VCE Applied Computing Study Design 2025–2028

Introducing the new study design

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Purpose of this session

- Changes to the new VCE Applied Computing Study Design (2025–2028)
- Focus on:
  - Units 1 and 2 Applied Computing
  - Units 3 and 4 Data Analytics
  - Units 3 and 4 Software Development
- Key knowledge
- Assessment tasks
- Support material for the study design
- Questions

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Developing the study design

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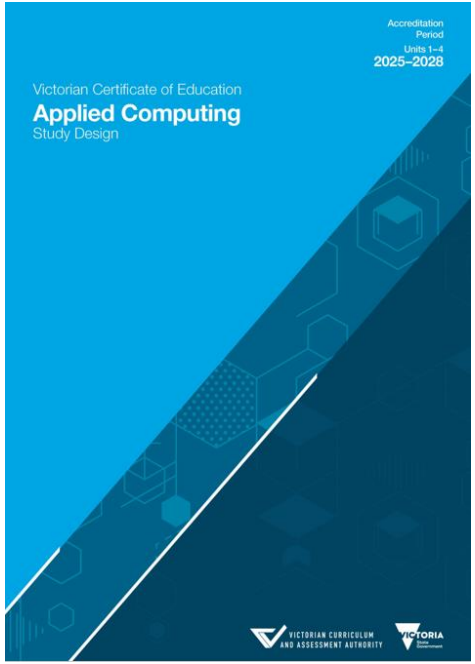
VCE Applied Computing Study Design

- Reviewed in 2023.
- Published in early 2024.
- Developed alongside:
  - Victorian Curriculum F–10 Digital Technologies curriculum Version 2.0
  - Victorian Curriculum F–10 Digital Literacy Foundational skill.
- Development of resources has commenced.



Reviewing the study design

Monitoring indicated the following directions to be considered:

- improve the clarity of the key knowledge – ‘such as’ and ‘including’
- improve the clarity of assessment tasks – Units 1&2 and Units 3&4 SACs
- update and refresh the content of the study design
- future proof the study design for emerging technologies/AI, etc.

Changes made to the study design

- Layout:
  - Terms used
  - PSM Specs
  - key knowledge
  - assessment tasks
- Key knowledge:
  - more use of ‘such as’ and ‘including’
- Improved clarity of assessment tasks:
  - Units 1 and 2
  - Units 3 and 4 SACs
- Refreshing of content across all outcomes and units
- Introduced new frameworks and specified sections of key legislation

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A look at the new study design

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Terms used in this study

Terms used in this study

For the purposes of this study design and associated assessment, the following definitions will apply.

Term	Definition
Alpha testing	A testing phase that checks whether modules or solutions meet all requirements and function as expected. Alpha testing is carried out by developers, independent testers or high-level users in a development or testing environment throughout the development phase.
Archiving	The process of moving data from a system that no longer needs to be accessed regularly to a less frequently accessed storage area for future use or to meet compliance requirements. This ensures that data can be stored separately to systems for long periods of time without impacting on current performance or storage requirements.
Backup	The process of making a copy of data and storing the copy separately to the original data in case it is needed due to data loss. Backed up data can be full (entire copy of data), differential (changes since last full backup), incremental (changes since last backup) or a combination of these. Backups can either run manually or be scheduled to run automatically, and can be stored on a local hard drive (distinct from the original source), on external storage devices or by using cloud computing. Backups are restored when data loss occurs.

Problem-solving methodology

Units 1 to 4: Problem-solving methodology specifications

Stage and activities		Description	Unit application					
			AC		DA		SD	
			1	2	3	4	3	4
Analysis: involves determining what is required to solve a problem. This involves acquiring and analysing data, and then identifying the solution requirements, constraints and scope.								
	Solution requirements	Solution requirements can be described as functional and non-functional.						
		Determine the functional requirements of the solution. These describe what the software solution should do. This involves specific details such as input required, output developed and functions of the solution, including data manipulation and validation.	•	•	•		•	
		Determine the non-functional requirements. These describe the quality attributes of the solution, including usability, reliability, portability, robustness and maintainability.	•	•	•		•	
		Use tools to assist in determining solution requirements, including context diagrams, data flow diagrams and use case diagrams.					•	
	Solution constraints	Solution constraints can be described as the conditions or limitations that must be considered when designing a solution.						
		Determine the constraints of the solution. These include economic (cost and time), technical (speed of processing, capacity, availability of equipment, compatibility, security), social (level of expertise of users), legal (intellectual property, ownership of data, privacy of data), and usability (accessibility, usefulness, ease of use).	•	•	•		•	

