



## SAMPLE COURSE OUTLINE

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**COMPUTER SCIENCE**  
**GENERAL YEAR 12**

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## Sample course outline

### Computer Science – General Year 12

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

Week	Syllabus content	
	Knowledge	Skills
1	<p><b>Course introduction</b></p> <ul style="list-style-type: none"> <li>overview of Semester 1</li> <li>assessment requirements</li> </ul> <p><b>Systems analysis and development</b></p> <ul style="list-style-type: none"> <li>the concept of project management, including: <ul style="list-style-type: none"> <li>planning</li> <li>scheduling</li> <li>budgeting</li> <li>tracking</li> </ul> </li> <li>types of system development methodologies <ul style="list-style-type: none"> <li>prototyping</li> <li>system development life cycle (SDLC)</li> </ul> </li> </ul>	
2–3	<p><b>Systems analysis and development</b></p> <ul style="list-style-type: none"> <li>stages of the SDLC <ul style="list-style-type: none"> <li>preliminary analysis</li> <li>analysis</li> <li>design</li> <li>development</li> <li>implementation</li> <li>evaluation and maintenance</li> </ul> </li> <li>systems development documentation as a part of the SDLC <ul style="list-style-type: none"> <li>context diagrams using Yourdon/DeMarco notation</li> </ul> </li> </ul>	<p><b>Systems analysis and development</b></p> <ul style="list-style-type: none"> <li>analyse context diagrams</li> <li>document an existing system</li> <li>create context diagrams using Yourdon/DeMarco notation, as a part of the SDLC</li> </ul>
4–6	<p><b>Systems analysis and development</b></p> <ul style="list-style-type: none"> <li>computer system hardware and software</li> <li>the concept of boot process</li> <li>storage capacities, including: <ul style="list-style-type: none"> <li>bit</li> <li>byte</li> <li>kilobyte</li> <li>megabyte</li> <li>gigabyte</li> <li>terabyte</li> </ul> </li> <li>appropriate hardware components for a computer system designed for a specific purpose, including: <ul style="list-style-type: none"> <li>input</li> <li>output</li> <li>processing</li> <li>storage (primary and secondary)</li> </ul> </li> <li>the role of the standard operating environment (SOE)</li> </ul>	

Week	Syllabus content	
	Knowledge	Skills
	<ul style="list-style-type: none"> <li>functions of the components of the central processing unit (CPU) <ul style="list-style-type: none"> <li>arithmetic logic unit (ALU)</li> <li>control unit (CU)</li> <li>registers</li> <li>program counter</li> <li>system clock</li> </ul> </li> <li>the concept of the fetch-execute cycle</li> <li>troubleshooting strategies, including: <ul style="list-style-type: none"> <li>diagnosis of fault</li> <li>implement a solution</li> <li>document troubleshoot procedure</li> </ul> </li> <li>appropriate physical preventative maintenance measures</li> <li>the purpose of an ICT code of conduct</li> <li>ethics in the development and use of ICT systems</li> <li>privacy considerations in the development and use of ICT systems</li> <li>digital communications etiquette when using ICT system</li> </ul>	
7–9	<p><b>Managing data</b></p> <ul style="list-style-type: none"> <li>spreadsheet terms, including: <ul style="list-style-type: none"> <li>cell</li> <li>formula</li> <li>function (sum, average, max, min, count, countif)</li> <li>label</li> <li>worksheet</li> <li>lookup tables (hlookup, vlookup)</li> </ul> </li> </ul>	<p><b>Managing data</b></p> <ul style="list-style-type: none"> <li>create solutions using a spreadsheet application using: <ul style="list-style-type: none"> <li>functions</li> <li>charts</li> <li>lookup functions</li> <li>sorting</li> </ul> </li> </ul>
10–12	<p><b>Managing data</b></p> <ul style="list-style-type: none"> <li>hierarchical structure of data <ul style="list-style-type: none"> <li>character/byte</li> <li>field</li> <li>record</li> <li>table/relation</li> </ul> </li> <li>data protection methods, including: <ul style="list-style-type: none"> <li>encryption</li> <li>authentication <ul style="list-style-type: none"> <li>passwords</li> <li>biometric</li> <li>digital signature</li> </ul> </li> </ul> </li> <li>data types, including: <ul style="list-style-type: none"> <li>number</li> <li>date/time</li> <li>currency</li> <li>text (string)</li> <li>Boolean (true/false)</li> </ul> </li> </ul>	

