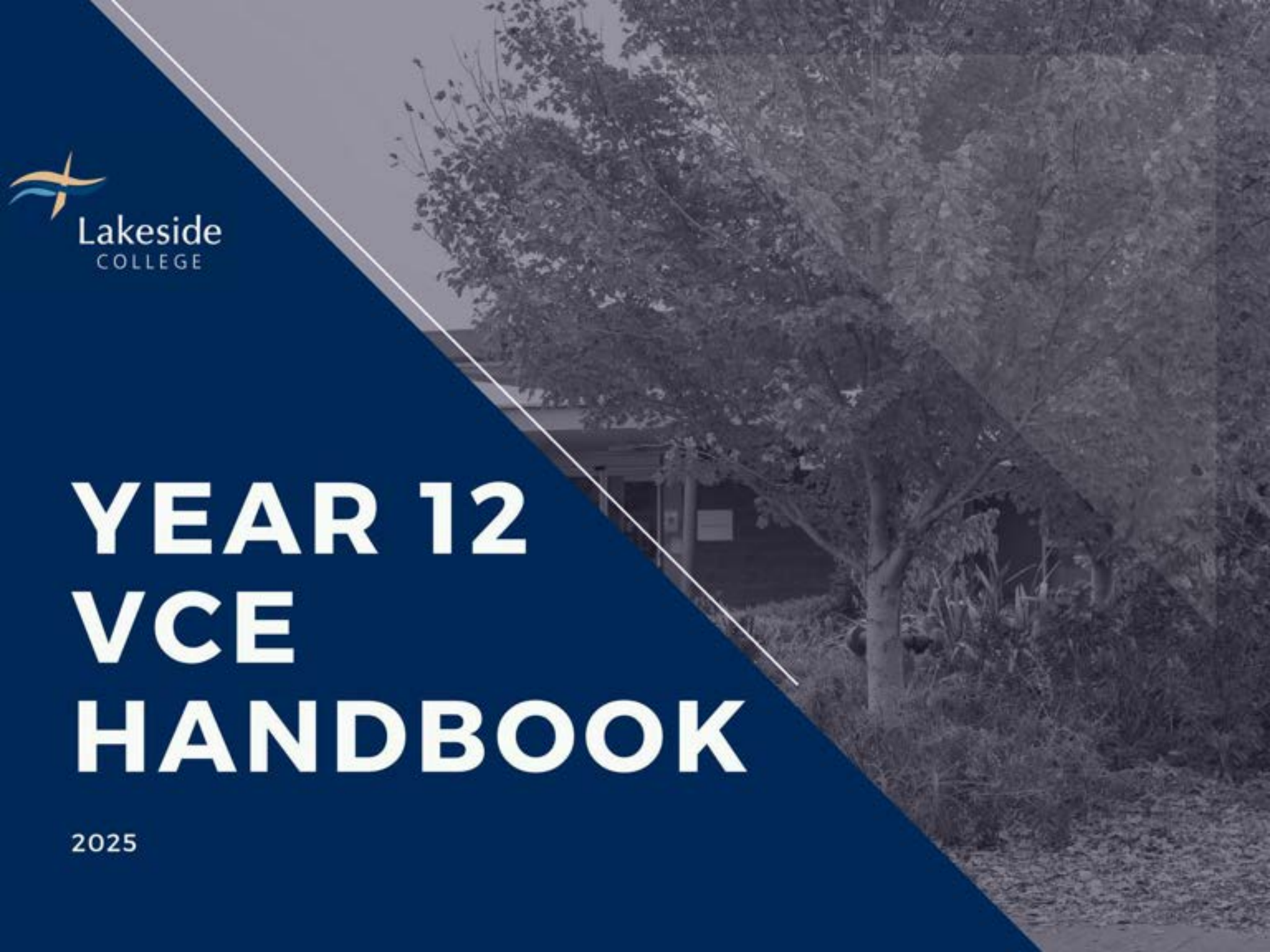
Lakeside
COLLEGE

YEAR 12 VCE HANDBOOK

2025



Introduction

Curriculum Overview

Lakeside College is a student-focused learning community which develops students in the key competencies of Christ-centred character, citizenship, collaboration, communication, creativity and critical thinking. Our passionate and experienced staff are committed to supporting all students through the provision of quality academic and co-curricular programs. While there is a strong focus on helping our VCE students move from interdependent to independent lifelong learners, partnerships between students, teachers and families are essential for success.

Active participation in the life of the College is strongly encouraged. We know that students who are involved in aspects of community service, sporting and performing arts programs also tend to perform well in their academic studies. Students, especially in Year 12, are also encouraged to make use of careers advice and information designed to improve their results.
This handbook contains general information about the VCE at Lakeside College as well as an outline of the VCE courses offered. We trust that this is a helpful resource and provides an opportunity for families to discuss pathways for the future.

Head of Senior School (Years 10-12)
Mrs Amanda Trewin

VCE Overview

Welcome to the Victorian Certificate of Education (VCE) course guide for Lakeside College. This handbook has been prepared to assist students and their families in the selection of an appropriate course of study and to provide information about the VCE and VET subjects offered.

All families are strongly encouraged to study all sections of the course guide. Parents and students are asked to allocate enough time to jointly discuss its contents. Students are encouraged to choose subjects based on their interests, skills and abilities.
Parents and students should understand the prerequisites that may be required for future career or educational pathways. The selection of the appropriate courses for each student is vital and students are encouraged to allocate time to do this properly. Students are also encouraged to:

- Discuss careers options and prerequisites with the Careers Practitioner
- Attend University open days
- Attend the VCE information evening.

VCE Coordinator
Duane Vaughan

VCE CONTACTS

VCE, VET and Distance Education Coordinator

Mr Duane Vaughan

Head of Secondary

Mrs Amanda Trewin

Inclusive Education Coordinator

Mrs Deidre Priebbenow

Factors to Consider in Choosing Studies

In choosing all studies, students should consider:

- Studies that they like doing and those in which they have an interest
- Studies in which they achieve high grades
- Studies that are pre-requisite studies for their chosen and anticipated tertiary courses

This handbook provides information about pathways in Years 11 and 12 studies and advice on the criteria for the selection of studies. The Study Selection process is organised by both the VCE Coordinator and the Head of Secondary School. Students will complete subject forms and complete preferences online. This handbook provides subject details to assist selecting courses of study

Every effort will be made to meet your choice of studies. The College timetable for 2024 will be constructed on the basis of student choices. The College has made a commitment that if a subject is a prerequisite for a university course the subject will run regardless of numbers. Ultimately, availability of courses will be dependent upon a number of factors, including:

- The number of students selecting a study (sufficient numbers are required for subjects to be timetabled)
- Staffing availability
- Timetabling constraints

Factors to Consider in Choosing Studies

It is therefore important for students to carefully submit considered choices; however, the final study program is ultimately at the ability and discretion of the College to offer the individualised program.

Above all, it is imperative that in making study selections, all students discuss their options with their parents/guardians and seek advice from the various teachers and staff available to assist them at school.

VCE Requirements

At Lakeside College, students undertake more than the minimum requirements to broaden their VCE program and subsequent career and tertiary course options. Furthermore, undertaking six units three and four sequences can help some students gain a higher Australian Tertiary Admissions Rank.

Usually at Lakeside College, students select a total of twenty-three semester length units of study. This involves one VCE Religious Education Unit in Year 11, two VCE English units and ten other units of study. At Year 12 all students will undertake two English Unit 3 and 4 sequences, plus 4 sequences of Unit 3 and 4 studies as well as Unit 2 Religion and Society. However, some students may elect to undertake a Unit 1 and 2 study in Year 10 and a Unit 3 and 4 sequence in Year 11, enabling a sixth Unit 3 and 4 sequence at Year 12 or a University Enhancement study at Year 12. Some students may undertake VET studies in the program.

Grounds for undertaking less than five Unit 3 and 4 , VCE/VET sequences at Year 12 would only exist if students had experienced earlier learning difficulties or have been diagnosed with a disability which impairs their ability to cope with five Unit 3 and 4 studies. Such a request would necessitate counselling and will necessitate an interview with the VCE Coordinator and the Head of Secondary School.

VCE Advanced Placement Program

VCE students may be invited to study at an accelerated level. For Year 10 students the accelerated level is to access a Unit 1 and 2 sequence and for Year 11 students the accelerated level is to access a Unit 3 and 4 VCE sequence, while for Year 12 students an accelerated study may be one of the University Enhancement Subjects. For each year level, an invitation to study at an accelerated level will be based on the following criteria:

- Demonstration of sound background of study and achievement in that area of study
- Evidence of very good overall academic results, based on assessment information
- Evidence of sound study and time management practices

Students will be invited in writing to consider taking part in the VCE Advanced Placement Program. Invitations will be issued after careful discussion and consideration by your child's teachers.

Inclusive Education and planning for senior school

Lakeside College recognises and values the uniqueness of each individual. The senior years of schooling *represent a pathway* for students to follow that will enable them to have the knowledge and skills required when they leave school, and for their future endeavours. There are many aspects and variables to consider in the senior years of schooling.

Inclusive Education supports many students, including those of Aboriginal and Torres Strait Islander descent, students (and their families) who have sought refuge in Australia, students who are living in an Out of Home Care situation.

This pathway can take different forms and requires consideration of what is the "best fit" for an individual. Educational planning conversations will begin as early as Year 9 for students with a disability, and it is vital that both our Inclusive Education Coordinator and Careers Practitioner be involved with educational planning and career conversations.

Students who have an Individual Education Plan prior to their VCE years will continue to be provided with the individual plan and adjustments as identified and required. Some students may need to apply for VCAA Special Examination Arrangements for the completion of their Unit 3 and 4 subjects, and the GAT.

Students with a disability and their families can contact and book meetings to discuss aspects of senior educational planning when required. Please do not hesitate to reach out for further advice or support.

Inclusive Support Coordinator
Mrs Deidre Pribbenow

COURSE OVERVIEWS

Victorian Certificate of Education (VCE)

VCE is a well-recognised and valuable acknowledgement of student achievement. Successful completion of the VCE provides students with an opportunity to seek access to tertiary institutions and provides information to employers about a student's ability to cope with a wide range of complex tasks, meet deadlines and apply knowledge and skills to problems.

The main aim of the VCE, and of the school, is to assist students to develop sound working habits so that all VCE studies undertaken are satisfactorily completed.

The VCAA requires details about the Satisfactory Completion of Outcomes and School Assessed Coursework Tasks for each unit. As a requirement of the courses set down by the VCAA, some policies have been established to ensure that the correct procedures are carried out in all schools.

Vocational Education and Training (VET)

Each year, some Lakeside College students may be enrolled in VET courses.

VET courses are delivered off-campus through providers such as Federation Training, Chisholm Institute, and accredited secondary colleges. It should be noted that VET courses incur an additional fee. Contact the VCE/VET Coordinator to determine the individual costs of VET courses.

Students undertaking any sort of traineeship as part of their work, including training through work such as Certificate III in Hospitality or Retail at workplaces such as McDonalds, KFC or Subway, should let the VET Coordinator know, as these traineeships may count as credits towards their VCE.

Distance Education

Courses offered from Virtual School Victoria are available to Lakeside College students when a student wishes to undertake a subject not offered at the College, or when two subjects that the student wishes to study are in the same block on the timetable. Students are encouraged to have regular contact with their Distance Education Teacher and may use phones and other available ICT resources to maintain effective lines of communication. A school-appointed Distance Education Coordinator is available to students completing subjects via Distance Education.

All work related to Distance Education, including languages, should be submitted by the due date. When corrected work is returned to the school, the student can collect it from the Distance Education Coordinator.

VCE attendance requirements for Satisfactory Completion

All VCE students are expected to attend all timetabled classes, excursions and assemblies and be always punctual. Students who are consistently absent or late cannot possibly meet the requirements for satisfying the achievement of the Key Knowledge and Key Skills required under VCAA guidelines.

- Students who have attended **less than 80% of scheduled classes** will be deemed not to have attended sufficient classes to allow teachers to verify satisfactory understanding of the outcomes and therefore receive an **N** result for the unit.

Absences
Normally require a medical certificate

It is vital that parents and guardians are aware of all absences from class. If a student is absent during a scheduled assessed task, the subject teacher should be notified immediately of this absence and a medical certificate required upon the student's return to school. The student will be required to complete an application to sit a supplementary SAC.

Each request for supplementary SAC arrangements will be considered on its merits and approval of the request will be at the discretion of the subject teacher in consultation with the VCE Coordinator. Please note that if a student is absent for a non-approved reason on the day of a SAC they will receive an N for the SAC and thus not satisfactorily meet the requirements for the successful completion of the unit of study.

All signed notes and medical certificates must be lodged with the VCE Coordinator.
All student absences must be approved by parents or guardians.

Types of Absences Approved

Bereavement: Funeral or significant personal loss.
Attendance at weddings or significant family events: Application to be sought at least 10 days prior to event.
National and state level sporting tournaments: Letter from the organisation outlining commitment and extended absence application completed.
Film and TV work: Student absence and learning plan to be completed in consultation with subject teachers.
TAFE/VET classes: Proof of enrolment required.
Religious Observances: Communication with VCE Coordinator, College Administration and subject teachers required.
Medical, Dental, Rehabilitation or Mental Health Appointments: Medical certificates or letter required.