Units 1 and 2
Applied Computing

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Changes to U1&2 Applied Computing

Unit 1

- Outcome 1:
  - SQL
  - Descriptive statistics
  - Updated assessment tasks
- Outcome 2:
  - Emerging trends
  - OOP
  - Removal of project management
  - Updated assessment tasks

Unit 2

- Outcome 1:
  - UN Sustainable Development Goals
  - AI
  - Frameworks
  - Updated assessment tasks
- Outcome 2:
  - Cyber security incident
  - Emerging trends/AI
  - Cryptography
  - Frameworks
  - Updated assessment tasks

Unit 1 – Key knowledge

Key knowledge

- types and purposes of qualitative and quantitative data, such as:
  - interviews and surveys to gather insights/perspectives on a topical issue
  - sensor data to monitor a person's health
  - census and demographic data for statistical analysis
  - data collected over a period of time
  - data generated by artificial intelligence
- characteristics of data types relevant to the selected software tools, such as:
  - text (character, string)
  - numeric (integer, floating point, date/time)
  - Boolean
- factors affecting the quality of data and information, such as:
  - accuracy
  - bias
  - integrity
  - relevance
  - reliability
- how emerging technologies are affected by key legislation and frameworks, such as:
  - Australia's Artificial Intelligence (AI) Ethics Principles
  - *Copyright Act 1968* (Cwlth)
  - *Health Records Act 2001* (HPP 1, 2, 5)
  - *Privacy Act 1988* (Cwlth) (APP 1, 2, 6)
  - *Privacy and Data Protection Act 2014* (IPP 1, 2, 5, 8)
- ethical issues arising from the development of emerging technologies, such as:
  - cyber security threats
  - biometric systems collecting and storing data
  - job displacement
- ethical issues arising from the use of artificial intelligence, such as:
  - creating content that is biased, discriminatory or otherwise harmful
  - creating content that could be used for cyber attacks
  - generating content from existing copyright materials

Unit 1 – Assessment tasks

Outcome 1

- A folio of exercises to demonstrate the learning of database, spreadsheet and data visualisation software tools.
- A solution including the use of database, spreadsheet and data visualisation software tools in response to teacher-provided solution requirements and designs.
- A personal portfolio to showcase the development of databases, spreadsheets and data visualisations.

Outcome 2

- A folio of exercises to demonstrate the learning of an object-oriented programming language.
- A software solution that includes the designs, solution and a testing table in response to teacher-provided solution requirements.
- The creation and maintenance of code repositories to track the progression of students' learning, using platforms such as GitHub.
- A software solution developed in response to a teacher-provided problem-solving challenge, presented as a hackathon.

Unit 2 – Assessment tasks

Outcome 1

- An innovative solution that includes an analysis, designs, the development of a proof of concept/prototype/product and an evaluation.
- A presentation (oral, multimedia, visual) of an innovative solution.
- A written report that documents the development of an innovative solution.
- An annotated visual report that documents the development of an innovative solution.

Outcome 2

- A teacher-provided case study with structured questions that investigates a cyber security incident and how it could be prevented in the future.
- A teacher-provided case study with structured questions that investigates a network, its vulnerabilities and how these could be mitigated.

Units 3 and 4
Data Analytics

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Changes to U3&4 Data Analytics

Unit 3

- Outcome 1:
  - Emerging trends
  - SQL
  - Statistical analysis
  - Updated assessment task (SAC)
- Outcome 2:
  - Ideation techniques
  - Updated assessment task (SAT)

Unit 4

- Outcome 1:
  - Statistical analysis
  - Updated assessment task (SAT)
- Outcome 2:
  - Emerging trends
  - Cryptography
  - Updated assessment task (SAC)