Week	Syllabus content	
	Knowledge	Skills
	<ul style="list-style-type: none"> <li>• database terms, including: <ul style="list-style-type: none"> <li>▪ data, field and record</li> <li>▪ data integrity</li> <li>▪ data redundancy</li> </ul> </li> <li>• ethical and legal issues relating to the personal use and storage of data</li> <li>• legal requirements and implication of information kept by various organisations about individuals</li> <li>• issues related to use of online databases</li> <li>• design considerations for visual interfaces and navigation systems within database systems</li> <li>• the purpose of database documentation for the user</li> </ul>	
13	<b>Task 5: Externally set task:</b> A task set by the SCSA based on the following content from Unit 3 – <teacher to insert information provided by the Authority>	
12–16		<p><b>Managing data</b></p> <ul style="list-style-type: none"> <li>• create a working single table database which includes: <ul style="list-style-type: none"> <li>▪ data types</li> <li>▪ primary keys</li> <li>▪ forms</li> <li>▪ reports</li> <li>▪ queries</li> </ul> </li> <li>• create a visual interface for users of a database</li> <li>• create database documentation</li> </ul>

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

Week	Syllabus content	
	Knowledge	Skills
1	<p><b>Course review</b></p> <ul style="list-style-type: none"> <li>• review of Semester 1</li> <li>• assessment requirements</li> <li>• overview of Semester 2</li> </ul> <p><b>Developing software</b></p> <ul style="list-style-type: none"> <li>• purpose and function of software to operate a computer system <ul style="list-style-type: none"> <li>▪ operating systems</li> <li>▪ utility software, including: <ul style="list-style-type: none"> <li>○ file compression</li> <li>○ defragmenter</li> <li>○ anti-virus</li> <li>○ anti-malware</li> </ul> </li> <li>▪ application software</li> </ul> </li> <li>• requirements for software licensing, including: <ul style="list-style-type: none"> <li>▪ freeware</li> <li>▪ open source</li> <li>▪ shareware</li> </ul> </li> </ul>	
2–3	<p><b>Developing software</b></p> <ul style="list-style-type: none"> <li>• stages of the software development cycle (SDC) <ul style="list-style-type: none"> <li>▪ state the problem</li> <li>▪ plan and design</li> <li>▪ develop the solution</li> <li>▪ test the solution</li> <li>▪ evaluate the solution</li> </ul> </li> <li>• factors affecting the development of software, including: <ul style="list-style-type: none"> <li>▪ user needs</li> <li>▪ user interface</li> </ul> </li> </ul>	<p><b>Developing software</b></p> <ul style="list-style-type: none"> <li>• apply software development requirements, including: <ul style="list-style-type: none"> <li>▪ user needs</li> <li>▪ user interface</li> </ul> </li> <li>• apply the SDC to create a digital solution</li> </ul>
4–7	<p><b>Programming</b></p> <ul style="list-style-type: none"> <li>• characteristics of data types, including: <ul style="list-style-type: none"> <li>▪ integer</li> <li>▪ real (floating point number)</li> <li>▪ Boolean</li> <li>▪ character</li> </ul> </li> <li>• naming conventions for variables</li> <li>• types of code, including: <ul style="list-style-type: none"> <li>▪ source</li> <li>▪ executable</li> </ul> </li> <li>• types of control structures, including: <ul style="list-style-type: none"> <li>▪ sequence</li> <li>▪ selection <ul style="list-style-type: none"> <li>○ one-way (if then)</li> <li>○ two-way (if then else)</li> <li>○ multi-way (nested if)</li> </ul> </li> <li>▪ iteration <ul style="list-style-type: none"> <li>○ test first (while)</li> <li>○ test last (repeat until)</li> <li>○ fixed (for)</li> </ul> </li> </ul> </li> </ul>	<p><b>Programming</b></p> <ul style="list-style-type: none"> <li>• use pseudocode to represent a programming solution</li> <li>• create flow charts to represent a programming solution</li> </ul>

