to scaffold student learning.

3. Each SLO starts with an achievable and assessable **command word** such as describe, relate, evaluate, etc. The purpose of the command words is to direct the attention of teachers and students to specific tasks that the students are expected to undertake in the course of their studies. The examination questions are framed using the same command words or their connotations to elicit evidence of these competencies in students' responses.

4. The SLOs are classified under three **cognitive levels**: knowledge (K), understanding (U) and application and other higher order skills (A) for effective planning during teaching and learning. Furthermore, it will help to derive multiple choice questions (MCQs), constructed response questions (CRQs) and extended response questions (ERQs) on a rational basis from the subject syllabi.

5. By focusing on the achievement of the SLOs, these syllabi aim to counter the culture of rote memorisation as the preferred method of examination preparation. While suggesting relevant, locally available textbooks for achieving these outcomes, AKU-EB recommends that teachers and students use multiple teaching and learning resources for achieving these outcomes.

6. The syllabi follow a uniform layout for all subjects to make them easier for students and teachers to follow. They act as a bridge between students, teachers and assessment specialists by providing a common framework of student learning outcomes and **exam specifications**.

7. On the whole, the AKU-EB syllabi for Secondary School Certificate (SSC) provide a framework that helps students to acquire conceptual understanding and learn to critically engage with it. This lays a solid foundation for HSSC and beyond.

Subject Rationale of AKU-EB Computer Studies

Why study AKU-EB Computer Studies?

There is no denying that Computer Studies is an essential discipline for everyone. This subject, offered to students of Commerce Group, is specially designed to provide the knowledge and skills related to latest technology as well as its application in the real world, particularly in businesses. This syllabus assumes prior knowledge of Computer Studies at earlier grades and, therefore, focuses on the latest development in the technology and related implications for businesses.

Studying computer studies will help students to develop problem-solving, critical thinking and complex analytical skills. Students will study the design, development and analysis of software and hardware used to solve problems in a variety of business, scientific and social contexts. The development in technology demands this subject to be taught from very earlier age and across various disciplines.

What will you learn in AKU-EB Computer Studies?

The AKU-EB examination syllabus of Computer Studies aims to fulfil the objectives of theoretical as well as practical concepts of computer studies keeping the latest updates of technology in mind. The theoretical part covers the hardware, software and basic operations of computers with a focus on cyber security laws and computer ethics and the practical portion majorly focuses on the hands-on practice of some useful tools like MS Word, Excel, PowerPoint, MS Access database and Dev C++ for basic programming using C language.

Where will it take you?

The focus of the AKU-EB computer studies examination syllabus is more towards conceptual understanding of the technology used in our daily life which prepares students appropriately for higher studies of technology-related fields.

The following list suggests the diversity of careers which graduates of commerce with computer studies as an optional subject can pursue:

- Data Analysis
- Digital Marketing
- Data Management
- Graphics and Animation
- Information System Audit
- E-Commerce Management
- Teaching and Academic Research
- Web Designing and Development
- Enterprise Resource Planning (ERP)
- Management Information System (MIS)

How to approach the syllabus?

The topics and the student learning outcomes (SLOs) guide regarding the details about what has to be achieved. The exam specification guides regarding what will be expected in the examination.

Student Learning Outcomes of AKU-EB HSSC Computer Studies Syllabus

Grade XII

Topics and Sub-topics		Student Learning Outcomes		Cognitive Level[1]		
				K	U	A
1. Basics of Information Technology		Students should be able to:				
1.1	Basic Concepts of Information Technology	1.1.1	define the term 'Information Technology' (IT);	*		
		1.1.2	describe the use of IT in sports, entertainment, medicine and defence sectors;		*	
1.2	Hardware and Software	1.2.1	differentiate between the terms hardware and software;		*	
		1.2.2	differentiate between the two main categories of computer software;		*	
		1.2.3	explain the uses of four specific types of application software with examples;		*	
		1.2.4	describe the four parts of a data processing cycle;		*	

[1] K = Knowledge, U = Understanding, A = Application and other higher-order cognitive skills