Types of Absences Not Approved

Driver's Licence Appointments may be approved if applied for in advance and no assessments are being held on that day.

Employment or work shifts will not be considered a reasonable excuse for an approved absence.

Holidays during school time **are not** approved absences. SACs missed due to holidays will be assessed as Satisfactory or Not Satisfactory and will not be given a mark due to the need for equity and fairness and the difficulty involved in rescheduling assessments.

This is a serious matter in Unit 3 and 4 studies and may affect Study Scores and the student's ATAR.

VCE ASSESMENT

Unit 1 & 2 Assessment Tasks

Assessment tasks are specific activities that contribute to a final grade for a subject. Units 1 & 2 assessment tasks are set by the school and may or may not be part of a learning outcome. These tasks will be graded, and the results posted on our learning management system.

Part of the assessment of all Units 1 & 2 subjects is a formal examination, conducted towards the end of each semester. This examination addresses all areas of study covered in that unit and is conducted during an Examination Week.

SACs consist of several assessment tasks that individually contribute a significant amount to the total mark in that study. Specific details of the task will be provided before the day of the assessment.

VCE ASSESMENT

Unit 3 & 4 School Assessed Coursework (SAC)

SACs allow the teacher to rank an individual student's performance in relation to other members of the class. At Units 3 & 4 level, the VCAA provides teachers with specific assessment criteria and a marking structure. Each SAC represents a significant component of the total school-based mark for that study.

Authentication

Unacknowledged resources (plagiarism) is a serious infringement of VCAA and school policy

All SACs must be clearly the student's own work and must be completed on time and to the standards required in the relevant Study Design and as outlined by Lakeside College staff members.
Students must ensure that any SAC work (planning or final copies) is submitted directly to the subject teacher.

- Students must ensure that all unacknowledged work submitted by them is their own.
- They must acknowledge all resources used, including text and source material and the name/s and status of the person/s who helped, as well as the type of assistance received.
- Students must not accept undue assistance from any person. Undue assistance would include using or copying another person's work or resources without acknowledgement, providing actual adjustments or improvements for a student's work, or dictating or directing a student to insert text.

The issue of copying and plagiarism, and the consequences thereof, are clearly spelled out by the VCAA and may result in an 'N' assessment result.

CHANGING SUBJECTS

Changes to course selection

No later than Week 3 of the start of a semester

Change of Subject Request Form

There may be times throughout the year when a student needs to reassess their program and its direction. Any changes to study selection must be discussed fully with parents, Careers Practitioner, teachers and the VCE Coordinator.

A Change of Subject Request Form will need to be completed and signed before a change may occur. This generally involves changing from one study to another.

Students will not be permitted to change a subject after three weeks from the beginning of the course. Course changes are offered at key times throughout the year. These are communicated to students.

- At the beginning of the year, students are given an opportunity to make changes to both Unit 1 and 3 subjects for a period of no more than 3 weeks. After this time, students are unable to change courses.
- Mid-year changes can be made between Unit 1 and 2 subjects only. Students cannot change Unit 3 or 4 subjects.
- At the end of the school year for the following year, subject change requests can be made during 'Course Confirmation' appointments, prior to the end of the 'Head Start' program.

Home Learning

Home Learning remains an essential part of the teaching and learning process. Students are expected to complete all home learning tasks by the due dates. Students are encouraged to use a diary to record all home learning tasks in order to manage their home learning time effectively. Students are also encouraged to make use of appropriate electronic assistants to manage their school-related activities.

As a guide, home learning should involve the following averaged times distributed across the subjects being studied:

- Year 10: at least 1 ½ hours per day
- Year 11: at least 2 hours per day
- Year 12: at least 3 hours per day

CURRICULUM OVERVIEW

Lakeside College VCE Studies

The VCE curriculum offered at Lakeside College includes the following units of study.

Unit 1 and 2 Studies	Unit 3 and 4 Studies
Art: Making and Exhibiting	Art: Making and Exhibiting
Biology	Biology
Business Management	Business Management
Chemistry	Chemistry
English	English
English Language	German (Languages)
German (Languages)	Health and Human Development
Geography	Legal Studies
Health and Human Development	Literature
History: 20th Century	Mathematics: General
Legal Studies	Mathematics: Methods
Literature	Mathematics: Specialist
Mathematics: General	Physical Education
Mathematics: Methods	Physics
Mathematics: Specialist	Psychology
Physical Education	Unit 2 Religion and Society
Physics	
Psychology	
Unit 1 Religion and Society	

The role of religion in society

Unit 1 Religion and Society

In this unit students explore the spiritual origins of religion and understand its role in the development of society, identifying the nature and purpose of religion over time. They investigate religion, including the totality of phenomena to which the term 'religion' refers, and acknowledge religion's contribution to the development of human society. They also focus on the role of spiritualities, religious traditions and religious denominations in shaping personal and group identity over time. Students examine how individuals, groups and new ideas have affected and continue to affect spiritualities, religious traditions and religious denominations.

The unit provides an opportunity for students to understand the often complex relationships that exist between individuals, groups, new ideas, truth narratives, spiritualities and religious traditions broadly and in the Australian society in which they live. A range of examples is studied throughout the unit. For all areas of study, students explore detailed examples from more than one spirituality, religious tradition or religious denomination. These may be from one or more of the groups below. In addition, for Areas of Study 1 and 2 further shorter illustrative examples should be selected for study from across all the groups below:

- Spiritualities of First Nations peoples (such as in Australia and Oceania; Africa; Canada and the rest of the Americas; Siberia and the rest of Russia; Scandinavia)
- Spiritual and religious ideas in prehistory (associated with, for example, hunter-gatherer societies, Çatalhöyük, Göbekli Tepe, Jericho, Lascaux, Stonehenge)
- Religious traditions of ancient civilisations and empires (such as Babylonia, Canaan, Ancient China, Ancient Egypt, the Indus Valley civilisation, Ancient Rome, Sumer)
- Asian religious and philosophical traditions (such as Buddhism, Confucianism, Hinduism, Jainism, Shintoism, Sikhism, Taoism)
- Abrahamic religions (such as the Baha'i Faith, Christianity, Islam, Judaism).

Students consider the aspects of religion when investigating selected spiritualities, religious traditions and religion in general.

Area of Study 1

The Nature and Purpose of Religion

In this area of study students are introduced to the nature and purpose of religion in general, exploring the role of religion in shaping and giving meaning to individuals and communities. Religion has often been drawn on to provide explanations for all phenomena, offering a means for finding answers to the big questions of life and answering such questions. Students examine the aspects of religion in general, and then apply the aspects of religion as a framework to further examine spiritualities, religious traditions and religious denominations. They also study the interrelation of these aspects generally, and apply the aspects to spiritualities, religious traditions and religious denominations studied. They investigate how the aspects may vary between spiritualities, religious traditions and religious denominations.

Outcome 1

On completion of this unit the student should be able to discuss the nature and purpose of religion and examine the aspects of religion as they apply to selected examples.

Area of Study 2

Religion Through the Ages

In this area of study students investigate how society and religion influence each other, and the roles of religion in society. They consider the factors that influence these roles and the effect that developments in society might have on religion.

Spirituality and religion have been an integral part of the development of human societies as cultural knowledge and understanding is passed from generation to generation through a process of socialisation. As people spread across the globe they encountered and exchanged religious and cultural ideas. Over time, religious traditions have encountered challenging philosophical and spiritual movements, political regimes, legal structures, scientific ideas, colonisation, national myths, globalisation, secularisation, technological developments and historical events.

These encounters have led to religious traditions taking various roles to initiate, endorse, modify or resist the spread of ideas and movements in society.

At times in history some spiritualities, religious traditions and religious denominations have lost the authority and power to explain meaning for their society and have been abandoned; other spiritualities, religious traditions and religious denominations have adapted and been resilient or were re-established in a different form. Some spiritualities, religious traditions and religious denominations have been able to adopt and adapt beliefs, ideas and practices from other religious traditions while retaining their distinctiveness.

Outcome 2

On completion of this unit the student should be able to discuss the changing roles and influence of religion in society

Area of Study 3

Religion in Australia

In this area of study students consider spiritualities and religion in Australia, past and present, and the influences on Australian religious composition, in particular from colonisation, migration and secularisation. They explore how the communities and later institutions of these spiritualities, religious traditions and religious denominations perceived themselves and expressed their collective identity in Australia. This expression of collective identity may have been cohesive or diverse. Students also examine the influence of religion on the personal identity of members, who may adopt religious ideas or practices from other spiritualities, religious traditions and religious denominations. They explore the influence of spiritualities, religious traditions and religious denominations on the development of social infrastructure in Australia, and consider factors such as the laws governing the provision of education and welfare. This exploration should include the interfaith and ecumenical initiatives between and within spiritualities, religious traditions and religious denominations in Australia and trends of religious adherence in Australia.

Outcome 3

On completion of this unit the student should be able to discuss the presence of religion in Australia, past and present.

Unit 2 Religion and Society

How do we know what is good? How do we make decisions in situations where it is unclear what is good or not good? Do we accept what society defines as good? Do we do what feels right? Or do we rely on a definition of what is good from a religious tradition? What are the principles that guide decision making? Ethics is concerned with discovering the perspectives that guide practical moral judgment. Studying ethics involves identifying the arguments and analysing the reasoning, and any other influences, behind these perspectives and moral judgments. An important influence on ethical perspective is the method of ethical decision-making, made up of concepts, principles and theories.

Ethical questions that demand practical moral judgment are raised at the personal, family, local, wider community, national and global level. Family, community and traditional connections tie people together and provide an ethical background to guide what individuals choose to do, approving of some choices and disapproving of others. This ethical background is enmeshed with the dominant religious and philosophical traditions of the times within a culture at a certain point in time.

Today, religious and philosophical traditions interact with other sources of moral values represented in the media and popular culture. Nevertheless, society still often relies on cultural heritages that contain a variety of ethical perspectives as well as values centred on human dignity and basic justice. These remain fundamental to many legal and social systems, and to codes of behaviour. These perspectives and values constitute the everyday categories of ethical discourse in the world. They are taken by the individuals and groups that hold them to be the starting point and common ground for discussion about ethical issues and moral behaviour in societies where multiple worldviews coexist.

In this unit students study in detail various methods of ethical decision-making in at least two religious traditions and their related philosophical traditions. They explore ethical issues in societies where multiple worldviews coexist, in the light of these investigations.

Area of Study 1

Ethical Decision-making and Moral Judgment

In this area of study students are introduced to the nature of ethical decision-making in societies where multiple worldviews coexist. Ethical decision-making involves the selection of methods which have guiding concepts, principles and theories. Students explore concepts that underpin ethical decision-making and influences on practical moral judgment.

Methods of ethical decision-making such as 'ought' ethics, character ethics and outcome ethics are discussed, as well as theories leading to and derived from these methods. These methods and their supporting theories are based on various sources of ethical authority. Ethical methods and practical moral judgment are subject to varying emphases on factors such as duties, outcomes, laws (secular and religious), divinity, social order and social norms, tradition, reason, love, fear, absolutism, relativism, subjectivism, emotionalism, social justice, institutions, the common good, natural law, poetic justice, anarchy, 'scientism', and pragmatism.

Outcome 1

On completion of this unit the student should be able to explain the variety of influences on ethical decision-making and moral judgment in societies where multiple worldviews coexist.

Area of Study 2

Religion and Ethics

In this area of study students examine religious ethical perspectives and other influences on moral judgments of at least two religious traditions in societies where multiple worldviews coexist. They also explore the philosophical traditions which have contributed to each religion's understanding of ethics. Certain authorities, values, norms, ideas, and ethical principles inform broad ethical perspectives and in turn moral judgments within religious and philosophical traditions. Other aspects of religion, in particular beliefs and texts, inform the decision-making process for religious traditions.

Outcome 2

On completion of this unit the student should be able to explain how ethical perspectives and moral judgments are formed within at least two religious traditions, in societies in which multiple worldviews coexist.

Area of Study 3

Ethical Issues in Society

In this area of study students build on the knowledge explored in Areas of Study 1 and 2. Focusing on two or more ethical issues, students apply this knowledge to an examination of debates about ethical issues conducted in the public arena of societies in which multiple religious and non-religious worldviews coexist. The analysis should explain why the issue is regarded as an ethical issue, identify contributors to the debate, including religious traditions, consider the influence of participants' contributions, and investigate the basis of ethical perspectives and moral judgments used in the debates, including the ethical methods involved in the decision-making process.

Outcome 3

On completion of this unit the student should be able to explain two or more debates on ethical issues in societies in which multiple worldviews coexist.

How do organisms regulate their functions?

In this unit students examine the cell as the structural and functional unit of life, from the single celled to the multicellular organism, including the requirements for sustaining cellular processes. Students focus on cell growth, replacement and death and the role of stem cells in differentiation, specialisation and renewal of cells. They explore how systems function through cell specialisation in vascular plants and animals, and consider the role homeostatic mechanisms play in maintaining an animal's internal environment.

A student-adapted or student-designed scientific investigation is undertaken in Area of Study 3. The investigation involves the generation of primary data and is related to the function and/or the regulation of cells or systems. The investigation draws on the key science skills and key knowledge from Area of Study 1 and/or Area of Study 2.

