



PERTH MODERN SCHOOL

Exceptional schooling. Exceptional students.

INDEPENDENT PUBLIC SCHOOL

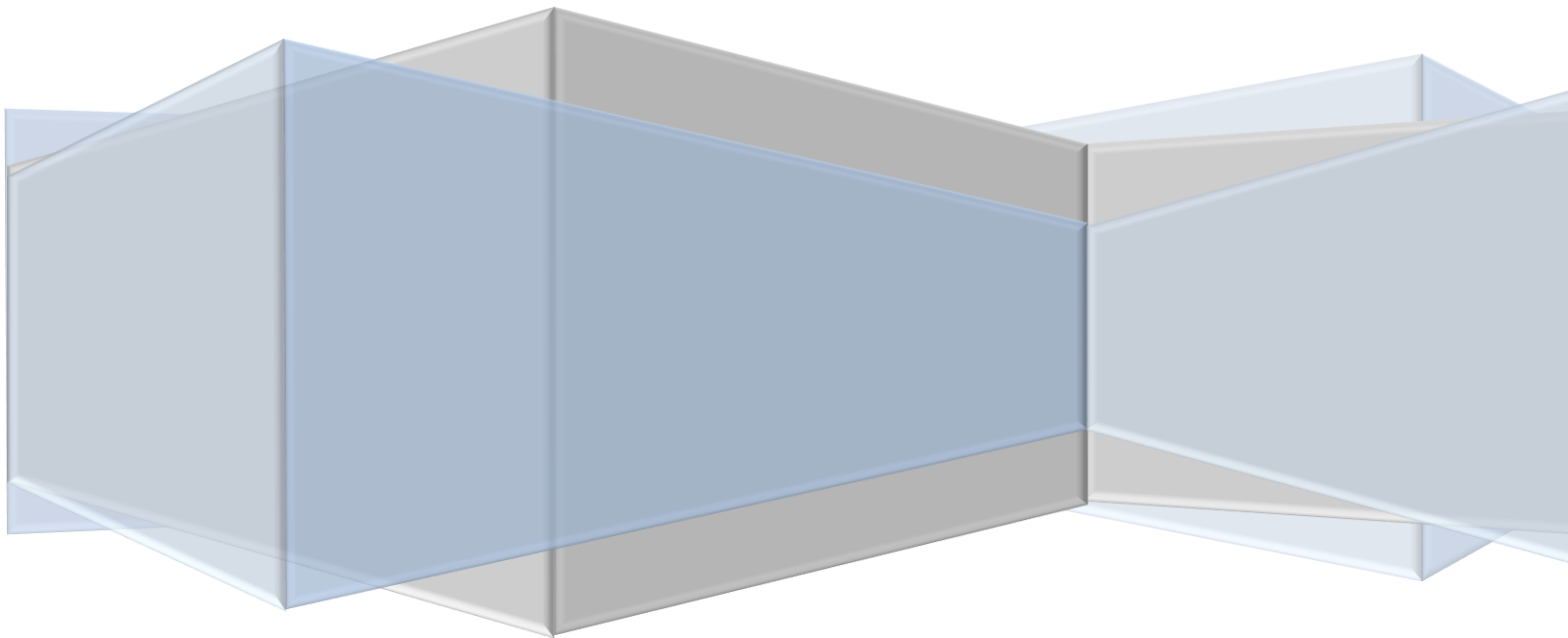
# COURSE OUTLINE 2021

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SEMESTER 1

## COMPUTER SCIENCE YEAR 10

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# Rationale

The Computer Science course focuses on the fundamental principles, concepts and skills within the field, and provides students with opportunities to develop flexibility and adaptability in the application of these in the roles of developers and users. The underpinning knowledge and skills in computer science are practically applied to the development of computer systems and software, while the connectivity between computers, peripheral devices and software used in the home, workplace and in education are examined. Students develop problem-solving abilities and technical skills as they learn how to diagnose and solve problems in the course of understanding the building blocks of computing.

In this course, the impact of technological developments on the personal, social and professional lives of individuals, businesses and communities is investigated. The ethical, moral and legal factors that influence developments in computing are explored so that students recognise the consequences of decisions made by developers and users in respect to the development and use of technology.

This course provides students with practical and technical skills that equip them to function effectively in a world where these attributes are vital for employability and daily life in a technological society. It provides a sound understanding of computing to support students pursuing further studies in related fields.

In Semester One the students will focus on System Analysis and Development, look at how computer system operates and the principal components of a computer system including hardware and software, Data Management through the use of Excel and Access as tool to understand and create databases, and look at Software Development tools and strategies. Students will explore programming language like Python.