Topics and Sub-topics		Student Learning Outcomes		Cognitive Level		
				K	U	A
		Students should be able to:				
1.3	Input and Output Devices {I/O Processors, Keyboard, Mouse, Character-Recognition Microphone, Camera, Scanners, LCD, CRT, Printers (Character, Dot Matrix, Daisy Wheel, Line, Chain, Drum, Laser Jet, Impact and Non-Impact) Plotters (Flatbed, Drum)}	1.3.1	describe various types of input devices and output devices mentioned in subtopic 1.3;		*	
		1.3.2	classify input devices into keyboards, pointing devices and source entry devices;		*	
		1.3.3	describe the function of input and output devices;		*	
		1.3.4	describe the merits and demerits of various input and output devices mentioned in subtopic 1.3;		*	
		1.3.5	describe the working of input and output devices in a particular environment;		*	
1.4	Operating System and Computer Programs {DOS, UNIX , LINUX and Windows}	1.4.1	compare an operating system with a computer program;		*	
		1.4.2	list different types of operating systems;	*		
		1.4.3	explain the major functions of operating systems;		*	
		1.4.4	differentiate a GUI from a command driven operating system;		*	
1.5	Basic Units of Data Storage and Memory	1.5.1	describe the terms memory cell, bit, byte, word and memory capacity;		*	
		1.5.2	list different units to measure the memory;	*		
		1.5.3	convert from one memory unit to another;			*
		1.5.4	describe different types of computer memory with examples;		*	

Topics and Sub-topics		Student Learning Outcomes		Cognitive Level		
				K	U	A
		Students should be able to:				
1.6	Information Systems Development	1.6.1 1.6.2	define information system; explain the process and life cycle of system development (problem orientation; analysis, design and development, testing and debugging; implementation; future development).	*	*	

Topics and Sub-topics		Student Learning Outcomes		Cognitive Level		
				K	U	A
2. Applications and Uses of Computers		Students should be able to:				
2.1	Impacts of Computers in Our Daily Life	2.1.1	identify the fields where computers are used;		*	
		2.1.2	explain the impacts of computers on human life;		*	
2.2	Types and Uses of System Used in Everyday Life, Education, Banks, Home, Business and Industries	2.2.1	describe the types and uses of the computer in a. education sector as teaching and learning tool; b. banking and financial sectors; c. automobile and manufacturing industry;		*	
		2.2.2	describe e-commerce and its benefits and limitations for a society;		*	
		2.2.3	explain computer simulation and its uses;		*	
		2.2.4	describe CAM, CAD and their uses;		*	
		2.2.5	describe the uses of computer in weather forecasting.		*	

Topics and Sub-topics		Student Learning Outcomes		Cognitive Level		
				K	U	A
3. Computer Hardware		Students should be able to:				
3.1	Computer Architecture	3.1.1	identify the different components of a computer CPU, input/output, data bus, address bus, control bus and ports);		*	
		3.1.2	illustrate a typical computer system with the help of a block diagram;			*
		3.1.3	describe CPU (ALU, CU), main memory (RAM, ROM) and their functions with the help of a block diagram;		*	
		3.1.4	describe size and functions of registers, program counter (PC), memory address register (MAR), memory buffer register (MBR), instruction register (IR), stack, accumulator, data register, data address register (DAR);		*	
3.2	Computer Operations	3.2.1	explain simple machine instructions format, instruction codes and processing machine instructions (fetch-decode-execute).		*	

Topics and Sub-topics		Student Learning Outcomes		Cognitive Level		
				K	U	A
4. Security, Copyright and the Governing Laws		Students should be able to:				
4.1	Computer Crimes	4.1.1	discuss computer crimes by giving real-life examples;		*	
		4.1.2	describe the process of electronic trespassing (hacking);		*	
4.2	Virus and Anti-Virus Issues	4.2.1	define computer virus;	*		
		4.2.2	differentiate between file viruses and boot sector viruses;		*	
		4.2.3	describe various types of viruses, i.e., Worm, Trojan Horse, Boot Sector, Web Scripting Virus, Browser Hijacker, Macro Virus, Polymorphic Virus;		*	
		4.2.4	discuss the strategies that can be used to protect personal and public computers against various types of viruses, i.e. Worm, Trojan Horse, Boot Sector, Web Scripting Virus, Browser Hijacker, Macro Virus, Polymorphic Virus;		*	
4.3	Data Protection and Legislation	4.3.1	discuss different ways of data protection;		*	
		4.3.2	discuss data protection legislation and its effectiveness;		*	
		4.3.3	discuss Pakistan's prevention of electronic crime act, 2016.		*	
		4.3.4	determine the strategies that can be used by individuals and companies to protect against computer crimes.			*