Area of Study 1

How do cells function?

In this area of study students examine the structure and functioning of prokaryotic and eukaryotic cells, and how the plasma membrane contributes to survival by controlling the movement of substances into and out of the cell. Students explore cellular growth, replacement and death. They become familiar with the key events and regulation of the cell cycle and the processes for cell division, including disruptions to the cell cycle and deviant cell behaviour. Students consider the properties of stem cells and their role in differentiation, specialisation and renewal of cells and tissues.

Outcome 1

On completion of this unit the student should be able to explain and compare cellular structure and function and analyse the cell cycle and cell growth, death and differentiation.

Area of Study 2

How do plant and animal systems function?

In this area of study students explore how systems function through cell specialisation in vascular plants and in digestive, endocrine and excretory systems in animals, focusing on regulation of water balance in plants, and temperature, blood glucose and water balance in animals. Students examine how homeostatic mechanisms in animals help maintain their internal environment within a narrow range of tolerance levels, and consider malfunctions in homeostatic mechanisms.

Outcome 2

On completion of this unit the student should be able to explain and compare how cells are specialised and organised in plants and animals, and analyse how specific systems in plants and animals are regulated.

Area of Study 3

How do scientific investigations develop understanding of how organisms regulate their functions?

Survival of organisms requires control and regulation of factors within an organism and often outside an organism. Different types of cells and adaptations enhance an organism's survival in a particular environment, while homeostatic mechanisms maintain the internal environment.

In this area of study students adapt or design and then conduct a scientific investigation to generate appropriate qualitative and/or quantitative data, organise and interpret the data, and reach a conclusion in response to the research question.

The student-adapted or student-designed scientific investigation relates to knowledge and skills developed in Area of Study 1 and/or Area of Study 2.

Outcome 3

On completion of this unit the student should be able to adapt or design and then conduct a scientific investigation related to function and/or regulation of cells or systems, and draw a conclusion based on evidence from generated primary data.

How does inheritance impact on diversity?

In this unit students explore reproduction and the transmission of biological information from generation to generation and the impact this has on species diversity. They apply their understanding of chromosomes to explain the process of meiosis. Students consider how the relationship between genes, and the environment and epigenetic factors influence phenotypic expression. They explain the inheritance of characteristics, analyse patterns of inheritance, interpret pedigree charts and predict outcomes of genetic crosses.

Students analyse the advantages and disadvantages of asexual and sexual reproductive strategies, including the use of reproductive cloning technologies. They study structural, physiological and behavioural adaptations that enhance an organism's survival. Students explore interdependences between species, focusing on how keystone species and top predators structure and maintain the distribution, density and size of a population. They also consider the contributions of Aboriginal and Torres Strait Islander knowledge and perspectives in understanding the survival of organisms in Australian ecosystems.

A student-directed research investigation into a contemporary ethical issue is to be undertaken in Area of Study 3. The investigation relates to the application of genetic knowledge, reproductive science, inheritance or adaptations and interdependencies beneficial for survival. The investigation draws on key knowledge and key science skills from Area of Study 1 and/or Area of Study 2.

Area of Study 1

How is inheritance explained?

In this area of study students describe the production of gametes in sexual reproduction through the key events in meiosis. They explore the nature of chromosomes and the use of genetic language to read and interpret patterns of inheritance and predict outcomes of genetic crosses.

Students explain how a characteristic or trait can be influenced by one gene, many genes acting together, and genes interacting with external environmental or epigenetic factors. They apply their genetic knowledge to analyse pedigree charts, determine patterns of inheritance and predict outcomes of genetic crosses.

Outcome 1

On completion of this unit the student should be able to explain and compare chromosomes, genomes, genotypes and phenotypes, and analyse and predict patterns of inheritance.

Area of Study 2

How do inherited adaptations impact on diversity?

In this area of study students analyse the advantages and disadvantages of asexual and sexual reproduction and investigate the use and application of reproductive cloning technologies. Students explore the biological importance of genetic diversity and the structural, physiological and behavioural adaptations that enable species to survive in an ecosystem.

Students explore the interdependencies between species, including the importance and impact of keystone species and top predators. They consider the contributions of Aboriginal and Torres Strait Islander knowledge and perspectives to the understanding of the adaptations of, and interdependencies between, species in Australian ecosystems.

Outcome 2

On completion of this unit the student should be able to analyse advantages and disadvantages of reproductive strategies, and evaluate how adaptations and interdependencies enhance survival of species within an ecosystem.

Area of Study 3

How do humans use science to explore and communicate contemporary bioethical issues?

In this area of study students explore a contemporary bioethical issue relating to the application of genetic knowledge, reproductive science, inheritance or adaptations and interdependencies beneficial for survival.

Examples of investigation topics include, but are not limited to: genomic and epigenetic research; cloning for agriculture, horticulture or other purposes; assisted reproductive technologies; prenatal and predictive genetic testing; strategies for maintaining genetic diversity within a species or population; the impact of introduced species; changes to specific keystone species on populations and ecosystems; or the use of biomimicry to solve human challenges or biopiracy of Indigenous knowledge.

Students may develop a research question related to the applications included above or, in conjunction with their teacher, they may develop their own research question related to Area of Study 1 and/or Area of Study 2. Possible starting points when developing a research question may include stimulus material such as announcements of recent discoveries, an expert's published point of view, a TED talk or a YouTube presentation, an article from a scientific publication, public concern about an issue, changes in government funding or new government initiatives.

Analysing and synthesising secondary data, students demonstrate and apply their knowledge and relevant key science skills to: explain the biological concepts specific to the identified bioethical issue; consider different perspectives; outline social, economic, legal and/or political factors relevant to the selected issue; choose a position or course of action on the basis of reasoning and reflection; and communicate their findings.

The application of ethical understanding in VCE Biology involves the consideration of approaches to bioethics and ethical concepts.

Outcome 3

On completion of this unit the student should be able to identify, analyse and evaluate a bioethical issue in genetics, reproductive science or adaptations beneficial for survival.

How do cells maintain life?

In this unit students investigate the workings of the cell from several perspectives. They explore the relationship between nucleic acids and proteins as key molecules in cellular processes. Students analyse the structure and function of nucleic acids as information molecules, gene structure and expression in prokaryotic and eukaryotic cells and proteins as a diverse group of functional molecules. They examine the biological consequences of manipulating the DNA molecule and applying biotechnologies.

Students explore the structure, regulation and rate of biochemical pathways, with reference to photosynthesis and cellular respiration. They explore how the application of biotechnologies to biochemical pathways could lead to improvements in agricultural practices.

Students apply their knowledge of cellular processes through investigation of a selected case study, data analysis and/or a bioethical issue. Examples of investigation topics include, but are not limited to: discovery and development of the model of the structure of DNA; proteomic research applications; transgenic organism use in agriculture; use, research and regulation of gene technologies, including CRISPR-Cas9; outcomes and unexpected consequences of the use of enzyme inhibitors such as pesticides and drugs; research into increasing efficiency of photosynthesis or cellular respiration or impact of poisons on the cellular respiration pathway.

The application of ethical understanding in VCE Biology involves the consideration of approaches to bioethics and ethical concepts.

A student-designed scientific investigation related to cellular processes and/or responses to challenges 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.

Area of Study 1

What is the role of nucleic acids and proteins in maintaining life?

In this area of study students explore the expression of the information encoded in a sequence of DNA to form a protein and outline the nature of the genetic code and the proteome. They apply their knowledge to the structure and function of the DNA molecule to examine how molecular tools and techniques can be used to manipulate the molecule for a particular purpose. Students compare gene technologies used to address human and agricultural issues and consider the ethical implications of their use.

Outcome 1

On completion of this unit the student should be able to analyse the relationship between nucleic acids and proteins, and evaluate how tools and techniques can be used and applied in the manipulation of DNA.

Area of Study 2

How are biochemical pathways regulated?

In this area of study students focus on the structure and regulation of biochemical pathways. They examine how biochemical pathways, specifically photosynthesis and cellular respiration, involve many steps that are controlled by enzymes and assisted by coenzymes. Students investigate factors that affect the rate of cellular reactions and explore applications of biotechnology that focus on the regulation of biochemical pathways.

Outcome 2

On completion of this unit the student should be able to analyse the structure and regulation of biochemical pathways in photosynthesis and cellular respiration, and evaluate how biotechnology can be used to solve problems related to the regulation of biochemical pathways.

Outcomes	Marks allocated	Assessment tasks
Outcome 1 Analyse the relationship between nucleic acids and proteins, and evaluate how tools and techniques can be used and applied in the manipulation of DNA.	40	**For Outcomes 1 and 2** For each outcome, one task selected from: • analysis and evaluation of a selected biological case study • analysis and evaluation of generated primary and/or collated secondary data • comparison and evaluation of biological concepts, methodologies and methods, and findings from three student practical activities • analysis and evaluation of a contemporary bioethical issue.
Outcome 2 Analyse the structure and regulation of biochemical pathways in photosynthesis and cellular respiration, and evaluate how biotechnology can be used to solve problems related to the regulation of biochemical pathways.	40	Each task type can only be selected once across Units 3 and 4. For each task the time allocated should be approximately 50–70 minutes for a written response and 10 minutes for a multimodal or oral presentation.
Total marks	**80**	

How does life change and respond to challenges?

In this unit students consider the continual change and challenges to which life on Earth has been, and continues to be, subjected to. They study the human immune system and the interactions between its components to provide immunity to a specific pathogen. Students consider how the application of biological knowledge can be used to respond to bioethical issues and challenges related to disease.

Students consider how evolutionary biology is based on the accumulation of evidence over time. They investigate the impact of various change events on a population's gene pool and the biological consequences of changes in allele frequencies. Students examine the evidence for relatedness between species and change in life forms over time using evidence from paleontology, structural morphology, molecular homology and comparative genomics. Students examine the evidence for structural trends in the human fossil record, recognising that interpretations can be contested, refined or replaced when challenged by new evidence.

Students demonstrate and apply their knowledge of how life changes and responds to challenges through investigation of a selected case study, data analysis and/or bioethical issue. Examples of investigation topics include, but are not limited to: deviant cell behaviour and links to disease; autoimmune diseases; allergic reactions; development of immunotherapy strategies; use and application of bacteriophage therapy; prevention and eradication of disease; vaccinations; bioprospecting for new medical treatments; trends, patterns and evidence for evolutionary relationships; population and species changes over time in non-animal communities such as forests and microbiota; monitoring of gene pools for conservation planning; role of selective breeding programs in conservation of endangered species; or impact of new technologies on the study of evolutionary biology.

The application of ethical understanding in VCE Biology involves the consideration of approaches to bioethics and ethical concepts.

A student-designed scientific investigation involving the generation of primary data related to cellular processes and/or how life changes and responds to challenges is undertaken in either Unit 3 or Unit 4, or across both Units 3 and 4, and is assessed in Unit 4, Outcome 3. The design, analysis and findings of the investigation are presented in a scientific poster format.

Area of Study 1

How do organisms respond to pathogens?

In this area of study students focus on the immune response of organisms to specific pathogens. Students examine unique molecules called antigens and how they illicit an immune response, the nature of immunity and the role of vaccinations in providing immunity. They explain how technological advances assist in managing immune system disorders and how immunotherapies can be applied to the treatment of other diseases.

Students consider that in a globally connected world there are biological challenges that can be mediated by identification of pathogens, the prevention of spread and the development of treatments for diseases.

Outcome 1

On completion of this unit the student should be able to analyse the immune response to specific antigens, compare the different ways that immunity may be acquired and evaluate challenges and strategies in the treatment of disease.

Area of Study 2

How are species related over time?

In this area of study students focus on changes to genetic material over time and the evidence for biological evolution. They consider how the field of evolutionary biology is based upon the accumulation of evidence over time and develop an understanding of how interpretations of evidence can change in the light of new evidence as a result of technological advances, particularly in molecular biology. Students consider the biological consequences of changes in allele frequencies and how isolation and divergence are required elements for speciation. They consider the evidence for determining the relatedness between species and examine the evidence for major trends in hominin evolution, including the migration of modern human populations around the world.

Outcome 2

On completion of this unit the student should be able to analyse the evidence for genetic changes in populations and changes in species over time, analyse the evidence for relatedness between species, and evaluate the evidence for human change over time.

Area of Study 3

How is scientific inquiry used to investigate cellular processes and/or biological change?

Students undertake a student-designed scientific investigation in either Unit 3 or Unit 4, or across both Units 3 and 4. The investigation involves the generation of primary data relating to cellular processes and/or how life changes and responds to challenges. The investigation draws on knowledge and related key science skills developed across Units 3 and 4 and is undertaken by students in the laboratory and/or in the field.

When undertaking the investigation students are required to apply the key science skills to develop a question, state an aim, formulate a hypothesis and plan a course of action to answer the question, while complying with safety and ethical guidelines. Students then undertake an investigation to generate primary quantitative data, analyse and evaluate the data, identify limitations of data and methods, link experimental results to scientific ideas, discuss implications of the results, and draw a conclusion in response to the question. The presentation format for the investigation is a scientific poster.

Outcome 3

On completion of this unit the student should be able to design and conduct a scientific investigation related to cellular processes and/or how life changes and responds to challenges, and present an aim, methodology and methods, results, discussion and a conclusion in a scientific poster.