In Semester Two, students will look and create programs through the use of Python programming language and some experimentation with Unity 3D gaming software and its programming applications.

The students will also investigate the components of a network and the theory behind the Internet and its different uses. They will use Packer tracer for the practical component of the course.

# Course Outline 2021

Week	Personal use of computer system	Activity and Skills	Assessment
1-2	<b>Introduction to the course Knowledge</b> <ul style="list-style-type: none"> <li>purpose of the systems development life cycle (SDLC)</li> <li>Purpose of CD and DFD</li> </ul>	Course outline – Connect Create Folders – Share Drive Name personal Storage device  <i>Implement and apply data storage and organisation techniques</i> <b>ACTDIP041</b>  Select topic for presentations  Understand CD and DFD elements Systems Entities Processes Data storage Data flow  Rules for creating a correct CD and DFD	<b>Practical Test – Presentations</b> Presentations start week 3 through to Week 19 – 10%.  <b>21 CLD:</b> real-world problem-solving and innovation
3	<b>Knowledge</b> <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> </ul>	Create CD and DFD from case studies  Pert Chart Gant Chart  SDLC vs RAD	
4	<b>Introduction to Computer System</b> <ul style="list-style-type: none"> <li>input               <ul style="list-style-type: none"> <li>keyboard</li> <li>mouse</li> <li>microphone</li> <li>digital camera/web cam</li> <li>scanner</li> </ul> </li> <li>processing</li> <li>primary storage               <ul style="list-style-type: none"> <li>random access memory (RAM)</li> <li>read only memory (ROM)</li> </ul> </li> </ul>	<ul style="list-style-type: none"> <li>connect peripheral devices to a computer system using:               <ul style="list-style-type: none"> <li>ports</li> <li>universal serial bus (USB)</li> <li>Firewire</li> <li>PS2</li> <li>ethernet</li> <li>serial</li> </ul> </li> </ul> <i>Role of hardware and software.</i> <b>ACTDIK034</b>	<b>Theory Test – Systems Analysis</b> 5%

	<ul style="list-style-type: none"> <li>▪ secondary storage <ul style="list-style-type: none"> <li>○ mechanical drive</li> <li>○ solid state drive</li> <li>○ online</li> </ul> </li> <li>▪ output <ul style="list-style-type: none"> <li>○ monitor</li> <li>○ printer</li> <li>○ speaker/headphones</li> </ul> </li> </ul>		
5	<p>functions of computer hardware components/flow of data through a computer system.</p> <ul style="list-style-type: none"> <li>○ input</li> <li>○ processing</li> <li>○ primary storage</li> <li>○ secondary storage</li> <li>○ output</li> </ul> <ul style="list-style-type: none"> <li>• the role of an operating system</li> <li>• central processing unit (CPU)</li> <li>• control unit (CU)</li> <li>• arithmetic logic unit (ALU)</li> <li>• registers</li> </ul>	<b>21CLD: Collaboration</b> <i>Real-World Problem-Solving</i>	<b>Task 1</b> Systems – Hardware and Software Building a computer system 35%
6	<ul style="list-style-type: none"> <li>• types of computer systems, including: <ul style="list-style-type: none"> <li>▪ mobile</li> <li>▪ desktop</li> <li>▪ server</li> </ul> </li> </ul>	<ul style="list-style-type: none"> <li>• Install simple software</li> <li>• Types of software</li> <li>• Type of software licences</li> </ul>	
7	<ul style="list-style-type: none"> <li>• types of hardware booting processes <ul style="list-style-type: none"> <li>▪ cold</li> <li>▪ warm</li> <li>▪ hot</li> </ul> </li> <li>• how user wants influence the choice, use and creation of personal computer systems</li> </ul>	<ul style="list-style-type: none"> <li>• apply the following hardware booting processes <ul style="list-style-type: none"> <li>▪ cold</li> <li>▪ warm</li> <li>▪ hot</li> </ul> </li> </ul>	
8	<p>basic maintenance strategies and computer protection software</p> <ul style="list-style-type: none"> <li>▪ defragmentation</li> <li>▪ error check</li> <li>▪ disk clean</li> <li>▪ back up</li> <li>▪ anti-malware</li> </ul>	<i>Role of hardware and software.</i> <b>ACTDIK034</b>	
9	<ul style="list-style-type: none"> <li>• basic maintenance strategies and techniques to rectify simple computer difficulties, including: <ul style="list-style-type: none"> <li>▪ diagnosis of fault</li> </ul> </li> </ul>	<ul style="list-style-type: none"> <li>• apply basic care and handling of hardware equipment measures to ensure personal safety and appropriate use of components</li> </ul>	<b>Task 1 Due</b>