Topics and Sub-topics		Student Learning Outcomes		Cognitive Level		
				K	U	A
5. Uses of Software		Students should be able to:				
5.1	Word Processing (Using MS-Word 2007 or Above)	5.1.1	explain the uses of word processor in daily life;		*	
		5.1.2	use font, paragraph, page formatting and printing commands;			*
		5.1.3	use tables and table related tasks;			*
		5.1.4	describe the concept of the clipboard;		*	
		5.1.5	use text boxes, graphics and word art options;			*
5.2	Spreadsheet (Using MS-Excel 2007 or Above)	5.2.1	explain the uses of spreadsheets in daily life;		*	
		5.2.2	use spreadsheet layout;			*
		5.2.3	apply formatting and customising tools to a data set;			*
		5.2.4	apply formulae, functions and name ranges;			*
		5.2.5	generate basic types of charts using data;			*
		5.2.6	apply print command to print worksheets and charts;			*
5.3	PowerPoint Presentation (Using MS-Powerpoint 2007 or Above)	5.3.1	explain the use of presentation software in daily life;		*	
		5.3.2	use PowerPoint interface to make a simple presentation of at least 5 slides selecting a suitable template;			*
		5.3.3	use pictures, graphics, text, charts or table and also delete and edit contents on the slides;			*
		5.3.4	apply the setup features and run the slide show with animation effects;			*
5.4	Presentations Using Prezi	5.4.1	use Prezi to create presentations and animations.			CA

Topics and Sub-topics		Student Learning Outcomes		Cognitive Level		
				K	U	A
6. Basics of Database (MS Access)		Students should be able to:				
6.1	Basic Concepts	6.1.1	describe the word 'database';		*	
		6.1.2	explain the objects of a database, i.e., table, form, query, report, relationship;		*	
		6.1.3	distinguish between fields and records;		*	
6.2	Using Access	6.2.1	use MS Access and its salient features;			*
		6.2.2	explain the use of wizard in MS Access;		*	
		6.2.3	use help feature while working in MS Access;			*
6.3	Create New Database	6.3.1	create a blank database and save it with database extension;			*
		6.3.2	create table in the design/ data sheet view;			*
		6.3.3	use appropriate field names and select data types;			*
6.4	Modification	6.4.1	apply insertion and deletion of field in MS Access;			*
		6.4.2	identify primary key in a database;		*	
		6.4.3	apply print command on a table;			*
6.5	Relationships	6.5.1	create a relationship between the existing tables;			*
		6.5.2	apply alteration in the tables in design view when required.			*

Topics and Sub-topics		Student Learning Outcomes		Cognitive Level		
				K	U	A
7. Advance Database (MS Access)		Students should be able to:				
7.1	Insertion and Editing Record	7.1.1 7.1.2	apply insert command in records in data sheet view; apply view, edit and delete records commands in data sheet view;			* *
7.2	Searching and Sorting Records	7.2.1 7.2.2	find and replace records in a database; apply sort commands on records in ascending and descending order;			* *
7.3	Using Queries	7.3.1 7.3.2 7.3.3	describe query and types of queries; create query in design view or by using wizard; apply adding a calculated field into a table;		* 	 * *
7.4	Using Forms	7.4.1 7.4.2 7.4.3	describe forms and their advantages; create different types of forms through form wizard; use edit options in forms in terms of field, layout and style;		* 	 * *
7.5	Using Reports	7.5.1 7.5.2 7.5.3	describe reports and its types that can be produced using the wizard; create reports using report wizard; apply format/ modify features to a report as per requirement.		* 	 * *

Topics and Sub-topics		Student Learning Outcomes		Cognitive Level		
				K	U	A
8. Algorithm and Flowchart		Students should be able to:				
8.1	Understanding the Problem	8.1.1	explain the following steps of problem solving process: a. define the problem b. analyse the problem c. planning the solution of the problem d. find candid solutions of the problem e. select the best solution;		*	
8.2	Algorithm	8.2.1	define an algorithm;	*		
		8.2.2	describe the following four essential parts of an algorithm: a. inputs b. processing c. decision d. outputs;		*	
		8.2.3	write algorithms for solving problems, i.e. a. performing arithmetic, relational and logical operations b. calculating the volume of geometrical shapes c. finding the area of various geometrical shapes d. converting from one unit to another unit of physical quantities e. finding the maximum and minimum from input values f. performing the counting and totaling on given values g. applying the repetition process h. applying the selection process;			*