Contribution to final assessment

School-assessed Coursework for Unit 4 will contribute 30 per cent to the study score.

Outcomes	Marks allocated	Assessment tasks
Outcome 1 Analyse the immune response to specific antigens, compare the different ways that immunity may be acquired and evaluate challenges and strategies in the treatment of disease.	40	**For Outcomes 1 and 2** For each outcome, one task selected from: • analysis and evaluation of a selected biological case study • analysis and evaluation of generated primary and/or collated secondary data • comparison and evaluation of biological concepts, methodologies and methods, and findings from three student practical activities • analysis and evaluation of a contemporary bioethical issue.
Outcome 2 Analyse the evidence for genetic changes in populations and changes in species over time, analyse the evidence for relatedness between species, and evaluate the evidence for human change over time.	40	Each task type can only be selected once across Units 3 and 4. For each task the time allocated should be approximately 50–70 minutes for a written response and 10 minutes for a multimodal or oral presentation.
Outcome 3 Design and conduct a scientific investigation related to cellular processes and/or how life changes and responds to challenges, and present an aim, methodology and method, results, discussion and a conclusion in a scientific poster.	40	**For Outcome 3** Communication of the design, analysis and findings of a student-designed and student-conducted scientific investigation through a structured scientific poster and logbook entries. The poster should not exceed 600 words.
Total marks	**120**	

Planning a business

Businesses of all sizes are major contributors to the economic and social wellbeing of a nation. The ability of entrepreneurs to establish a business 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, as well as the effect of these on planning a business. They also consider the importance of the business sector to the national economy and social wellbeing.

Area of Study 1

The business idea

Businesses of all sizes are major contributors to the economic and social wellbeing of a nation. The ability of entrepreneurs to establish a business 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, as well as the effect of these on planning a business. They also consider the importance of the business sector to the national economy and social wellbeing.

Outcome 1

On completion of this unit the student should be able to describe a process for creating and developing a business idea, and explain how innovative and entrepreneurial practices can contribute to the national economy and social wellbeing.

Area of Study 2

Internal business environment and planning

The internal environment affects the approach a business takes to planning and the extent to which planning is successful. A business owner will generally have more control over the activities, functions and pressures that occur within the business. These factors, such as business models, legal business structures and staffing, will also be influenced to some extent by the external environment. Students explore the factors within the internal business environment and consider how planning decisions involving these factors may affect the ultimate success of a business, with success being measured by the extent to which business objectives are met within a specific timeframe.

Outcome 2

On completion of this unit the student should be able to describe the internal business environment and analyse how factors from within it may affect business planning.

Area of Study 3

External business environment and planning

The external environment consists of all elements outside a business that may act as pressures or forces on business operations. Students consider factors from the external environment such as legal, political, social, economic, technological, global and corporate social responsibility factors and the effects these may have on the decisions made when planning a business.

Outcome 3

On completion of this unit the student should be able to describe the external environment of a business and explain how the macro and operating factors within it may affect business planning.

Establishing a business

This unit focuses on the establishment phase of a business. Establishing a business involves compliance with legal requirements as well as 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 met 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 management practices by applying key knowledge to contemporary business case studies from the past four years.

Area of Study 1

Legal requirements and financial considerations

It is essential to deal with legal and financial matters when establishing a business. In this area of study students are introduced to the legal requirements and financial considerations that are vital in establishing a business. They also consider the implications for the business if legal and financial requirements are not met.

Outcome 1

On completion of this unit the student should be able to outline the key legal requirements and financial record-keeping considerations when establishing a business, and explain the importance of establishing effective policies and procedures to achieve compliance with these requirements.

Area of Study 2

Marketing a business

Establishing a strong customer base for a business is an important component of success. In this area of study students develop an understanding that marketing encompasses a wide range of management practices, from identifying the needs of the target market and creating a brand presence through to consideration of the 7Ps of marketing and the impact of rapidly changing technology on marketing practices. They also consider effective public relations strategies and the benefits these can bring to a business.

Outcome 2

On completion of this unit the student should be able to explain how establishing a customer base and a marketing presence supports the achievement of business objectives, analyse effective marketing and public relations strategies and apply these strategies to business-related case studies.

Area of Study 3

Staffing a business

Staff, as one of the greatest assets of a business, are an important consideration during the establishment phase. The quantity and quality of staff has a direct link to business productivity and the achievement of business objectives. In this area of study students consider staffing requirements that will meet the needs of a business and contribute to productivity and achievement of business objectives. They research the processes undertaken by the business in relation to the recruitment, selection and induction of staff. Students consider the opportunities that the skills and capabilities of staff can offer a business, the legal obligations that must be addressed in relation to staff, and the relationship between employers and employees within a business.

Outcome 3

On completion of this unit the student should be able to discuss the importance of staff to a business, discuss the staffing needs for a business, and evaluate staff-management strategies from both an employer and staff perspective.

Managing a Business

In this unit students explore the key processes and considerations for managing a business efficiently and effectively to achieve business objectives. Students examine different types of businesses and their respective objectives and stakeholders. They investigate strategies to manage both staff and business operations to meet objectives, and develop an understanding of the complexity and challenge of managing businesses. Students compare theoretical perspectives with current practice through the use of contemporary Australian and global business case studies from the past four years.

Area of Study 1

Business foundations

This area of study introduces students to the key characteristics of businesses and their stakeholders. Students investigate potential conflicts between the different demands of stakeholders on a business. They examine corporate culture and a range of management styles and management skills that may be used when managing a business, and apply these to contemporary business case studies from the past four years.

Outcome 1

On completion of this unit the student should be able to analyse the key characteristics of businesses, their stakeholders, management styles and skills, and corporate culture.

Area of Study 2

Human resource management

In this area of study students investigate considerations for the effective management of employees to ensure business objectives are achieved. They consider employee motivation in terms of Maslow's Hierarchy of Needs, Locke and Latham's Goal Setting Theory, and Lawrence and Nohria's Four Drive Theory. Using these theories of motivation and motivation strategies, students propose and justify possible strategies for employee management in contemporary business case studies from the past four years. Students study an overview of workplace relations, including the main participants and their roles in the dispute resolution process.

Outcome 2

On completion of this unit the student should be able to explain theories of motivation and apply them to a range of contexts, and analyse and evaluate strategies related to the management of employees.

Area of Study 3

Operations management

The production of goods and services is a core objective of businesses. Effective management of the process of transforming inputs into outputs is vital to the success of a business, both in terms of maximising the efficiency and effectiveness of the production process and meeting the needs of stakeholders. In this area of study students examine operations management and consider the best and most responsible use of available resources to produce a quality final good or service in a competitive, global environment.

Outcome 3

On completion of this unit the student should be able to analyse the relationship between business objectives and operations management, and propose and evaluate strategies to improve the efficiency and effectiveness of business operations.

Contribution to final assessment

School-assessed Coursework for Unit 3 will contribute 25 per cent to the study score.

Outcomes	Marks allocated	Assessment tasks
Outcome 1 Analyse the key characteristics of businesses, their stakeholders, management styles and skills, and corporate culture.	20	The student's performance on each outcome is assessed using two or more of the following • a case study • structured questions • an essay • a report • a media analysis
Outcome 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	
Outcome 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	
Total marks	**100**	

Transforming a Business

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 effective management and leadership in change management. Using one or more contemporary business case studies from the past four years, students evaluate business practice against theory.

Area of Study 1

Reviewing performance – the need for change

IIn this area of study students develop their understanding of the need for change. Managers regularly review and evaluate business performance through use of key performance indicators and use the results to make decisions affecting the future of a business. Managers can take both a proactive and reactive approach to change. Students investigate the ways a business can search for new business opportunities as a source of future business growth and consider current forces for change on a business. They apply Lewin's Force Field Analysis theory to contemporary case studies from the past four years and consider approaches to strategic management using Porter's Generic Strategies.

Outcome 1

On completion of this unit the student should be able to explain the way business change may come about, analyse why managers may take a proactive or reactive approach to change, use key performance indicators to analyse the performance of a business, explain the driving and restraining forces for change, and evaluate management strategies to position a business for the future.

Area of Study 2

Implementing change

In this area of study students explore how businesses respond to evaluation data. It is important for managers to know where they want a business to be positioned for the future before implementing a variety of strategies to bring about the desired change. Students consider the importance of leadership in change management and discuss and evaluate effective strategies for managing change. Students consider how leaders can inspire change and the effect change can have on stakeholders of a business. They consider the principles of Senge's Learning Organisation and apply the Three-step Change Model (Lewin) in implementing change in a business. Using one or more contemporary business case studies from the past four years, students evaluate business practice against theory, considering how corporate social responsibility can be incorporated into the change process.

Outcome 2

On completion of this unit the student should be able to discuss the importance of effective management strategies and leadership in relation to change, 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.

Contribution to final assessment

School-assessed Coursework for Unit 4 will contribute 25 per cent to the study score.

Outcomes	Marks allocated	Assessment tasks
Outcome 1 Explain the way business change may come about, analyse why managers may take a proactive or reactive approach to change, use key performance indicators to analyse the performance of a business, explain the driving and restraining forces for change, and evaluate management strategies to position a business for the future.	50	The student's performance on each outcome is assessed using two or more of the following • a case study • structured questions • an essay • a report • a media analysis
Outcome 2 Discuss the importance of effective management strategies and leadership in relation to change, 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	
Total marks	**100**	

How can the diversity of materials be explained?

The development and use of materials for specific purposes is an important human endeavour. In this unit students investigate the chemical structures and properties of a range of materials, including covalent compounds, metals, ionic compounds and polymers. They are introduced to ways that chemical quantities are measured. They consider how manufacturing innovations lead to more sustainable products being produced for society through the use of renewable raw materials and a transition from a linear economy towards a circular economy.

Students conduct practical investigations involving the reactivity series of metals, separation of mixtures by chromatography, use of precipitation reactions to identify ionic compounds, determination of empirical formulas, and synthesis of polymers.

Throughout this unit students use chemistry terminology including symbols, formulas, chemical nomenclature and equations to represent and explain observations and data from their own investigations and to evaluate the chemistry-based claims of others.

A student-directed research investigation into the sustainable production or use of a selected material is to be undertaken in Area of Study 3. The investigation explores how sustainability factors such as green chemistry principles and the transition to a circular economy are considered in the production of materials to ensure minimum toxicity and impacts on human health and the environment. The investigation draws on key knowledge and key science skills from Area of Study 1 and/or Area of Study 2.

Area of Study 1

How do the chemical structures of materials explain their properties and reactions?

In this area of study students focus on elements as the building blocks of useful materials. They investigate the structures, properties and reactions of carbon compounds, metals and ionic compounds, and use chromatography to separate the components of mixtures. They use metal recycling as a context to explore the transition in manufacturing processes from a linear economy to a circular economy.

The selection of learning contexts should allow students to develop practical techniques to investigate the properties and reactions of various materials. Students develop their skills in the use of scientific equipment and apparatus. Students may conduct flame tests to identify elements in the periodic table. They may model covalent, metallic and ionic structures using simple ball-and-stick models and may use computer simulations of the three-dimensional representations of molecules and lattices to better understand structures. They use solubility tables to experimentally identify unknown ions in solution. They respond to challenges such as developing their own reactivity series by reacting samples of metals with acids, oxygen and water.

Outcome 1

On completion of this unit the student should be able to explain how elements form carbon compounds, metallic lattices and ionic compounds, experimentally investigate and model the properties of different materials, and use chromatography to separate the components of mixtures.

Area of Study 2

How are materials quantified and classified?

In this area of study students focus on the measurement of quantities in chemistry and the structures and properties of organic compounds, including polymers.

The selection of learning contexts should allow students to develop practical techniques to quantify amounts of substances and to investigate the chemistry of organic compounds. Students develop their skills in the use of scientific equipment and apparatus. They perform calculations based on the generation of primary data, such as determining the empirical formula of an ionic compound or hydrated salt, and consider how the quality of data generated in experiments can be improved. They may construct models to visualise the similarities and differences between families of organic compounds. Students may use common substances in their experiments such as making glue from milk. They may investigate the environmental impact of the production of polymers: for example, the recycling of biodegradable polymers derived from natural resources such as biopolyethene (Bio-PE).

Students respond to challenges such as investigating how changing formulations for polymers affects their structure and properties: for example, by creating slime.

Outcome 2

On completion of this unit the student should be able to calculate mole quantities, use systematic nomenclature to name organic compounds, explain how polymers can be designed for a purpose, and evaluate the consequences for human health and the environment of the production of organic materials and polymers.

Area of Study 3

Research investigation

How can chemical principles be applied to create a more sustainable future?

Knowledge of the structure and properties of matter has developed over time through scientific and technological research, leading to the production of a range of useful chemicals, materials and products for society. Chemists today, through sustainable practices, seek to improve the efficiency with which natural resources are used to meet human needs for chemical products and services. Chemists also learn from Aboriginal and Torres Strait Islander peoples about the ways that they sustainably modify and process raw materials using techniques developed over millennia. Sustainability requires innovation in designing and discovering new chemicals, production processes and product management systems that will provide increased yield or performance at a lower cost while meeting the goals of protecting and enhancing human health and the environment.

