آغا خان یونیورسٹی ایگزامینیشن بورڈ

AGA KHAN UNIVERSITY EXAMINATION BOARD

Pacing Guide for Teachers

Computer Science

Grade IX

Theory

Number of weeks: 28

Number of periods per week: 5

Key Textbook: Textbook of Computer Science Grade 9,

National Book Foundation, Islamabad

Teacher Developer(s): Sobia Zeeshan and Najmus Sahar

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Topic	Total Periods
1. Basics of Computer	39

Sub-Topic	Range of SLOs	Periods (40 mins)
1.1 Introduction to Computer	1.1.1 - 1.1.3	6
1.2 Significance of Computer	1.2.1 - 1.2.2	3
1.3 Computer Hardware	1.3.1 - 1.3.10	20
1.4 Working of a Computer	1.4.1 - 1.4.2	3
1.5 Computer Software	1.5.1 - 1.5.4	7

Learning Resources

- David Watson and Helen Williams. Cambridge IGCSE Computer Science (Chapter 4 Operating Systems and Computer Architecture, Chapter 5 Input and Output Devices, Chapter 6 Memory and Data Storage)
- The Textbook of Computer Science for grade 9 by Sindh Textbook Board, Chapter 1: Fundamentals of Computers
- Watch video to understand the historical background of the computer https://www.youtube.com/watch?v=vtUYvG9ME4A

  Advantages and disadvantages of various generations.

  https://www.chtips.com/differences/differences-between-general-purpose-computers-and-special-purpose-computers/

Suggested Activities and/or Formative Assessment

Activity 1

a. **Compare and Contrast:** Compare and contrast the different generations of computers and their defining characteristics.
b. **Build your Book:** Create a table that lists the different generations of computers, along with their defining characteristics.

Activity 2

What am I good at? Researching different types of input and output devices and the specific functions they are needed for.

Activity 3

All about Memory: Identifying the use of various types of memory, either permanent or temporary and labeling them as portable or non-portable.

Activity 4

Exploration through Interviews: Interview professionals in different industries, such as doctors, scientists, or business owners to gain insights into how they use computers in their work.

Activity 5

Sharing Hour: Let students share their experiences of various system software used by different machines. Ask them for real-world examples to illustrate system software and its importance in machines.

Activity 6

Construct a Mind Map showing what technology was being used in a particular computer generation.

Activity 7

Provide a worksheet displaying various types of codes and symbols that involve magnetic ink characters, bar codes, QR codes etc. Ask students to identify the code type and the device which can interpret that code.

Activity 8

Ask students to create a timeline or infographic illustrating the history and development of microcomputers and their impact on society.

Activity 9

Evolution of Microcomputers: Ask students to research the history and evolution of microcomputers, from their earliest models to the latest developments in laptops, tablets, and smartphones. Ask them to construct a timeline accordingly.

Activity 10

Let students identify the different parts of a computer, such as the monitor, keyboard, mouse, CPU, and other peripherals. You can have them do this by labelling a diagram or doing a scavenger hunt where they physically find the different parts of a computer.

Activity 11

Formative Assessment: Ask students to create a presentation or write a report on the applications of minicomputers in different industries and compare their uses to other types of computers.

Activity 12

Mainframe vs Microcomputer: Have students compare and contrast the characteristics and uses of a mainframe computer and a microcomputer. They can research and report on specific examples of each type of computer and their respective applications.

Activity 13

Identifying Types of Software: Provide students with a list of software applications and have them categorise them into different types of software, such as system software, application software, programming software, or utility software. You can also have them research and find examples of each type of software.

Topic	Total Periods
2. Basics of Operating System	12

Sub-Topic	Range of SLOs	Periods (40 mins)
2.1 Introduction of Operating System	2.1.1 - 2.1.3	5
2.2 Classification and Types of Operating System	2.2.1 - 2.2.2	3
2.3 Getting Started with GUI OS	2.3.1 - 2.3.2	3
2.4 System Installation	2.4.1 - 2.4.3	1

Learning Resources

- David Watson and Helen Williams. Cambridge IGCSE Computer Science (Chapter 4 Operating Systems and Computer Architecture)
- The Textbook of Computer Science for grade 9 by Sindh Textbook Board (Chapter 2: Fundamentals of Operating Systems)

Suggested Activities and/or Formative Assessment

Activity 1

Selection of an appropriate User Interface: Providing various specifications/constraints about an app (application) ask students to choose a User Interface depending on the nature of that application, the target user audience, and the goals of the application's developers.

Activity 2

Accessing the location: Give path (full location) or QR code of a file and ask students to access/ open that file on their computers.

Activity 3

Delete Vs Permanently Delete: Ask students to make copies of a file and to delete, and permanently delete its copies.

