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# **SUBJECT SELECTION HANDBOOK**

## **2017**

*"Aims to provide a solid foundation for academic excellence and spiritual growth towards authentic Christian Living."*

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## Introduction

The purpose of this Subject Selection Handbook is to provide a resource for students and parents / guardians to assist them with the selection of subjects for Years 11 and 12. At Kerang Christian College, we believe that the process of subject selection needs to incorporate careful planning, evaluation and reflection, as well as accommodating individual interests and abilities.

Students are encouraged to choose subjects with a clear understanding of the requirements and recommendations for potential future study and work. It is advisable that students select subjects that suit their interests, develop their talents and skills, build on their strengths and enable them to pursue their goals and aspirations.

The College is pleased to be able to offer a wide range of VCE studies to our Senior School students. The College offered Unit 3 and 4 subjects for the first time in the College's history during 2016 and we are excited to further enhance and consolidate teaching and learning programs in 2017.

During 2015 and 2016, the College participated in an innovative video conference partnership with other Christian Schools in our region. This provided the College with greater flexibility to best meet the individual needs of each student undertaking the VCE. In 2017, we will once again look for the most appropriate way to delivery VCE studies to all of our VCE students.

Learning is the result of actions and effort on the part of the student, and the staff at Kerang Christian College aims to provide the environment to maximise the learning that happens. Our students are encouraged to develop high expectations for their learning and to develop a dedicated work ethic throughout their VCE studies. We encourage students to look upon this final stage of Secondary education at Kerang Christian College with an attitude of shared commitment and community, so that they may be able to create fond memories and a sense of accomplishment.

Subject teachers, the Heads of Senior School and the Head of Secondary School will work together with you as a team this year in helping you to meet the requirements of the VCE. We wish you every success and God's blessing for the year ahead.

## General Information

This document is to assist students in the selection of a VCE program that best suits them and their future pathways. It is designed to accompany the VCE Student Handbook, which contains the rules, regulations and expectations for students regarding the effective operation of the VCE at Kerang Christian College.

Please use the information provided in this guide to help you begin the planning of your VCE program. Subject descriptions, along with the nature of the assessments are provided as well as some suggestions for a VCE program for specific career interests.

## Accelerated Studies

Year 10 students in 2017 will be provided with the opportunity to study a Unit 1 & 2 VCE subject as an accelerated study. There are a number of benefits of such an opportunity for Year 10 students: it allows a student to complete six subjects at a Unit 3 & 4 sequence, thus providing more flexibility for ATAR calculations (please refer to VCE Student Policy Handbook for more information) and it provides students with access to the requirements of VCE study.

The College places an expectation on the performance of students in accelerated studies, and students need to apply for the opportunity to take part. More information is provided in the VCE Student Policy Handbook.

## Subject Requirements

When designing a VCE program, please be aware of the following:

- English is compulsory
- Year 11 students must select six subjects
- Year 12 students must select five subjects
- Tertiary prerequisites are available in the VTAC publications, “Prerequisites for 2018” and “Prerequisites for 2019”. They are also available from individual tertiary institutions.

## Recommended Prerequisites

Before undertaking a Unit 3 and 4 sequence in a subject it is recommended that a student have previously completed the Units 1 and/or 2 of the same subject. Whilst the content may or may not be preparatory to the Unit 3 and 4 study, in most cases students will be introduced to specific skills and styles that will better assist them in the study. Students who wish to undertake a Unit 3 and 4 study without having completed Units 1 and/or 2 will need to discuss the matter with the Head of Senior School. Please remember that any desired changes in a student’s VCE program after the timetable is produced will be subject to constraints. Students are reminded to make their subject selections carefully, after considering all relevant information.

## The Subject Selection Process

The subject selection process undertaken by Kerang Christian College begins early in Term 3 and is undertaken with the needs of students as the central focus. The process outlined below pertains to the subject selection process that takes place at Year 10, in preparation for Unit 1 & 2 studies in 2017.

### Step 1. VCE Information Evening

Early in Term 3, students and parents will be invited to attend the VCE Information Evening which will provide all the relevant information for the selection of the following year's VCE subjects. Because this stage is the start of the student's selection of their VCE program for the following year, it is important that understand the features and requirements of Senior School and VCE education before making their choices.

### Step 2. Subject Preferences

As part of the VCE Information Evening, Year 10 students will be provided with a Subject Preference Form, which allows them to identify subjects of interest. Students are asked to consider the options carefully and indicate this on the form in order of preference. Year 10 students completing an acceleration subject in 2016 are encouraged to list the relevant Unit 3 & 4 subject in second place, if they wish to continue with the acceleration pathway. Year 9 students will be provided with an Acceleration Application Form and are asked to identify the subjects they would be interested in during 2017. All students are asked to indicate their career pathway preferences. Students currently in Year 11 will be provided with the Unit 3 & 4 blocking sheet in order to select their subjects. In most cases, students will continue studying the subjects they have undertaken at Units 1 & 2.

### Step 3. Subject Blocking

Based on the Subject Preference Forms that are returned by Year 10 students and the Acceleration Application Forms, returned by the Year 9 students, a blocking sheet for Unit 1 & 2 studies will be developed. Consideration will be given to subject preferences, proposed class sizes, the Unit 3 & 4 blocking for the following year and staffing requirements, when developing the proposed blocking. The College will endeavour to offer as many subjects as possible, but cannot guarantee this until the blocking is completed. Students and parents may be consulted during this stage, if required.

### Step 4. Final Subject Selection

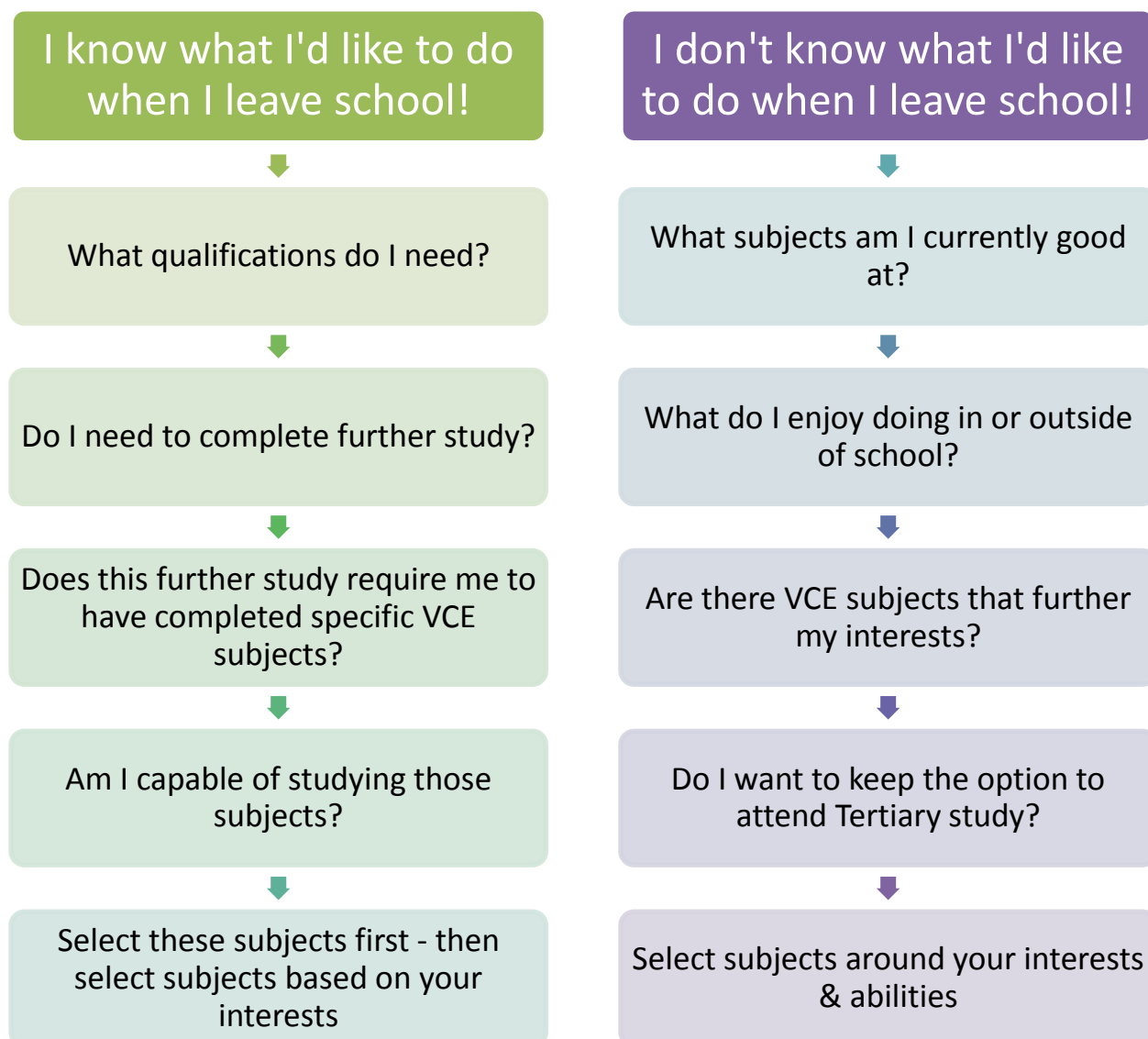
The final blocking sheets for Units 1 & 2 will be distributed and students will be required to make a final decision on their subject choices. Parents and students will be required to sign off on the final subject selection form. Please note that the final offering is dependent on minimum numbers, choices, timetable and staffing arrangements. Students are advised to make their subject selection carefully.

## Choosing a VCE Program

When choosing the specific studies for a student's VCE, please consider the following points:

- What does the student enjoy?  
*Students are generally successful in the subjects they enjoy.*
- In what subject is the student already achieving high results?  
*Success is a motivator, and existing success may indicate a strong interest or ability in a subject area.*
- What subjects might the student need for future study or work?  
*Further qualifications may require that students complete specific subjects in Year 11 or Year 12. More information is available from the Head of Senior School if required.*

The following may assist you in selecting appropriate VCE studies:



## VCE Subject Options for 2016

<b>Subject</b>	<b>Page Number</b>
Accounting – Units 1 & 2	13
Accounting – Units 3 & 4	15
Agricultural and Horticultural Studies – Units 1 & 2	17
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History: 20 <sup>th</sup> Century – Units 1 & 2	47
History: Revolutions – Units 3 & 4	49
Legal Studies – Units 1 & 2	51
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Mathematics: General Mathematics (Unit 1 & 2)	55
Mathematics: Further Mathematics (Unit 3 & 4)	57
Mathematics: Mathematical Methods (CAS) – Units 1 & 2	59
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Physical Education – Units 1 & 2	63
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Physics – Units 1 & 2	67
Physics – Units 3 & 4	69
Psychology – Units 1 & 2	71
Psychology – Units 3 & 4	73
Systems Engineering – Units 1 & 2	75
Systems Engineering – Units 3 & 4	77

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# Potential Pathways & Associated VCE Programs

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# PATHWAY: COMMERCE

With Acceleration  
6 Unit 3 & 4 Sequences Completed

## Year 10

Normal Year 10 Program	Unit 1 & 2 Business Management Acceleration
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## Year 11

Unit 1 & 2 English	Unit 1 & 2 Accounting	Unit 1 & 2 Legal Studies	Unit 1 & 2 General Mathematics	Unit 1 & 2 Mathematical Methods	Unit 3 & 4 Business Management Acceleration
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## Year 12

Unit 3 & 4 English	Unit 3 & 4 Accounting	Unit 3 & 4 Legal Studies	Unit 3 & 4 Further Mathematics	Unit 3 & 4 Mathematical Methods
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### Possible further education/career pathways:

Accounting	Business	Commerce
Economics	Insurance	Marketing
Office Management	Property	Sport Management
Travel & Tourism	Environmental	Catering and Hotel
Management	Management	Management
Retail Management	Banking & Finance	Criminal Justice
Law		

### *Always make sure you fulfil the following:*

- Minimum of 4 sequences of Unit 3 & 4 subjects, which must include three units of English
- Check that your studies include the prerequisites for the range of Tertiary/TAFE courses you are considering

# PATHWAY: EDUCATION

With Acceleration  
6 Unit 3 & 4 Sequences Completed

## Year 10

Normal Year 10 Program	Unit 1 & 2 VCE Acceleration
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## Year 11

Unit 1 & 2 English	Unit 1 & 2 General Mathematics	Unit 1 & 2 VCE Elective 1	Unit 1 & 2 VCE Elective 2	Unit 1 & 2 VCE Elective 3	Unit 3 & 4 Acceleration Subject
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## Year 12

Unit 3 & 4 English	Unit 3 & 4 Further Mathematics	Unit 3 & 4 VCE Elective 1	Unit 3 & 4 VCE Elective 2	Unit 3 & 4 VCE Elective 3
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### Possible further education/career pathways:

Primary Teaching  
Industry Training

P – 10 Teaching

Secondary Teaching

*Specialising in:*

-Performing Arts (choose arts electives)

-Science (choose science electives)

-English/Humanities (choose Humanities electives)

### Always make sure you fulfil the following:

- Minimum of 4 sequences of Unit 3 & 4 subjects, which must include three units of English
- Check that your studies include the prerequisites for the range of Tertiary/TAFE courses you are considering

# PATHWAY: ELECTRONICS/ENGINEERING

With Acceleration  
6 Unit 3 & 4 Sequences Completed

## Year 10

Normal Year 10 Program	Unit 1 & 2 Systems Engineering Acceleration
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## Year 11

Unit 1 & 2 English	Unit 1 & 2 General Mathematics	Unit 1 & 2 Mathematical Methods	Unit 1 & 2 VCE Elective 1	Unit 1 & 2 VCE Elective 2	Unit 3 & 4 Systems Engineering Acceleration
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## Year 12

Unit 3 & 4 English	Unit 3 & 4 Further Mathematics	Unit 3 & 4 Mathematical Methods	Unit 3 & 4 VCE Elective 1	Unit 3 & 4 VCE Elective 1
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### Possible further education/career pathways:

Engineering  
Electronics  
Automotive

Construction  
Electrical

Robotics  
Mechanics

### *Always make sure you fulfil the following:*

- Minimum of 4 sequences of Unit 3 & 4 subjects, which must include three units of English
- Check that your studies include the prerequisites for the range of Tertiary/TAFE courses you are considering

# PATHWAY: HEALTH SCIENCE

With Acceleration  
6 Unit 3 & 4 Sequences Completed

## Year 10

Normal Year 10 Program	Unit 1 & 2 Biology Acceleration
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## Year 11

Unit 1 & 2 English	Unit 1 & 2 General Mathematics	Unit 1 & 2 Mathematical Methods	Unit 1 & 2 Chemistry	Unit 1 & 2 Psychology	Unit 3 & 4 Biology Acceleration
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## Year 12

Unit 3 & 4 English	Unit 3 & 4 Further Mathematics	Unit 3 & 4 Mathematical Methods	Unit 3 & 4 Chemistry	Unit 3 & 4 Psychology
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### Possible further education/career pathways:

Medicine	Physiotherapy	Dentistry
Veterinary Science	Nursing	Podiatry
Prosthetics & Orthotics	Occupational Therapy	Behavioural Neuroscience
Biotechnology	Animal Technology	Myotherapy
Medical Laboratory Technology		

### Always make sure you fulfil the following:

- Minimum of 4 sequences of Unit 3 & 4 subjects, which must include three units of English
- Check that your studies include the prerequisites for the range of Tertiary/TAFE courses you are considering

# PATHWAY: PLAN YOUR OWN

With Acceleration  
6 Unit 3 & 4 Sequences Completed

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## Year 10

Normal Year 10 Program	
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## Year 11

Unit 1 & 2 English	Unit 1 & 2 General Mathematics				
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*\*Unit 1 & 2 General Mathematics is strongly recommended.*

## Year 12

Unit 3 & 4 English				
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**Possible further education/career pathways:**

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***Always make sure you fulfil the following:***

- Minimum of 4 sequences of Unit 3 & 4 subjects, which must include three units of English
- Check that your studies include the prerequisites for the range of Tertiary/TAFE courses you are considering

# UNIT 1 & 2 ACCOUNTING

## Subject Introduction

Students of Unit 1 & 2 Accounting can expect to gain skills to assist in the recording of financial transactions for a small business, to prepare financial reports and provide analytical financial data for business owners/managers. They can also expect to gain the understanding necessary to interpret the data they process in order to develop strategies to assist small business owners to improve the financial success of their businesses. Single entry accounting is the basis of financial recording used.

Unit 1 & 2 Accounting would be of interest to students who intend to pursue further study in the commerce/financial area or, who are interested in owning/operating their own small business.