Week	Syllabus content	
	Knowledge	Skills
	<ul style="list-style-type: none"> <li>types of program or code errors, including: <ul style="list-style-type: none"> <li>syntax errors</li> <li>run-time errors</li> <li>logical errors</li> </ul> </li> <li>the concept of data validation, including: <ul style="list-style-type: none"> <li>test data</li> <li>trace table</li> </ul> </li> <li>modelling of an algorithm to test for logic using flow charts</li> </ul>	
8–13		<p><b>Programming</b></p> <ul style="list-style-type: none"> <li>apply, using pseudocode and a programming language, the following programming concepts: <ul style="list-style-type: none"> <li>constants</li> <li>variables</li> </ul> </li> <li>apply, using pseudocode and a programming language, the following control structures: <ul style="list-style-type: none"> <li>sequence</li> <li>selection</li> <li>iteration</li> </ul> </li> <li>apply, using pseudocode and a programming language, the following techniques: <ul style="list-style-type: none"> <li>develop internal and external documentation</li> <li>select and apply suitable test data for checking the solution</li> <li>use trace tables to test for and debug logic errors</li> </ul> </li> <li>apply the SDC to create a digital solution</li> </ul>
14	<p><b>Networks and communications</b></p> <ul style="list-style-type: none"> <li>functions of the following computer hardware components required for networks <ul style="list-style-type: none"> <li>router</li> <li>switch</li> <li>firewall</li> <li>modem</li> <li>network interface card (NIC)</li> <li>wireless access point</li> <li>bridge</li> </ul> </li> <li>communication terms, including: <ul style="list-style-type: none"> <li>protocols</li> <li>digital</li> <li>analogue</li> <li>ethernet</li> </ul> </li> <li>types of communication networks <ul style="list-style-type: none"> <li>personal area network (PAN)</li> <li>local area network (LAN)</li> <li>wide area network (WAN)</li> </ul> </li> </ul>	

Week	Syllabus content	
	Knowledge	Skills
	<ul style="list-style-type: none"> <li>technologies appropriate for the implementation of a client/server and peer-to-peer network</li> <li>star network topology</li> <li>diagrammatic representation of network topologies for PAN, LAN and WAN</li> <li>characteristics of transmission media, including: <ul style="list-style-type: none"> <li>twisted pair</li> <li>fibre optic</li> <li>satellite</li> <li>cellular</li> <li>wireless</li> </ul> </li> </ul>	<p><b>Networks and communications</b></p> <ul style="list-style-type: none"> <li>create network diagrams using CISCO network diagram conventions to represent network topologies for PAN and LAN</li> </ul>
15–16	<p><b>Networks and communications</b></p> <ul style="list-style-type: none"> <li>types of communication protocols, including: <ul style="list-style-type: none"> <li>post office protocol 3 (POP3)</li> <li>internet message access protocol (IMAP)</li> <li>simple mail transfer protocol (SMTP)</li> <li>wireless access protocol (WAP)</li> </ul> </li> <li>methods used to ensure security of information over the internet, including: <ul style="list-style-type: none"> <li>authentication</li> <li>encryption</li> <li>firewalls</li> </ul> </li> <li>types of malware, including: <ul style="list-style-type: none"> <li>viruses</li> <li>worms</li> <li>trojans</li> <li>spyware</li> </ul> </li> </ul>	