Activity 4

Customise your PC: Ask students to install / uninstall a program on their computer.

Activity 5

a. **Compare and Contrast:** Compare and contrast the different generations of computers and their defining characteristics.
b. **Build your Book:** Create a table that lists the different generations of computers, along with their defining characteristics.

Activity 6

What am I good at?: Brainstorm and identify different types of input and output devices and the specific functions they are needed for.

Activity 7

Exploring Different Operating Systems: Have students research and compare different operating systems, such as Windows, MacOS, and Linux etc. They can discuss the similarities and differences in their features, interfaces, and applications.

Activity 8

Ask students to create a chart comparing the features and advantages of different operating systems.

Activity 9

Ask students to demonstrate how they would troubleshoot a specific operating system issue, such as a program not responding or a system error message appearing.

Activity 10

Ask through a worksheet: Which type of Interfaces are used by ATM machines? Can any another interface prove to be more interactive?

Activity 11

Operating System History: Have students research the history and evolution of operating systems, from early systems like MS-DOS to modern systems like Windows 11. They can discuss the major developments and changes in operating systems over time.

Topic	Total Periods
3. Office Automation I (MS Word 2007 or above)	13

Sub-Topic	Range of SLOs	Periods (40 mins)
3.1 Word Processing	3.1.1 - 3.1.7	9
3.2 Urdu Editor (Inpage 2018)	3.2.1	4

Learning Resource

- The Textbook of Computer Science for grade 9 by Sindh Textbook Board Chapter 3: Office Automation

Web Resources

https://edu.gcfglobal.org/en/word2007/

https://support.microsoft.com/en-au/office/word-for-windows-training-7bcd85e6-2c3d-4c3c-a2a5-5ed8847eae73

Suggested Activities and/or Formative Assessment

Activity 1

Working on MS Word: Using MS word, create your Curriculum Vitae (CV), insert your passport size image to the document, and put your academics records in a table. Also create hyperlinks to your social media accounts in the CV.

Activity 2

Working on in page/ any Urdu Editor: Ask students to bring any Urdu newspaper clipping, ask them to re-create the content using in page or MS Word (Install font Jamil Noori Nastaleeq) on their computers.

Activity 3

Ask students to create a template for a specific document type, such as a resume or a flyer. They can choose and customise formatting options and include placeholder text and images.

Activity 4

Provide students with a document to format, such as a report or letter, and have them practice using formatting tools to apply styles, fonts, and colors. You can also have them research and explain other formatting options, such as headers and footers, page numbering, or bullet points.

Activity 5

Provide students with a collaborative document, such as a group project or presentation, and have them practice using collaboration tools to share, review, and edit the document with others.

Activity 6

Identify and correct spelling and grammatical errors in a file using word processor features.

Activity 7

Assess student's competence through:

a. the use of multimedia projector to show an objective document to incorporate (with text, images/ video or hyperlinks.)

b. ask students to insert customised headers, footers, page borders, watermarks and page numbers etc.

Topic	Total Periods
4. Fundamentals of Data Communication	20

Sub-Topic	Range of SLOs	Periods (40 mins)
4.1 Basics of Communication	4.1.1 - 4.1.6	6
4.2 Transmission Medium	4.2.1 - 4.2.2	6
4.3 Communication Devices	4.3.1	2
4.4 Communication Data Rates	4.4.1 - 4.4.3	6

Learning Resources

- David Watson and Helen Williams. Cambridge IGCSE Computer Science (Chapter 2 Communication and Internet Technologies)
- The Textbook of Computer Science for grade 9 by Sindh Textbook Board Chapter 4: Data Communication and Computer Networks

Suggested Activities and/or Formative Assessment

Activity 1

Video Link to be played through Multimedia and Have a discussion on key ideas:

https://www.youtube.com/watch?v=64FSgQdWHrE&t=15s

Activity 2

Identify devices as Analog/Hybrid/Digital: Identify Various Analog, Digital or Hybrid devices around you.

Activity 3

Reflections: Ask students to write reflections on the characteristics of good communication. For each characteristic, ask them to identify one device which enhances it.

Activity 4

Group activity on advantages of un-guided/ guided media: Students will form groups to support their narrative if guided media communication is effective more than unguided media or vice versa.

Activity 5

Provide students with a list of different transmission medium, such as twisted pair, coaxial cable, fiber optics, and wireless. Have them research and compare the advantages and disadvantages of each medium, including factors such as speed, cost, reliability, and range.

Activity 6

Ask students to explain how network bandwidth is measured and how it can be affected by different factors and demonstrate how to use different tools to measure bandwidth.

Activity 7

Ask students to compare guided media and un-guided media in terms of network accessibility at their school.

Activity 8

Translate a digital signal (wave) into a series of binary digits.