Topics and Sub-topics	Student Learning Outcomes		Cognitive Level		
			K	U	A
	Students should be able to:				
8.3 Flowchart	8.3.1	define a program flowchart;	*		
	8.3.2	describe the importance of a program flowchart for solving a problem;		*	
	8.3.3	identify the flowchart symbols for the following: a. input b. process c. decision making d. outputs e. terminator/ terminal point f. connectors;		*	
	8.3.4	draw flowcharts for the problems mentioned in SLO 8.2.3;			*
	8.3.5	complete the trace table for a given flowchart.			*

Topics and Sub-topics		Student Learning Outcomes		Cognitive Level		
				K	U	A
9. Introduction to 'C' Language		Students should be able to:				
9.1	High Level Programming Language	9.1.1	describe high level programming language;		*	
		9.1.2	differentiate between high level and low level programming language;		*	
9.2	Basic Structure of 'C' Program	9.2.1	describe 'C' language;		*	
		9.2.2	explain the advantages of 'C' language over other programming language;		*	
9.3	The Environment of 'C'	9.3.1	use editor of 'C' language and explain its menus;			*
		9.3.2	explain the basic structure of 'C' program by using block diagram/ flow chart.		*	

Topics and Sub-topics		Student Learning Outcomes		Cognitive Level		
				K	U	A
10. Creating 'C' Program		Students should be able to:				
10.1	Creating, Editing and Saving a Source Program	10.1.1	write a simple 'C' program by opening a 'C' editor and saving it;			*
		10.1.2	explain setting of header files (include & lib) from option menu;		*	
10.2	Compiling, Linking and Executing a Program	10.2.1	explain the compilation process with the source program;		*	
		10.2.1	apply the steps of creating the executable file with the Linker (.cpp,.obj,.exe);			*
		10.2.3	explain the uses of comments in 'C' language.		*	

Topics and Sub-topics	Student Learning Outcomes		Cognitive Level		
			K	U	A
11. Fundamentals of 'C' Language	Students should be able to:				
11.1 Data Types	11.1.1	describe different data types;		*	
	11.1.2	explain the number range of numeric data (int, long, float and double);		*	
11.2 Input/ Output Statements	11.2.1	explain the use of printf, scanf, format specifier, field with specifier and getch with the help of a program;		*	
	11.2.2	write a program which prints a text of 4 lines consisting of characters, integer values and floating point values using printf statement;			*
	11.2.3	describe escape sequences;		*	
	11.2.4	create a program that reads and prints the data using the escape sequences;			*
11.3 Functions and Subroutines	11.3.1	describe functions and subroutines;		*	
	11.3.2	explain the purposes of built-in functions with the relevance to their importance strings, i.e. ASC, CHR, LEN, LEFT, RIGHT, MID, RND, SQR;		*	
11.4 Operators	11.4.1	describe operators (arithmetic, relational, logical);		*	
	11.4.2	write 'C' programs which uses operators.			*

Topics and Sub-topics		Student Learning Outcomes		Cognitive Level		
				K	U	A
12. Control Statements		Students should be able to:				
12.1	Loops	12.1.1	explain in detail FOR-NEXT (counter) and DO-WHILE while (controlled) loops;		*	
		12.1.2	write 'C' programs which uses FOR loop statement;			*
		12.1.3	write 'C' programs which uses while loop and nested while loop;			*
		12.1.4	write 'C' programs which uses do-while loop;			*
12.2	Conditional Statements	12.2.1	describe certain conditions to use IF-ELSE, ELSE-IF, switch statement and conditional operators;		*	
		12.2.2	write 'C' programs which uses IF, IF-ELSE, ELSE-IF and nested IF-ELSE statements;			*
		12.2.3	write 'C' programs which uses a switch statement and breaks the program if certain condition is observed.			*