## Unit Descriptions

<b>Unit 1: Establishing and operating a service business</b>	<b>Unit 2: Accounting for a trading business</b>
<p>Focuses on the establishment of a small business and the appropriate management of the financial nature of business.</p> <p>It introduces the processes of gathering, recording, reporting and analysing financial data and information used by internal and external users.</p> <p>The unit examines the role of accounting in the decision-making process using single entry recording of financial data and information for the owner of a service business.</p>	<p>Focuses on accounting for a single activity sole trader.</p> <p>The unit utilises an accrual approach, using a single entry recording system for the recording and reporting of cash and credit transactions and stock.</p> <p>It uses financial and non-financial information to evaluate the performance of a business, and students use these evaluations to suggest strategies to the owner on how to improve the performance of the business.</p> <p>The use of ICT in Accounting.</p>

## UNIT 1 & 2 ACCOUNTING

### Outcomes

Unit 1	Unit 2
1. Describe the resources required, and explain and discuss the knowledge and skills necessary, to set up a small business.	1. Record financial data and report accounting information for a sole trader.
2. Identify and record the financial data, and report and explain accounting information, for a sole proprietor of a service business.	2. Record financial data and report accounting information for a single activity sole trader using a commercial accounting software package, and discuss the use of ICT in the accounting process.
	3. Select and use financial and non-financial information to evaluate the performance of a business and discuss strategies that may improve business performance.
<i>ICT Must be used in at least two assessments.</i>	<i>ICT Must be used in at least two assessments.</i>

### Assessment

Students will be assessed on whether they have satisfactorily achieved all outcomes via tests, assignments and exercises completed in class.

Achievement for VCE purposes will be indicated by an S (Satisfactory)  
Non-achievement will be indicated by an N (Not Satisfactory)

Level of achievement will be indicated by a letter grade and percentage. This result is for College reporting only.

Students will complete an examination at the end of each unit. The examination contributes 40% to the overall grade for this subject.

### Prerequisites

No specific subject prerequisites.

An understanding of percentages and ratios in mathematics is preferred.

# UNIT 3 & 4 ACCOUNTING

## Subject Introduction

Students of Unit 3 & 4 Accounting can expect to enhance the skills required to record financial transactions for a small business, prepare financial reports and provide analytical financial data for business owners/managers. They can also expect to gain the understanding necessary to interpret the data they process in order to develop strategies to assist small business owners to improve the financial success of their businesses. Double entry is the method of financial recording used.

Unit 3 & 4 Accounting would be of interest to students who intend to pursue further study in the commerce/financial area or, who are interested in owning/operating their own small business.

## Unit Descriptions

<b>Unit 3: Recording and reporting for a trading business</b>	<b>Unit 4: Control and analysis of business performance</b>
<p>Focuses on financial accounting for a single activity trading business as operated by a sole trader and emphasises the role of accounting as an information system.</p> <p>The unit introduces the double entry system of recording using the accrual basis of accounting. The perpetual method of stock recording with the First In, First Out (FIFO) method is used.</p>	<p>Extends the recording and reporting processes from Unit 3 and the use of financial and non-financial information in assisting management in the decision-making process.</p> <p>Students learn about the role and importance of budgeting for the business and undertake the practical completion of budgets for cash, financial performance and financial position.</p> <p>Students also evaluate the information prepared and analyse the results in order to suggest strategies to the owner.</p>



## UNIT 3 & 4 ACCOUNTING

### Outcomes & Weightings

Unit 3	Marks	Unit 4	Marks
1. Record financial data for a single activity sole trader using a double entry system, and discuss the function of various aspects of this accounting system.	50	1. Record financial data using double entry accounting and report accounting information using an accrual-based system for a single activity sole-trader, and discuss the function of various aspects of this accounting system.	50
2. Record balance day adjustments and prepare and interpret accounting reports.	50	2. <b>Part A</b> Prepare budgets and variance reports.  <b>Part B</b> Evaluate the performance of a business using financial and non-financial information and discuss strategies to improve the profitability and liquidity of the business.	30  20

### Assessment

Students will be assessed on whether they have satisfactorily achieved all outcomes via tests, assignments and exercises completed in class.

Achievement for VCE purposes will be indicated by an S (Satisfactory)  
Non-achievement will be indicated by an N (Not Satisfactory)

Level of achievement for Study Score and ATAR purposes is determined from School Assessed Coursework (Moderated) and an End of Year Examination.

Contribution to final assessment:

Unit 3 School Assessed Coursework	25%
Unit 4 School Assessed Coursework	25%
2 hour End of Year Examination (External Assessment)	50%

### Prerequisites

None, although either Unit 1 or Unit 2 Accounting will be an advantage.

**Sequence Requirements:** Units 3 and 4 must be completed in sequence to obtain a Study Score.

# UNIT 1 & 2 AGRICULTURAL AND HORTICULTURAL STUDIES

## Subject Introduction

VCE Agricultural and Horticultural Studies is designed to develop students' understanding of the operations and practices involved with sustainable agricultural and horticultural systems within an economic, social and environmental context. This study allows students to develop and apply theoretical knowledge and skills to real world business and practices. An understanding of agribusiness operations involves a broad familiarity with interdisciplinary skills and knowledge of technology, science, economics and business management, marketing, geography and information and communications technology (ICT). Students apply their acquired knowledge and skills to design, develop and manage an agricultural and/or horticultural business as a project within this study.

The broad applied nature of the study of agribusiness operations prepares students to make decisions about career opportunities or further studies in agriculture, horticulture, land management, agricultural business practice and natural resource management.

## Unit Descriptions

<b>Unit 1: Agricultural and horticultural operations</b>	<b>Unit 2: Production</b>
<p>In this unit students study local agricultural and horticultural operations and the economic, social, environmental and historical factors that influence these operations. Students develop an understanding of how the biological and physical components of the environment and human resources influence the type of agribusinesses undertaken at particular locations. They consider the importance of using scientific methodology when investigating agricultural and horticultural systems.</p> <p>Students apply their knowledge and skills in researching the feasibility and establishment of a small agricultural and/or horticultural business project. Students consider business opportunities and financial aspects, and growth and production of plants and animals. They use appropriate production skills, plan and use resources sustainably, and evaluate and report on the progress of the small business.</p>	<p>This unit focuses on plant and animal nutrition, and growth and reproduction and their relationships within agribusiness systems. Students analyse agricultural and/or horticultural production systems in terms of timelines for production, taking into account physical, biological, economic, social and environmental factors. They consider the impacts of climate extremes on plant and animal production and use a scientific approach to investigating aspects of production.</p> <p>Students use a small business project to explore the role of agribusiness in value adding to the product of an agricultural and/or a horticultural business. They consider business and production operations, production and environmental risks, sustainability of operations, and marketing. Students monitor and evaluate the outcomes of the small business project.</p>

# UNIT 1 & 2 AGRICULTURAL AND HORTICULTURAL STUDIES

## Outcomes

Unit 1	Unit 2
1. Describe a range of biological, physical and human resources and their influence on agricultural and/or horticultural systems in the local area, and explain the importance of the application of scientific principles in production.	1. Describe the nutritive and reproductive processes of plants and animals, their application to agricultural and/or horticultural production systems, and specific biological and environmental factors that influence production systems.
2. Plan, implement and evaluate management and production activities to operate a small agricultural and/or a horticultural business project involving the care and monitoring of living plants or animals.	2. Plan, implement, monitor and evaluate the production processes and marketing for a small agricultural and/or horticultural business project, demonstrating how the business adds value to the product and manages risk.

## Assessment

Students will be assessed on whether they have satisfactorily achieved all outcomes via annotated visual displays, multimedia presentations, tests, written reports, research reports, practical demonstrations, business plans including budgets, evidence of production, including visual material (for example, photographs), business report, including production and financial evaluation, media responses and scientific investigations.

Achievement for VCE purposes will be indicated by an S (Satisfactory)  
Non-achievement will be indicated by an N (Not Satisfactory)

Level of achievement will be indicated by a letter grade and percentage. This result is for College reporting only.

Students will complete an examination at the end of each unit. The examination contributes 30% to the overall grade for this subject.

## Prerequisites

No specific subject prerequisites.

# UNIT 1 & 2 BIOLOGY

## Subject Introduction

Biology is a diverse and evolving science that seeks to understand and explore the nature of life, past and present. In Units 1 & 2 Biology students will specifically study the following topics: How organisms function; how living systems sustain life; how reproduction maintains the continuity of life; how inheritance is explained, and will be involved in practical investigations. An important feature of undertaking a VCE science study is the opportunity for students to engage in a range of inquiry tasks that may be self-designed, develop key science skills and interrogate the links between theory, knowledge and practice.

VCE Biology provides for a range of study pathways and leads to a range of careers. Branches of biology include botany, genetics, immunology, microbiology, pharmacology and zoology. In addition, biology is applied in many other fields including biotechnology, dentistry, ecology, education, food science, forestry, health care, horticulture, medicine, optometry, physiotherapy and veterinary science. Biologists also work in cross-disciplinary areas such as bushfire research, environmental management, forensic science, medical research and sports science.

## Unit Descriptions

<b>Unit 1: How do living things stay alive?</b>	<b>Unit 2: How is continuity of life maintained?</b>
<p>In this unit students are introduced to some of the challenges to an organism in sustaining life. Students examine the cell as the structural and functional unit of life, from the single celled to the multicellular organism, and the requirements for sustaining cellular processes in terms of inputs and outputs. They analyse types of adaptations that enhance the organism's survival in a particular environment and consider the role homeostatic mechanisms play in maintaining the internal environment. Students investigate how a diverse group of organisms form a living interconnected community that is adapted to, and utilises, the abiotic resources of its habitat. The role of a keystone species in maintaining the structure of an ecosystem is explored. Students consider how the planet's biodiversity is classified and the factors that affect the growth of a population.</p>	<p>In this unit students focus on cell reproduction and the transmission of biological information from generation to generation. Students learn that all cells are derived from pre-existing cells through the cell cycle. They examine the process of DNA replication and compare cell division in both prokaryotic and eukaryotic organisms. Students explore the mechanisms of asexual and sexual reproductive strategies, and consider the advantages and disadvantages of these two types of reproduction. The role of stem cells in the differentiation, growth, repair and replacement of cells in humans is examined, and their potential use in medical therapies is considered.</p> <p>Students use chromosome theory and terminology from classical genetics to explain the inheritance of characteristics, analyse patterns of inheritance, interpret pedigree charts and predict outcomes of genetic crosses. They explore the relationship between genes, the environment and the regulation of genes in giving rise to phenotypes. They consider the role of genetic knowledge in decision making about the inheritance of autosomal dominant, autosomal recessive and sex-linked genetic conditions. In this context the uses of genetic screening and its social and ethical issues are examined.</p>

# UNIT 1 & 2 BIOLOGY

## Outcomes

Unit 1	Unit 2
1. Investigate and explain how cellular structures and systems function to sustain life.	1. Compare the advantages and disadvantages of asexual and sexual reproduction, explain how changes within the cell cycle may have an impact on cellular or tissue system function and identify the role of stem cells in cell growth and cell differentiation and in medical therapies.
2. Explain how various adaptations enhance the survival of an individual organism, investigate the relationships between organisms that form a living community and their habitat, and analyse the impacts of factors that affect population growth.	2. Apply an understanding of genetics to describe patterns of inheritance, analyse pedigree charts, predict outcomes of genetic crosses and identify the implications of the uses of genetic screening and decision making related to inheritance.
3. Design and undertake an investigation related to the survival of an organism or species, and draw conclusions based on evidence from collected data.	3. Investigate and communicate a substantiated response to a question related to an issue in genetics and/or reproductive science.

## Assessment

Students will be assessed on whether they have satisfactorily achieved Outcomes 1 and 2 via assessments selected from the following: a report of a fieldwork activity, annotations of a practical work folio of activities or investigations, a bioinformatics exercise, media response, data analysis, problem solving involving biological concepts, skills and/or issues, a reflective learning journal/blog related to selected activities or in response to an issue, a test comprising multiple choice and/or short answer and/or extended response.

Outcome 3 will be assessed via a report of a student-designed or adapted investigation related to the survival of an organism or a species using an appropriate format, for example a scientific poster, practical report, oral communication or digital presentation.

Achievement for VCE purposes will be indicated by an S (Satisfactory)

Non-achievement will be indicated by an N (Not Satisfactory)

Level of achievement will be indicated by a letter grade and percentage. This result is for College reporting only.

Students will complete an examination at the end of each unit. The examination contributes 50% to the overall grade for this subject.

## Prerequisites

No specific subject prerequisites.

An understanding and interest of the Natural Sciences would be of advantage. Subject may contain dissection of organs.

# UNIT 3 & 4 BIOLOGY

## Subject Introduction

Biology is a diverse and evolving science that seeks to understand and explore the nature of life, past and present. In Units 3 & 4 Biology students will specifically study the following topics: how cellular processes work, how cells communicate, how species are related, how humans impact biological processes, and will be involved in practical investigations. An important feature of undertaking a VCE science study is the opportunity for students to engage in a range of inquiry tasks that may be self-designed, develop key science skills and interrogate the links between theory, knowledge and practice.

VCE Biology provides for continuing study pathways within the discipline and leads to a range of careers. Branches of biology include botany, genetics, immunology, microbiology, pharmacology and zoology. In addition, biology is applied in many fields of endeavour including biotechnology, dentistry, ecology, education, food science, forestry, health care, horticulture, medicine, optometry, physiotherapy and veterinary science. Biologists also work in cross-disciplinary areas such as bushfire research, environmental management and conservation, forensic science, geology, medical research and sports science.

## Unit Descriptions

<b>Unit 3: How do cells maintain life?</b>	<b>Unit 4: How does life change and respond to challenges over time?</b>
<p>Students investigate the cell from several perspectives. They explore the importance of the insolubility of the plasma membrane in water and its differential permeability to specific solutes in defining the cell, its internal spaces and the control of the movement of molecules and ions in and out of such spaces. Students consider base pairing specificity, the binding of enzymes and substrates, the response of receptors to signalling molecules and reactions between antigens and antibodies</p>	<p>In this unit students consider the continual change and challenges to which life on Earth has been subjected. They investigate the relatedness between species and the impact of various change events on a population's gene pool. The accumulation of changes over time is considered as a mechanism for biological evolution. Students examine change in life forms using evidence from palaeontology, biogeography, developmental biology and structural morphology. They explore how technological developments have resulted in evidence of change through measurements of relatedness between species.</p>
<p>Students study the synthesis, structure and function of nucleic acids and proteins as key molecules in cellular processes. They explore the chemistry of cells by examining the nature of biochemical pathways, their components and energy transformations. Students consider the types of signals, and the transduction of information. At this molecular level students study the human immune system and the interactions between its components to provide immunity to a specific antigen.</p>	<p>Students examine the structural and cognitive trends in the human fossil record and the interrelationships between human biological and cultural evolution. The biological consequences, and social and ethical implications, of manipulating the DNA molecule and applying biotechnologies is explored for both the individual and the species.</p>
<p>A student practical investigation related to cellular processes and/or biological change and continuity over time is undertaken in either Unit 3 or Unit 4, or across both Units 3 and 4, and is assessed in Unit 4, Outcome 3.</p>	<p>A student practical investigation related to cellular processes and/or biological change and continuity over time is undertaken in either Unit 3 or Unit 4, or across both Units 3 and 4, and is assessed in Unit 4, Outcome 3.</p>

## UNIT 3 & 4 BIOLOGY

### Outcomes & Weightings

Unit 3	Marks	Unit 4	Marks
1. Explain the dynamic nature of the cell in terms of key cellular processes including regulation, photosynthesis and cellular respiration, and analyse factors that affect the rate of biochemical reactions.	50	1. Analyse evidence for evolutionary change, explain how relatedness between species is determined, and elaborate on the consequences of biological change in human evolution.	30
2. Apply a stimulus-response model to explain how cells communicate with each other, outline human responses to invading pathogens, distinguish between the different ways that immunity may be acquired, and explain how malfunctions of the immune system cause disease.	50	2. Describe how tools and techniques can be used to manipulate DNA, explain how biological knowledge is applied to biotechnical applications, and analyse the interrelationship between scientific knowledge and its applications in society.	30
		3. Design and undertake an investigation related to cellular processes and/or biological change and continuity over time, and present methodologies, findings and conclusions in a scientific poster.	30

### Assessment

Students will be assessed on whether they have satisfactorily achieved all outcomes via practical reports, evaluation of research, a report using primary or secondary data and a structured scientific poster, in accordance with VCAA requirements.

Achievement for VCE purposes will be indicated by an S (Satisfactory)  
Non-achievement will be indicated by an N (Not Satisfactory)

Level of achievement for Study Score and ATAR purposes is determined from School Assessed Coursework (Moderated) and an End of Year Examination.