In this area of study students undertake an investigation involving the selection and evaluation of a recent discovery, innovation, advance, case study, issue or challenge linked to the knowledge and skills developed in Unit 1 Area of Study 1 and/or Area of Study 2, including consideration of sustainability concepts (green chemistry principles, sustainable development and the transition towards a circular economy). Examples of investigation topics and possible research questions are provided below.

Students may select a research question related to the investigation topics included below or, in conjunction with their teacher, develop their own research question related to Unit 1 Area of Study 1 and/or Area of Study 2. Possible starting points when developing a research question may include visiting a chemical laboratory, local chemical manufacturer or industrial plant; announcements of recent materials science research findings; an interview with an expert involved in materials science or sustainability; an expert's published point of view; a public concern about an issue related to the production of a chemical or material; 'green field' research leading to new technologies; changes in government funding or policy or new government initiatives, such as incentives promoting the transition from a linear economy to a circular economy; case studies related to how Aboriginal and Torres Strait Islander peoples process natural materials for particular purposes; a TED talk; a YouTube presentation; or an article from a scientific publication.

Students apply critical and creative thinking and science inquiry skills to prepare a communication to explain the relevant chemical concepts associated with their investigation, critically examine the information and data available to answer the research question, and identify the sociocultural, economic, political, legal and ethical implications of the selected investigation in terms of sustainability.

Outcome 3

On completion of this unit the student should be able to investigate and explain how chemical knowledge is used to create a more sustainable future in relation to the production or use of a selected material.

How do chemical reactions shape the natural world?

Society is dependent on the work of chemists to analyse the materials and products in everyday use. In this unit students analyse and compare different substances dissolved in water and the gases that may be produced in chemical reactions. They explore applications of acid-base and redox reactions in society.

Students conduct practical investigations involving the specific heat capacity of water, acid-base and redox reactions, solubility, molar volume of a gas, volumetric analysis, and the use of a calibration curve.

Throughout the unit students use chemistry terminology, including symbols, formulas, chemical nomenclature and equations, to represent and explain observations and data from their own investigations and to evaluate the chemistry-based claims of others.

A student-adapted or student-designed scientific investigation is undertaken in Area of Study 3. The investigation involves the generation of primary data and is related to the production of gases, acid-base or redox reactions, or the analysis of substances in water. It draws on the key science skills and key knowledge from Unit 2 Area of Study 1 and/or Area of Study 2.

Area of Study 1

How do substances interact with water?

In this area of study students focus on understanding the properties of water and investigating acid-base and redox reactions. They explore water's properties, including its density, specific heat capacity and latent heat of vaporisation. They write equations for acid-base and redox reactions, and apply concepts including pH as a measure of acidity. They explore applications of acid-base reactions and redox reactions in society.

The selection of learning contexts should allow students to develop practical techniques to investigate the properties of water and acid-base and redox reactions. Students develop their skills in the use of scientific equipment and apparatus. They may demonstrate their understanding of concentration using coloured solutions such as ammonium molybdate. Students explore pH: for example, by making their own indicators from natural materials, developing their own pH scale and comparing the accuracy of their indicators with commercial indicators. They may investigate redox reactions by comparing corrosion rates of iron in tap water and sea water or building simple cells to power a diode. They respond to challenges such as investigating the action of soda water on seashells and linking their findings to socio-scientific issues such as ocean acidification.

Outcome 1

On completion of this unit the student should be able to explain the properties of water in terms of structure and bonding, and experimentally investigate and analyse applications of acid-base and redox reactions in society.

Area of Study 2

How are chemicals measured and analysed?

In this area of study students focus on the analysis and quantification of chemical reactions involving acids, bases, salts and gases. They measure the solubility of substances in water, explore the relationship between solubility and temperature using solubility curves, and learn to predict when a solute will dissolve or crystallise out of solution. They quantify amounts in chemistry using volumetric analysis, application of the ideal gas equation, stoichiometry and calibration curves.

The selection of learning contexts should allow students to develop practical techniques to investigate substances that may be dissolved in water or found in soils, particularly salts, acids and bases, as well as gases. Students develop their skills in the use of scientific equipment and apparatus. They use precipitation reactions to purify water: for example, by using iron or aluminium compounds to precipitate and remove phosphorus from wastewater. They perform acid-base titrations, such as comparing the ethanoic acid concentrations of vinegar, mayonnaise and tomato sauce. They construct calibration curves to analyse unknown concentrations of substances, such as the amount of nitrates or phosphates in water or soil samples. Students respond to challenges such as determining the set of standards required in setting up a calibration curve in colorimetry.

Outcome 2

On completion of this unit the student should be able to calculate solution concentrations and predict solubilities, use volumetric analysis and instrumental techniques to analyse for acids, bases and salts, and apply stoichiometry to calculate chemical quantities.

Area of Study 3

How do quantitative scientific investigations develop our understanding of chemical reactions?

Many of the 17 goals in the United Nations' 2030 Agenda for Sustainable Development relate to ensuring that people have access to potable water, clean air and good quality soil to meet their basic needs. The quality of water, air and soil must be monitored closely to ensure that human health and the environment are not compromised.

In this area of study students adapt or design and then conduct a scientific investigation related to chemical equations and/or analysis, which must include the generation of primary data. They develop a research question related to the production of gases, acid-base or redox reactions or the analysis of substances in water, and adapt or design and then conduct a scientific investigation to generate appropriate quantitative data. Students organise and interpret the data and reach a conclusion in response to their research question.

Research questions may relate to different scientific methodologies. Pattern seeking may be utilised in investigating questions such as 'Is there a relationship between salinity concentration and the rate of rusting of iron?'. Controlled experiments may be designed to investigate questions such as 'Why is isopropyl alcohol measured as %(v/v) while chlorine bleach is measured in ppm, and what concentrations of isopropyl alcohol and chlorine bleach are required to disinfect surfaces?'. Students may also investigate product, process or system development, such as formulating a UV-stable natural indicator.
The student-adapted or student-designed scientific investigation relates to knowledge and skills developed in Unit 2 Area of Study 1 and/or Area of Study 2.

Outcome 3

On completion of this unit the student should be able to draw an evidence-based conclusion from primary data generated from a student-adapted or student-designed scientific investigation related to the production of gases, acid-base or redox reactions or the analysis of substances in water.

How can chemical processes be designed to optimise efficiency?

The global demand for energy and materials is increasing with world population growth. In this unit students explore energy options and the chemical production of materials with reference to efficiencies, renewability and the minimisation of their impact on the environment.

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. In this context they use the electrochemical series to predict and write half and overall redox equations, and apply Faraday's laws to calculate quantities in electrolytic reactions.

Students analyse manufacturing processes with reference to factors that influence their reaction rates and extent. They investigate and apply the equilibrium law and Le Chatelier's principle to different reaction systems, including to predict and explain the conditions that will improve the efficiency and percentage yield of chemical processes. 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.

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. The findings of the investigation are presented in a scientific poster forma

Area of Study 1

What are the options for energy production?

In this area of study students focus on analysing and comparing a range of energy resources and technologies, including fossil fuels, biofuels, galvanic cells and fuel cells, with reference to the energy transformations and chemical reactions involved, energy efficiencies, environmental impacts and potential applications. Students use the specific heat capacity of water and thermochemical equations to determine the enthalpy changes and quantities of reactants and products involved in the combustion reactions of a range of renewable and non-renewable fuels.

Students conduct practical investigations involving redox reactions, including the design, construction and testing of galvanic cells, and account for differences between experimental findings and predictions made by using the electrochemical series. They compare the design features, operating principles and uses of galvanic cells and fuel cells, and summarise cell processes by writing balanced equations for half and overall cell processes.

Outcome 1

On completion of this unit the student should be able to 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.

Area of Study 2

How can the yield of a chemical product be optimised?

In this area of study students explore the factors that increase the efficiency and percentage yield of a chemical manufacturing process while reducing the energy demand and associated costs.

Students investigate how the rate of a reaction can be controlled so that it occurs at the optimum rate while avoiding unwanted side reactions and by-products. They explain reactions with reference to the collision theory including reference to Maxwell-Boltzmann distribution curves. The progression of exothermic and endothermic reactions, including the use of a catalyst, is represented using energy profile diagrams.

Students explore homogeneous equilibrium systems and apply the equilibrium law to calculate equilibrium constants and concentrations of reactants and products. They investigate Le Chatelier's principle and the effect of different changes on an equilibrium system and make predictions about the optimum conditions for the production of chemicals, taking into account rate and yield considerations. Students represent the establishment of equilibrium and the effect of changes to an equilibrium system using concentration-time graphs.

Students investigate a range of electrolytic cells with reference to their basic design features and purpose, their operating principles and the energy transformations that occur. They examine the discharging and recharging processes in rechargeable cells, and apply Faraday's laws to calculate quantities in electrochemistry and to determine cell efficiencies.

Outcome 2

On completion of this unit the student should be able to 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.

Contribution to final assessment

Outcomes	Marks allocated	Assessment tasks
Outcome 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	Analysis and evaluation of stimulus material. OR A report on a laboratory investigation OR A reflective learning journal/blog related to selected activities or in response to an issue. (approximately 50 minutes or not exceeding 1000 words)
Outcome 2 Apply rate and equilibrium principals 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	At least one task selected from: • Annotations of at least two practical activities from a practical logbook • A report of a student investigation • An evaluation of research • Analysis of data including generalisations and conclusions • Media analysis/response • A graphic organiser illustrating a chemical process • An analysis of an unfamiliar chemical process • An analysis of an unfamiliar chemical manufacturing process or electrolytic cell • A response to a set of structured questions (approximately 50 minutes or not exceeding 1000 words for each task)
Total marks	**100**	

How are organic compounds categorised, analysed and used?

The carbon atom has unique characteristics that explain the diversity and number of organic compounds that not only constitute living tissues but are also found in the fuels, foods, medicines and many of the materials we use in everyday life. In this unit students investigate the structural features, bonding, typical reactions and uses of the major families of organic compounds including those found in food.

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.

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.

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. The findings of the investigation are presented in a scientific poster format as outlined in the template on page 11.

Area of Study 1

How can the diversity of carbon compounds be explained and categorised?

In this area of study students explore why such a vast range of carbon compounds is possible. They examine the structural features of members of several homologous series of compounds, including some of the simpler structural isomers, and learn how they are represented and named.

Students investigate trends in the physical and chemical properties of various organic families of compounds. They study typical reactions of organic families and some of their reaction pathways, and write balanced chemical equations for organic syntheses.

Students learn to deduce or confirm the structure and identity of organic compounds by interpreting data from mass spectrometry, infrared spectroscopy and proton and carbon-13 nuclear magnetic resonance spectroscopy.

Outcome 1

On completion of this unit the student should be able to 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.

Area of Study 2

What is the chemistry of food?

Food contains various organic compounds that are the source of both the energy and the raw materials that the human body needs for growth and repair. In this area of study students explore the importance of food from a chemical perspective.

Students study the major components of food with reference to their structures, properties and functions. They examine the hydrolysis reactions in which foods are broken down, the condensation reactions in which new biomolecules are formed and the role of enzymes, assisted by coenzymes, in the metabolism of food.

Students study the role of glucose in cellular respiration and investigate the principles of calorimetry and its application in determining enthalpy changes for reactions in solution. They explore applications of food chemistry by considering the differences in structures of natural and artificial sweeteners, the chemical significance of the glycaemic index of foods, the rancidity of fats and oils, and the use of the term 'essential' to describe some amino acids and fatty acids in the diet.

Outcome 2

On completion of this unit the student should be able to 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

Area of Study 3

Practical investigation

A student-designed or adapted practical investigation related to energy and/or food is undertaken in either Unit 3 or Unit 4, or across both Units 3 and 4.

The investigation relates to knowledge and skills developed across Unit 3 and/or Unit 4. The investigation requires the student to identify an aim, develop a question, formulate a hypothesis and plan a course of action to answer the question and that complies with safety and ethical requirements. The student then undertakes an experiment that involves the collection of primary qualitative and/or quantitative data, analyses and evaluates the data, identifies limitations of data and methods, links experimental results to science ideas, reaches a conclusion in response to the question and suggests further investigations which may be undertaken. Findings are communicated in a scientific poster format according to the template on page 11. A practical logbook must be maintained by the student for record, authentication and assessment purposes.

Outcome 3

On the completion of this unit the student should be able to design and undertake a practical investigation related to energy and/or food, and present methodologies, findings and conclusions in a scientific poster.

Contribution to final assessment

Outcomes	Marks allocated	Assessment tasks
Outcome 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	At least one task selected from: • Annotations of at least two practical activities from a practical logbook • A report of a student investigation • An evaluation of research • Analysis of data including generalisations and conclusions • Media analysis/response • A response to a set of structured questions • A reflective learning journal/blog related to comparison of organic structures or pathways (approximately 50 minutes or not exceeding 1000 words for each task)
Outcome 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	Response to stimulus material OR A report on a laboratory investigation OR A comparison of food molecules OR A reflective learning journal/blog related to selected activities or in response to an issue. (approximately 50 minutes or not exceeding 1000 words)
Outcome 3 Design and undertake a practical investigation related to energy and/or food, and present methodologies, findings and conclusions in a scientific poster.	30	A structured scientific poster according to the VCAA standard template (not exceeding 1000 words)
Total marks	**90**	

Area of Study 1

Reading and Exploring Text

In this area of study, students engage in reading and viewing texts with a focus on personal connections with the story. They discuss and clarify the ideas and values presented by authors through their evocations of character, setting and plot, and through investigations of the point of view and/or the voice of the text. They develop and strengthen inferential reading and viewing skills, and consider the ways a text's vocabulary, text structures and language features can create meaning on several levels and in different ways.