Topics and Sub-topics		Student Learning Outcomes		Cognitive Level		
				K	U	A
13. Functions		Students should be able to:				
13.1	Uses of Functions	13.1.1	explain functions and their advantages;		*	
		13.1.2	distinguish built-in functions and user-defined functions;		*	
		13.1.3	explain the built-in functions (ABS, COS, LOG, TAN, SIN, SQRT);		*	
		13.1.4	write 'C' programs to create functions and calls those functions in the 'main' program;			*
13.2	Arguments	13.2.1	explain variations of functions;		*	
		13.2.2	write a user-defined function which takes multiple arguments to draw geometrical shapes.			*

Scheme of Assessment

Grade XII

Table 1: Number of Student Learning Outcomes by Cognitive Level

Topic No.	Topics	No. of Sub Topics	SLOs			Total
			K	U	A	
1.	Basic of Information Technology	6	4	16	1	21
2.	Applications and Use of Computers	2	0	7	0	7
3.	Computer hardware	2	0	4	1	5
4.	Security, Copyright and the Law	3	1	8	1	10
5.	Use of Software	4	0	4	12	16
6.	Basics of Database (MS Access)	5	0	5	9	14
7.	Advance Database (MS Access)	5	0	3	10	13
8.	Algorithm and Flowchart	3	2	4	3	9
9.	Introduction to C Language	3	0	5	1	6
10.	Creating C Program	2	0	3	2	5
11.	Fundamentals of C Language	4	0	7	3	10
12.	Control Statements	2	0	2	5	7
13.	Functions	2	0	4	2	6
	Total	**43**	**7**	**72**	**50**	**129**
	Percentage		**5**	**56**	**39**	**100**

Table 2: Exam Specifications

Topic No.	Topics	Marks Distribution			Total Marks
		MCQs	CRQs	ERQs	
1.	Basic of Information Technology	6	Total 2 Marks (1 CRQ)		8
2.	Applications and Use of Computers	2			2
3.	Computer hardware	2			2
4.	Security, Copyright and the Law			7 Marks Choose any ONE from TWO	7
5.	Use of Software	3	Total 4 Marks (1 CRQ)		7
6.	Basics of Database (MS Access)	3			3
7.	Advance Database (MS Access)	3			3
8.	Algorithm and Flowchart	3	Total 3 Marks (1 CRQ)		6
9.	Introduction to C Language	4			4
10.	Creating C Program	3			3
11.	Fundamentals of C Language	6			6
12.	Control Statements	3	Total 4 Marks (1 CRQ)		7
13.	Functions	2			2
	Total	**40**	**13**	**7**	**60**
	Practical				**15**
	Total Marks				**75**

- Multiple Choice Question (MCQ) requires candidates to choose one best/ correct answer from four options for each question. Each MCQ carries ONE mark.

- Constructed Response Question (CRQ) requires students to respond with a short text (few phrases/ sentences), calculations or diagrams.

- Extended Response Question (ERQ) requires students to answer in a more descriptive form. The answer should be in paragraph form, with diagrams where needed, and address all parts of the question.

- Tables 1 indicate the number and nature of SLOs in each topic in grade XII. This will serve as a guide in the construction of the examination paper. It also indicates that more emphasis has been given to the Understanding (56%), Application and higher order skills (39%) to discourage rote memorisation. Tables 1 however, do not translate directly into marks.

- There will be examination at the end of Class XII.

- The theory paper will be in two parts: paper I and paper II. Both papers will be of duration of 3 hours.

- Paper I theory will consist of 40 compulsory, multiple choice items. These questions will involve four response options.

- Paper II theory will carry 20 marks and consist of a number of compulsory, structured questions and a number of extended response questions. Each extended response question will be presented in an either/or form.

- All constructed response questions will be in a booklet which will also serve as an answer script.

***Practical:**

- Practical examination will be conducted separate from the theory paper and will consist of 15 marks.

- Practical examination will be based on the list of practical activities given in the examination syllabus. Schools may design their own practical manuals based on these activities.

- Practical journal/ portfolio should be developed by students and endorsed by a figure of authority, such as a teacher or principal, and submitted at the time of the practical examination.

- It is essential for each school to equip its computer laboratories with necessary devices, software etc. to meet the requirements of the practicals in the examination syllabus. Each school will be responsible to make sure that each student is provided the opportunity to do the practicals.