Contribution to final assessment:

Unit 3 School Assessed Coursework	16%
Unit 4 School Assessed Coursework	24%
2.5 hour End of Year Examination (External Assessment)	60%

### Prerequisites

Biology Unit 1 is strongly recommended before doing Units 3 & 4.

**Sequence Requirements:** Units 3 and 4 must be completed in sequence to obtain a Study Score.

# UNIT 1 & 2 BUSINESS MANAGEMENT

## Subject Introduction

VCE Business Management examines the ways businesses manage resources to achieve objectives, and follows the process from the first idea through to day-to-day planning. Unit 1 & 2 Business Management examines management theory and practice involved in planning a business and bringing a business into existence.

This subject would be of interest to students who intend to pursue further study in the commerce/management area, are keen on exploring a pathway in management in employment for a business, or, who are interested in owning/operating their own business.

## Unit Descriptions

<b>Unit 1: Planning a business</b>	<b>Unit 2: Establishing a business</b>
Businesses of all sizes are major contributors to the economic and social wellbeing of a nation. Therefore how businesses are formed and the fostering of conditions under which new business ideas can emerge are vital for a nation's wellbeing. Taking a business idea and planning how to make it a reality are the cornerstones of economic and social development. In this unit students explore the factors affecting business ideas and the internal and external environments within which businesses operate, and the effect of these on planning a business.	This unit focuses on the establishment phase of a business's life. Establishing a business involves complying with legal requirements as well as making decisions about how best to establish a system of financial record keeping, staff the business and establish a customer base. In this unit students examine the legal requirements that must be satisfied to establish a business. They investigate the essential features of effective marketing and consider the best way to meet the needs of the business in terms of staffing and financial record keeping. Students analyse various management practices in this area by applying this knowledge to contemporary business case studies from the past four years.



# UNIT 1 & 2 BUSINESS MANAGEMENT

## Outcomes

Unit 1	Unit 2
1. Describe how and why business ideas are created and developed, and explain the methods by which a culture of business innovation and entrepreneurship may be fostered in a nation.	1. Explain the importance when establishing a business of complying with legal requirements and financial record keeping, and establishing effective policies and procedures.
2. Describe the external environment of a business and explain how the macro and operating factors within it may affect business planning.	2. Explain the importance of establishing a customer base and a marketing presence to achieve the objectives of the business, analyse effective marketing and public relations strategies and apply these strategies to business-related case studies.
3. Describe the internal business environment and analyse how factors from within it may affect business planning.	3. Discuss the staffing needs for a business and evaluate the benefits and limitations of management strategies in this area from both an employer and an employee perspective.

## Assessment

Students will be assessed on whether they have satisfactorily achieved the outcomes via case study analyses, business research report, business simulation exercise, essay, media analyses, a school based business activity and business plan where applicable.

Achievement for VCE purposes will be indicated by an S (Satisfactory)  
Non-achievement will be indicated by an N (Not Satisfactory)

Level of achievement will be indicated by a letter grade and percentage. This result is for College reporting only.

Students will complete an examination at the end of each unit. The examination contributes 40% to the overall grade for this subject.

## Prerequisites

No specific subject prerequisites.

# UNIT 3 & 4 BUSINESS MANAGEMENT

## Subject Introduction

Unit 3 & 4 Business Management continues the journey of management by examining what is involved in managing a business on a daily basis and dealing with change if need be to continue to meet objectives.

This subject would be of interest to students who intend to pursue further study in the commerce/management area, are keen on exploring a pathway in management in employment for a business, or, who are interested in owning/operating their own business.

## Unit Descriptions

<b>Unit 3: Managing a business</b>	<b>Unit 4: Transforming a business</b>
<p>In this unit students explore the key processes and issues concerned with managing a business efficiently and effectively to achieve the business objectives. Students examine the different types of businesses and their respective objectives. They consider corporate culture, management styles, management skills and the relationship between each of these. Students investigate strategies to manage both staff and business operations to meet objectives.</p> <p>Students develop an understanding of the complexity and challenge of managing businesses and through the use of contemporary business case studies from the past four years have the opportunity to compare theoretical perspectives with current practice.</p>	<p>Businesses are under constant pressure to adapt and change to meet their objectives. In this unit students consider the importance of reviewing key performance indicators to determine current performance and the strategic management necessary to position a business for the future. Students study a theoretical model to undertake change, and consider a variety of strategies to manage change in the most efficient and effective way to improve business performance. They investigate the importance of leadership in change management. Using a contemporary business case study from the past four years, students evaluate business practice against theory.</p>

## UNIT 3 & 4 BUSINESS MANAGEMENT

### Outcomes & Weightings

Unit 3	Marks	Unit 4	Marks
1. Discuss the key characteristics of businesses and stakeholders, and analyse the relationship between corporate culture, management styles and management skills.	20	1. Explain the way business change may come about, use key performance indicators to analyse the performance of a business, discuss the driving and restraining forces for change and evaluate management strategies to position a business for the future.	50
2. Explain theories of motivation and apply them to a range of contexts, and analyse and evaluate strategies related to the management of employees.	40	2. Evaluate the effectiveness of a variety of strategies used by managers to implement change and discuss the effect of change on the stakeholders of a business.	50
3. Analyse the relationship between business objectives and operations management, and propose and evaluate strategies to improve the efficiency and effectiveness of business operations.	40		

### Assessment

Students will be assessed on whether they have satisfactorily achieved all outcomes via case studies, media analyses, tests and structured questions.

Achievement for VCE purposes will be indicated by an S (Satisfactory)

Non-achievement will be indicated by an N (Not Satisfactory)

Level of achievement for Study Score and ATAR purposes is determined from School Assessed Coursework (Moderated) and an End of Year Examination.

Contribution to final assessment:

Unit 3 School Assessed Coursework	25%
Unit 4 School Assessed Coursework	25%
2 hour End of Year Examination (External Assessment)	50%

### Prerequisites

No specific subject is required.

**Sequence Requirements:** Units 3 and 4 must be completed in sequence to obtain a Study Score.

# UNIT 1 & 2 CHEMISTRY

## Subject Introduction

Chemistry explores and explains the composition and behaviour of matter and the chemical processes that occur on Earth and beyond. Chemical models and theories are used to describe and explain known chemical reactions and processes. Chemistry underpins the production and development of energy, the maintenance of clean air and water, the production of food, medicines and new materials, and the treatment of wastes. In Units 1 & 2 Chemistry students will specifically study the following topics: how the knowledge of elements explains the properties of matter, how the versatility of non-metals can be explained, how substances interact with water, how substances in water are measured and analysed, and will be involved in a research investigation and a practical investigation. An important feature of undertaking a VCE science study is the opportunity for students to engage in a range of inquiry tasks that may be self-designed, develop key science skills and interrogate the links between theory, knowledge and practice.

VCE Chemistry provides for a range of study pathways and leads to a range of careers. Branches of chemistry include organic chemistry, inorganic chemistry, analytical chemistry, physical chemistry and biochemistry. In addition, chemistry is applied in a range of fields including agriculture, bushfire research, dentistry, dietetics, education, engineering, environmental sciences, forensic science, forestry, horticulture, medicine, metallurgy, pharmacy, sports science, toxicology, veterinary science and viticulture.

## Unit Descriptions

<b>Unit 1: How can the diversity of materials be explained?</b>	<b>Unit 2: What makes water such a unique chemical?</b>
<p>In this unit students investigate the chemical properties of a range of materials from metals and salts to polymers and nanomaterials. Using their knowledge of elements and atomic structure students explore and explain the relationships between properties, structure and bonding forces within and between particles that vary in size from the visible, through nanoparticles, to molecules and atoms.</p> <p>Students examine the modification of metals, assess the factors that affect the formation of ionic crystals and investigate a range of non-metallic substances from molecules to polymers and giant lattices and relate their structures to specific applications.</p> <p>Students are introduced to quantitative concepts in chemistry including the mole concept. They determine the relative masses of elements and the composition of substances. Students use chemistry terminology including symbols, formulas, chemical nomenclature and equations to represent and explain observations and data from experiments, and to discuss chemical phenomena.</p>	<p>In this unit students explore the physical and chemical properties of water, the reactions that occur in water and various methods of water analysis.</p> <p>Students examine the polar nature of a water molecule and the intermolecular forces between water molecules. They explore the relationship between these bonding forces and the physical and chemical properties of water. In this context students investigate solubility, concentration, pH and reactions in water including precipitation, acid-base and redox. Students are introduced to stoichiometry and to analytical techniques and instrumental procedures, and apply these to determine concentrations of different species in water samples, including chemical contaminants. They use chemistry terminology including symbols, units, formulas and equations to represent and explain observations and data from experiments, and to discuss chemical phenomena. Students explore the solvent properties of water in a variety of contexts and analyse selected issues associated with substances dissolved in water.</p>

# UNIT 1 & 2 CHEMISTRY

## Outcomes

Unit 1	Unit 2
1. Relate the position of elements in the periodic table to their properties, investigate the structures and properties of metals and ionic compounds, and calculate mole quantities.	1. Relate the properties of water to its structure and bonding, and explain the importance of the properties and reactions of water in selected contexts.
2. Investigate and explain the properties of carbon lattices and molecular substances with reference to their structures and bonding, use systematic nomenclature to name organic compounds, and explain how polymers can be designed for a purpose.	2. Measure amounts of dissolved substances in water and analyse water samples for salts, organic compounds and acids and bases.
3. Investigate a question related to the development, use and/or modification of a selected material or chemical and communicate a substantiated response to the question.	3. Design and undertake a quantitative laboratory investigation related to water quality, and draw conclusions based on evidence from collected data.

## Assessment

Students will be assessed on whether they have satisfactorily achieved the Outcomes 1 and 2 via any of the following: annotations of a practical work folio of activities or investigations, a report of a practical activity or investigation, a modelling activity, media response, problem-solving involving chemical concepts, skills and/or issues, a reflective learning journal/blog related to selected activities or in response to an issue, data analysis, a test comprising multiple choice and/or short answer and/or extended response. Outcome 3 of Unit 1 is assessed via a report of an independent investigation of a selected topic. Outcome 3 of Unit 2 is assessed via a report of a student-designed quantitative laboratory investigation.

Achievement for VCE purposes will be indicated by an S (Satisfactory)  
Non-achievement will be indicated by an N (Not Satisfactory)

Level of achievement will be indicated by a letter grade and percentage. This result is for College reporting only.

Students will complete an examination at the end of each unit. The examination contributes 50% to the overall grade for this subject.

## Prerequisites

No specific subject is required.

Access to subject is based on the recommendation of a member of the Science faculty.

# UNIT 3 & 4 CHEMISTRY

## Subject Introduction

VCE Chemistry enables students to explore key processes related to matter and its behaviour. Students consider the relationship between materials and energy through four themes: the design and composition of useful materials, the reactions and analysis of chemicals in water, the efficient production and use of energy and materials, and the investigation of carbon-based compounds as important components of body tissues and materials used in society. An understanding of the complexities and diversity of chemistry leads students to appreciate the interconnectedness of the content areas both within chemistry, and across chemistry and the other sciences. An important feature of undertaking a VCE science study is the opportunity for students to engage in a range of inquiry tasks that may be self-designed, develop key science skills and interrogate the links between theory, knowledge and practice.

VCE Chemistry provides for continuing study pathways within the discipline and leads to a range of careers. Branches of chemistry include organic chemistry, inorganic chemistry, analytical chemistry, physical chemistry and biochemistry. In addition, chemistry is applied in many fields of endeavour including agriculture, bushfire research, dentistry, dietetics, education, engineering, environmental sciences, forensic science, forestry, horticulture, medicine, metallurgy, meteorology, pharmacy, sports science, toxicology, veterinary science and viticulture.

## Unit Descriptions

<b>Unit 3: How can chemical processes be designed to optimise efficiency?</b>	<b>Unit 4: How are organic compounds categorised, analysed and used?</b>
<p>Students compare and evaluate different chemical energy resources, including fossil fuels, biofuels, galvanic cells and fuel cells. They investigate the combustion of fuels, including the energy transformations involved, the use of stoichiometry to calculate the amounts of reactants and products involved in the reactions, and calculations of the amounts of energy released and their representations. Students consider the purpose, design and operating principles of galvanic cells, fuel cells and electrolytic cells.</p> <p>Students analyse manufacturing processes with reference to factors that influence their reaction rates and extent. They use the language and conventions of chemistry including symbols, units, chemical formulas and equations to represent and explain observations and data collected from experiments, and to discuss chemical phenomena.</p> <p>A student practical investigation related to energy and/or food is undertaken either in Unit 3 or Unit 4, or across both Units 3 and 4, and is assessed in Unit 4, Outcome 3.</p>	<p>Students study the ways in which organic structures are represented and named. They process data from instrumental analyses of organic compounds to confirm or deduce organic structures, and perform volumetric analyses to determine the concentrations of organic chemicals in mixtures. Students consider the nature of the reactions involved to predict the products of reaction pathways and to design pathways to produce particular compounds from given starting materials.</p> <p>Students investigate key food molecules through an exploration of their chemical structures, the hydrolytic reactions in which they are broken down and the condensation reactions in which they are rebuilt to form new molecules. In this context the role of enzymes and coenzymes in facilitating chemical reactions is explored. Students use calorimetry as an investigative tool to determine the energy released in the combustion of foods.</p> <p>A student practical investigation related to energy and/or food is undertaken in either Unit 3 or in Unit 4, or across both Units 3 and 4, and is assessed in Unit 4, Outcome 3.</p>

## UNIT 3 & 4 CHEMISTRY

### Outcomes & Weightings

Unit 3	Marks	Unit 4	Marks
1. Compare fuels quantitatively with reference to combustion products and energy outputs, apply knowledge of the electrochemical series to design, construct and test galvanic cells, and evaluate energy resources based on energy efficiency, renewability and environmental impact.	50	1. Compare the general structures and reactions of the major organic families of compounds, deduce structures of organic compounds using instrumental analysis data, and design reaction pathways for the synthesis of organic molecules.	30
2. Apply rate and equilibrium principles to predict how the rate and extent of reactions can be optimised, and explain how electrolysis is involved in the production of chemicals and in the recharging of batteries.	50	2. Distinguish between the chemical structures of key food molecules, analyse the chemical reactions involved in the metabolism of the major components of food including the role of enzymes, and calculate the energy content of food using calorimetry.	30
		3. Design and undertake a practical investigation related to energy and/or food, and present methodologies, findings and conclusions in a scientific poster.	30

### Assessment

Students will be assessed on whether they have satisfactorily achieved all outcomes via a range of tasks, possibly including, a response to a set of structured questions, an extended experimental investigation, written reports of practical investigations, an evaluation of research, and a structured scientific poster, in accordance with VCAA requirements..

Achievement for VCE purposes will be indicated by an S (Satisfactory)  
Non-achievement will be indicated by an N (Not Satisfactory)

Level of achievement for Study Score and ATAR purposes is determined from School Assessed Coursework (Moderated) and an End of Year Examination.

Contribution to final assessment:

Unit 3 School Assessed Coursework	16%
Unit 4 School Assessed Coursework	24%
2.5 hour End of Year Examination (External Assessment)	60%

### Prerequisites

No specific subject is required. Units 1 and 2 Chemistry are preferred.

**Sequence Requirements:** Units 3 and 4 must be completed in sequence to obtain a Study Score.

# UNIT 1 & 2 COMPUTING

## Subject Introduction

Digital systems are developing at a fast and rapid pace and, together with the increasing availability of digitised data and information is significantly influencing many aspects of society and the economy. VCE Computing supports students to participate in a globalised society and economy as they learn how to exploit the capabilities of digital systems and manage risks when communicating and collaborating with others locally and globally. The study provides students with practical opportunities to create digital solutions for real-world problems in a range of settings, developing an essential tool set for current and future learning, work and social endeavours. In Units 1 & 2 students will both study and apply various software tools.

VCE Computing provides a pathway to further studies in areas such as computer science, information systems, business, systems engineering, robotics, linguistics, logistics, database management and software development, and to careers in digital-technologies based areas such as information architecture, web design, business analysis and project management.

## Unit Descriptions

<b>Unit 1: Computing</b>	<b>Unit 2: Computing</b>
Focus is on how data, information and networked digital systems can be used to meet a range of users' current and future needs. Students collect primary data when investigating an issue, practice or event and create a digital solution that graphically presents the findings of the investigation. They examine the technical underpinnings of wireless and mobile networks, and security controls to protect stored and transmitted data, to design a network solution that meets an identified need or opportunity. They predict the impact on users if the network solution were implemented. Students acquire and apply their knowledge of information architecture and user interfaces, together with web authoring skills, when creating a website to present different viewpoints on a contemporary issue.	In this unit the focus is on data and how the application of computational, design and systems thinking skills support the creation of solutions that automate the processing of data. Students develop their computational thinking skills when using a programming or scripting language to create solutions. They engage in the design and development stages of the problem-solving methodology. They also develop a sound understanding of data and how a range of software tools can be used to extract data from large repositories and manipulate it to create visualisations that are clear, usable and attractive, and reduce the complexity of data. Finally students apply all stages of the problem-solving methodology to create a solution using database management software and explain how they are personally affected by their interactions with a database system.