Students' exploration of texts involves understanding and appreciating the role of vocabulary, text structures and language features in creating story and meaning. They contemplate the ways a text can present and reflect human experiences, and how stories or aspects of stories resonate with their own memories and lives. Students are encouraged to share their experience and understanding of the world, and make connections with key ideas, concerns and tensions presented in a text. They also explore the cultural, social and historical values embedded in the text, and can compare these values with their own. It is through these moments of connection that students engage more closely with the reading experience, and draw parallels with their own observations of the world.

Through participation in discussions about their own experiences and the ways they make connections with a text, students develop their own thinking and engage with the ideas of others to extend their understanding of a text. They draw on personal experience and understanding in developing writing about a text, and work to shape their ideas and knowledge into formal essay structures.

For this outcome, students will read and explore one set text, or extracts from the set text (EAL). This text must be of a different text type from that selected for study in Unit 2. The text selected should reflect the interests of the students and be worthy of close study.

Students are provided with opportunities to practise and extend their writing about texts. They are given time and support to extend their writing through reflection, editing and feedback.

Outcome 1

On completion of this unit the student should be able to make personal connections with, and explore the vocabulary, text structures, language features and ideas in a text.

Area of Study 2

Crafting texts

In this area of study, students engage with and develop an understanding of effective and cohesive writing. They apply, extend and challenge their understanding and use of imaginative, persuasive and informative text through a growing awareness of situated contexts, stated purposes and audience.
Students read and engage imaginatively and critically with mentor texts that model effective writing. Through guided reading of mentor texts, students develop an understanding of the diverse ways that vocabulary, text structures, language features and ideas can interweave to craft compelling texts. They consider these texts through knowledge of the ways purpose, context (including mode) and audience influence and shape writing.

Both individual and shared reading of mentor texts provides students with opportunities for rich discussion about what constitutes effective writing. Students collaborate through classwork to cultivate their understandings of cohesive and successful texts.

Students employ and experiment with the qualities of effective writing in their own work. Considering clear purpose, context (including mode) and audiences for their writing, and through engaging with and expanding on ideas drawn from mentor texts and other reading, they extend their creativity, fluency and range. As they craft their texts, students explore text structures and language features, and ideas. They build a varied vocabulary, which can include abstract and technical language, and apply standard and/or non-standard conventions of language, including syntax and spelling, as appropriate. They are also able to explore other forms of non-standard or informal language including colloquial and idiomatic language such as slang or dialects, where appropriate.

Outcome 2

On completion of this unit the student should be able to demonstrate an understanding of effective and cohesive writing through the crafting of their own texts designed for a specific context and audience to achieve a stated purpose; and to describe individual decisions made about the vocabulary, text structures, language features and conventions used during writing processes.

Area of Study 1

Reading and Exploring Texts

In this area of study, students develop their reading and viewing skills, including deepening their capacity for inferential reading and viewing, to further open possible meanings in a text, and to extend their writing in response to text. Students will develop their skills from Unit 1 through an exploration of a different text type from that studied in Unit 1.

Students read or view a text, engaging with the ideas, concerns and tensions, and recognise ways vocabulary, text structures, language features and conventions of a text work together to create meaning. Through discussions about representations in a text, they examine the ways readers understand text considering its historical context, and social and cultural values. They also explore the text through the prism of their own cultural knowledge, experiences and understanding of the world, and extend their observations into analytical and abstracted explorations.

Developing analytical writing about a text provides students with opportunities to build skills to discuss ideas, apply appropriate metalanguage, integrate evidence from a text to support key points, and explore organisational structures such as formal essays.

Outcome 1

On completion of this unit the student should be able to explore and analyse how the vocabulary, text structures, language features and ideas in a text construct meaning.

Area of Study 2

Exploring argument

In this area of study, students consider the way arguments are developed and delivered in many forms of media. Through the prism of a contemporary and substantial local and/or national issue, students read, view and listen to a range of texts that attempt to position an intended audience in a particular context. They explore the structure of these texts, including contention, sequence of arguments, use of supporting evidence and persuasive strategies. They closely examine the language and the visuals employed by the author, and offer analysis of the intended effect on the audience. Students apply their knowledge of argument to create a point of view text for oral presentation.

Suitable texts for study should reflect a variety of persuasive texts. Appropriate texts could be drawn from print, digital, audio and audio visual sources. These texts may include speeches, digitally presented texts, opinion and comment pieces, and other texts designed to position audiences in relation to an issue.

Students practise analysing persuasive texts using note taking, summaries and short-answer questions, and through formal, analytical writing. When working with audio or audio visual texts, they explore elements of spoken language including intonation, volume, pace, pausing and stress, and develop analysis of the ways these elements contribute to argument and the effect on the audience.

Students craft their writing using evidence from the texts to support their analysis. They draft and revise their writing and invite feedback from their teacher and other students to refine their ideas and expression. They aim for coherence, logic and accuracy in their writing.

Students employ their understanding of argument to create their own point of view text. They construct this text for oral presentation, and learn about the conventions of oral presentation for persuasive purposes.

Outcome 2

On completion of this unit the student should be able to explore and analyse persuasive texts within the context of a contemporary issue, including the ways argument and language can be used to position an audience; and to construct a point of view text for oral presentation.

In this unit students read and respond to texts analytically and creatively. They analyse arguments and the use of persuasive language in texts.

Texts selected for study in Area of Study 1 must be chosen from the Text List published annually by the VCAA.

The texts selected for study in Unit 3 Area of Study 2 must have appeared in the media since 1 September of the previous year.

The term 'selected text' refers to a text chosen from the list of prescribed texts in the Text List published by the VCAA.

Area of Study 1

Reading and Creating Texts

In this area of study students identify, discuss and analyse how the features of selected texts create meaning and how they influence interpretation. In identifying and analysing explicit and implied ideas and values in texts, students examine the ways in which readers are invited to respond to texts. They develop and justify their own detailed interpretations of texts.

Students prepare sustained analytical interpretations of selected texts, discussing how features of the texts create meaning and using textual evidence to support their responses. They use planning and drafting to test and clarify their ideas, and editing to produce clear and coherent expression. They craft their writing for convincing and effective presentation.

Students present sustained creative responses to selected texts, demonstrating their understanding of the world of the texts and how texts construct meaning. In developing a creative response, they explore issues of purpose and audience and make key choices about structure, conventions and language. They develop a credible and effective voice and style and use the chosen features of the selected text, for example characters, narrative or dialogue, to offer an interpretation of the selected text. They produce and share drafts, practising the skills of revision, editing and refining for stylistic and imaginative effect.

Outcome 1

On completion of this unit the student should be able to produce an analytical interpretation of a selected text, and a creative response to a different selected text.

Area of Study 2

Analysing Argument

In this area of study students analyse and compare the use of argument and language in texts that debate a topical issue. The texts must have appeared in the media since 1 September of the previous year. Students read and view media texts in a variety of forms, including print, non-print and multimodal, and develop their understanding of the way in which language and argument complement one another in positioning the reader.

Considering information about the purpose, audience and context of a text, students explore the argument of a persuasive piece, and the way written, spoken and visual language is used. In considering these, students examine the ways that persuasive language is used to express an argument and how this may strengthen or detract from the intended impact of a text.

Students develop written and spoken critical analyses of the use of argument and language in written, spoken, and/or multimodal texts, including analysis of the quality of the reasoning presented and the use of features intended to position audiences. They compare different written texts presenting argument on similar ideas or issues, considering different ways authors use language to express arguments. They produce drafts and practise the skills of revision and editing for clarity and coherence in analysis and accuracy in the use of language.

Outcome 2

On completion of this unit the student should be able to 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.

Contribution to final assessment

School-assessed Coursework for Unit 3 will contribute 25 per cent to the study score.

Outcomes	Marks allocated	Assessment tasks
Outcome 1 Produce an analytical interpretation of a selected text, and a creative response to a different selected text.	30	An analytical interpretation of a selected text in written form **and**
	30	A creative response to a selected text in written or oral form with a written explanation of decisions made in the writing process and how these demonstrate understanding of the text.
Outcome 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**	An analysis and comparison, in written form, of argument and the use of persuasive language in two to three texts that present a point of view on an issue. Texts must include written and visual material and have appeared in the media since 1 September of the previous year.
Total marks	**100**	

In this unit students compare the presentation of ideas, issues and themes in texts.
They create an oral presentation intended to position audiences about an issue currently debated in the media.

Texts selected for Area of Study 1 must be chosen from the Text List published annually by the VCAA. The issues selected for Area of Study 2 must have appeared in the media since 1 September of the previous year, but need not be the same as the issue selected for study in Unit 3.

The term 'selected texts' refers to a combination of texts chosen from the list of prescribed texts for comparative study in the Text List published by the VCAA.

Area of Study 1

Reading and Comparing Texts

In this area of study students explore the meaningful connections between two texts. They analyse texts, including the interplay between character and setting, voice and structure, and how ideas, issues and themes are conveyed. By comparing the texts, they gain a deeper understanding of the ideas, issues and themes that reflect the world and human experiences.

Students produce a written analysis comparing selected texts, discussing important similarities and differences and exploring how the texts deal with similar or related ideas, issues or themes from different perspectives to reflect particular values. Through discussion and preparatory drafting they compare in detail the ideas encountered in the texts and the features of the texts on which the comparison is based.

They use planning and drafting to test and clarify their ideas, and edit for clear and coherent expression of them. They apply the conventions of written analysis and textual evidence. They draft, revise and edit for clarity, coherence and technical accuracy, and refine for effective presentation of the insights gained through comparison.

Outcome 1

On completion of this unit the student should be able to produce a detailed comparison which analyses how two selected texts present ideas, issues and themes.

Area of Study 2

Presenting Argument

In this area of study students build their understanding of both the 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 in relation to a topical issue that has appeared in the media since 1 September of the previous year.

This area of study focuses on the construction of persuasive texts. Students use their understanding of argument and language as the basis for the development of an oral presentation of their points of view. Students draw on their knowledge to express their viewpoints through arguments and persuasive language selected specifically to position an audience.

Students use discussion and writing to clarify their thinking and develop a viewpoint on an issue, to plan and prepare an argument and its supporting evidence, and to develop and prepare any materials to support an oral presentation. Students identify approaches to positioning the audience that are appropriate to the issue. Students also consider how oral conventions may be used to influence the audience and refine these through rehearsal. Students develop, test and practise argument, critically analysing their own developing text. Students reflect on their intentions in positioning the reader and consider how their use of language expresses their argument. They explore options for language use for audience engagement and persuasive effect. They use the conventions of spoken texts appropriately, draw on evidence soundly and include accurate acknowledgment.

Outcome 2

On completion of this unit the student should be able to construct a sustained and reasoned point of view on an issue currently debated in the media.

Contribution to final assessment

School-assessed Coursework for Unit 3 will contribute 25 per cent to the study score.

Outcomes	Marks allocated	Assessment tasks
Outcome 1 Produce a detailed comparison which analyses how two selected texts present ideas, issues and themes.	60	A detailed comparison in written form of how two selected texts present ideas, issues and themes.
Outcome 2 Construct a sustained and reasoned point of view on an issue currently debated in the media	10	A written statement of intention to accompany the student's own oral presentation, articulating the intention of decisions made in the planning process, and how these demonstrate understanding of argument and persuasive language.
	30	A point of view presented in oral form using sound argument and persuasive language. The point of view should relate to an issue that has appeared in the media since 1 September of the previous year. The issue does not have to be the same as the issue selected for study in Outcome 2, Unit 3.
Total marks	**100**	

IIn this unit students investigate the way German speakers interpret and express ideas, and negotiate and persuade in German through the study of three or more subtopics from the prescribed themes and topics. Each area of study must cover a different subtopic, though teachers may choose to teach more than one subtopic in an area of study. Students interpret information, inform others, and reflect upon and develop persuasive arguments. They access and share useful information on the subtopics through German, and consolidate and extend vocabulary and grammar knowledge and language skills. Students consider the influence of language and culture in shaping meaning and reflect on the practices, products and perspectives of the cultures of German-speaking communities. They reflect on how knowledge of German and German-speaking communities can be applied in a range of contexts and endeavours, such as further study, travel, business or community involvement.

Area of Study 1

Interpersonal communication

In this area of study students develop skills and knowledge to resolve a personal issue by negotiating a mutually agreeable outcome in a spoken exchange in German on a selected subtopic. Students research relevant content, language and cultural information, in particular that associated with acknowledging other speakers' points of view, and negotiating and persuading in culturally appropriate ways. They consider the interplay between cultural perspectives and mutual understanding, and focus on language important for effective participation in spoken interactions in German. Students develop their understanding that language choices influence outcomes and impressions created in the exchange.

Outcome 1

On completion of this unit the student should be able to participate in a spoken exchange in German to resolve a personal issue.