Annex A: List of Acronyms and Their Full Forms

Acronym	Full Form
MCR	Magnetic Card Reader
MICR	Magnetic Ink Character Reader
OCR	Optical Character Reader
OMR	Optical Mark Reader
QR	Quick Response
LED	Light Emitting Diode
LCD	Liquid Crystal Display
CRT	Cathode Ray Tube
KB	Kilobyte
MB	Megabyte
GB	Gigabyte
TB	Terabyte
PB	Petabyte
RAM	Random Access Memory
ROM	Read Only Memory
SRAM	Static Random Access Memory
DRAM	Dynamic Random Access Memory
PROM	Programmable Read Only Memory
EPROM	Erasable Programmable Read Only Memory
EEPROM	Electrically Erasable Programmable Read Only Memory
CD	Compact Disc
DVD	Digital Versatile Dics
CD-ROM	Compact Disc Read Only Memory
CPU	Central Processing Unit
ALU	Arithmetic Logic Unit
CU	Control Unit
ACC	Accumulator
MDR	Memory Data Register
IR	Instruction Register

Acronym	Full Form
MAR	Memory Address Register
PC	Program Counter
MBR	Memory Buffer Register
USB	Universal Serial Bus
HDMI	High Definition Multimedia Interface
SIMM	Single In-Line Memory Module
DIMM	Dual In-Line Memory Module
DBA	Database Administrator
SQL	Structured Query Language
I/ O	Input/ Output
OS	Operating System
SDLC	Software Development Life Cycle

Annex B: Examples of C Programming

Selection Statement
1. Calculate the grades of students on the basis of marks. 2. Show whether a number is positive, negative or zero. 3. Find the maximum and minimum values from three numbers. 4. Show whether a number is even or odd. 5. Calculate the electricity bill on the basis of charges allocated to each unit range.
Loops
1. Generate a number series (even, odd, prime etc.) by taking input of starting and ending point. 2. Generate sum of series using loops. 3. Generate table of any inputted number. 4. Calculate factorial of any inputted number. 5. Print pyramid, rectangle and square shapes using nested loops. 6. Input multiple values using loop and calculate average, maximum or minimum value using selection statement.
Functions
1. Write a user defined function to perform basic arithmetic operations, i.e. add, subtract, multiply and divide. 2. Write a user defined function to calculate area of circle, triangle and parallelogram. 3. Write a user defined function to calculate volume of cylinder, sphere and cube. 4. Write a user defined function to calculate average of numbers. 5. Write a user defined function to calculate factorial of a given number.

Annex C: List of Practical

Grade XII

S.No	SLO No	Objective	Equipment	Software
		Topic 5: Use of Software MS-Word, MS-Excel, MS-PowerPoint (2007 or Above)		
1.	5.1.4	Open and save files in specified path or a new folder Selection of text by different methods and applying different operations, Copying, moving (by clipboard and drag & drop method) and deletion	Computer and Printer	MS Word 2007 or above
2.	5.1.2	Formatting text (Bold, Underline, Font, Colour etc)		
3.	5.1.2	Use of Undo and Redo		
4.	5.1.2	Use of Text Alignment, Indenting and managing space. use of bullets and numbering		
5.	5.1.2	Use of Page Setup including Page Margin, Size, Paper Source and Layout		
6.	5.1.2	Skills of Printer Settings		
7.	5.1.3	Use of Tables and Columns		
8.	5.1.2	Use of Spell Check Grammar and Thesaurus		
9.	5.1.2 5.1.3 5.1.4	Use of shortcuts		
10.	5.2.3	Inserting & Deleting Cells, Rows and Columns	Computer and Printer	MS Excel 2007 or above
11.	5.2.3	Managing Worksheets		
12.	5.2.4	Formatting and Customizing Data		
13.	5.2.5	Use of Formulas and functions (formatting numbers, decimal places, column & rows setup etc)		
14.	5.2.6	Generating of different types of charts		
15.	5.2.7	Use of Page Setup and Printing Configurations		

		Topic 5: Use of Software MS-Word, MS-Excel, MS-PowerPoint (2007 or Above)		
16.	5.3.2	Create Presentation	Computer and Printer	MS PowerPoint 2007 or above
17.	5.3.2	Add New Slides, Text Boxes, Text in Text Boxes and Slide Notes		
18.	5.3.3	Insert Pictures, Graphics, Charts and Tables		
19.	5.3.2	Rearranging the Slides		
20.	5.3.4	Creating Slide shows and Animations using Effects		

