

DAWOOD PUBLIC SCHOOL

Computer Science

Course Outline for 2017-2018

Class X

August	Section2: Practical Problem-solving and Programming 2.1 Algorithm Design and Problem Solving 2.1.1 Problem-Solving and Design 2.1.2 Pseudocode 2.2 Programming 2.2.1 Programming concepts While...Do...Loop and Repeat...Until
September	Section2: Practical Problem-solving and Programming 2.2 Programming (continued) 2.2.1 Programming concepts 2.2.2 Data structures: Arrays 2.3 Databases
October	Section1: Theory of Computer Science 1.3 Hardware 1.3.2 Von Neumann Model 1.3.5 Storage Device 1.3.6 Operating System 1.3.7 High-level and low-level language
November	<i>Revision</i>
December	<i>Mid-Year Examination</i>
January	Section1: Theory of Computer Science 1.2 Communication and Internet technologies 1.2.1 Serial and Parallel data transmission 1.2.2 Security aspect 1.2.3 Internet principles of operation
February	Section1: Theory of Computer Science 1.4 Security 1.4.1 Need of keeping data safe 1.4.2 Ways to keep data safe 1.4.3 Keeping online systems safe from attacks 1.4.4 Study of real life scenario 1.5 Ethics
March	<i>Mock Exams</i>

Month-Wise Distribution of Topics

August

Section2: Practical Problem-solving and Programming

2.1 Algorithm Design and Problem Solving

2.1.1 Problem-solving and Design

2.1.2 Pseudocode

2.2 Programming

2.2.1 Programming concepts

2.2.2 Data structures: Arrays

Contents	Activities or Learning resources
<ul style="list-style-type: none"> ▪ Computer system and its sub-system <p>Understand that every computer system is made up of subsystems.</p> <ul style="list-style-type: none"> ▪ Top-down design approach and discuss the advantages and disadvantage of top-down design approach ▪ Definition ,purpose and testing of Algorithms ▪ Use of standard methods of solution ▪ Application of suitable test data. Explain and apply test data: Normal data. Abnormal and extreme data. ▪ Know the basic data types: String, Integer, Character and Boolean. ▪ Error correction and Dry running of Pseudocodes/flowcharts ▪ Understand the importance of verification ,possible strategies for verifying input Understand the need for validation and verification checks: Range check, Length check/Limit check, type check (character, numeric, alphanumeric) Consistency, Format, Presence/Uniqueness, check digits. ▪ Use of Operators 	<p>Practice Question from past papers will be given for practice.</p> <p>Resource: Paper1 of 7010 from 2005 to 2014</p> <p><u>Book Reference:</u> Unit 9 and 10</p>

September

Section2: Practical Problem-solving and Programming

2.2 Programming (continued)

2.2.1 Programming concepts

2.2.2 Data structures: Arrays

2.3 Databases

<p><u>MEMORY, STORAGE DEVICES AND MEDIA</u></p> <ul style="list-style-type: none"> ▪ Show understanding of the difference between: primary, secondary and off-line storage. ▪ Describe the principles of operation of a range of types of storage devices and media including magnetic, optical and solid state. ▪ Describe how these principles are applied to currently available storage solutions, such as SSDs, hard disk drives, USB flash memory, DVDs, CDs and Blu-ray. <p>Calculate the storage requirement of a file.</p> <p><u>OPERATING SYSTEMS</u></p> <ul style="list-style-type: none"> ▪ Describe the purpose of an operating system. Show understanding of : <ul style="list-style-type: none"> ○ The need for interrupts. ○ Polling, Handshaking, Buffers, Checksum ▪ Role of operating system in file management, processor management.(demonstrating Windows Task Manager) ▪ Main differences between GUI and CLI and their respective advantages disadvantages. <p><u>HIGH- AND LOW-LEVEL LANGUAGES AND THEIR TRANSLATORS</u></p> <ul style="list-style-type: none"> ▪ Understanding of the need for both high-level and low-level languages. ▪ Understanding of the need for compilers when translating programs written in a high-level language. ▪ Understanding of the use of interpreters with high-level language programs. <p>Understanding of the need for assemblers when translating programs written in assembly language</p>	<p>Example questions given in specimen & past papers for syllabus 2210</p> <p><u>Book Reference:</u> 'Unit# 3-Hardware' Pg79-88</p> <p><u>Practice:</u> Example questions given in specimen papers for syllabus 2210 and past papers for syllabus 7010 <i>Cambridge O Level Computer Studies Coursebook</i> pp. 92–4 <i>Cambridge O Level Computer Studies Revision Book 13</i></p> <p>Introduction to operating systems: http://gcsecomputing.net/wp-content/uploads/2012/01/OCR%20A451%202.1.2%20CPU%20-%20Summary.pdf</p> <p>Several pages describing operating systems and their functions: www.howstuffworks.com/operating-system1.htm</p> <p>Windows, Linux, Android could be used as examples <i>Cambridge O Level Computer Studies Coursebook</i> pp. 102–5</p> <p>Theory notes and activities on buffers (and drivers): www.teach-ict.com/gcse_new/computer%20systems/buffers_driver/home_buffers.htm</p> <p>Old but still relevant article that compares interrupts with polling: www.atarimagazines.com/compute/issue149/60_Interrupts_made_easy.php</p> <p><i>Cambridge O Level Computer Studies Coursebook</i> pp. 98–100</p> <p>Theory notes, activities and quizzes on user interfaces: www.teach-ict.com/gcse_computing/ocr/213_software/user_interface/home_user_interface.htm</p> <p>Notes on user interfaces: www.OLevelict.info/theory/1/uis/index.html</p> <p>Quizzes to test understanding at: www.teach-ict.com/gcse_computing/gcse_computing_quizzes.htm</p> <p>An introduction to different levels of programming language: www.teach-ict.com/gcse_computing/ocr/216_programming/programming_languages/home_programming_languages.htm</p>
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November

