Government of **Western Australia**
School Curriculum and Standards Authority

SAMPLE COURSE OUTLINE

COMPUTER SCIENCE
GENERAL YEAR 12

Acknowledgement of Country

Kaya. The School Curriculum and Standards Authority (the Authority) acknowledges that our offices are on Whadjuk Noongar boodjar and that we deliver our services on the country of many traditional custodians and language groups throughout Western Australia. The Authority acknowledges the traditional custodians throughout Western Australia and their continuing connection to land, waters and community. We offer our respect to Elders past and present.

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	**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)	

2–3	**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
	• appropriate hardware components for a computer system designed for a specific purpose, including:
	  ▪ input
	  ▪ output	

Week	Syllabus content	
	Knowledge	**Skills**
	- 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) - 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 systems	
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
10–12	**Managing data** - hierarchical structure of data - character/byte - field - record - table/relation - data protection methods, including: - encryption - authentication - passwords - biometric - digital signature	

Week	Syllabus content	
	Knowledge	**Skills**
	- 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	
13	**Task 5: Externally set task** – a task set by the School Curriculum and Standards Authority based on the following content from Unit 3 – <teacher to insert information provided by the Authority>	
12–16		**Managing data** - create a working single table database which includes: - data types - primary keys - forms - reports - queries - create a visual interface for users of a database - create database documentation

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

Week	Syllabus content	
	Knowledge	**Skills**

1	**Course review**
	• review of Semester 1
	• assessment requirements
	• overview of Semester 2
	
	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	

2–3	**Developing software**
	• 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
		• apply software development requirements, including:
		  ▪ user needs
		  ▪ user interface
		• apply the SDC to create a digital solution

4–7	**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
		Programming
		• use pseudocode to represent a programming solution
		• create flow charts to represent a programming solution

Week	Syllabus content	
	Knowledge	**Skills**
	o one-way (if then) o two-way (if then else) o multi-way (nested if) ▪ iteration o test first (while) o test last (repeat until) o 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	
14	**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	**Networks and communications** • create network diagrams using CISCO network diagram conventions to represent network topologies for PAN and LAN

Week	Syllabus content	
	Knowledge	**Skills**
	▪ cellular ▪ wireless	
15–16	**Networks and communications** • types of communication protocols, including: ▪ post office protocol 3 (POP3) ▪ internet message access protocol (IMAP) ▪ simple mail transfer protocol (SMTP) • methods used to ensure security of information over the internet, including: ▪ authentication ▪ encryption ▪ firewalls • types of malware, including: ▪ viruses ▪ worms ▪ trojans ▪ spyware	