S.No	SLO No	Objective	Equipment	Software
		Topic 6: Basics of Database (MS Access 2007 or Above) **Topic 7: Advance Database (MS Access 2007 or Above)**		
1.	6.3.1 6.3.2	Creating different tables in design view and wizard.	Computer and Printer	MS Access 2007 or Above
2.	6.3.3	Assign appropriate data types to the fields in a table.		
3.	7.2.2	Sorting records in a table.		
4.	6.5.1	Create relationship among tables using primary and foreign key.		
5.	7.4.2	Create simple forms using wizards and design view.		
6.	7.4.2	Navigating through records in a form.		
7.	7.4.3	Using forms to add, delete or modify a record.		
8.	7.5.2	Create reports using wizard.		
9.	7.5.3	View and print reports.		

S.No	SLO No	Objective	Equipment	Software
		Topic 12: Control Structures		
1.	12.2.2	Write a program for each **if**, **if-else** and **else-if**.	Computer	Dev-C ++ or Any Other C Compiler
2.	12.2.2	Write a program using **nested if** statement.		
3.	12.2.3	Write a program using **switch** statement.		
4.	12.1.2	Write a C program that uses **for** loop.		
5.	12.1.3	Write a C program that uses **while** loop.		
6.	12.1.4	Write a C program that uses **do while** loop.		
		Topic 14: Functions		
1.	13.3.2	Write a program involving user defined function to perform basic arithmetic operations, i.e. add, subtract, multiply and divide.	Computer	Dev-C ++ or Any Other C Compiler
2.	13.2.2	Write a program involving user defined function to calculate area of circle, triangle and parallelogram.		
3.	13.2.2	Write a program involving use of user defined function to calculate volume of cylinder, sphere and cube.		
4.	13.2.2	Write a program involving user defined function to calculate factorial of a given number.		
5.	13.2.2	Write a program involving user defined function to calculate average of numbers.		

Acknowledgements

Aga Khan University Examination Board (AKU-EB) would like to acknowledge the contributions of all those who played an important part in the revision of the AKU-EB HSSC Computer Studies syllabus.

We would like to thank **Abid Sohail**, **Lead Specialist,** and **Hassan Ud Din, Specialist, Computer Science,** AKU-EB, for taking the subject **lead** during the entire process of revising the HSSC Computer Studies syllabus.

We also thank the following **post-revision reviewer** for their feedback on relevance of the content, skills, exam specification and resources of the syllabus:

- **Narjis Fatima**
  Habib Girls' School, Karachi
- **Sehrish Farrukh**
  Habib Girls' School, Karachi
- **Younus Bashir**
  Habib Public School, Karachi

Furthermore, we thank the following for reviewing the syllabus for **higher education preparedness**, ensuring that the syllabus includes adequate skills and content to effectively prepare students for the next level of education.

- **Rabia Saleem**
  Lecturer, Shaheed Zulfiqar Ali Bhutto Institute of Science and Technology

In-house Team

- **Final Reviewer and Advisor: Dr Shehzad Jeeva**
  CEO, AKU-EB

- **Mentor and Guide for Syllabi Review: Dr Naveed Yousuf**
  Former Associate Director, Assessment

- **Syllabi Review Lead: Raabia Hirani**
  Manager, Curriculum Development

- **Syllabi Review Facilitators:**
  Dur Nasab, Associate, Curriculum Development
  Mahrukh Jiwa, Specialist, Middle School Programme

- **Internal Reviewer: Zain-ul-Muluk**
  Manager, Examination Development

- **Learning Resources Reviewer: Ali Bijani**
  Manager, Teacher Support and Team

- **Administrative Support:**
  Hanif Shariff, Associate Director, Operations
  Raheel Sadruddin, Manager, Administration, and team

- **Syllabi Feedback Data Analysts:**
  Tooba Farooqui, Former Lead Specialist, Assessment
  Muhammad Kashif, Former Specialist, Assessment
  Muhammad Faheem, Lead Specialist, Assessment

- **Design Support: Hatim Yousuf**
  Specialist, Communications

We would like to thank the students and teachers of affiliated schools from across Pakistan who gave their valuable feedback at various stages of the review process.

We also thank **Shahid Arwani**, Assistant AKU-EB for data compilation and formatting. In addition, we thank **Noshaba Hameed**, Assistant AKU-EB, for her support during formatting.