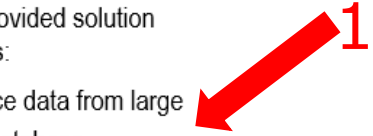
Units 3&4 DA – Key knowledge

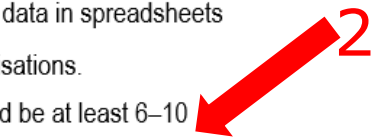
Key knowledge

- effective and efficient methods to manipulate data using software tools, including:
  - use of templates
  - software functions
  - use of artificial intelligence tools to represent data and information
- techniques for analysing data to refine findings for data visualisations, including:
  - descriptive statistics (average, median, minimum, maximum, range, standard deviation, count/frequency, sum)
  - Pearson's correlation co-efficient (*r*)
  - the shape and skew of data
- techniques for implementing data security, including:
  - using security controls
  - developing an implementation plan
  - using a checklist to ensure controls are successfully implemented
- characteristics of information for target audiences, including:
  - age appropriateness
  - commonality of language
  - culture and gender inclusiveness
- techniques for developing infographics and dynamic data visualisations, including:
  - organising the hierarchy of information
  - pagination
  - clarifying data refresh requirements
- formats and conventions applied to infographics and dynamic data visualisations to improve their effectiveness for intended users, including:
  - use of colours, fonts, images and icons
  - visual hierarchy and clarity of message
- techniques for improving data quality by validating and verifying data, including:
  - existence checking
  - type checking
  - range checking
  - checking end-to-end data integrity from collection to visualisation

Data Analytics – U3 O1 SAC Task

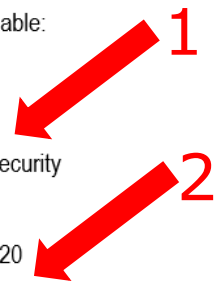
Outcomes	Marks allocated	Assessment tasks
Unit 3 **Outcome 1** Interpret teacher-provided solution requirements and designs, extract data from large repositories, manipulate and cleanse data, conduct statistical analysis and develop data visualisations to display findings.	**100**	In response to teacher-provided solution requirements and designs: • extract and reference data from large repositories into a database • query data using databases and SQL • use spreadsheet functions to manipulate data • statistically analyse data in spreadsheets • develop data visualisations. Task time allocated should be at least 6–10 lessons.
Total marks	**100**	





Data Analytics – U4 O2 SAC Task

Outcomes	Marks allocated	Assessment tasks
Unit 4 **Outcome 2** Respond to a teacher-provided case study to analyse the impact of a data breach on an organisation, identify and evaluate threats, evaluate current security strategies and make recommendations to improve security strategies.	**100**	The student's performance will be assessed using one of the following: • structured questions • a report in written format • a report in multimedia format. The case study scenario needs to enable: • an analysis of the breach • an evaluation of the threats • recommendations to improve security strategies. Task time allocated should be 100–120 minutes.
Total marks	**100**	



Data Analytics – U3 O2 and U4 O1 SAT

Outcomes	Assessment tasks
Unit 3 **Outcome 2** Propose a research question, formulate a project plan, collect and prepare data, and generate design ideas and a preferred design for creating infographics and/or dynamic data visualisations.	A documented research question and a project plan (Gantt chart) indicating tasks, times, milestones, dependencies and the critical path **AND** An analysis that defines the requirements, constraints and scope of infographics and/or dynamic data visualisations **AND** A collection of complex data sets that has been referenced **AND** A folio of design ideas and evaluation criteria **AND** Detailed design specifications of the preferred design. Time allocated should be at least 8–10 weeks of class time.

1

2

3

4

Unit 4 **Outcome 1** Develop and evaluate infographics and/or dynamic data visualisations that meet requirements and assess the effectiveness of the project plan.	Infographics and/or dynamic data visualisations that present findings in response to a research question **AND** • an evaluation of the efficiency and effectiveness of infographics and/or dynamic data visualisations • an assessment of the effectiveness of the project plan (Gantt chart) in monitoring project progress in one of the following: • a written report • an annotated visual plan. Time allocated should be at least 8 weeks of class time.

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Units 3 and 4
Software Development

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Changes to U3&4 Software Development

Unit 3

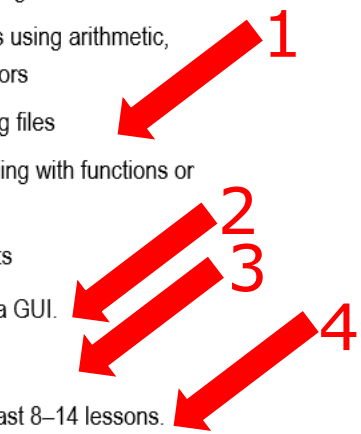
- Outcome 1:
  - Emerging trends
  - OOP
  - Errors
  - Updated assessment task (SAC)
- Outcome 2:
  - Brief
  - OOP
  - File management
  - Ideation techniques
  - Updated assessment task (SAT)