Area of Study 2

Interpretive communication

In this area of study students extract information from three or more texts relating to the selected subtopic, and create written responses to specific questions or instructions in German. Students synthesise information from written, spoken and visual texts. Students consider relevant content, language and cultural information from three or more texts to identify and interpret key ideas and detail on the selected subtopic. Texts could include extracts, articles, blogs, webpages, postcards, stories, podcasts, songs, plays, news items, films, photographs, maps and other written, spoken or viewed texts. Students connect and compare ideas and identify different points of view or perspectives in each of the texts. Students respond to the texts in writing in German. They consider the influence of language, culture, social norms and ways of thinking in shaping meaning and the sequencing of ideas in the response.

Outcome 2

On completion of this unit the student should be able to interpret information from texts and write responses in German.

Area of Study 3

Presentational communication

In this area of study students create an extended original piece of personal, informative or imaginative writing in German to express ideas, thoughts or responses on an aspect of the selected subtopic. Students analyse and reflect on content related to the selected subtopic to assist in identifying aspects suited to reflection, informing or storytelling. They may use cultural products or practices as stimulus material for their writing. Cultural products or practices can be drawn from a diverse range of texts, activities and creations. Students consider the language and features of the types of text they encounter to ensure that their writing includes culturally appropriate content.

Outcome 3

On completion of this unit the student should be able to express ideas in a personal, informative or imaginative piece of writing in German.

Contribution to final assessment

School-assessed Coursework for Unit 3 will contribute 25 per cent to the study score.

Outcomes	Marks allocated	Assessment tasks
Outcome 1 Participate in a spoken exchange in German to resolve a personal issue.	20	A three to four-minute role play, focussing on negotiating a solution to a personal issue.
Outcome 2 Interpret information from texts and write responses in German	15	Responses to specific questions or instructions using information extracted from written, spoken and viewed texts on the selected subtopic.
Outcome 3 Express ideas in a personal, informative or imaginative piece of writing in German.	**15**	An approximately 250 word personal, informative or imaginative piece of writing
Total marks	**50**	

In this unit students investigate aspects of culture through the study of two or more subtopics from the prescribed themes and topics. Area of Study 1 and Area of Study 2 may focus on the same subtopic. Area of Study 3 should cover a different subtopic to the subtopic/s chosen for Areas of Study 1 and 2. Students build on their knowledge of German-speaking communities, considering cultural perspectives and language and explaining personal observations. Students consolidate and extend vocabulary, grammar knowledge and language skills to investigate the topics through German.

Students identify and reflect on cultural products or practices that provide insights into German-speaking communities. Cultural products or practices can be drawn from a diverse range of texts, activities and creations. Students reflect on the ways culture, place and time influence values, attitudes and behaviours. They consider how knowledge of more than one culture can influence the ways individuals relate to each other and function in the world.

Area of Study 1

Interpersonal communication

In this area of study students research and present information on a cultural product or practice from a German speaking community. Students develop knowledge and skills to share observations and consider how the product or practice may reflect a specific cultural perspective or behaviour.

Through the investigation of a cultural product or practice, students research specialised content, language and cultural information related to the selected subtopic. The subtopic for Area of Study 1 may be the same as the subtopic for Area of Study 2.

Students use knowledge of the subtopic to explain differences and similarities between cultural contexts, such as the present and the past or between German-speaking communities in different locations around the world. They develop language important for effective participation in spoken interaction in German, including deep knowledge of the subtopic, to present information, ideas and opinions about the cultural product or practice and to participate in an extended discussion.

Outcome 1

On completion of this unit the student should be able to share information, ideas and opinions in a spoken exchange in German.

Area of Study 2

Interpersonal communication

In this area of study students analyse and present in writing information extracted from written, spoken and viewed texts in German on a selected subtopic. The subtopic for Area of Study 2 may be the same as the subtopic for Area of Study 1. The texts should provide insights into an aspect of life in German-speaking communities and opportunities for students to make comparisons between cultures, places or times. Viewed texts may include photographs, drawings, maps, films or posters. Students respond to the texts in an extended piece of writing in German that requires a different text type to the stimulus material. Students identify and analyse key ideas and make comparisons between the details, ideas and points of view expressed in each of the texts.

Outcome 2

On completion of this unit the student should be able to analyse information from written, spoken and viewed texts for use in a written response in German.

Area of Study 3

Presentational communication

In this area of study students present information, concepts and ideas in an extended written response to persuade an audience of a point of view or evaluate existing ideas and opinions about an aspect of the selected subtopic. The selected subtopic must be different from the subtopic/s used in Areas of Study 1 and 2. Students investigate relevant content, language and cultural information to assist in persuading others of a particular position or evaluating existing positions and opinions on an issue related to the subtopic. They develop knowledge and understanding of the issue, such as the benefits of learning German, the ongoing effects of an historical event, environmental concerns, youth issues in contemporary society or an aspect of the literary or artistic heritage of the German-speaking communities.

Students create an original written text in German on an aspect of the subtopic for a specified audience and text type. The written text is for a persuasive or evaluative purpose. Students consider acceptable ways of persuading others or evaluating arguments, and carefully select and sequence language for the audience and purpose of the writing.

Outcome 3

On completion of this unit the student should be able to present information, concepts and ideas in evaluative or persuasive writing on an issue in German.

Contribution to final assessment

School-assessed Coursework for Unit 4 will contribute 25 per cent to the study score.

Outcomes	Marks allocated	Assessment tasks
Outcome 1 Share information, ideas and opinions in a spoken exchange in German.	20	A three to four-minute interview providing information and responding to questions about a cultural product or practice.
Outcome 2 Analyse information from written, spoken and viewed texts for use in a written response in German.	15	An approximately 250-word written response for a specific audience and purposes, incorporating information from three or more texts.
Outcome 2 Present information, concepts and ideas in evaluative or persuasive writing on an issue in German.	**15**	An approximately 300 word evaluative or persuasive piece of writing
Total marks	**50**	

Understanding health and wellbeing

In this unit, students explore health and wellbeing as a concept with varied and evolving perspectives and definitions. They come to understand that it occurs in many contexts and is subject to a wide range of interpretations, with different meanings for different people. As a foundation to their understanding of health, students investigate the World Health Organization's (WHO) definition and other interpretations. They also explore the fundamental conditions required for health as stated by the WHO, which provide a social justice lens for exploring health inequities.

In this unit, students identify perspectives relating to health and wellbeing, and inquire into factors that influence health attitudes, beliefs and practices, including among Aboriginal and Torres Strait Islander Peoples. Students look at multiple dimensions of health and wellbeing, the complex interplay of influences on health outcomes and the indicators used to measure and evaluate health status. With a focus on youth, the unit equips students to consider their own health as individuals and as a cohort. They build health literacy by interpreting and using data in a research investigation into one youth health focus area, and by investigating the role of food.

Area of Study 1

Concepts of health

In this area of study, students take a broad, multidimensional approach to health and wellbeing. Such an approach acknowledges that defining and measuring concepts of health are complicated by a diversity of social and cultural contexts. Students consider the measurable indicators of population health and look at data reflecting the health status of young Australians. Focusing on youth, students inquire into the reasons for variations and inequalities in health status, including the sociocultural factors that contribute to variations in health outcomes.

Outcome 1

On completion of this unit, the student should be able to explain multiple dimensions of health and wellbeing, explain indicators used to measure health status and analyse sociocultural factors that contribute to variations in the health status of youth.

Area of Study 2

Youth health and wellbeing

In this area of study, students apply the broad concepts of health and wellbeing from Area of Study 1 to their study of Australia's youth. They identify major health inequalities impacting Australia's youth and reflect on the causes. Students inquire into how governments and organisations develop and implement youth health programs and consider factors that influence the implementation of and access to these programs.

Students conduct a research investigation and apply research skills to find out what young people are most focused on and concerned about regarding health outcomes. The focus for this research could include key areas such as mental health and wellbeing, smoking and vaping, alcohol and other drugs, gambling, relationships and sexuality, and safety (for example, on the road, in the water and the sun, and online).
Students select a particular focus area and conduct research, interpret data and draw conclusions on how the health of Australia's youth can be promoted and improved.

Outcome 2

On completion of this unit, the student should be able to interpret data to identify key areas for improving youth health and wellbeing, and analyse one youth health area in detail.

Area of Study 3

Health and nutrition

In this area of study, students explore food and nutrition as foundations for good health. They investigate the roles and sources of major nutrients and the use of food selection models and other initiatives to promote healthy eating. Students explore the health consequences of nutritional imbalance, especially for youth, and consider the sociocultural and commercial factors that influence the food practices of, and food choices made, by youth. They develop strategies for building health literacy and evaluating nutrition information from various sources, including advertisements and social media.

Outcome 3

On completion of this unit, the student should be able to apply nutrition information, food selection models and initiatives to evaluate nutrition information.

Managing health and development

In this unit, students investigate transitions in health and wellbeing, and human development, from lifespan and societal perspectives. They explore the changes and expectations that are integral to the progression from youth to adulthood. Students apply health literacy skills through an examination of adulthood as a time of increasing independence and responsibility, involving the establishment of long-term relationships, possible considerations of parenthood and management of health-related milestones and changes.

Students explore health literacy through an investigation of the Australian healthcare system from the perspective of youth and analyse health information. They investigate the challenges and opportunities presented by digital media and consider issues surrounding the use of health data and access to quality health care.

Area of Study 1

Developmental transitions

In this area of study, students examine the developmental transitions from youth to adulthood, with a focus on expected changes, significant decisions, and protective factors including behaviours. They consider perceptions of what it means to be a youth and an adult and investigate the expected physical and social changes. They inquire into factors that influence both the transition from youth to adulthood and later health status. They consider the characteristics of respectful, healthy relationships. Students examine parenthood as a transition in life. With a focus on the influence of parents or carers, and families, they investigate factors that contribute to development, and health and wellbeing during the prenatal, infancy and early childhood stages of the human lifespan. Health and wellbeing is considered as an intergenerational concept; that is, the health and wellbeing of one generation affects the next.

Outcome 1

On completion of this unit, the student should be able to explain developmental changes in the transition from youth to adulthood, analyse factors that contribute to healthy development during the prenatal and early childhood stages of the human lifespan and explain health and wellbeing as an intergenerational concept.

Area of Study 2

Youth health literacy

In this area of study, students investigate the health system in Australia from the perspective of youth and their rights and responsibilities. They examine the functions of various entities that play a role in our health system. Students inquire into equity of access to health services, as well as the rights and responsibilities of youth receiving health care. They research the range of health services in their communities and suggest ways of improving the health literacy and health outcomes of youth.

Outcome 2

On completion of this unit, the student should be able to explain factors affecting access to Australia's health system that contribute to health literacy and promote the health and wellbeing of youth.

Australia's health in a globalised world

In this unit, students look at health and wellbeing, disease and illness as being multidimensional, dynamic and subject to different interpretations and contexts. They explore health and wellbeing as a global concept and take a broader approach to inquiry. Students consider the benefits of optimal health and wellbeing and its importance as an individual and a collective resource. They extend this to health as a universal right, analysing and evaluating variations in the health status of Australians.

Students focus on health promotion and improvements in population health over time. Through researching health improvements and evaluating successful programs, they explore various public health approaches and the interdependence of different models. While the emphasis is on the Australian health system, the progression of change in public health approaches should be seen within a global context.

Area of Study 1

Understanding health and wellbeing

In this area of study, students explore health and wellbeing, and illness as complex, dynamic and subjective concepts. They reflect on both the universality of public health goals and the increasing influence of global conditions on Australians. Students develop their understanding of the indicators used to measure and evaluate health status, and the factors that contribute to variations in health status between different groups.

Outcome 1

On completion of this unit, the student should be able to explain the complex, dynamic and global nature of health and wellbeing, interpret and apply Australia's health status data, and analyse variations in health status.

Area of Study 2

Promoting health in Australia

In this area of study, students look at different approaches to public health over time, with an emphasis on changes and strategies that have succeeded in improving health outcomes. They examine the progression of public health in Australia since 1900, noting global changes and influences such as the Ottawa Charter for Health Promotion, and the general transition of focus from the health and wellbeing of individuals to that of population groups including Aboriginal and Torres Strait Islander Peoples. Students investigate the Australian health system and its role in promoting health and wellbeing. They apply their understanding of successful health promotion campaigns, programs and case studies to evaluate the ability of initiatives to identify priorities and improve health outcomes in Australia.

Outcome 2

On completion of this unit, the student should be able to explain changes to public health approaches, analyse improvements in population health over time and evaluate health promotion strategies and initiatives.

Contribution to final assessment

School-assessed Coursework for Unit 3 will contribute 25 per cent to the study score.

Outcomes	Marks allocated	Assessment tasks
Outcome 1 Explain the complex, dynamic and global nature of health and wellbeing, interpret and apply Australia's health status data and analyse variations in health status.	50	The student's performance on each outcome is assessed using one or more of the following:
Outcome 2 Explain changes to public health approaches, analyse improvements in population health over time and evaluate health promotion strategies and initiatives.	50	• a written report, such as a media analysis, a research investigation a blog post or a case study analysis • an extended response question analysing a range of stimuli with an emphasis on annotating, synthesising and planning the response • an oral presentation, such as a debate or a podcast • a visual presentation such as a concept map, an annotated poster, or a digital presentation • structured questions, including data analysis or case study analysis.
Total marks	**100**	Each task type can only be selected once across Outcome 1 and Outcome 2.