Activity 9

Open book quiz (for brainstorming): Provide students with a set of multiple choices that cover the different types of transmission media, their characteristics, and their uses. For example, identify the best transmission medium for long-distance communication among the given ones?

Topic	Total Periods
5. Fundamentals of Computer Networks	16

Sub-Topic	Range of SLOs	Periods (40 mins)
5.1 Basics of Networks	5.1.1-5.1.5	6
5.2 Types of Networks	5.2.1-5.2.3	5
5.3 Communication over the Networks	5.3.1-5.3.2	5

Learning Resources

- David Watson and Helen Williams. Cambridge IGCSE Computer Science (Chapter 2 Communication and Internet Technologies)
- The Textbook of Computer Science for grade 9 by Sindh Textbook Board Chapter 4: Data Communication and Computer Networks

Suggested Activities and/or Formative Assessment

Activity 1

Role Play: Students will play the role of Hub, a switch and a router to understand how these devices help/affect the communications? What are their limitations? etc. (Rest of students will be nodes in a network. A network device will be provided with a message to be communicated with another node on the network.)

Activity 2

Call a few Internet Service Providers (ISPs) and ask for specifications of various services they are offering.

Activity 3

Provide students with a set of terms related to types of networks, such as LAN, WAN, MAN, PAN, and SAN, and have them match each term to its definition or example.

For example, "LAN" matches with "a network that covers a small area, such as a home or office.

Activity 4

Network Comparison: Provide students with two or more types of networks, such as LAN and WAN, and have them compare and contrast the characteristics, advantages, and limitations of each type. Grade them based on the depth and clarity of the analysis.

Activity 5

In a worksheet, provide specific number of computers, geographical area to be covered. Ask students to use an appropriate network topology and geographical network type.

Topic	Total Periods
6. World Wide Web (WWW) and Hyper Text Markup Language (HTML)	40

Sub-Topic	Range of SLOs	Periods (40 mins)
6.1 Introduction to World Wide Web (WWW)	6.1.1-6.1.2	3
6.2 Introduction to Hypertext Markup Language (HTML)	6.2.1-6.2.2	2
6.3 Designing Webpage I: Text Formatting	6.3.1-6.3.2	8
6.4 Designing Webpage II: Creating Lists	6.4.1	3
6.5 Designing Webpage III: Images and Backgrounds	6.5.1-6.5.3	6
6.6 Designing Webpage IV: Hyperlinks	6.6.1-6.6.4	6
6.7 Designing Webpage V: Creating Tables	6.7.1	6
6.8 Designing Webpage VI: Creating Frames	6.8.1-6.8.3	6

Learning Resources

- David Watson and Helen Williams. Cambridge IGCSE Computer Science (Chapter 2 Communication and Internet Technologies)
- The Textbook of Computer Science for grade 9 by Sindh Textbook Board Chapter 4: Data Communication and Computer Networks

Web Resource

https://www.w3schools.com/html/

Suggested Activities and/or Formative Assessment

Activity 1

Web Development

Create a website that consists of at least 4 pages connected altogether through anchor tag (it must include table, img tags' attributes and internal links).

Activity 2

Remove errors, helping other students: Ask students to help another student by helping him/her in removing errors in HTML code.

Activity 3

How other websites work: Ask students to search for HTML based websites, see their source code, copy it and make changes to the copied tags (for practice only).

Activity 4

Quiz: Code Tracing: Provide students with a sample HTML code and have them trace the output of the code, identifying the tags, attributes, and their functions. For example, given the code Hello World! , the student would identify that the paragraph tag contains the strong tag that bolds the text.

Activity 5

Assessment: Web Page Design: Provide students with a scenario, such as a business that needs a simple website, and have them design a web page using HTML that includes elements such as headings, paragraphs, images, and links. Grade them based on the completeness, accuracy, and creativity of the design.

Activity 6

Assessment: Code Correction: Provide students with a sample HTML code that contains errors, such as missing tags, incorrect syntax, or broken links, and have them identify and correct the errors using their knowledge of HTML. Grade them based on the accuracy and efficiency of the correction process.

Activity 7

Assessment: Project Presentation: Have students work in pairs or small groups to design and develop a simple website using HTML, and have them present their website to the class, highlighting the elements, functions, and design decisions they made. Grade them based on the completeness, creativity, and effectiveness of the website and presentation.

Activity 8

Formative Assessment

Formative Assessment may include following tasks:

a. Match the columns that define tags' definition.

b. Identify errors in the given code.

c. Write OUTPUT of any given HTML code.

d. Write HTML tags and container elements for the given OUTPUT.

Activity 9

Create HTML Home page using a vertical frameset that divides window in 1:4 proportion. Give an HTML link for each frame.

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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