## UNIT 1 & 2 COMPUTING

### Outcomes

Unit 1	Unit 2
1. Acquire, secure and interpret data, and design and develop a graphic solution that communicates the findings of an investigation.	1. Design working modules in response to solution requirements, and use a programming or scripting language to develop the modules.
2. Design a network with wireless capability that meets an identified need or opportunity, explain its configuration and predict risks and benefits for intended users.	2. Apply the problem-solving methodology and use appropriate software tools to extract relevant data and create a data visualisation that meets a specified user's needs.
3. Design and develop a website collaboratively with others that presents an analysis of a contemporary issue and the team's point of view on the issue.	3. Apply the problem-solving methodology to create a solution using database management software, and explain the personal benefits and risks of interacting with a database.

### Assessment

Students will be assessed on whether they have satisfactorily achieved the outcomes via a selection of the following: visual presentations, oral presentations, written reports and for Unit 2 using digital systems and techniques, creating a solution in response to a need or opportunity.

Achievement for VCE purposes will be indicated by an S (Satisfactory)

Non-achievement will be indicated by an N (Not Satisfactory)

Level of achievement will be indicated by a letter grade and percentage. This result is for College reporting only.

Students will complete an examination at the end of each unit. The examination contributes 40% to the overall grade for this subject.

### Prerequisites

No specific subject is required.

# UNIT 3 & 4 COMPUTING: INFORMATICS

## Subject Introduction

Digital systems are developing at a fast and rapid pace and, together with the increasing availability of digitised data and information is significantly influencing many aspects of society and the economy. VCE Computing supports students to participate in a globalised society and economy as they learn how to exploit the capabilities of digital systems and manage risks when communicating and collaborating with others locally and globally. The study provides students with practical opportunities to create digital solutions for real-world problems in a range of settings, developing an essential tool set for current and future learning, work and social endeavours. In Units 3 & 4 students will both study and apply various software tools and focus on data, information and information systems.

VCE Computing provides a pathway to further studies in areas such as computer science, information systems, business, systems engineering, robotics, linguistics, logistics, database management and software development, and to careers in digital-technologies based areas such as information architecture, web design, business analysis and project management.

## Unit Descriptions

<b>Unit 3: Informatics</b>	<b>Unit 4: Informatics</b>
<p>Students consider data and how it is acquired, managed, manipulated and interpreted to meet a range of needs. They investigate the way organisations acquire data using interactive online solutions, such as websites and applications (apps), and consider how users interact with these solutions when conducting online transactions. They examine how relational database management systems (RDBMS) store and manipulate data typically acquired this way. Students use software to create user flow diagrams that depict how users interact with online solutions, and acquire and apply knowledge and skills in the use of an RDBMS to create a solution.</p> <p>Students develop an understanding of the power and risks of using complex data as a basis for decision-making. Students complete the first part of a project. They frame a hypothesis and then select, acquire and organise data from multiple data sets to confirm or refute this hypothesis. This data is manipulated using tools such as spreadsheets or databases to help analyse and interpret it so that students can form a conclusion regarding their hypothesis. Students take an organised approach to problem solving by preparing project plans and monitoring the progress of the project. The second part of the project is completed in Unit 4.</p>	<p>Students focus on strategies and techniques for manipulating, managing and securing data and information to meet a range of needs. They draw on the analysis and conclusion of their hypothesis determined in Unit 3, Outcome 2, and then design, develop and evaluate a multimodal, online solution that effectively communicates the conclusion and findings. The evaluation focuses on the effectiveness of the solution in communicating the conclusion and the reasonableness of the findings. Students use their project plan to monitor their progress and assess the effectiveness of their plan and adjustments in managing the project.</p> <p>In Area of Study 2, students explore how different organisations manage the storage and disposal of data and information to minimise threats to the integrity and security of data and information and to optimise the handling of information.</p>

## UNIT 3 & 4 COMPUTING: INFORMATICS

### Outcomes & Weightings

Unit 3	Marks	Unit 4	Marks
1. Design a solution, develop it using a relational database management system, and diagrammatically represent how users interact with an online solution when supplying data for a transaction.	90  10	2. Compare and contrast the effectiveness of information management strategies used by two organisations to manage the storage and disposal of data and information, and recommend improvements to their current practices.	100
<b>School Assessed Task (Across Units 3 &amp; 4)</b>			
3.2 <b>Unit 3</b> Use a range of appropriate techniques and processes to acquire, prepare, manipulate and interpret complex data to confirm or refute a hypothesis, and formulate a project plan to manage progress.			
4.1 <b>Unit 4</b> Design, develop and evaluate a multimodal online solution that confirms or refutes a hypothesis, and assess the effectiveness of the project plan in managing progress.			

### Assessment

Students will be assessed on whether they have satisfactorily achieved the outcomes for Unit 3 via a relational database management system solution and annotated diagrammatical representation in response to a design brief. Outcome 2 for Unit 4 is assessed via a written report or annotated visual report.

Students will be required to complete a School Assessed Task which comprises of a report, a collection of data sets and information derived from them, a project plan, a folio of alternative design ideas and details of preferred design, multimodal online solution and a written evaluation and assessment of the solution.

Achievement for VCE purposes will be indicated by an S (Satisfactory)  
Non-achievement will be indicated by an N (Not Satisfactory)

Level of achievement for Study Score and ATAR purposes is determined from School Assessed Coursework (Moderated) and an End of Year Examination.

Contribution to final assessment:

Unit 3 School Assessed Coursework	10%
Unit 4 School Assessed Coursework	10%
School Assessed Task	30%
2 hour End of Year Examination (External Assessment)	50%

### Prerequisites

No specific subject is required.

**Sequence Requirements:** Units 3 and 4 must be completed in sequence to obtain a Study Score.

# UNIT 1 & 2 ENGLISH

## Subject Introduction

VCE English focuses on how English language is used to create meaning in written, spoken and multimodal texts of varying complexity. Literary texts selected for study are drawn from the past and present, from Australia and from other cultures. Other texts are selected for analysis and presentation of argument. The study is intended to meet the needs of students with a wide range of expectations and aspirations, including those for whom English is an additional language.

In Unit 1 students read and respond to texts analytically and creatively. They analyse arguments and the use of persuasive language in texts and create their own texts intended to position audiences. In Unit 2 students compare the presentation of ideas, issues and themes in texts. They analyse arguments presented and the use of persuasive language in texts and create their own texts intended to position audiences. Students develop their skills in creating written, spoken and multimodal texts in both Units.

## Unit Descriptions

Unit 1:	Unit 2:
<p>Students explore how meaning is created in a text. They identify, discuss and analyse decisions authors have made and explore how authors use structures, conventions and language to represent characters, settings, events, explore themes, and build the world of the text for the reader. Students investigate how the meaning of a text is affected by the contexts in which it is created and read.</p> <p>Students focus on the analysis and construction of texts that attempt to influence an audience. Students read a range of texts that attempt to position audiences in a variety of ways. They explore the use of language for persuasive effect and the structure and presentation of argument.</p> <p>Students practise written analysis of the presentation of argument and the use of language to position the intended audience.</p>	<p>Students explore how comparing texts can provide a deeper understanding of ideas, issues and themes. They investigate how the reader's understanding of one text is broadened and deepened when considered in relation to another text. Students practise their listening and speaking skills through discussion, developing their ideas and thinking in relation to the texts studied. Students produce a written comparison of selected texts, discussing important similarities and differences, and exploring how the texts deal with similar or related ideas, issues or themes from different perspectives.</p> <p>Students build on their understanding of argument and the use of persuasive language in texts. Students consider a range of texts where the primary purpose is to convince an audience to share a point of view. They develop an understanding of how texts are constructed for specific persuasive effects by identifying and discussing the impact of argument and persuasive language used to influence an audience. In addition to developing critical analysis of the use of language and the presentation of argument in texts, students practise presenting arguments and points of view in writing.</p>

## UNIT 1 & 2 ENGLISH

### Outcomes

Unit 1	Unit 2
1. Produce analytical and creative responses to texts.	1. Compare the presentation of ideas, issues and themes in two texts.
2. Analyse how argument and persuasive language can be used to position audiences, and create their own texts intended to position audiences.	2. Identify and analyse how argument and persuasive language are used in text/s that attempt to influence an audience, and create a text which presents a point of view.

### Assessment

Students will be assessed in Unit 1 on whether they have satisfactorily achieved the outcomes via any of the following: an analytical response to a set text, a creative response to a set text such as a monologue, script, short story, illustrated narrative, short film or graphic text, an analysis of the use of argument and persuasive language in text/s, a text intended to position an audience. Assessment tasks for Outcome 1 must include at least one analytical and one creative response to set texts. One assessment task, but no more than one task, in Unit 1 must be in oral or multimodal form.

In Unit 2 students will be assessed via any of the following: a comparative analytical response to set texts, a persuasive text that presents an argument or viewpoint or an analysis of the use of argument and persuasive language in text/s. Assessments tasks for Outcomes 1 and 2 must be in written form.

Achievement for VCE purposes will be indicated by an S (Satisfactory)  
Non-achievement will be indicated by an N (Not Satisfactory)

Level of achievement will be indicated by a letter grade and percentage. This result is for College reporting only.

Students will complete an examination at the end of each unit. The examination contributes 40% to the overall grade for this subject.

### Prerequisites

English is compulsory.

# UNIT 3 & 4 ENGLISH

## Subject Introduction

The benefit to studying English is the development of a student's literary skills. Unit 3 & 4 English continues to develop critical and imaginative thinking, aesthetic appreciation and creativity. Effective use of the English language in both written and oral form and in specific contexts enables students to better function in the world of study and work.

## Unit Descriptions

<b>Unit 3</b>	<b>Unit 4</b>
<p>Students identify, discuss and analyse how the features of selected texts create meaning and how they influence interpretation. Students particularly examine the ways in which readers are invited to respond to texts, they then develop and justify their own interpretations.</p> <p>Students will also analyse and compare the use of argument and language in texts to debate a topical issue. Students read and view media texts in a variety of forms to develop their understanding of the way in which language and argument complement one another in positioning a reader. Students present their understanding in both written and oral form</p>	<p>Students study and explore the meaningful connections between two texts. They analyse texts, comparing characters and settings, voice and structure and how ideas, issues and themes are conveyed. They will complete written analysis comparing the selected texts.</p> <p>Students will continue to build on their understanding of both analysis and construction of texts that attempt to influence audiences. They use their knowledge of argument and persuasive language as a basis for the development of their own persuasive texts.</p>

## UNIT 3 & 4 ENGLISH

### Outcomes & Weightings

Unit 3	Marks	Unit 4	Marks
1. Produce an analytical interpretation of a selected text, and a creative response to a different selected text	60	1. Produce a detailed comparison which analyses how two selected texts present ideas, issues and themes	60
2. Analyse and compare the use of argument and persuasive language in texts that present a point of view on an issue currently debated in the media	40	2. Construct a sustained and reasoned point of view on an issue currently debated in the media	40

### Assessment

Students will be assessed on whether they have satisfactorily achieved all outcomes via a variety of written and oral texts.

Achievement for VCE purposes will be indicated by an S (Satisfactory)

Non-achievement will be indicated by an N (Not Satisfactory)

Level of achievement for Study Score and ATAR purposes is determined from School Assessed Coursework (Moderated) and an End of Year Examination.

Contribution to final assessment:

Unit 3 School Assessed Coursework	25%
Unit 4 School Assessed Coursework	25%
3 hour End of Year Examination (External Assessment)	50%

### Prerequisites

English is compulsory.

**Sequence Requirements:** Units 3 and 4 must be completed in sequence to obtain a Study Score.

# UNIT 1 & 2 FOOD STUDIES

## Subject Introduction

Unit 1 & 2 Food Studies provides students with knowledge of Australia's varied and abundant food supply, examining the background to this abundance and exploring reasons for our food choices. Students develop their understanding of food while acquiring skills that enable them to take greater ownership of their food decisions and eating patterns.

Unit 1 & 2 Food Studies complements and supports further training and employment opportunities in the fields of home economics, food technology, food manufacturing and hospitality.

## Unit Descriptions

<b>Unit 1: Food origins</b>	<b>Unit 2: Food makers</b>
<p>Students investigate the origins and roles of food through time and across the world.</p> <p>In Area of Study 1 students explore how humanity has historically sourced its food, examining the general progression from hunter-gatherer to rural-based agriculture, to today's urban living and global trade in food. Students consider the origins and significance of food through inquiry into particular food-producing regions of the world.</p> <p>In Area of Study 2 students focus on Australia. They look at Australian indigenous food prior to European settlement and how food patterns have changed since, particularly through the influence of food production, processing and manufacturing industries and immigration. Students investigate cuisines that are part of Australia's culinary identity today and reflect on the concept of an Australian cuisine. They consider the influence of technology and globalisation on food patterns. Throughout this unit, students complete topical and contemporary practical tasks to enhance, demonstrate and share their learning with others.</p>	<p>Students investigate food systems in contemporary Australia.</p> <p>Area of Study 1 focuses on commercial food production industries, while Area of Study 2 looks at food production in small-scale domestic settings, as both a comparison and complement to commercial production. Students gain insight into the significance of food industries to the Australian economy and investigate the capacity of industry to provide safe, high-quality food that meets the needs of consumers.</p> <p>Students use practical skills and knowledge to produce foods and consider a range of evaluation measures to compare their foods to commercial products. They consider the effective provision and preparation of food in the home, and analyse the benefits and challenges of developing and using practical food skills in daily life. In demonstrating their practical skills, students design new food products and adapt recipes to suit particular needs and circumstances. They consider the possible extension of their role as small-scale food producers by exploring potential entrepreneurial opportunities.</p>



# UNIT 1 & 2 FOOD STUDIES

## Outcomes

Unit 1	Unit 2
1. Identify and explain major factors in the development of a globalised food supply, and demonstrate adaptations of selected food from earlier cuisines through practical activities.	1. Describe Australia's major food industries, analyse relationships between food suppliers and consumers, discuss measures in place to ensure a safe food supply and design a brief and a food product that demonstrates the application of commercial principles.
2. Describe patterns of change in Australia's food industries and cultures, and use foods indigenous to Australia and those introduced through migration in the preparation of food products.	2. Compare and evaluate similar foods prepared in different settings, explain the influences on effective food provision and preparation in the home, and design and create a food product that illustrates potential adaptation in a commercial context.

## Assessment

Students will be assessed on whether they have satisfactorily achieved the outcomes via a range of practical activities with records that reflect on ingredients found in earlier cultures, and any of the following: a short written report: media analysis, research inquiry, historical timeline, comparative food-testing analysis or product evaluation, oral presentation, practical demonstration, design brief, video or podcast.

Achievement for VCE purposes will be indicated by an S (Satisfactory)  
Non-achievement will be indicated by an N (Not Satisfactory)

Level of achievement will be indicated by a letter grade and percentage. This result is for College reporting only.

Students will complete an examination at the end of each unit. The examination contributes 30% to the overall grade for this subject.

## Prerequisites

No specific subject is required.

# UNIT 3 & 4 FOOD STUDIES

## Subject Introduction

Unit 3 & 4 Food Studies provides students with knowledge of Australia's varied and abundant food supply, examining the background to this abundance and exploring reasons for our food choices. Students develop their understanding of food while acquiring skills that enable them to take greater ownership of their food decisions and eating patterns.

Unit 3 & 4 Food Studies complements and supports further training and employment opportunities in the fields of home economics, food technology, food manufacturing and hospitality.