Unit 4

- Outcome 1:
  - Innovative approaches to software development
  - Alpha and beta testing
  - Updated assessment task (SAT)
- Outcome 2:
  - Threat modelling principles
  - Frameworks
  - Updated assessment task (SAC)

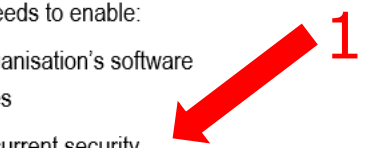
Software Development – U3 O1 SAC Task

Outcomes	Marks allocated	Assessment tasks
Unit 3 **Outcome 1** Interpret teacher-provided solution requirements and designs and use appropriate features of an object-oriented programming language to develop working software modules.	100	In response to teacher-provided solution requirements and designs, develop four working modules with increasing complexity of programming skills. • Module 1: Simple calculations using arithmetic, logical and conditional operators • Module 2: Reading and writing files • Module 3: Sorting and searching with functions or methods • Module 4: Classes and objects At least two modules must include a GUI. All modules must include testing. Task time allocated should be at least 8–14 lessons.
Total marks	100	



Software Development – U4 O2 SAC Task

Outcomes	Marks allocated	Assessment tasks
Unit 4 **Outcome 2** Respond to a teacher-provided case study to analyse an organisation's software development practices, identify and evaluate current security controls and threats to software development practices, and make recommendations to improve practices.	**100**	The student's performance will be assessed using one of the following: • structured questions • a report in written format • a report in multimedia format. The case study scenario needs to enable: • an analysis of the organisation's software development practices • an evaluation of the current security controls and threats • recommendations to improve practices. Task time allocated should be 100–120 minutes.
Total marks	**100**	



Software Development – U3 O2 and U4 O1 SAT

Outcomes	Assessment tasks
Unit 3 **Outcome 2** Document a problem, need or opportunity, formulate a project plan, document an analysis, and generate design ideas and a preferred design for creating a software solution.	A brief outlining the proposed solution and a project plan (Gantt chart) indicating tasks, times, milestones, dependencies and the critical path **AND** Analytical tools that depict the interactions between systems, users, data and networks **AND** An analysis that defines the requirements, constraints and scope of a solution in the form of a software requirements specification **AND** A folio of design ideas and evaluation criteria **AND** Detailed design specifications of the preferred design. Time allocated should be at least 8–10 weeks of class time.
Unit 4 **Outcome 1** Develop and evaluate a software solution that meets requirements and assess the effectiveness of the project plan.	A software solution that meets the software requirements specification **AND** Preparation and conduction of beta testing **AND** • an evaluation of the efficiency and effectiveness of the software solution • an assessment of the effectiveness of the project plan (Gantt chart) in monitoring project progress in one of the following: • a written report • an annotated visual plan. Time allocated should be at least 8 weeks of class time.

Support material

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Support material for the study design

Things we are developing to support VCE Applied Computing in 2025:

- Implementation on-demand videos – **available now**
- Support material (formally Advice for teachers) – **available now**
- Performance descriptors – **available now**
- Administrative information for School-based Assessment (SAT Criteria)
- Support documentation for each unit
- Resources for SACs and SATs ready for 2025

Implementation on-demand videos

Units 1 and 2
Applied Computing

- Background to the VCE Applied Computing (2025–2028) Study Design
- Background to Unit 1 Outcome 1 Applied Computing
- Background to Unit 1 Outcome 2 Applied Computing
- Background to Unit 2 Outcome 1 Applied Computing
- Background to Unit 2 Outcome 2 Applied Computing

Units 3 and 4
Data Analytics

- Background to the VCE Applied Computing (2025–2028) Study Design
- Background to Unit 3 Outcome 1 Data Analytics
- Background to Unit 3 Outcome 2 Data Analytics
- Background to Unit 4 Outcome 1 Data Analytics
- Background to Unit 4 Outcome 2 Data Analytics

Units 3 and 4
Software Development

- Background to the VCE Applied Computing (2025–2028) Study Design
- Background to Unit 3 Outcome 1 Software Development
- Background to Unit 3 Outcome 2 Software Development
- Background to Unit 4 Outcome 1 Software Development
- Background to Unit 4 Outcome 2 Software Development

Support material

- Formally known as the Advice for teachers.
- This has been rewritten for 2025–2028.
- Content includes:
  - Teaching and learning activities
  - School-assessed Task (SAT)
  - Sample approaches to developing an assessment task (SAC)
  - Performance descriptors
  - Sample weekly planners

Teaching and learning activities

- Students use design tools, such as mock-ups, IPO charts, flowcharts and pseudocode, to design a software solution in response to a case study. An example of a software solution could involve a payroll system that calculates the gross pay, tax deducted (30% of gross pay), superannuation collected (12% of gross pay before tax) and net pay from the input of hours worked and hourly rate paid.

