

DAWOOD PUBLIC SCHOOL

Computer Science

Course Outline for 2017-2018

Class XI

Study Guide**Text book:** IGCSE Computer Science Course book by David Watson and Helen Williams**Reference Book:** Information Systems by Stephen Doyle
Computer Course book by Chris Lead better**Web links:** www.teach-ict.com

August	1.3.2 Computer Architecture & Instruction cycle 1.5 Computer Ethics Revision: 2.2.1 Problem solving and programming concepts
September	1.3.4 Input devices 1.3.5 Output devices 1.3.6 Storage devices Revision: 2.2.2 Arrays
October	Revision: 1.1.1 Binary data Revision: 1.1.2 Hexadecimal data Revision: 1.1.3 Data formats Revision: 2.2.2 Arrays
November	Revision: 1.3.1 Logic gates Revision: 1.3.2 Computer Architecture Revision: 1.3.3 Instruction cycle Revision: 1.4 Internet Security Revision: 2.2.1 Problem solving and programming
December	MID YEAR EXAM
January	Revision: 1.2.1 Serial and Parallel data transmission Revision: 1.2.2 Data security Revision: 1.2.3 Internet principles of operation Revision: 2.2.2 Arrays
February	Revision: 1.1.1 Binary Data Revision: 1.1.2 Hexadecimal Revision: 1.1.3 Data formats Revision 1.4 Internet security Revision 1.5 Ethics Revision: 2.1 Problem solving and programming Revision 2.2 Programming concepts 2.3 Database
March	MOCK EXAM

Month-Wise Distribution of Topics

August

1.3.2 Computer Architecture

1.3.3 Instruction cycle

1.5 Computer Ethics

Revision: 2.2.1 Problem solving and programming concepts

Contents	Activities or Learning resources
<p><u>COMPUTER ARCHITECTURE AND THE FETCH EXECUTE CYCLE:</u></p> <ul style="list-style-type: none"> ▪ Show understanding of the basic Von Neumann model for a computer system and the stored program concept. ▪ Describe the stages of the fetch-execute cycle. <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><u>REVISION OF :PROBLEM-SOLVING AND PROGRAMMING CONCEPTS</u></p>	<p>Useful notes on 2210 syllabus: www.O Levelict.info/</p> <p>Notes and animations of fetch-execute cycle: www.eastaughs.fsnet.co.uk/cpu/execution-cycle.htm</p> <p>http://comminfo.rutgers.edu/~muresan/201_JavaProg/09LMC/lmcsCan.PDF</p> <p>Little Man Computer Download: http://gcsecomputing.org.uk/lmc/lmc.html</p> <p><u>Online quiz Activity:</u></p> <p>http://quizlet.co/subject/computer-ethics/</p> <p>http://quizlet.com/subject/computing/</p>

September:

1.3.4 Input devices

1.3.5 Output devices

1.3.6 Storage devices

Revision: 2.2.2 Arrays

Contents	Activities or Learning resources
<p><u>INPUT DEVICES</u></p> <ul style="list-style-type: none"> ▪ Describe the principles of operation of a range of input devices including; scanners, barcode readers, digital cameras, keyboards, mice, touch screens, microphones. ▪ Describe how these principles are applied to real-life scenarios, ▪ Describe how a range of sensors can be used to input data into a computer system, including : <ul style="list-style-type: none"> ○ Light, temperature, magnetic field, gas, pressure, moisture, humidity, pH/acidity/alkalinity and motion/infra-red. <p>Describe how these sensors are used in real-life scenarios</p>	<p><u>Book Reference:</u> Unit#11,Pg 274 (from Chris Leadbetter)</p> <p><u>Resource:</u> A handout based on the questions from past exams will be shared with the students.</p> <p><u>Book Reference:</u> ‘Unit# 3-Hardware’ Pg49-70</p> <p><u>Book Reference:</u> ‘Unit# 3-Hardware’ Pg71-78</p>

<p>OUTPUT DEVICES</p> <ul style="list-style-type: none"> ▪ Describe the principles of operation of a range of output devices, including: <ul style="list-style-type: none"> ○ Inkjet, laser and 3D printers; ○ 2D and 3D cutters; ○ speakers and headphones; actuators; ○ flat-panel display screens; LCD,LED <p>STORAGE DEVICES</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: <ul style="list-style-type: none"> ○ 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>REVISION OF ARRAYS</p>	<p>Book Reference: 'Unit# 3-Hardware' Pg79-88</p> <p>www.bbc.co.uk/schools/gcsebitesize/ict/hardware/1datastoragerev2.shtml</p> <p>Websites such as:</p> <p>http://computer.howstuffworks.com/computer-ram-memory-channel.htm</p> <p>and</p> <p>http://en.wikipedia.org/ which has entries for various related topics</p> <p>Cambridge O Level Computer Studies Course book page. 79–88 Cambridge O Level Computer Studies Revision Book Chapter 12.4</p>
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October:

Revision: 1.1.1 Binary data

Revision: 1.1.2 Hexadecimal data

Revision: 1.1.3 Data formats

Revision: 2.2.2 Arrays

Contents	Activities or Learning resources
<p><u>BINARY AND HEXADECIMAL NOTATION</u></p> <ul style="list-style-type: none"> ▪ Perform conversions of binary and hexadecimal number to and from denary system ▪ Identify the use of Hexadecimal in representing colors in HTML, MAC address. ▪ Explain the use of binary notation for IP addressing of resources. <p><u>DATA FORMATS</u></p> <ul style="list-style-type: none"> ▪ Identify common file standards: JPG, GIF, PDF, MP3, MPEG, and MIDI. ▪ Understand the ways to detect and then correct errors: Parity check, check digits, checksums, ARQ(Automatic Repeat Request) ▪ Lossless and lossy compression applied to music/video, photos, and text files ▪ Differentiate between lossless & lossy compression <p><u>DATA STRUCTURE: ARRAYS</u></p> <ul style="list-style-type: none"> ▪ Declare and initialize arrays ▪ Read values into arrays. Calculate average, highest and lowest value from an array 	<p>For Practice: Past paper questions on Binary data: Q15: 7010_s12_qp_11 Q11:7010_w11_qp_11</p> <p>Practice questions to convert to and from GB,MB,KB</p> <p>Book Reference: Unit 2</p> <p>Lossy and lossless compression notes: http://en.wikibooks.org/wiki/GCSE_Computing/the_differences_between_lossy_and_lossless_compression</p> <p>Notes on ARQ: http://en.wikipedia.org/wiki/Automatic_repeat_request</p>

November

Revision: 1.3.1 Logic gates

Revision: 1.3.2 Computer Architecture

Revision: 1.3.3 Instruction cycle

Revision: 1.4 Internet security

Revision: 2.2.1 Problem solving and programming

Contents	Activities or Learning resources
<p><u>LOGIC GATES</u></p> <ul style="list-style-type: none"> ▪ Use logic gates to create electronic circuits. ▪ Understand and define the functions of NOT, AND, OR, NAND, NOR and XOR (EOR) gates, including the binary output produced from all the possible binary inputs. ▪ Draw truth tables and recognize a logic gate from its truth table. ▪ Produce truth tables for given logic circuits. ▪ Produce a logic circuit to solve a given problem <p><u>COMPUTER ARCHITECTURE AND THE FETCH EXECUTE CYCLE:</u></p> <ul style="list-style-type: none"> ▪ Show understanding of the basic VonNeumann model for a computer system and the stored program concept. ▪ Describe the stages of the fetch-execute cycle. <p><u>INTERNET SECURITY</u></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) ▪ 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> <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 <p><u>PROBLEM SOLVING AND PROGRAMMING</u></p> <ul style="list-style-type: none"> ▪ Top-down design approach ▪ Definition ,purpose and testing of Algorithms ▪ Use of standard methods of solution. ▪ Application of suitable test data and know the basic data types: String, Integer, and Character and Boolean. 	<p><u>Book Reference:</u> Unit#11,Pg 274 (from Chris Leadbetter) UNIT#3: Page 44 to 67 (from David Watson)</p> <p>Notes and animations of fetch-execute cycle: www.eastaughs.fsnet.co.uk/cpu/execution-cycle.htm</p> <p>http://comminfo.rutgers.edu/~muresan/201_JavaProg/09LMC/ImcScan.PDF</p> <p>Little Man Computer Download: http://gcsecomputing.org.uk/lmc/lmc.html</p> <p>Video – history of the internet (8 mins, animation): http://vimeo.com/2696386?pg=embed&sec=2696386</p> <div data-bbox="1036 1521 1175 1647" data-label="Image"> </div> <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>Notes on Encryption:</u> www.O_Levelict.info/theory/4/secure/index.html</p>

<ul style="list-style-type: none"> ▪ Explain and apply test data: Normal data. Abnormal and extreme data. ▪ Identify errors in given algorithms and suggest ways of removing these errors. ▪ Dry running of Pseudocodes/flowcharts using trace tables ▪ 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. ▪ Produce an algorithm for a given problem ▪ Comment on the effectiveness of solution 	
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December

Mid-Year Examination



January

Revision: 1.2.1 Serial and Parallel data transmission

Revision: 1.2.2 Data security

Revision: 1.2.3 Internet principles of operation

Revision: 2.2.2 Arrays

Contents	Activities or Learning resources
<ul style="list-style-type: none"> ▪ Understand the concept of transmission of data: serial and parallel ▪ 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 <ul style="list-style-type: none"> ▪ Identify the effects of Internet threats; viruses, worms, hacking, spyware. ▪ 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 ▪ Role of DNS server, MAC address; cookies. ▪ Distinguish between HTML structure and presentation <p>Explain the importance of HTML and its derivatives as a standard for the creation of WebPages</p> <p><u>ARRAYS</u></p> <ul style="list-style-type: none"> ▪ Declare and initialize arrays ▪ Read values into arrays. Calculate average, highest and lowest value from an array 	<p><u>Making Charts:</u> Make a chart to discuss the pros and cons of serial and parallel data transmission</p> <p>Simulated network builder: www.gcsecomputing.org.uk/support/network/NWB_SIM.swf</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>http, html and associated terms: www.webopedia.com/TERM/H/HTTP.html</p> <p>Resource : Pre-Release material</p>

February

Revision: 1.1 Binary Data

Revision: 1.2 Hexadecimal

Revision: 1.3 Data formats

Revision: 1.4 Internet security

Revision: 1.5 Ethics

Revision: 2.1 Problem solving and programming

Revision: 2.2 Programming concepts

Revision: 2.3 Databases

Contents

Revision will be done through tests and practicing

March**Mock Exams**