## Unit Descriptions

Unit 3: Food in daily life	Unit 4: Food issues, challenges and futures
<p>Students investigate the physiology of eating and appreciating food, and the microbiology of digestion. They also investigate the functional properties of food and the changes that occur during food preparation and cooking. They analyse the scientific rationale behind the Australian Dietary Guidelines and the Australian Guide to Healthy Eating and develop their understanding of diverse nutrient requirements.</p> <p>Students inquire into the role of food in shaping and expressing identity and connectedness and the ways in which food information can be filtered and manipulated. They investigate behavioural principles that assist in the establishment of lifelong, healthy dietary patterns.</p>	<p>Students examine debates about global and Australian food systems. Students research a selected topic, seeking clarity on current situations and points of view, considering solutions and analysing work undertaken to solve problems and support sustainable futures.</p> <p>Students consider how to assess information and draw evidence-based conclusions. They apply this methodology to navigate contemporary food fads, trends and diets. They practise and improve their food selection skills by interpreting food labels and analysing the marketing terms used on food packaging.</p>

## UNIT 3 & 4 FOOD STUDIES

### Outcomes & Weightings

Unit 3	Marks	Unit 4	Marks
1. Explain the processes of eating and digesting food and absorption of macronutrients, explain causes and effects of food allergies, food intolerances and food contamination, analyse food selection models, and apply principles of nutrition and food science in the creation of food product.	50	1. Explain a range of food systems issues, respond to a selected debate with analysis of problems and proposals for future solutions, apply questions of sustainability and ethics to the selected food issue and develop and create a food repertoire that reflects personal food values and goals.	60
2. Explain and analyse factors affecting food access and choice, analyse the influences that shape an individual's food values, beliefs and behaviours, and apply practical skills to create a range of healthy meals for children and families.	50	2. Explain a variety of food information contexts, analyse the formation of food beliefs, evaluate a selected food trend, fad or diet and create food products that meet the Australian Dietary Guidelines.	40

### Assessment

Students will be assessed on whether they have satisfactorily achieved the outcomes via a range of practical activities with records that reflect on the topic, and any of the following: a short written report, media analysis, research inquiry, structured questions, case study analysis, annotated visual report, oral presentation, practical demonstration, video or podcast.

Achievement for VCE purposes will be indicated by an S (Satisfactory)  
Non-achievement will be indicated by an N (Not Satisfactory)

Level of achievement for Study Score and ATAR purposes is determined from School Assessed Coursework (Moderated) and an End of Year Examination.

Contribution to final assessment:

Unit 3 School Assessed Coursework	30%
Unit 4 School Assessed Coursework	30%
1.5 hour End of Year Examination (External Assessment)	40%

### Prerequisites

No specific subject is required.

**Sequence Requirements:** Units 3 and 4 must be completed in sequence to obtain a Study Score.

# UNIT 1 & 2 HEALTH AND HUMAN DEVELOPMENT

## Subject Introduction

Unit 1 & 2 Health and Human Development assists students with the skills and knowledge to make informed decisions about their own health and to recognise the importance of health in society.

This subject would be of interest to students who intend to pursue further study in the areas of health promotion, community health research and policy development, humanitarian aid work, allied health practices, education and the health profession.

## Unit Descriptions

<b>Unit 1: The health and development of Australia's youth</b>	<b>Unit 2: Individual human development and health issues</b>
<p>Focuses on the health and individual human development of Australia's youth.</p> <p>Students identify issues that have an impact on the health and individual human development of Australia's youth. Students investigate one health issue in detail and analyse personal, community and government strategies or programs that affect youth health and individual human development.</p>	<p>Focuses on the health and individual human development for the lifespan stages of prenatal, childhood and adulthood.</p> <p>Students identify issues that affect the health and individual human development of Australia's mothers and babies, children and adults. Students investigate health issues in detail and analyse personal, community and government strategies and programs that affect the health and individual human development of mothers and babies, children and adults.</p>

# UNIT 1 & 2 HEALTH AND HUMAN DEVELOPMENT

## Outcomes

Unit 1	Unit 2
1. Describe the dimensions of, and the interrelationships within and between, youth health and individual human development, and analyse the health status of Australia's youth using appropriate measurements.	1. Describe and explain factors that affect the health and individual human development during the prenatal stage.
2. Describe and explain the factors that have an impact on the health and individual human development of Australia's youth, outline health issues relevant to Australia's youth and, in relation to a specific health issue, analyse strategies or programs that have an impact on youth health and development.	2. Describe and explain factors that affect the health and individual human development of Australia's children.
	3. Describe and explain the factors that affect the health and individual human development of Australia's adults.

## Assessment

Students will be assessed on whether they have satisfactorily achieved the outcomes via a selection of the following: tests, case study analyses, data analyses, visual, oral and/or multimedia presentations, a blog or a written report or research assignment.

Achievement for VCE purposes will be indicated by an S (Satisfactory)  
Non-achievement will be indicated by an N (Not Satisfactory)

Level of achievement will be indicated by a letter grade and percentage. This result is for College reporting only.

Students will complete an examination at the end of each unit. The examination contributes 40% to the overall grade for this subject.

## Prerequisites

No specific subject is required.

# UNIT 3 & 4 HEALTH AND HUMAN DEVELOPMENT

## Subject Introduction

Unit 3 & 4 Health and Human Development continues to build on the knowledge and skills of students to make informed decisions about their own health and to recognise the importance of health in Australian society and in a global context.

This subject would be of interest to students who intend to pursue further study in the areas of health promotion, community health research and policy development, humanitarian aid work, allied health practices, education and the health profession.

## Unit Descriptions

<b>Unit 3: Australia's health</b>	<b>Unit 4: Global health and human development</b>
<p>In this unit students develop understanding of the health status of Australians by investigating the burden of disease and the health of population groups in Australia. Students use key health measures to compare health in Australia and analyse how determinants of health, including the physical environment, biological, behavioural and social, contribute to variations in health status.</p> <p>The NHPAs initiative seeks to bring a national health policy focus to diseases and conditions that have a major impact on the health of Australians. The NHPAs represent the disease groups with the largest burden of disease and potential costs (direct, indirect and intangible) to the Australian community. Students examine the development of the NHPAs and their relationship to burden of disease in Australia. They analyse initiatives designed to promote health relevant to the NHPAs, and come to understand that nutrition is an important factor for a number of the NHPAs.</p> <p>Students examine different models of health and health promotion. Students investigate the roles and responsibilities of governments in addressing health needs and promoting health for all through the provision of a national health system and health promotion initiatives. They examine the role of government and non-government organisations in providing programs and support for the promotion of healthy eating.</p>	<p>This area of study explores global health, human development and sustainability. Students identify similarities and differences in the health status between people living in developing countries and Australians, and analyse reasons for the differences. The role of the United Nations' Sustainable Development Goals is investigated in relation to achieving sustainable improvements in health status and human development.</p> <p>This area of study explores the role of international organisations including the UN and WHO in achieving sustainable improvements in health and human development. Students consider strategies designed to promote health and sustainable human development globally, as well as Australia's contribution to international health programs and contributions to non-government organisations.</p>

## UNIT 3 & 4 HEALTH AND HUMAN DEVELOPMENT

### Outcomes & Weightings

Unit 3	Marks	Unit 4	Marks
1. Compare the health status of Australia's population with that of other developed countries, compare and explain the variations in health status of population groups within Australia and discuss the role of the National Health Priority Areas in improving Australia's health status.	60	1. Analyse factors contributing to variations in health status between Australia and developing countries, and explain the contribution the United Nations' Sustainable Development Goals can make to promoting global health and sustainable human development.	50
2. Discuss and analyse approaches to health and health promotion, and describe Australia's health system and the different roles of government and non-government organisations in promoting health.	40	2. Describe and evaluate programs implemented by international and Australian government and non-government organisations, and analyse the interrelationships between health, human development and sustainability.	50

### Assessment

Students will be assessed on whether they have satisfactorily achieved the outcomes via a selection of the following: tests, case study analyses, data analyses, visual, oral and/or multimedia presentations, a blog or a written report or research assignment.

Achievement for VCE purposes will be indicated by an S (Satisfactory)  
Non-achievement will be indicated by an N (Not Satisfactory)

Level of achievement for Study Score and ATAR purposes is determined from School Assessed Coursework (Moderated) and an End of Year Examination.

Contribution to final assessment:

Unit 3 School Assessed Coursework	25%
Unit 4 School Assessed Coursework	25%
2 hour End of Year Examination (External Assessment)	50%

### Prerequisites

No specific subject is required.

**Sequence Requirements:** Units 3 and 4 must be completed in sequence to obtain a Study Score.

# UNIT 1 & 2 HISTORY: 20<sup>th</sup> CENTURY

## Subject Introduction

History involves inquiry into human action in the past, to make meaning of the past using primary sources as evidence. Although history deals with the particular – specific individuals and key events – the potential scope of historical inquiry is vast and formed by the questions that historians pursue, the availability of sources and the capacity of historians to interpret those sources. VCE History reflects this range of inquiry by enabling students to engage with a range of times, people, places and ideas. Twentieth century History examines the aftermath of the Great War as well as the causes and consequences of World War Two.

## Unit Descriptions

<b>Unit 1: Twentieth century history 1918-1939</b>	<b>Unit 2: Twentieth century history 1945-2000</b>
<p>Students explore the nature of political, social and cultural change in the period between the world wars.</p> <p>World War One (WW1) is regarded by many as marking the beginning of twentieth century history since it represented such a complete departure from the past and heralded changes that were to have an impact for decades. The post-war treaties ushered in a period where the world was, to a large degree, reshaped with new borders, movements, ideologies and power structures. These changes affected developments in Europe, the USA, Asia, Africa and the Middle East. Economic instability caused by the Great Depression contributed to the development of political movements. Despite ideals about future peace, reflected in the establishment of the League of Nations, the world was again overtaken by war in 1939.</p> <p>The period after WW1 was characterised by significant social and cultural change in the contrasting decades of the 1920s and 1930s. New fascist governments used the military, education and propaganda to impose controls on the way people lived, to exclude particular groups of people and silence criticism. In Germany, the persecution of the Jewish people intensified. In the USSR, millions were forced to work in state-owned factories and farms and had limited personal freedom. Japan became increasingly militarised and anti-western. In the USA, the consumerism and material progress of the 1920s was tempered by the Great Crash of 1929. Writers, artists, musicians, choreographers and filmmakers reflected, promoted or resisted political, economic and social changes.</p>	<p>In Unit 2 students explore the nature and impact of the Cold War and challenges and changes to existing political, economic and social arrangements in the second half of the twentieth century.</p> <p>The establishment of the United Nations in 1945 was intended to take an internationalist approach to avoiding warfare, resolving political tensions and addressing threats to human life and safety. The Universal Declaration of Human Rights adopted in 1948 was the first global expression of human rights.</p> <p>Despite internationalist moves, the second half of the twentieth century was dominated by the competing ideologies of democracy and communism, setting the backdrop for the Cold War.</p> <p>This period also saw challenge and change to the established order in many countries. The continuation of moves towards decolonisation led to independence movements in former colonies in Africa, the Middle East, Asia and the Pacific. New countries were created and independence was achieved through both military and diplomatic means. Old conflicts also continued and terrorism became increasingly global. The second half of the twentieth century also saw the rise of social movements that challenged existing values and traditions, such as the civil rights movement, feminism and environmental movements.</p>



## UNIT 1 & 2 HISTORY: 20<sup>th</sup> CENTURY

### Outcomes

Unit 1	Unit 2
1. Explain the consequences of the peace treaties which ended World War One, the impact of ideologies on nations and the events that led to World War Two.	1. Explain the ideological divisions in the post-war period and analyse the nature, development and impact of the Cold War on nations and people, in relation to one or more particular conflicts in the period.
2. Explain patterns of social life and cultural change in one or more contexts, and analyse the factors which influenced changes to social life and culture, in the inter-war years.	2. Explain the causes and nature of challenge and change in relation to two selected contexts in the second half of the twentieth century and analyse the consequences for nations and people.

### Assessment

Students will be assessed on whether they have satisfactorily achieved the outcomes via a selection of the following: a historical inquiry, an analysis of primary sources, an analysis of historical interpretations, or an essay.

Achievement for VCE purposes will be indicated by an S (Satisfactory)  
Non-achievement will be indicated by an N (Not Satisfactory)

Level of achievement will be indicated by a letter grade and percentage. This result is for College reporting only.

Students will complete an examination at the end of each unit. The examination contributes 40% to the overall grade for this subject.

### Prerequisites

No specific subject is required.

# UNIT 3 & 4 HISTORY: REVOLUTIONS

## Subject Introduction

In Units 3 and 4 Revolutions students investigate the significant historical causes and consequences of political revolution. Revolutions represent great ruptures in time and are a major turning point which brings about the collapse and destruction of an existing political order resulting in a pervasive change to society. Revolutions are caused by the interplay of ideas, events, individuals and popular movements. Their consequences have a profound effect on the political and social structures of the post-revolutionary society. Revolution is a dramatically accelerated process whereby the new order attempts to create political and social change and transformation based on a new ideology. Progress in a post-revolutionary society is not guaranteed or inevitable. Post-revolutionary regimes are often threatened internally by civil war and externally by foreign threats. These challenges can result in a compromise of revolutionary ideals and extreme measures of violence, oppression and terror.

In these units students develop an understanding of the complexity and multiplicity of causes and consequences in the revolutionary narrative. They construct an argument about the past using primary sources as evidence and evaluate the extent to which the revolution brought change to the lives of people. They consider how perspectives of the revolution give an insight into the continuity and change experienced by those who lived through dramatic revolutionary moments. Students evaluate historical interpretations about the causes and consequences of revolution and the effects of change instigated by the new order.

## Unit Descriptions

<b>Unit 3: American Revolution of 1776</b>	<b>Unit 4: Russian Revolution of October 1917</b>
<p>Students consider the following questions in the context of the American Revolution:</p> <ul style="list-style-type: none"><li>• What were the significant causes of revolution?</li><li>• How did the actions of popular movements and particular individuals contribute to triggering a revolution?</li><li>• To what extent did social tensions and ideological conflicts contribute to the outbreak of revolution?</li><li>• How did the consequences of revolution shape the new order?</li><li>• How did the new regime consolidate its power?</li><li>• How did the revolution affect the experiences of those who lived through it?</li><li>• To what extent was society changed and revolutionary ideas achieved?</li></ul>	<p>Students consider the following questions in the context of the Russian Revolution:</p> <ul style="list-style-type: none"><li>• What were the significant causes of revolution?</li><li>• How did the actions of popular movements and particular individuals contribute to triggering a revolution?</li><li>• To what extent did social tensions and ideological conflicts contribute to the outbreak of revolution?</li><li>• How did the consequences of revolution shape the new order?</li><li>• How did the new regime consolidate its power?</li><li>• How did the revolution affect the experiences of those who lived through it?</li><li>• To what extent was society changed and revolutionary ideas achieved?</li></ul>

## UNIT 3 & 4 HISTORY: REVOLUTIONS

### Outcomes & Weightings

Unit 3	Marks	Unit 4	Marks
1. Analyse the causes of revolution, and evaluate the contribution of significant ideas, events, individuals and popular movements.	50	1. Analyse the causes of revolution, and evaluate the contribution of significant ideas, events, individuals and popular movements.	50
2. Analyse the consequences of revolution and evaluate the extent of change brought to society.	50	2. Analyse the consequences of revolution and evaluate the extent of change brought to society.	50

### Assessment

Students will be assessed on whether they have satisfactorily achieved the outcomes via a selection of the following: a historical inquiry, an analysis of primary sources, an analysis of historical interpretations, or an essay.

Achievement for VCE purposes will be indicated by an S (Satisfactory)  
Non-achievement will be indicated by an N (Not Satisfactory)

Level of achievement for Study Score and ATAR purposes is determined from School Assessed Coursework (Moderated) and an End of Year Examination.

Contribution to final assessment:

Unit 3 School Assessed Coursework	25%
Unit 4 School Assessed Coursework	25%
2 hour End of Year Examination (External Assessment)	50%

### Prerequisites

No specific subject is required. A Unit 1 and 2 History study is preferred.

**Sequence Requirements:** Units 3 and 4 must be completed in sequence to obtain a Study Score.

# UNIT 1 & 2 LEGAL STUDIES

## Subject Introduction

Unit 1 & 2 Legal Studies provides students with an introduction to the worlds of Criminal law and Civil law. Students examine the justice system and consider its fairness, as well as the areas of alternate dispute resolution.

This subject would be of interest to students who intend to pursue further study in business/commerce or justice, including law enforcement, criminal justice and community and health services.

## Unit Descriptions

<b>Unit 1: Criminal law in action</b>	<b>Unit 2: Issues in civil law</b>
<p>Students examine the need for laws; investigate key features of criminal law, consider the role of parliament and subordinate bodies in law-making and the impact of the Victorian Charter of Rights and Responsibilities on Victorian law enforcement and adjudication.</p> <p>Students investigate the processes and procedures followed by courts in hearing and resolving criminal cases; and consider the effectiveness of the criminal justice system in achieving justice.</p>	<p>Civil law regulates the rights and responsibilities that exist between individuals, groups and organisations. If legal rights have been infringed, the aggrieved party may pursue legal action through the court system, through a tribunal, or by using one of the methods of dispute resolution.</p> <p>Students examine the rights that are protected, as well as obligations that laws impose. They investigate types of civil laws and the resolution of civil disputes through judicial determination and alternative methods.</p>

## UNIT 1 & 2 LEGAL STUDIES

### Outcomes

Unit 1	Unit 2
1. Explain the need for effective laws and describe the main sources and types of law in society.	1. Explain the principles of civil law, law-making by courts, and elements of torts, and apply these to relevant cases.
2. Explain the key principles and types of criminal law, apply the key principles to relevant cases, and discuss the impact of criminal activity on the individual and society.	2. Explain and evaluate the processes for the resolution of civil disputes.
3. Describe the processes for the resolution of criminal cases, and discuss the capacity of these processes to achieve justice.	3. Explain one or more area/s of civil law, and discuss the legal system's capacity to respond to issues and disputes related to the selected area/s of law.
	4. Describe an Australian case illustrating rights issues, and discuss the impact of the case on the legal system and the rights of individuals.