- Students work in small groups to research and create a multimedia presentation that focuses on issues such as: code plagiarism; code theft; unauthorised distribution of software; software piracy; non-compliance with open-source licenses and the reverse engineering of proprietary software to modify the code.

Performance descriptors

manipulate and cleanse data using spreadsheet software	Uses spreadsheet software to:
	• identify data for manipulation and cleansing
	• create worksheets
	• identify input data for validation.
		Uses spreadsheet software to:
		• import data from database software using a range of data types
		• apply a range of appropriate formats to data
		• validate data using one of the following checks:
		  • existence
		  • type
		  • range.
			Uses spreadsheet software to:
			• apply conditional formatting
			• filter data using criteria
			• sort data using one field/column
			• manipulate data using formulas
			• validate data using two of the following checks:
			  • existence
			  • type
			  • range.
			Some errors exist with data and/or calculations. Few errors have been corrected.
				Uses spreadsheet software to:
				• link between worksheets
				• sort data using multiple fields/columns
				• validate data using all the following checks:
				  • existence
				  • type
				  • range.
				Minor errors exist with data and/or calculations. Some errors have been corrected.
					Uses spreadsheet software to:
					• format all data and charts for export to data visualisations
					• validate all relevant input data and checks the reasonableness of all input data.
					All errors with data and/or calculations have been identified and corrected.

Administrative information (SAT Criteria)

- The plan is to have each criterion written the same way as the Performance descriptors for the SACs in the Administrative information.
- The 2025 Administrative information will still have 10 criteria.
- Each criterion will be out of 10 marks for a total of 100 marks.

Administrative information (SAT Criteria)

VCE Software Development: School-assessed Task 2025							
Assessment Criteria	**Levels of Performance**						
	Indicators	**Not shown**	**1–2 (very low)**	**3–4 (low)**	**5–6 (medium)**	**7–8 (high)**	**9–10 (very high)**
Unit 4 Outcome 1 **6. Skills in using the features of the programming language.**	• Uses a range of appropriate features of the programming language.	Insufficient evidence	Develops the solution using: • instructions • arithmetic operators.	Develops the solution using: • local variables and constants • logical and conditional operators • control structures of sequence and selection • graphical user interfaces (GUIs).	Develops the solution using: • global variables • the control structure of iteration/repetition • relevant GUI controls.	Develops the solution using: • functions and methods • access modifiers.	Develops the solution using: • classes and objects. Applies all relevant OOP principles.
	• Uses a range of appropriate data types, data structures and data sources.		Identifies data types, including text, numeric and Boolean.	Uses data types for local variables. Outlines, in the internal documentation, why the selected data types were used.	Uses appropriate data types for global variables and data structures, including arrays and/or records. Explains, in the internal documentation, why the selected data types and data structures were used.	Uses appropriate data types, data structures and data sources. Explains, in the internal documentation, why the selected data sources were used.	Uses a range of data types, data structures and data sources. Explains and justifies, in the internal documentation, why the selected data types, data structures and data sources were used.
		0 ❑	1 ❑ 2 ❑	3 ❑ 4 ❑	5 ❑ 6 ❑	7 ❑ 8 ❑	9 ❑ 10 ❑

Draft only – May change

Draft only – May change

Other support documentation

- The Software tools and functions document for Data Analytics and the Programming requirements document for Software Development will be retired.
- A new document, currently called the Software tools and functions and outcome-specific requirements document will be developed for each set of units across Units 1–4.
- The plan is to provide guidance for each outcome.
- This document will include:
  - Design and ideation tools, software functions, programming languages, key legislation and frameworks.

Resources

- We will be updating current resources to support Units 1–4.
- These will include:
  - Templates for developing an assessment task
  - SAC Task templates
  - SAT templates
  - SAC on-demand videos
  - SAT on-demand videos
- There will also be SAT webinars in February/March.

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