	<ul style="list-style-type: none"> <li>▪ implementation of a solution</li> <li>▪ description of process</li> </ul>	<ul style="list-style-type: none"> <li>• apply basic maintenance strategies and computer protection software</li> <li>• apply basic maintenance strategies and techniques</li> </ul>	
<b>Managing Data</b>			
<b>10</b>	<ul style="list-style-type: none"> <li>• data management techniques for personal computer use, including hierarchical storage of data using files and folders</li> <li>• issues related to ethics in the storage of personal data</li> <li>• features of word processing software, including common formatting functions</li> </ul>	<ul style="list-style-type: none"> <li>• Use word processing software (MS Word)</li> </ul> <p><i>Simple compression <b>ACTDIK035</b></i></p>	
<b>11</b>	features of spread sheet <ul style="list-style-type: none"> <li>▪ simple functions (sum, average, min and max)</li> <li>▪ simple formulae (addition, subtraction, multiplication and division)</li> </ul>	<ul style="list-style-type: none"> <li>• Use spread sheet software (MS Excel)</li> </ul>	<b>Task 2 - Project</b> Databases - Spread sheet Project 25%
<b>12</b>	<p><b>Databases – Theory</b></p> <ul style="list-style-type: none"> <li>• features of database software, including:               <ul style="list-style-type: none"> <li>▪ components of a single table database (field, record, file)</li> <li>▪ data entry forms</li> <li>▪ simple search techniques</li> <li>▪ create a simple query</li> <li>▪ simple data types (number, text, Boolean, date, currency)</li> </ul> </li> </ul>	<ul style="list-style-type: none"> <li>▪ Use Database Software (MS Access)</li> <li>▪ ERD (Entity Relationship Databases)</li> </ul> <p><i>Analyse and visualise data to create information and address complex problems <b>ACTDIP037</b></i></p>	
<b>13-14</b>	Introduction to Programming <ul style="list-style-type: none"> <li>• the components of a computer program               <ul style="list-style-type: none"> <li>▪ inputs</li> <li>▪ processing</li> <li>▪ outputs</li> </ul> </li> <li>• control structures               <ul style="list-style-type: none"> <li>▪ sequence</li> <li>▪ selection</li> <li>▪ iteration</li> </ul> </li> <li>• the concepts of variables and data types, including:               <ul style="list-style-type: none"> <li>▪ integer</li> </ul> </li> </ul>	Create simple algorithm using flowchart  Understand different control structures:  Single  Double  Multiple  Loop	Task 2 Due  <b>Practical Test 2</b> Databases – 10%

	<ul style="list-style-type: none"> <li>▪ real</li> <li>▪ character</li> <li>▪ string</li> </ul>		
15	Exam Revision Week		
16-17	<b>Semester 1 Exam</b>		<b>Semester Exam – 15%</b>
18	Introduction to Python programming language	<ul style="list-style-type: none"> <li>• use variables, data types, control structures and a simple programming language to develop a software solution</li> <li>• use web tools to create linked web pages</li> </ul> <p><i>Explore techniques for acquiring, storing and validating quantitative and qualitative data</i></p> <p><b>ACTDIP036</b></p>	
19-20	<b>Programming and coding</b>	<ul style="list-style-type: none"> <li>• Python</li> </ul> <p><i>Design the user experience of a digital system</i></p> <p><b>ACTDIP039</b></p>	

**\*\*Course Outline and Program are subject to change at teacher discretion**

<b>Habits of Mind</b>				
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General Capabilities	LIT	NUM	ICT	CCT	PSC	EB	ICU
Cross Curricular	ATSIHC		AAEA		SUST		

**LIT** = Literacy, **NUM** = Numeracy, **ICT** = Information Communication & Technology, **CCT** = Critical & Creative Thinking, **PSC** = Person & Social Competence, **EB** = Ethical behaviour, **ICU** = Intercultural Understanding  
**ATSIHC** = Aboriginal & Torres Strait Islander History & Culture, **AAEA** = Asia Australia's Engagement with Asia, **SUST** = Sustainability

**21 CLD:** collaboration • knowledge construction • self-regulation • real-world problem-solving and innovation • the use of ICT for learning • skilled communication

## Grading

Schools report student achievement in terms of the following grades:

Grade	Interpretation	Percentages
<b>A</b>	Excellent achievement	78
<b>B</b>	High achievement	69
<b>C</b>	Satisfactory achievement	50
<b>D</b>	Limited achievement	30
<b>E</b>	Very low achievement	0