### Assessment

Students will be assessed on whether they have satisfactorily achieved the outcomes via a selection of the following: structured assignment, essay; mock court or role-play; folio and report; case study; test; report (written, visual, oral or multimedia).

Achievement for VCE purposes will be indicated by an S (Satisfactory)  
Non-achievement will be indicated by an N (Not Satisfactory)

Level of achievement will be indicated by a letter grade and percentage. This result is for College reporting only.

Students will complete an examination at the end of each unit. The examination contributes 40% to the overall grade for this subject.

### Prerequisites

No specific subject is required.

# UNIT 3 & 4 LEGAL STUDIES

## Subject Introduction

Unit 3 & 4 Legal Studies explores, in more detail, the institutions that determine our laws, and their law-making powers and processes. It also examines the institutions that resolve disputes and analyses the effectiveness of the legal system.

This subject would be of interest to students who intend to pursue further study in business/commerce or justice, including law enforcement, criminal justice and community and health services.

## Unit Descriptions

<b>Unit 3: Law-making</b>	<b>Unit 4: Resolution and justice</b>
<p>In this unit students develop an understanding of the institutions that determine our laws, their powers and processes. Students develop an appreciation of the complex nature of law-making.</p> <p>Students develop an understanding of the Commonwealth Constitution in their lives and on society as a whole, and of the role of the High Court.</p> <p>Students investigate the importance of courts as law-makers and evaluate their effectiveness as such.</p>	<p>Students examine the institutions that adjudicate criminal and civil disputes and investigate methods of dispute resolution.</p> <p>Students investigate the processes and procedures followed in courtrooms and develop an understanding of the adversary system of trial and jury system as well as trial and pre-trial procedures.</p> <p>Students consider the extent to which court processes contribute to the effective operation of the legal system, and consider reforms or changes that could further improve its effective operation.</p>

## UNIT 3 & 4 LEGAL STUDIES

### Outcomes & Weightings

Unit 3	Marks	Unit 4	Marks
1. Explain the structure and role of parliament, including its processes and effectiveness as a law-making body, describe why legal change is needed, and the means by which such change can be influenced.	25	1. Describe and evaluate the effectiveness of institutions and methods for the determination of criminal cases and the resolution of civil disputes.	40
2. Explain the role of the Commonwealth Constitution in defining law-making powers within a federal structure, analyse the means by which law-making powers may change, and evaluate the effectiveness of the Commonwealth Constitution in protecting human rights.	50	2. Explain the processes and procedures for the resolution of criminal cases and civil disputes, and evaluate their operation and application, and evaluate the effectiveness of the legal system.	60
3. Describe the role and operation of courts in law-making, evaluate their effectiveness as law-making bodies and discuss their relationship with parliament.	25		

### Assessment

Students will be assessed on whether they have satisfactorily achieved the outcomes via a selection of the following: a case study; structured questions; a test; an essay; a report in written format; a report in multimedia format and a folio of exercises.

Achievement for VCE purposes will be indicated by an S (Satisfactory)  
Non-achievement will be indicated by an N (Not Satisfactory)

Level of achievement for Study Score and ATAR purposes is determined from School Assessed Coursework (Moderated) and an End of Year Examination.

Contribution to final assessment:

Unit 3 School Assessed Coursework	25%
Unit 4 School Assessed Coursework	25%
2 hour End of Year Examination (External Assessment)	50%

### Prerequisites

No specific subject is required.

**Sequence Requirements:** Units 3 and 4 must be completed in sequence to obtain a Study Score.

# MATHEMATICS:

## UNIT 1 & 2 GENERAL MATHEMATICS

### Subject Introduction

General Mathematics Units 1 and 2 provides for a range of courses of study involving non-calculus based topics for a broad range of students and may be implemented in various ways to reflect student interests in, and applications of, mathematics. They incorporate topics that provide preparation for various combinations of studies at Units 3 and 4 and cover assumed knowledge and skills for those units. Some students will not study Mathematics beyond Units 1 and 2, while others will intend to study Further Mathematics Units 3 and 4. The areas of study for General Mathematics Unit 1 and Unit 2 are 'Algebra and structure', 'Arithmetic and number', 'Discrete mathematics', 'Geometry, measurement and trigonometry', 'Graphs of linear and non-linear relations' and 'Statistics'.

Students are reminded to confirm tertiary entrance requirements when selecting their mathematics program.

### Unit Descriptions

Unit 1	Unit 2
<p>To suit the range of students entering the study, content will be selected from the six areas of study: Algebra and structure, arithmetic and number, discrete mathematics, geometry, measurement and trigonometry, graphs of linear and non-linear relations and statistics. Because of the core content of Units 3 &amp; 4 Further Mathematics, arithmetic and number and statistics will be covered.</p> <p>In undertaking these units, students are expected to be able to apply techniques, routines and processes involving rational and real arithmetic, sets, lists and tables, diagrams and geometric constructions, algebraic manipulation, equations and graphs with and without the use of technology. They should have facility with relevant mental and by-hand approaches to estimation and computation. The use of numerical, graphical, geometric, symbolic, financial and statistical functionality of technology for teaching and learning mathematics, for working mathematically, and in related assessment, is to be incorporated throughout each unit as applicable.</p>	<p>Unit 2 is designed to progress from Unit 1 and content will be selected from the six areas of study: Algebra and structure, arithmetic and number, discrete mathematics, geometry, measurement and trigonometry, graphs of linear and non-linear relations and statistics. Because of the core content of Units 3 &amp; 4 Further Mathematics, arithmetic and number and statistics will be covered.</p> <p>In undertaking these units, students are expected to be able to apply techniques, routines and processes involving rational and real arithmetic, sets, lists and tables, diagrams and geometric constructions, algebraic manipulation, equations and graphs with and without the use of technology. They should have facility with relevant mental and by-hand approaches to estimation and computation. The use of numerical, graphical, geometric, symbolic, financial and statistical functionality of technology for teaching and learning mathematics, for working mathematically, and in related assessment, is to be incorporated throughout each unit as applicable.</p>



## UNIT 1 & 2 GENERAL MATHEMATICS

### Outcomes

Units 1 & 2
1. Define and explain key concepts as specified in the selected content from the areas of study, and apply a range of related mathematical routines and procedures.
2. Select and apply mathematical facts, concepts, models and techniques from the topics covered in the unit to investigate and analyse extended application problems in a range of contexts.
3. Select and use numerical, graphical, symbolic and statistical functionalities of technology to develop mathematical ideas, produce results and carry out analysis in situations requiring problem-solving, modelling or investigative techniques or approaches.

### Assessment

Students will be assessed on whether they have satisfactorily achieved the outcomes via a selection of the following: assignments, tests, problem solving tasks, modelling tasks, mathematical investigations and summary or review notes.

Achievement for VCE purposes will be indicated by an S (Satisfactory)  
Non-achievement will be indicated by an N (Not Satisfactory)

Level of achievement will be indicated by a letter grade and percentage. This result is for College reporting only.

Students will complete an examination at the end of each unit. The examination contributes 40% to the overall grade for this subject.

### Prerequisites

Access to subject will be based on the recommendation of a member of the Mathematics Faculty.

# MATHEMATICS:

## UNIT 3 & 4 FURTHER MATHEMATICS

### Subject Introduction

Further Mathematics Units 3 and 4 are designed to be widely accessible and comprise a combination of non-calculus based content from a prescribed core and a selection of two from four possible modules across a range of application contexts. They provide general preparation for employment or further study, in particular where data analysis, recursion and number patterns are important. The assumed knowledge and skills for the Further Mathematics Units 3 and 4 prescribed core are covered in specified topics from General Mathematics Units 1 and 2. Students who have done only Mathematical Methods Units 1 and 2 will also have had access to assumed knowledge and skills to undertake Further Mathematics but may need to undertake some supplementary study of statistics content. Further Mathematics consists of two areas of study, a compulsory Core area of study to be completed in Unit 3 and an Applications area of study to be completed in Unit 4.

Students are reminded to confirm tertiary entrance requirements when selecting their mathematics program.

### Unit Descriptions

Unit 3: Core	Unit 4: Applications
<p>The Core comprises 'Data analysis' and 'Recursion and financial modelling'. 'Data analysis' comprises 40 per cent of the content to be covered, 'Recursion and financial modelling' comprises 20 per cent of the content to be covered. patterns and recursion'.</p> <p>Students are expected to be able to apply techniques, routines and processes involving rational and real arithmetic, sets, lists and tables, diagrams and geometric constructions, algebraic manipulation, equations, and graphs. They should have a facility with relevant mental and by-hand approaches to estimation and computation. The use of numerical, graphical, geometric, symbolic, financial and statistical functionality of technology for teaching and learning mathematics, for working mathematically, and in related assessment, is to be incorporated throughout each unit as applicable.</p>	<p>The Applications comprises <b>two</b> modules to be completed in their entirety, from a selection of four possible modules: 'Matrices', 'Networks and decision mathematics', 'Geometry and measurement' and 'Graphs and relations'. The two modules selected will comprise 20 per cent of the content to be covered of the Unit 3 and 4 sequence.</p> <p>In undertaking these units, students are expected to be able to apply techniques, routines and processes involving rational and real arithmetic, sets, lists and tables, diagrams and geometric constructions, algebraic manipulation, equations, and graphs. They should have a facility with relevant mental and by-hand approaches to estimation and computation. The use of numerical, graphical, geometric, symbolic, financial and statistical functionality of technology for teaching and learning mathematics, for working mathematically, and in related assessment, is to be incorporated throughout each unit as applicable.</p>

## UNIT 3 & 4 FURTHER MATHEMATICS

### Outcomes & Weightings

Unit 3	Marks	Unit 4	Marks
1. Define and explain key concepts and apply related mathematical techniques and models as specified in Area of Study 1 (core topics) in routine contexts.	15	1. Define and explain key concepts as specified in the content from the two selected modules, and apply related mathematical techniques and models in routine contexts.	10
2. Select and apply the mathematical concepts, models and techniques as specified in Area of Study 1 (core topics) in a range of contexts of increasing complexity.	30	2. Select and apply the mathematical concepts, models and techniques from the two selected modules in a range of contexts of increasing complexity.	20
3. Select and appropriately use numerical, graphical, symbolic and statistical functionalities of technology to develop mathematical ideas, produce results and carry out analysis in situations requiring problem-solving, modelling or investigative techniques or approaches.	15	3. Select and appropriately use numerical, graphical, symbolic and statistical functionalities of technology to develop mathematical ideas, produce results and carry out analysis in situations requiring problem-solving, modelling or investigative techniques or approaches.	10

### Assessment

Students will be assessed on whether they have satisfactorily achieved the outcomes via extended modeling or problem-solving tasks and applications tasks.

Achievement for VCE purposes will be indicated by an S (Satisfactory)

Non-achievement will be indicated by an N (Not Satisfactory)

Level of achievement for Study Score and ATAR purposes is determined from School Assessed Coursework (Moderated) and an End of Year Examination.

Contribution to final assessment:

Unit 3 School Assessed Coursework	20%
Unit 4 School Assessed Coursework	14%
1.5 hour End of Year Examination 1	33% (External Assessment)
2 hour End of Year Examination 2	33% (External Assessment)

Examination 1 is designed to assess students' knowledge of mathematical concepts, models and techniques and their ability to reason, interpret, and apply this knowledge. Examination 2 is designed to assess students' ability to select and apply mathematical facts, concepts, models and techniques to solve extended application problems in a range of contexts.

### Prerequisites

General Mathematics Units 1 & 2 or Mathematical Methods Units 1 & 2 with possible supplementary work on statistics.

**Sequence Requirements:** Units 3 and 4 must be completed in sequence to obtain a Study Score.

# MATHEMATICS:

## UNIT 1 & 2 MATHEMATICAL METHODS

### Subject Introduction

Mathematical Methods Units 1 and 2 provide an introductory study of simple elementary functions of a single real variable, algebra, calculus, probability and statistics and their applications in a variety of practical and theoretical contexts. They are designed as preparation for Mathematical Methods Units 3 and 4 and contain assumed knowledge and skills for these units. The focus of Unit 1 is the study of simple algebraic functions, and the areas of study are 'Functions and graphs', 'Algebra', 'Calculus' and 'Probability and statistics'. In Unit 2 students focus on the study of simple transcendental functions and the calculus of simple algebraic functions. The areas of study are 'Functions and graphs', 'Algebra', 'Calculus', and 'Probability and statistics'.

Students are reminded to confirm tertiary entrance requirements when selecting their mathematics program. Students should be aware that Mathematical Methods is often a prerequisite for Tertiary courses in Sciences, Engineering and Medicine.

### Unit Descriptions

Unit 1	Unit 2
<p>The focus of Unit 1 is the study of simple algebraic functions, and the areas of study are 'Functions and graphs', 'Algebra', 'Calculus' and 'Probability and Statistics'.</p> <p>Students cover the graphical representation of simple algebraic functions (polynomial and power functions) of a single real variable and the key features of functions and their graphs such as axis intercepts, domain (including the concept of maximal, natural or implied domain), co-domain and range, stationary points, asymptotic behaviour and symmetry.</p> <p>Polynomial functions of low degree and transformations of the plane are studied. Students cover constant and average rates of change and an introduction to instantaneous rate of change of a function in familiar contexts, including graphical and numerical approaches to estimating and approximating these rates of change. Finally, they consider the concepts of event, frequency, probability and representation of finite sample spaces and events using various forms such as lists, grids, venn diagrams, karnaugh maps, tables and tree diagrams.</p>	<p>In Unit 2 students focus on the study of simple transcendental functions and the calculus of simple algebraic functions. The areas of study are 'Functions and graphs', 'Algebra', 'Calculus', and 'Probability and statistics'.</p> <p>In Unit 2, students cover graphical representation of functions of a single real variable and the key features of graphs of functions such as axis intercepts, domain (including maximal, natural or implied domain), co-domain and range, asymptotic behaviour, periodicity and symmetry.</p> <p>In Unit 2 the focus is on the algebra of some simple transcendental functions and transformations of the plane. In the Calculus area of study, students cover first principles approach to differentiation, differentiation and anti-differentiation of polynomial functions and power functions by rule, and related applications including the analysis of graphs.</p> <p>In the Probability and Statistics area of study, students cover introductory counting principles and techniques and their application to probability and the law of total probability in the case of two events.</p>

## UNIT 1 & 2 MATHEMATICAL METHODS

### Outcomes

Units 1 & 2	
1.	Define and explain key concepts as specified in the content from the areas of study, and apply a range of related mathematical routines and procedures.
2.	Apply mathematical processes in non-routine contexts, including situations requiring problem-solving, modelling or investigative techniques or approaches, and analyse and discuss these applications of mathematics.
3.	Select and use numerical, graphical, symbolic and statistical functionalities of technology to develop mathematical ideas, produce results and carry out analysis in situations requiring problem-solving, modelling or investigative techniques or approaches.

### Assessment

Students will be assessed on whether they have satisfactorily achieved the outcomes via a selection of the following: assignments, tests, problem solving tasks and modelling tasks.

Achievement for VCE purposes will be indicated by an S (Satisfactory)

Non-achievement will be indicated by an N (Not Satisfactory)

Level of achievement will be indicated by a letter grade and percentage. This result is for College reporting only.

Students will complete an examination at the end of each unit. The examination contributes 40% to the overall grade for this subject.

### Prerequisites

Access to subject will be based on the recommendation of a member of the Mathematics Faculty. Students will need to have achieved a minimum of 70% average across the range of topics covered during Year 10 Mathematics.

# MATHEMATICS:

## UNIT 3 & 4 MATHEMATICAL METHODS

### Subject Introduction

Mathematical Methods Units 3 and 4 extend the introductory study of simple elementary functions of a single real variable, to include combinations of these functions, algebra, calculus, probability and statistics, and their applications in a variety of practical and theoretical contexts. Units 3 and 4 consist of the areas of study 'Functions and graphs', 'Calculus', 'Algebra' and 'Probability and statistics'. Assumed knowledge and skills for Mathematical Methods Units 3 and 4 are contained in Mathematical Methods Units 1 and 2, and will be drawn on, as applicable, in the development of related content from the areas of study, and key knowledge and skills for the outcomes of Mathematical Methods Units 3 and 4.

Students are reminded to confirm tertiary entrance requirements when selecting their mathematics program.