Section1: Theory of Computer Science

1.2 Communication and Internet technologies

1.2.1 Serial and Parallel data transmission

1.2.2 Security aspect

1.2.3 Internet principles of operation

Contents	Activities or Learning resources

December

Mid-Year Examination



January

Section1: Theory of Computer Science

1.2 Communication and Internet technologies

1.2.1 Serial and Parallel data transmission

1.2.2 Security aspect

1.2.3 Internet principles of operation

Contents	Activities or Learning resources
<p>Data transmission: Serial & Parallel</p> <ul style="list-style-type: none"> ▪ Understand the concept of transmission of data: Current use of serial & parallel data transmission. ▪ Differentiate between serial and parallel data transmission ▪ Reason for choosing and current uses of serial and parallel data transmission such as Integrated Circuit (IC) and Universal Serial Bus(USB) <p>Error detection techniques</p> <ul style="list-style-type: none"> ▪ Know the need to check for errors. ▪ Use of parity bit <p>Internet risk and ways to prevent a computer from those risks: viruses spyware, malware and hacking</p> <ul style="list-style-type: none"> ▪ Identify the effects of Internet threats; viruses, worms, hacking, spyware. 	<p><u>Making Charts:</u> Make a chart to discuss the pros and cons of serial and parallel data transmission</p> <p><u>Brainstorming:</u> Students will brainstorm and then jot down the ways through which one can keep their sensitive data secure and protected. Students will be asked to explore and search for the real life situations where data privacy is important and they will be asked to suggest prevention methods and techniques.</p> <p><u>Practice Worksheet:</u> A worksheet will be given to the students to work out the parity bit settings during transmission of data.</p>

<p>Role of browser and internet server</p> <ul style="list-style-type: none"> ▪ Define the terms: Network, types of networks (WAN, MAN, LAN), Communication ways & resources shared over the network. ▪ Examination of browser screen to identify key components: comparison of two or more browsers ▪ Explain the need for IP addressing of resources on the Internet <p>Concept of MAC ,IP address & cookies</p> <ul style="list-style-type: none"> ▪ Role of DNS server, MAC address; cookies. <p>http & HTML</p> <ul style="list-style-type: none"> ▪ Distinguish between HTML structure and presentation <p>Explain the importance of HTML and its derivatives as a standard for the creation of WebPages</p>	
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February

Section1: Theory of Computer Science

1.4 Security

- 1.4.1** Need of keeping data safe
- 1.4.2** Ways to keep data safe
- 1.4.3** Keeping online systems safe from attacks
- 1.4.4** Study of real life scenario

1.5 Ethics

<p>Contents</p> <p>Data safety and measures that should be taken to prevent data loss</p> <ul style="list-style-type: none"> ▪ Learn safety measures that must be taken in order to keep data safe from malicious actions(including unauthorized viewing ,deleting, copying and corruption) <p>Ways of keeping data safe</p> <ul style="list-style-type: none"> ▪ Use of anti-virus and other protection software to keep data secure. <ul style="list-style-type: none"> ✓ Use of passwords(both entered at a keyboard and biometric) ✓ Use of Firewalls(both software and hardware including proxy servers) ✓ Use of Secure Socket Layer(SSL) ▪ Understand the need to keep system safe from service attacks, phishing, pharming <p>Use of symmetric encryption</p> <ul style="list-style-type: none"> ▪ Know the ways for symmetric encryption <p>Plain text, Cipher text</p>	<p>Activities or Learning resources</p> <p><u>Open Discussion Activity:</u> The topic will be covered through open discussion session. Students will be asked to prepare a presentation to highlight major ethical issues.</p> <p><u>Online quiz Activity:</u> http://quizlet.co/subject/computer-ethics/</p> <p><u>Notes on Encryption:</u> www.O_Levelict.info/theory/4/secure/index.html</p> <p><u>Game Activity:</u> CIA code-breaking game: https://www.cia.gov/kids-page/games/break-the-code/code-1.html</p> <p><u>Handout:</u> A handout of well prepared notes will be given to the</p>
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<ul style="list-style-type: none"> ▪ Understanding of the need to keep online systems safe: <ul style="list-style-type: none"> ○ Denial of service attacks (DoS) ○ Phishing ○ Pharming ▪ Study of real life scenarios to understand the importance of keeping data secure <p><u>Computer Ethics</u></p> <ul style="list-style-type: none"> ▪ Show understanding of ethical issues raised by the spread of electronic communication and computer systems including hacking ,cracking and production of malware ▪ Understand copyright and plagiarism issues ▪ Distinguish between software, freeware and shareware <p>Understand the implications and ways of preventing each issue</p>	<p>students relevant to the topic.</p>
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March

Mock Exams

