Print - Course Outline 2021

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Computer Science – General Year 12

Semester 1 – Unit 3 – Developing computer-based solutions and producing spreadsheet and database solutions

Week	Key teaching points		
	Knowledge	Skills	Assessments
1-2	**Course introduction** • overview of Semester 1 • assessment requirements **Systems analysis and development** • the concept of project management, including: ○ planning ○ scheduling ○ budgeting ○ tracking • types of system development methodologies ○ prototyping ○ system development life cycle (SDLC)		
3	**Systems analysis and development** • stages of the SDLC ○ preliminary analysis ○ analysis ○ design ○ development ○ implementation ○ evaluation and maintenance • systems development documentation as a part of the SDLC ○ context diagrams using Yourdon/Demarco notation	**Systems analysis and development** • analyse context diagrams • document an existing system • create context diagrams using Yourdon/Demarco notation, as a part of the SDLC	
4–6	**Systems analysis and development** • computer system hardware and software • the concept of boot process • storage capacities, including: ○ bit ○ byte ○ kilobyte ○ megabyte ○ gigabyte ○ terabyte • hardware components for a computer system designed for a specific purpose, including: ○ input ○ output ○ processing ○ storage (primary and secondary) • the role of the standard operating environment (SOE) • functions of the components of the central processing unit (CPU) ○ arithmetic logic unit (ALU) ○ control unit (CU)		Term1- Week 6 **Task 1: Theory-Test 1** A series of short answer and extended questions based upon System Analysis and Development

	○ registers ○ program counter ○ system clock • the concept of the fetch-execute cycle • troubleshooting strategies, including: ○ diagnosis of fault ○ implement a solution ○ document troubleshoot procedure • appropriate physical preventative maintenance measures • the purpose of an ICT code of conduct • ethics in the development and use of ICT systems • privacy considerations in the development and use of ICT systems • digital communications etiquette when using ICT system		
7–9	**Managing data** • spreadsheet terms, including: ○ cell ○ formula ○ function (sum, average, max, min, count, countif) ○ label ○ worksheet ○ lookup tables (hlookup, vlookup)	**Managing data** • create solutions using a spreadsheet application using: ○ functions ○ charts ○ lookup functions ○ sorting	Term1- Week 9 **Task 2: Project 1 (investigation) -** Spreadsheet Create a spreadsheet workbook based upon a given scenario **Task 3: Practical (Validation) -Test 1** Spreadsheet
	EASTER BREAK		
Term 2 Begins 10–12	**Managing data** • hierarchical structure of data ○ character/byte ○ field ○ record ○ table/relation • data protection methods, including: ○ encryption ○ authentication ▪ passwords ▪ biometric ▪ digital signature • data types, including: ○ number ○ date/time ○ currency ○ text (string) ○ Boolean (true/false) • database terms, including: ○ data, field and record ○ data integrity ○ data redundancy • ethical and legal issues relating to the personal use and storage of data • legal requirements and implication of information kept by various organisations about individuals • issues related to use of online databases • design considerations for visual interfaces and navigation systems within database systems • the purpose of database documentation for the user		Term 2- Week 3 **Task 4: Theory-Test 2** A series of short answer and extended questions based upon Managing Data **Task 5: Project 2 - Database** Create a simple relational database based upon a given scenario
13	**Revision** from Unit 3 – <teacher to insert information provided by the Authority>	**Managing data** • create a working single table database which includes: • data types	Term 2- Week 4 **Task 6: Practical-Test 2** Database

		• primary keys • forms • reports • queries • create a visual interface for users of a database • create database documentation	
14-15 **Exam Week**	**Task 5: Externally set task:** A task set by the SCSA based on the following content from Unit 3 – <teacher to insert information provided by the Authority>		**Term 2- Week 5-6** **Task 7 : Externally Set Task** **One hour assessment written by SCaSA on Unit 3 content**

Semester 2 – Unit 4 – Developing computer-based solutions and communications

Week	Key teaching points		
	Knowledge	Skills	Assessments
Term 2 Week 7 1-5	**Programming** • characteristics of data types, including: ○ integer ○ real (floating point number) ○ Boolean ○ character • naming conventions for variables • types of code, including: ○ source ○ executable • types of control structures, including: ○ sequence ○ selection ▪ one-way (if then) ▪ two-way (if then else) ▪ multi-way (nested if) • iteration ○ test first (while) ○ test last (repeat until) ○ fixed (for) • types of program or code errors, including: ○ syntax errors ○ run-time errors ○ logical errors • the concept of data validation, including: ○ test data ○ trace table • modelling of an algorithm to test for logic using flow charts	**Programming** • apply, using pseudocode and a programming language, the following programming concepts: ○ constants ○ variables • apply, using pseudocode and a programming language, the following control structures: ○ sequence ○ selection ○ iteration • apply, using pseudocode and a programming language, the following techniques: ○ develop internal and external documentation ○ select and apply suitable test data for checking the solution ○ use trace tables to test for and debug logic errors • apply the SDC to create a digital solution	**Task 8: Practical-Test 3** Grok Learning - Programming Competition
	WINTER BREAK		
Term 3 Begins 6–9	**Course review** • review of Semester 1 • assessment requirements • overview of Semester 2 **Developing software**	**Developing software** apply software development requirements, including: user needs user interface apply the SDC to create a digital solution	**Task 8 due Term 3 Week 1**

	• stages of the software development cycle (SDC) ○ state the problem ○ plan and design ○ develop the solution ○ test the solution ○ evaluate the solution • factors affecting the development of software, including: ○ user needs ○ user interface **Developing software** • purpose and function of software to operate a computer system ○ operating systems ○ utility software, including: ▪ file compression ▪ defragmenter ▪ anti-virus ▪ anti-malware ○ application software • requirements for software licensing, including: ○ freeware ○ open source ○ shareware		Term 3 Week 9 **Task 9: Project 3 - Programming** Follow SDC to create an Arcade Game based upon a given scenario **Task 10: Theory-Test 3** A series of short answer and extended questions based upon Programming & Developping Software
10-13	**Networks and communications** • functions of the following computer hardware components required for networks ○ router ○ switch ○ firewall ○ modem ○ network interface card (NIC) ○ wireless access point ○ bridge • communication terms, including: ○ protocols ○ digital ○ analogue ○ ethernet • types of communication networks ○ personal area network (PAN) ○ local area network (LAN) ○ wide area network (WAN) • technologies appropriate for the implementation of a client/server and peer-to-peer network • star network topology • diagrammatic representation of network topologies for PAN, LAN and WAN • characteristics of transmission media, including: ○ twisted pair ○ fibre optic ○ satellite ○ cellular ○ wireless		
14–15	**Networks and communications** • types of communication protocols, including: ○ post office protocol 3 (POP3) ○ internet message access protocol (IMAP)	**Networks and communications** • create network diagrams using CISCO network diagram conventions to represent network topologies for PAN and LAN	**Task 11: Theory-Test 4** A series of short answer and extended questions based upon Networks and Communications

	○ simple mail transfer protocol (SMTP) ○ wireless access protocol (WAP) • methods used to ensure security of information over the internet, including: ○ authentication ○ encryption ○ firewalls • types of malware, including: ○ viruses ○ worms ○ trojans ○ spyware		