### Unit Descriptions

Unit 3	Unit 4
<p>In Functions and Graphs, students cover transformations of the plane and the behaviour of some elementary functions of a single real variable, including key features of their graphs such as axis intercepts, stationary points, points of inflection, domain (including maximal, implied or natural domain), co-domain and range, asymptotic behaviour and symmetry.</p> <p>The also consider the algebra of functions, including composition of functions, simple functional relations, inverse functions and the solution of equations. Students investigate systems of equations using various techniques for finding solutions.</p> <p>They look at the graphical treatment of limits, continuity and differentiability of functions of a single real variable, and differentiation, anti-differentiation and integration of these functions.</p> <p>In Probability and Statistics, the focus is on understanding the notion of a random variable, related parameters, properties and application and interpretation in context for a given probability distribution.</p>	<p>In the Functions and Graphs area of study students cover inverse circular functions, reciprocal functions, rational functions and other simple quotient functions, the absolute value function, graphical representation of these functions, and the analysis of key features of their graphs including asymptotic behaviour and the nature and location of stationary points, periodicity, and symmetry.</p> <p>In Algebra, students cover the expression of simple rational functions as a sum of partial fractions; the arithmetic and algebra of complex numbers, including polar form; points and curves in the complex plane; and an introduction to factorisation of polynomial functions over the complex field.</p> <p>In the Calculus area of study, students cover advanced calculus techniques for analytic and numeric differentiation and integration of a range of functions, and combinations of functions; and their application in a variety of theoretical and practical situations, including curve sketching, evaluation of arc length, area and volume, differential equations and kinematics.</p> <p>Finally, students cover the arithmetic and algebra of vectors, linear dependence and independence of a set of vectors, proof of geometric results using vectors, vector representation of curves in the plane and vector kinematics in one and two dimensions.</p>

## UNIT 3 & 4 MATHEMATICAL METHODS

### Outcomes & Weightings

Unit 3	Marks	Unit 4	Marks
1. Define and explain key concepts as specified in the content from the areas of study, and apply a range of related mathematical routines and procedures.	15	1. Define and explain key concepts as specified in the content from the areas of study, and apply a range of related mathematical routines and procedures.	15
2. Apply mathematical processes in non-routine contexts, including situations requiring problem-solving, modelling or investigative techniques or approaches, and analyse and discuss these applications of mathematics.	20	2. Apply mathematical processes in non-routine contexts, including situations requiring problem-solving, modelling or investigative techniques or approaches, and analyse and discuss these applications of mathematics.	20
3. Select and appropriately use numerical, graphical, symbolic and statistical functionalities of technology to develop mathematical ideas, produce results and carry out analysis in situations requiring problem-solving, modelling or investigative techniques or approaches.	15	3. Select and appropriately use numerical, graphical, symbolic and statistical functionalities of technology to develop mathematical ideas, produce results and carry out analysis in situations requiring problem-solving, modelling or investigative techniques or approaches.	15

### Assessment

Students will be assessed on whether they have satisfactorily achieved the outcomes via a selection of the following: analysis tasks, applications tasks and tests.

Achievement for VCE purposes will be indicated by an S (Satisfactory)  
Non-achievement will be indicated by an N (Not Satisfactory)

Level of achievement for Study Score and ATAR purposes is determined from School Assessed Coursework (Moderated) and an End of Year Examination.

Contribution to final assessment:

Unit 3 School Assessed Coursework	17%
Unit 4 School Assessed Coursework	17%
1 hour End of Year Examination (External Assessment without calculator, software or notes.)	22%
2 hour End of Year Examination (External Assessment with CAS calculator and bound reference)	44%

### Prerequisites

Mathematical Methods Unit 1 & 2 is required.

**Sequence Requirements:** Units 3 and 4 must be completed in sequence to obtain a Study Score.

# UNIT 1 & 2 PHYSICAL EDUCATION

## Subject Introduction

VCE Physical Education explores the complex interrelationships between anatomical, biomechanical, physiological and skill acquisition principles to understand their role in producing and refining movement, and examines behavioural, psychological, environmental and sociocultural influences on performance and participation in physical activity.

The assimilation of theoretical understanding and practice is central to the study of VCE Physical Education. Students participate in practical activities to examine the core concepts that underpin movement and that influence performance and participation in physical activity, sport and exercise. Through integrated physical, written, oral and digital learning experiences, students apply theoretical concepts and reflect critically on factors that affect all levels of performance and participation in sport, exercise and physical activity.

This VCE study is suitable for students with a wide range of aspirations, including those who wish to pursue further formal study at tertiary level or in vocational education and training settings. The study prepares students for such fields as the health sciences, exercise science and education, as well as providing valuable knowledge and skills for participating in their own sporting and physical activity pursuits to develop as critical practitioners and lifelong learners.

## Unit Descriptions

<b>Unit 1: The human body in motion</b>	<b>Unit 2: Physical activity, sport and society</b>
<p>In this unit students explore how the musculoskeletal and cardiorespiratory systems work together to produce movement. Through practical activities students explore the relationships between the body systems and physical activity, sport and exercise, and how the systems adapt and adjust to the demands of the activity. Students investigate the role and function of the main structures in each system and how they respond to physical activity, sport and exercise. They explore how the capacity and functioning of each system acts as an enabler or barrier to movement and participation in physical activity.</p> <p>Using a contemporary approach, students evaluate the social, cultural and environmental influences on movement. They consider the implications of the use of legal and illegal practices to improve the performance of the musculoskeletal and cardiorespiratory systems, evaluating perceived benefits and describing potential harms. They also recommend and implement strategies to minimise the risk of illness or injury to each system.</p>	<p>Through a series of practical activities, students experience and explore different types of physical activity promoted in their own and different population groups. They gain an appreciation of the level of physical activity required for health benefits. They collect data to determine perceived enablers of and barriers to physical activity and the ways in which opportunities for participation in physical activity can be extended in various communities, social, cultural and environmental contexts. Students investigate individual and population-based consequences of physical inactivity and sedentary behaviour.</p> <p>Students apply various methods to assess physical activity and sedentary behaviour levels at the individual and population level, and analyse the data in relation to physical activity and sedentary behaviour guidelines. Students study and critique a range of individual- and settings-based strategies that are effective in promoting participation in some form of regular physical activity.</p>



## UNIT 1 & 2 PHYSICAL EDUCATION

### Outcomes

Unit 1	Unit 2
<p>1. On completion of this unit students should be able to collect and analyse information from, and participate in, a variety of practical activities to explain how the musculoskeletal system functions and its limiting conditions, and evaluate the ethical and performance implications of the use of practices and substances that enhance human movement.</p>	<p>1. On completion of this unit the student should be able to collect and analyse data related to individual and population levels of participation in physical activity and sedentary behaviour to create, undertake and evaluate an activity plan that meets the physical activity and sedentary behaviour guidelines for an individual or a specific group.</p>
<p>2. On completion of this unit students should be able to collect and analyse information from, and participate in, a variety of practical activities to explain how the cardiovascular and respiratory systems function and the limiting conditions of each system, and discuss the ethical and performance implications of the use of practices and substances to enhance the performance of these two systems.</p>	<p>2. Apply a social-ecological framework to research, analyse and evaluate a contemporary issue associated with participation in physical activity and/or sport in a local, national or global setting.</p>

Students will be assessed on whether they have satisfactorily achieved the outcomes via a selection of the following: written reports, a practical laboratory report, case study analysis, a data analysis, written reports, structured questions and a written plan and critically reflective folio.

Achievement for VCE purposes will be indicated by an S (Satisfactory)  
Non-achievement will be indicated by an N (Not Satisfactory)

Level of achievement will be indicated by a letter grade and percentage. This result is for College reporting only.

Students will complete an examination at the end of each unit. The examination contributes 40% to the overall grade for this subject.

### Prerequisites

No specific subject is required.

# UNIT 3 & 4 PHYSICAL EDUCATION

## Subject Introduction

VCE Physical Education examines the biological, physiological, psychological, social and cultural influences on performance and participation in physical activity. It focuses on the interrelationship between motor learning and psychological, biomechanical, physiological and sociological factors that influence physical performances, and participation in physical activity. The study of physical activity and sedentary behaviour is significant for the understanding of health, wellbeing and performance of people.

This VCE study is suitable for students with a wide range of aspirations, including those who wish to pursue further formal study at tertiary level or in vocational education and training settings. The study prepares students for such fields as the health sciences, exercise science and education, as well as providing valuable knowledge and skills for participating in their own sporting and physical activity pursuits to develop as critical practitioners and lifelong learners.

## Unit Descriptions

<b>Unit 3: Physical activity participation and physiological performance</b>	<b>Unit 4: Enhancing performance</b>
In this unit students develop an understanding of physical activity and sedentary behaviour from a participatory and physiological perspective. Students investigate the contribution of energy systems during performance in physical activity and explore the multi-factorial causes of fatigue and consider different strategies used to delay and manage fatigue and to promote recovery.	In this unit, students undertake an activity analysis to investigate the required fitness components to design, implement, and evaluate a personal training program designed to improve or maintain selected components. Students learn to critically evaluate different performance enhancing techniques and practices used in a variety of sporting competitions.

## UNIT 3 & 4 PHYSICAL EDUCATION

### Outcomes & Weightings

Unit 3	Marks	Unit 4	Marks
1. Analyse individual and population levels of sedentary behaviour and participation in physical activity, and evaluate initiatives and strategies that promote adherence to Australia's Physical Activity and Sedentary Behaviour Guidelines.	40	1. Plan, implement and evaluate training programs to enhance specific fitness components.	60
2. Use data collected in practical activities to analyse how the major body and energy systems work together to enable movements to occur, and explain the fatigue mechanisms and recovery strategies.	60	2. Analyse and evaluate strategies designed to enhance performance or promote recovery.	40

### Assessment

Students will be assessed on whether they have satisfactorily achieved the outcomes via a selection of the following: written reports, tests, data analyses, practical laboratory reports and case study analyses.

Achievement for VCE purposes will be indicated by an S (Satisfactory)  
Non-achievement will be indicated by an N (Not Satisfactory)

Level of achievement for Study Score and ATAR purposes is determined from School Assessed Coursework (Moderated) and an End of Year Examination.

Contribution to final assessment:

Unit 3 School Assessed Coursework	25%
Unit 4 School Assessed Coursework	25%
2 hour End of Year Examination (External Assessment)	50%

### Prerequisites

No specific subject is required.

**Sequence Requirements:** Units 3 and 4 must be completed in sequence to obtain a Study Score.

**Please note:** The curriculum outlined above for Unit 3 & 4 Physical Education will be replaced with the updated Study Design in 2018.

# UNIT 1 & 2 PHYSICS

## Subject Introduction

VCE Physics provides students with opportunities to explore questions related to the natural and constructed world. The study provides a contextual approach to exploring selected areas within the discipline including atomic physics, electricity, fields, mechanics, thermodynamics, quantum physics and waves. In Units 1 and 2 the following questions are explored: How can thermal effects be explained? How do electric circuits work? What is matter and how is it formed? And how can motion be described and explained? In consultation with their teacher student's select an option for further explanation: What are the stars? Is there life beyond Earth's Solar System? How do forces act on the body? How can AC electricity charge a DC device? How do heavy things fly? How do fusion and fission compare as viable nuclear energy power sources? How is radiation used to maintain human health? How do particle accelerators work? How can human vision be enhanced? How do instruments make music? How can performance in ball sports be improved? Or how does the human body use electricity? Students will also perform a practical investigation.

VCE Physics provides for a range of study pathways and leads to a range of careers. Physicists may undertake research in areas including acoustics, astrophysics and cosmology, atmospheric physics, computational physics, energy research, engineering, instrumentation, lasers and photonics, medical physics, nuclear science, optics, pyrotechnics and radiography.

## Unit Descriptions

<b>Unit 1: What ideas explain the physical world?</b>	<b>Unit 2: What do experiments reveal about the physical world?</b>
<p>Ideas in physics are dynamic. As physicists explore concepts, theories evolve. Often this requires the detection, description and explanation of things that cannot be seen. Students explore how physics explains phenomena, at various scales, which are not always visible to the unaided human eye. They examine some of the fundamental ideas and models used by physicists in an attempt to understand and explain the world. Students consider thermal concepts by investigating heat, probe common analogies used to explain electricity and consider the origins and formation of matter.</p> <p>Thermodynamic principles are used to explain phenomena related to changes in thermal energy. They apply thermal laws when investigating energy transfers within and between systems, and assess the impact of human use of energy on the environment. Students examine the motion of electrons and explain how it can be manipulated and utilised. They explore current scientifically accepted theories that explain how matter and energy have changed since the origins of the Universe.</p>	<p>In this unit students explore the power of experiments in developing models and theories. They investigate a variety of phenomena by making their own observations and generating questions, which in turn lead to experiments. Students make direct observations of physics phenomena and examine the ways in which phenomena that may not be directly observable can be explored through indirect observations.</p> <p>In the core component of this unit students investigate the ways in which forces are involved both in moving objects and in keeping objects stationary. Students choose one of twelve options related to astrobiology, astrophysics, bioelectricity, biomechanics, electronics, flight, medical physics, nuclear energy, nuclear physics, optics, sound and sports science. The option enables students to pursue an area of interest by investigating a selected question.</p>

## UNIT 1 & 2 PHYSICS

### Outcomes

Unit 1	Unit 2
1. Apply thermodynamic principles to analyse, interpret and explain changes in thermal energy in selected contexts, and describe the environmental impact of human activities with reference to thermal effects and climate science concepts.	1. Investigate, analyse and mathematically model the motion of particles and bodies.
2. Investigate and apply a basic DC circuit model to simple battery-operated devices and household electrical systems, apply mathematical models to analyse circuits, and describe the safe and effective use of electricity by individuals and the community.	2. Depends on options selected.
3. Explain the origins of atoms, the nature of subatomic particles and how energy can be produced by atoms.	3. Design and undertake an investigation of a physics question related to the scientific inquiry processes of data collection and analysis, and draw conclusions based on evidence from collected data.

### Assessment

Students will be assessed on whether they have satisfactorily achieved the outcomes for Unit 1 and Outcomes 1 and 2 for Unit 2 via a selection of the following: an annotated folio of practical activities, data analysis, design, building, testing and evaluation of a device, an explanation of the operation of a device, a proposed solution to a scientific or technological problem, a report of a selected physics phenomenon, a modelling activity, a media response, a summary report of selected practical investigations, a reflective learning journal/blog related to selected activities or in response to an issue, or a test comprising multiple choice and/or short answer and/or extended response. Outcome 3 of Unit 2 is assessed via a report of a practical investigation (student designed or adapted) using an appropriate format.

Achievement for VCE purposes will be indicated by an S (Satisfactory)  
Non-achievement will be indicated by an N (Not Satisfactory)

Level of achievement will be indicated by a letter grade and percentage. This result is for College reporting only.

Students will complete an examination at the end of each unit. The examination contributes 50% to the overall grade for this subject.

### Prerequisites

Access to this subject is based on the recommendation of a member of the Science Faculty.

# UNIT 3 & 4 PHYSICS

## Subject Introduction

Physics seeks to understand and explain the physical world. It examines models and ideas used to make sense of the world and which are sometimes challenged as new knowledge develops. By looking at the way matter and energy interact through observations, measurements and experiments, physicists gain a better understanding of the underlying laws of nature. VCE Physics provides students with opportunities to explore questions related to the natural and constructed world. An important feature of undertaking a VCE science study is the opportunity for students to engage in a range of inquiry tasks that may be self-designed, develop key science skills and interrogate the links between theory and practice.

This study design will assist teachers to provide a curriculum that is interesting and challenging for students with a wide range of expectations, including students who are aiming for medical, engineering, technology-based and science-based careers.

## Unit Descriptions

<b>Unit 3: How do fields explain motion and electricity?</b>	<b>Unit 4: How can two contradictory models explain both light and matter?</b>
<p>In this unit students explore the importance of energy in explaining and describing the physical world. They examine the production of electricity and its delivery to homes. Students consider the field model as a construct that has enabled an understanding of why objects move when they are not apparently in contact with other objects. Applications of concepts related to fields include the transmission of electricity over large distances and the design and operation of particle accelerators. They explore the interactions, effects and applications of gravitational, electric and magnetic fields.</p> <p>Students use Newton's laws to investigate motion in one and two dimensions, and are introduced to Einstein's theories to explain the motion of very fast objects. They consider how developing technologies can challenge existing explanations of the physical world, requiring a review of conceptual models and theories. Students design and undertake investigations involving at least two continuous independent variables.</p> <p>A student-designed practical investigation related to waves, fields or motion is undertaken either in Unit 3 or Unit 4, or across both Units 3 and 4, and is assessed in Unit 4, Outcome 3.</p>	<p>A complex interplay exists between theory and experiment in generating models to explain natural phenomena including light. Wave theory has classically been used to explain phenomena related to light; however, continued exploration of light and matter has revealed the particle-like properties of light. On very small scales, light and matter – which initially seem to be quite different – have been observed as having similar properties.</p> <p>In this unit, students explore the use of wave and particle theories to model the properties of light and matter. They examine how the concept of the wave is used to explain the nature of light and explore its limitations in describing light behaviour. Students further investigate light by using a particle model to explain its behaviour. A wave model is also used to explain the behaviour of matter which enables students to consider the relationship between light and matter. Students learn to think beyond the concepts experienced in everyday life to study the physical world from a new perspective. Students design and undertake investigations involving at least two continuous independent variables.</p> <p>A student-designed practical investigation related to waves, fields or motion is undertaken either in Unit 3 or Unit 4, or across both Unit 3 and Unit 4, and is assessed in Unit 4, Outcome 3.</p>

## UNIT 3 & 4 PHYSICS

### Outcomes & Weightings

Unit 3	Marks	Unit 4	Marks
1. Analyse gravitational, electric and magnetic fields, and use these to explain the operation of motors and particle accelerators and the orbits of satellites.	30	1. Apply wave concepts to analyse, interpret and explain the behaviour of light.	30
2. Analyse and evaluate an electricity generation and distribution system.	30	2. Provide evidence for the nature of light and matter, and analyse the data from experiments that supports this evidence.	30
3. Investigate motion and related energy transformations experimentally, analyse motion using Newton's laws of motion in one and two dimensions, and explain the motion of objects moving at very large speeds using Einstein's theory of special relativity.	30	3. Design and undertake a practical investigation related to waves or fields or motion, and present methodologies, findings and conclusions in a scientific poster.	35

### Assessment

Students will be assessed on whether they have satisfactorily achieved the outcomes via a selection of the following: a data analysis, tests, report of a student investigation, report of a physics phenomenon, and a structured scientific poster, in accordance with VCAA requirements.

Achievement for VCE purposes will be indicated by an S (Satisfactory)  
Non-achievement will be indicated by an N (Not Satisfactory)

Level of achievement for Study Score and ATAR purposes is determined from School Assessed Coursework (Moderated) and an End of Year Examination.

Contribution to final assessment:

Unit 3 School Assessed Coursework	21%
Unit 4 School Assessed Coursework	19%
2.5 hour End-of-Year Examination (External Assessment)	60%

### Prerequisites

No specific subject is required, however completion of Units 1 & 2 Physics is strongly recommended.

**Sequence Requirements:** Units 3 and 4 must be completed in sequence to obtain a Study Score.

# UNIT 1 & 2 PSYCHOLOGY

## Subject Introduction

VCE Psychology enables students to explore how people think, feel and behave through the use of a biopsychosocial approach. As a scientific model, this approach considers biological, psychological and social factors and their complex interactions in the understanding of psychological phenomena. Specific questions explored in Units 1 and 2 Psychology are as follows: How does the brain function? What influences psychological development? What influences a person's perception of the world? And, how are people influenced to behave in particular ways? Students also complete research and practical investigations.

VCE Psychology provides for continuing study pathways within the discipline and leads to a range of careers. Opportunities may involve working with children, adults, families and communities in a variety of settings such as academic and research institutions, management and human resources, and government, corporate and private enterprises. Fields of applied psychology include educational, environmental, forensic, health, sport and organisational psychology. Specialist fields of psychology include counselling and clinical contexts, as well as neuropsychology, social psychology and developmental psychology. Psychologists also work in cross-disciplinary areas such as medical research or as part of on-going or emergency support services in educational, institutional and industrial settings.

## Unit Descriptions

<b>Unit 1: How are behaviour and mental processes shaped?</b>	<b>Unit 2: How do external factors influence behaviour and mental processes?</b>
<p>Human development involves changes in thoughts, feelings and behaviours. In this unit students investigate the structure and functioning of the human brain and the role it plays in the overall functioning of the human nervous system. Students explore brain plasticity and the influence that brain damage may have on a person's psychological functioning. They consider the complex nature of psychological development, including situations where psychological development may not occur as expected. Students examine the contribution that classical and contemporary studies have made to an understanding of the human brain and its functions, and to the development of different psychological models and theories used to predict and explain the development of thoughts, feelings and behaviours.</p> <p>A student-directed research investigation related to brain function and/or development is undertaken in this unit.</p>	<p>A person's thoughts, feelings and behaviours are influenced by a variety of biological, psychological and social factors. In this unit students investigate how perception of stimuli enables a person to interact with the world around them and how their perception of stimuli can be distorted. They evaluate the role social cognition plays in a person's attitudes, perception of themselves and relationships with others. Students explore a variety of factors and contexts that can influence the behaviour of an individual and groups. They examine the contribution that classical and contemporary research has made to the understanding of human perception and why individuals and groups behave in specific ways.</p> <p>A student practical investigation related to internal and external influences on behaviour is undertaken in this unit.</p>



# UNIT 1 & 2 PSYCHOLOGY

## Outcomes

Unit 1	Unit 2
1. Describe how understanding of brain structure and function has changed over time, explain how different areas of the brain coordinate different functions, and explain how brain plasticity and brain damage can change psychological functioning.	1. Compare the sensations and perceptions of vision and taste, and analyse factors that may lead to the occurrence of perceptual distortions.
2. Identify the varying influences of nature and nurture on a person's psychological development, and explain different factors that may lead to typical or atypical psychological development.	2. Identify factors that influence individuals to behave in specific ways, and analyse ways in which others can influence individuals to behave differently.
3. Investigate and communicate a substantiated response to a question related to brain function and/or development, including reference to at least two contemporary psychological studies and/or research techniques.	3. Design and undertake a practical investigation related to external influences on behaviour, and draw conclusions based on evidence from collected data.

## Assessment

Students will be assessed on whether they have satisfactorily achieved Outcomes 1 and 2 via a selection from the following: a brain structure modelling activity (Unit 1 only), a report of a practical activity involving the collection of primary data, a research investigation involving the collection of secondary data, a logbook of practical activities, analysis of data/results including generalisations/conclusions, media analysis/response, problem solving involving psychological concepts, skills and/or issues, a test comprising multiple choice and/or short answer and/or extended response or a reflective learning journal/blog related to selected activities or in response to an issue.

Outcome 3 of Unit 1 is assessed via a report of an investigation into brain function and/or development that can be presented in various formats. Outcome 3 of Unit 2 is assessed via a report of an investigation into internal and/or external influences on behaviour that can be presented in various formats.

Achievement for VCE purposes will be indicated by an S (Satisfactory)

Non-achievement will be indicated by an N (Not Satisfactory)

Level of achievement will be indicated by a letter grade and percentage. This result is for College reporting only.

Students will complete an examination at the end of each unit. The examination contributes 50% to the overall grade for this subject.

## Prerequisites

No specific subject is required.

# UNIT 3 & 4 PSYCHOLOGY

## Subject Introduction

VCE Psychology enables students to explore how people think, feel and behave through the use of a biopsychosocial approach. As a scientific model, this approach considers biological, psychological and social factors and their complex interactions in the understanding of psychological phenomena. The study explores the connection between the brain and behaviour by focusing on several key interrelated aspects of the discipline: the interplay between genetics and environment, individual differences and group dynamics, sensory perception and awareness, memory and learning, and mental health. Students examine classical and contemporary research and the use of imaging technologies, models and theories to understand how knowledge in psychology has evolved, and continues to evolve in response to new evidence and discoveries. An understanding of the complexities and diversity of psychology leads students to appreciate the interconnectedness between different content areas both within psychology, and across psychology and the other sciences.

VCE Psychology provides for continuing study pathways within the discipline and leads to a range of careers. Opportunities may involve working with children, adults, families and communities in a variety of settings such as academic and research institutions, management and human resources, and government, corporate and private enterprises. Fields of applied psychology include educational, environmental, forensic, health, sport and organisational psychology.

## Unit Descriptions

<b>Unit 3: How does experience affect behaviour and mental processes?</b>	<b>Unit 4: How is wellbeing developed and maintained?</b>
<p>The nervous system influences behaviour and the way people experience the world. In this unit students examine how the functioning of the nervous system can explain how the human nervous system enables a person to interact with the world around them. They explore how stress may affect a person's psychological functioning and consider the causes and management of stress.</p> <p>Students investigate how mechanisms of memory and learning lead to the acquisition of knowledge, and the development of new capacities. They consider the limitations and fallibility of memory and how memory can be improved. They examine the contribution that classical and contemporary research has made to the understanding of the structure and function of the nervous system, and to the understanding of the factors that influence learning and memory.</p>	<p>Consciousness and mental health are two of many psychological constructs that can be explored by studying the relationship between the mind, brain and behaviour. In this unit students examine the nature of consciousness and how changes in levels of consciousness can affect mental processes and behaviour. They consider the role of sleep and the impact that sleep disturbances may have on a person's functioning.</p> <p>Students explore the concept of a mental health continuum and apply a biopsychosocial approach to analyse mental health and disorder. They use specific phobia to illustrate how the development and management of a mental disorder can be considered as an interaction between biological, psychological and social factors.</p> <p>A student practical investigation related to mental processes and psychological functioning is undertaken in either Unit 3 or Unit 4, or across both Units 3 and 4, and is assessed in Unit 4, Outcome 3.</p>

## UNIT 3 & 4 PSYCHOLOGY

### Outcomes & Weightings

Unit 3	Marks	Unit 4	Marks
1. Explain how the structure and function of the human nervous system enables a person to interact with the external world and analyse the different ways in which stress can affect nervous system functioning.	50	1. Explain consciousness as a continuum, compare theories about the purpose and nature of sleep, and elaborate on the effects of sleep disruption on a person's functioning.	30
2. Apply biological and psychological explanations for how new information can be learnt and stored in memory, and provide biological, psychological and social explanations of a person's inability to remember information.	50	2. Explain the concepts of mental health and mental illness including influences of risk and protective factors, apply a biopsychosocial approach to explain the development and management of specific phobia, and explain the psychological basis of strategies that contribute to mental wellbeing.	30
		3. Design and undertake a practical investigation related to mental processes and psychological functioning, and present methodologies, findings and conclusions in a scientific poster.	30

### Assessment

Students will be assessed on whether they have satisfactorily achieved the outcomes via a selection of the following: a data analysis, tests, extended practical investigations, reports and a summary report of selected practical activities.

Achievement for VCE purposes will be indicated by an S (Satisfactory)

Non-achievement will be indicated by an N (Not Satisfactory)

Level of achievement for Study Score and ATAR purposes is determined from School Assessed Coursework (Moderated) and an End of Year Examination.

Contribution to final assessment:

Unit 3 School Assessed Coursework	16%
Unit 4 School Assessed Coursework	24%
2.5 hour End of Year Examination (External Assessment)	60%

### Prerequisites

No specific subject is required.

**Sequence Requirements:** Units 3 and 4 must be completed in sequence to obtain a Study Score.

# UNIT 1 & 2 SYSTEMS ENGINEERING

## Subject Introduction

The study provides opportunities for students to learn about and engage with systems from a practical and purposeful perspective. Students gain knowledge and understanding about, and learn to appreciate and apply technological systems.

VCE Systems Engineering integrates aspects of designing, planning, fabricating, testing and evaluating in a project management process. It prepares students for careers in engineering, manufacturing and design through either university or TAFE vocational study pathway, employment, apprenticeships or traineeships. The study provides a rigorous academic foundation and a practical working knowledge of design, manufacturing and evaluation techniques. These skills, and the ability to apply systems engineering processes, are growing in demand as industry projects become more complex and multidisciplinary.

## Unit Descriptions

<b>Unit 1: Introduction to mechanical systems</b>	<b>Unit 2: Introduction to electrotechnology systems</b>
<p>This unit focuses on engineering fundamentals as the basis of understanding underlying principles and the building blocks that operate in simple to more complex mechanical devices.</p> <p>While this unit contains the fundamental physics and theoretical understanding of mechanical systems and how they work, the main focus is on the construction of a system. The construction process draws heavily upon design and innovation.</p>	<p>Students study fundamental electrotechnology principles including applied electrical theory, representation of electronic components and devices, elementary applied physics in electrical circuits, and mathematical calculations that can be applied to define and explain electrical characteristics of circuits.</p> <p>The unit offers opportunities for students to apply their knowledge in the design, construction, testing and evaluation of an operational system. The system should be predominately electrotech based, but would generally have electro-mechanical components within the system. The constructed system should provide a tangible demonstration of some of the theoretical principles studied in this unit.</p>

## UNIT 1 & 2 SYSTEMS ENGINEERING

### Outcomes

Unit 1	Unit 2
1. Describe and use basic engineering concepts, principles and components, and using selected relevant aspects of the Systems Engineering Process, design and plan a mechanical or an electro-mechanical system.	1. Investigate, represent, describe and use basic electrotechnology and basic control engineering concepts, principles and components, and using selected relevant aspects of the Systems Engineering Process, design and plan an electrotechnology system.
2. Make, test and evaluate a mechanical or an electro-mechanical system using selected relevant aspects of the Systems Engineering Process.	2. Make, test and evaluate an electrotechnology system, using selected relevant aspects of the Systems Engineering Process.

### Assessment

Students will be assessed on whether they have satisfactorily achieved the outcomes via a selection of the following: documentation of the systems engineering process, production work, practical demonstrations and tests.

Achievement for VCE purposes will be indicated by an S (Satisfactory)  
Non-achievement will be indicated by an N (Not Satisfactory)

Level of achievement will be indicated by a letter grade and percentage. This result is for College reporting only.

Students will complete an examination at the end of each unit. The examination contributes 30% to the overall grade for this subject.

### Prerequisites

No specific subject is required.

# UNIT 3 & 4 SYSTEMS ENGINEERING

## Subject Introduction

The study provides opportunities for students to learn about and engage with systems from a practical and purposeful perspective. Students gain knowledge and understanding about, and learn to appreciate and apply technological systems.

VCE Systems Engineering integrates aspects of designing, planning, fabricating, testing and evaluating in a project management process. It prepares students for careers in engineering, manufacturing and design through either university or TAFE vocational study pathway, employment, apprenticeships and traineeships. The study provides a rigorous academic foundation and a practical working knowledge of design, manufacturing and evaluation techniques. These skills, and the ability to apply systems engineering processes, are growing in demand as industry projects become more complex and multidisciplinary.

## Unit Descriptions

<b>Unit 3: Integrated systems engineering and energy</b>	<b>Unit 4: Systems control and new and emerging technologies</b>
<p>In this unit students study the engineering principles that are used to explain the physical properties of integrated systems and how they work.</p> <p>Through the application of their knowledge, students design and plan an operational, mechanical-electrotechnology integrated and controlled system. They learn about the technologies used to harness energy sources to provide power for engineered systems.</p>	<p>In this unit students complete the production work and test and evaluate the integrated controlled system they designed in Unit 3. Students investigate new and emerging technologies, consider reasons for their development and analyse their impacts.</p> <p>Students expand their knowledge of new and emerging developments and innovations through their investigation and analysis of a range of engineered systems. They analyse a specific new or emerging innovation, including its impacts.</p>

## UNIT 3 & 4 SYSTEMS ENGINEERING

### Outcomes & Weightings

Unit 3	Marks	Unit 4	Marks
2. Discuss the advantages and disadvantages of renewable and non-renewable energy sources, and analyse and evaluate the technology used to harness, generate and store non-renewable and renewable energy.	50	2. Describe and evaluate a range of new or emerging technologies, and analyse the likely impacts of a selected innovation.	50
<b>School Assessed Task (Across Units 3 &amp; 4)</b>			
3.1 <b>Unit 3</b> Investigate, analyse and use advanced mechanical-electrotechnology integrated and control systems concepts, principles and components, and using selected relevant aspects of the Systems Engineering Process, design, plan and commence construction of an integrated and controlled system.			
4.1 <b>Unit 4</b> Produce, test and diagnose an advanced mechanical-electrotechnology integrated and controlled system using selected relevant aspects of the Systems Engineering Process, and manage, document and evaluate the system and processes.			

### Assessment

Students will be assessed on whether they have satisfactorily achieved the outcomes via a selection of the following: tests, written reports and case studies.

Achievement for VCE purposes will be indicated by an S (Satisfactory)  
Non-achievement will be indicated by an N (Not Satisfactory)

Level of achievement for Study Score and ATAR purposes is determined from School Assessed Coursework (Moderated) and an End of Year Examination.

Contribution to final assessment:

Unit 3 School Assessed Coursework	10%
Unit 4 School Assessed Coursework	10%
School Assessed Task	50%
1.5 hour End of Year Examination (External Assessment)	30%

### Prerequisites

No specific subject is required.

**Sequence Requirements:** Units 3 and 4 must be completed in sequence to obtain a Study Score.