Health and human development in a global context

In this unit, students examine health and human development in a global context. They use data to investigate health status and human development in different countries, exploring factors that contribute to health inequalities between and within countries, including the physical, social and economic conditions in which people live. Students build their understanding of health in a global context through examining changes in health status over time and studying the key concept of sustainability. They consider the health implications of increased globalisation and worldwide trends relating to climate change, digital technologies, world trade, tourism, conflict and the mass movement of people.

Students consider global action to improve health and human development, focusing on the United Nations' (UN's) Sustainable Development Goals (SDGs) and the priorities of the World Health Organization (WHO). They also investigate the role of non-government organisations and Australia's overseas aid program. Students evaluate the effectiveness of health initiatives and programs in a global context and reflect on their own capacity to act.

Area of Study 1

Global health and human development

In this area of study, students explore similarities and differences in health status and human development in low-, middle- and high-income countries, including Australia. They investigate a range of factors that contribute to health inequalities and study the concepts of sustainability and the Human Development Index to further their understanding of health and human development in a global context. Students inquire into the effects of global trends on health and human development.

Outcome 1

On completion of this unit, the student should be able to analyse similarities and differences in health status and human development globally and analyse the factors that contribute to these differences.

Area of Study 2

Health and the Sustainable Development Goals

In this area of study, students look at action for promoting health globally. They consider the importance of and relationships between the UN's SDGs, focusing on their promotion of health and human development. Students investigate the priorities of the WHO and evaluate Australia's aid program and the role of non-government organisations. They reflect on meaningful and achievable individual and social actions that could contribute to the work of national and international organisations that promote health and wellbeing.

Outcome 2

On completion of this unit, the student should be able to analyse the relationships between the SDGs and their role in the promotion of health and human development and evaluate the effectiveness of global aid programs.

Contribution to final assessment

Outcomes	Marks allocated	Assessment tasks
Outcome 1 Analyse similarities and differences in health status and human development globally and analyse the factors that contribute to these differences.	50	The student's performance on each outcome is assessed using one or more of the following:
Outcome 2 Analyse the relationships between the SDGs and their role in the promotion of health and human development and evaluate the effectiveness of global aid programs.	50	• a written report, such as a media analysis, a research investigation, a blog post or a case study analysis • an extended response question analysing a range of stimuli with an emphasis on annotating, synthesising and planning the response • an oral presentation, such as a debate or a podcast • a visual presentation, such as a concept map, an annotated poster, or a digital presentation • structured questions, including data analysis or case study analysis.
Total marks	**100**	Each task type can only be selected once across Outcome 1 and Outcome 2.

Unit 1: Change and conflict

In this unit students investigate the nature of social, political, economic and cultural change in the later part of the 19th century and the first half of the 20th century. Modern History provides students with an opportunity to explore the significant events, ideas, individuals and movements that shaped the social, political, economic and technological conditions and developments that have defined the modern world.

The late 19th century marked a challenge to existing empires, alongside growing militarism and imperialism. Empires continued to exert their powers as they competed for new territories, resources and labour across Asia-Pacific, Africa and the Americas, contributing to tremendous change. This increasingly brought these world powers into contact and conflict. Italian unification and German unification changed the balance of power in Europe, the USA emerged from a bitter civil war and the Meiji Restoration brought political revolution to Japan. Meanwhile, China under the Qing struggled to survive due to foreign imperialism. Modernisation and industrialisation also challenged and changed the existing political, social and economic authority of empires and states. During this time the everyday lives of people significantly changed.

World War One was a significant turning point in modern history. It represented a complete departure from the past and heralded changes that were to have significant consequences for the rest of the twentieth century. 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 and led to the creation of many new nation states. These changes had many unintended consequences that would lay the foundations for future conflict and instability in Europe, the Americas, Asia, Africa and the Middle East. Economic instability caused by the Great Depression contributed to great social hardship as well as to the development of new political movements.

The period after World War One, in the contrasting decades of the 1920s and 1930s, was characterised by significant social, political, economic, cultural and technological change. In 1920 the League of Nations was established, but despite its ideals about future peace, subsequent events and competing ideologies would contribute to the world being overtaken by war in 1939.

New fascist governments used the military, education and propaganda to impose controls on the way people lived, to exclude particular groups of people and to silence criticism. In Germany, the persecution of the Jewish people and other minorities intensified, resulting, during World War Two, in the Holocaust.

In the Union of Soviet Socialist Republics (USSR), millions of people were forced to work in state-owned factories and farms and had limited personal freedom. Japan became increasingly militarised and anti-Western. Turkey emerged out of the ruins of the Ottoman Empire and embarked on reforms to establish a secular democracy. In the United States of America (USA), foreign policy was shaped by isolationism, and the consumerism and material progress of the Roaring Twenties was tempered by the Great Depression in 1929. Writers, artists, musicians, choreographers and filmmakers reflected, promoted or resisted political, economic and social changes.

Area of Study 1

Ideology and conflict

- How did significant events and ideas contribute to conflict and change?
- How did individuals and movements challenge existing political and economic conditions?
- What were the consequences of World War One?
- How did ideology influence the emergence of new nation states?
- To what extent did the events, ideologies, individuals, movements and new nations contribute to the causes of World War Two?

In this area of study students focus on the events, ideologies, individuals and movements of the period that led to the end of empires and the emergence of new nation states before and after World War One; the consequences of World War One; the emergence of conflict; and the causes of World War Two. They investigate the impact of the treaties which ended the Great War and which redrew the maps of Europe and its colonies, breaking up the former empires of the defeated nations, such as the partitioning of the German, Austro-Hungarian and Ottoman Empires. They consider the aims, achievements and limitations of the League of Nations.

While democratic governments initially replaced the monarchies and authoritarian forms of government in European countries at the end of the war, new ideologies of socialism, communism and fascism gained popular support. Communism emerged in Russia/USSR after the 1917 Bolshevik Revolution. Fascism first emerged in Italy when the Italian Fascist Party gained power in 1922, and before the end of the decade fascist parties existed in various countries around the world. In 1933, Adolf Hitler's National Socialist German Workers' Party (Nazi) gained power in Germany. In Japan, the government was increasingly influenced by the military and by anti-Western attitudes, shaping much of its political and social action, alongside growing imperial ambitions in Manchuria. In the wake of World War One, the USA pursued an isolationist policy.

While the Roaring Twenties was a decade of economic growth, the 1930s saw considerable suffering as a result of the Great Depression, a global economic event that challenged and changed societies such as Germany and Australia.

As a result of the post-World War One treaties and despite the establishment of the League of Nations, the world became increasingly hostile and unstable. Widespread economic instability, failure of diplomacy, growing militarism and territorial aggression in Europe, Africa and Asia, along with totalitarianism, combined in 1939 to draw the world into a second major conflict.
In this area of study students may focus on one or more of the following contexts: Australia, China, France, Germany, Italy, Japan, Russia/USSR, the Ottoman Empire/Turkey, the British Empire/United Kingdom and/or the USA.

Outcome 1

On completion of this unit the student should be able to explain how significant events, ideologies and individuals contributed to political and economic changes in the first half of the 20th century, and analyse how these contributed to the causes of World War Two.

Area of Study 2

Social and cultural change

- How did society and culture change?
- How did cultural life both reflect and challenge the prevailing political, economic and social conditions?
- How did ideologies contribute to continuities and changes in society and culture?
- What role did individuals, groups and movements play in social and cultural continuity and/or change?
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In this area of study students focus on the social life and cultural expression in the late nineteenth century and the first half of the twentieth century, and their relation to the technological, political and economic changes of the period. Students explore particular forms of cultural expression from the period.

The period between the wars was characterised by significant social and cultural change. While the 1920s, a time in Western society known as the Roaring Twenties, was largely marked by optimism and material prosperity in the West and Japan, by contrast the thirties was a period of severe economic hardship for many, dominated by the impact of the Great Depression.

At the end of World War One, new governments in Italy, Germany and Japan led to the emergence of societies driven by new ideologies and, in some countries, the oppression and persecution of certain groups, most especially the Jewish community in Nazi Germany. In the USSR, the establishment of a communist regime in 1917 was initially greeted with support by a large proportion of the people, but under Stalin millions of people were forced to work in state-owned factories and farms and dissenters were sent to labour camps.

In the USA, during the decades between the wars, controls such as prohibition and race segregation affected the lives of many people, as did the presence of groups such as the Ku Klux Klan. While the 1920s was characterised by material progress, new technologies, increased personal freedoms and unprecedented economic growth, the Great Depression brought hardship to many nations.

The creative arts both reflected and challenged social and political life and change in this period. Mass entertainment and information by means of radio and film became widespread.
In this area of study students may focus on one or more of the following contexts: Australia, China, France, Germany, Italy, Japan, Russia/USSR, the Ottoman Empire/Turkey, the British Empire/United Kingdom and/or the USA.

Outcome 2

On completion of this unit the student should be able to explain patterns of social and cultural change in everyday life in the first half of the twentieth century, and analyse the conditions which influenced these changes.

Unit 2: The changing world order

In this unit students investigate the nature and impact of the Cold War and challenges and changes to social, political and economic structures and systems of power in the second half of the twentieth century and the first decade of the twenty-first century.

The establishment of the United Nations (UN) 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. However, despite internationalist moves, the second half of the twentieth century was dominated by the Cold War, competing ideologies of democracy and communism and proxy wars. By 1989 the USSR began to collapse. Beginning with Poland, Eastern European communist dictatorships fell one by one. The fall of the Berlin Wall was a significant turning point in modern history.

The period also saw continuities in and challenges and changes to the established social, political and economic 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. Ethnic and sectarian 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, as well as new political partnerships, such as the UN, European Union, APEC, OPEC, ASEAN and the British Commonwealth of Nations.

The beginning of the twenty-first century heralded both a changing world order and further advancements in technology and social mobility on a global scale. However, terrorism remained a major threat, influencing politics, social dynamics and the migration of people across the world. The attack on the World Trade Centre on 11 September, 2001 was a significant turning point for what became known as the war on global terror and shaped the first decade of the twenty-first century, including the wars in Afghanistan and Iraq.

The Global Financial Crisis challenged and contributed to some change in the social, political and economic features and structures; however, many continuities remained. Technology also played a key role in shaping social and political change in different contexts. The internet significantly changed everyday life and revolutionised communication and the sharing of information and ideas, some of which challenged authority, most notably the Arab Spring.

Area of Study 1

Causes, course and consequences of the Cold War

- What were the causes of the Cold War?
- How did Cold War ideology contribute to increased tensions and conflict?
- What were the consequences of the Cold War on nations and peoples?
- What caused the end of the Cold War?
- How did the social, political, economic and cultural conditions influence and change the post-Cold War world?

In this area of study students focus on the causes and consequences of the Cold War; the competing ideologies that underpinned events, the consequences on people, groups and nations, and the causes of the end of the Cold War and the collapse of the USSR.

Students investigate the causes of the Cold War in the decades that followed World War Two. They analyse the significant contribution of events, ideologies and individuals, and the consequences for nations and people in the period 1945–1991. While the USA and the USSR never engaged in direct armed conflict, they opposed each other in a range of international conflicts and proxy wars such as those in Berlin, Korea, Angola, Cuba and Vietnam. They both tried to exert their influence through aid and propaganda in Africa, Asia and the Americas and engaged in an arms race and a space race, with competition also extending to sport and the arts.

Students consider the reasons for the end of this long-running period of ideological conflict and the collapse of the USSR in 1991, as well as exploring the legacy of communism and/or socialism in the post-Soviet era and the emergence of democracy in new nations.

Outcome 1

On completion of this unit the student should be able to explain the causes of the Cold War and analyse its consequences on nations and people.

Area of Study 2

Challenge and change

- What caused the challenges to existing political and/or social structures and conditions?
- How did the actions and ideas of popular movements and individuals contribute to continuity and change?
- To what extent did change occur?
- What were the perspectives and experiences of those who demanded and/or resisted change?

While the Cold War dominated the second half of the twentieth century, social and political challenges, continuities and changes occurred within and between nations based on religion, nationalism, race, gender and human rights. Nations were challenged by internal struggles over ideology such as the Islamic Revolution in Iran in 1979. Independence movements led to the emergence of new nations. Nations such as Algeria and Timor-Leste achieved sovereignty through armed struggle, while Papua New Guinea and other Pacific nations achieved independence through diplomatic means.

Regional conflicts continued and emerged, including the Arab–Israeli conflict, the struggle against Apartheid in South Africa and civil and sectarian conflict in Northern Ireland, the Horn of Africa, Rwanda, Kashmir, and the breakup of the former Yugoslavia. Although, terrorism was not a new phenomenon, it took on new dimensions and became increasingly global, such as the attack in the USA on 11 September, 2001, and the Bali Bombings in 2002, particularly with the rise of prominent groups such as Al Qaeda.

Developments in media and mass communication including cable television, the internet and social media meant that many social and political ideas and movements transcended national boundaries. The digital revolution in the beginning of the 21st century saw the rise of social media, which played a key role in challenging traditional authority, work, lifestyle, and forms of communication and media, and in changing the nature of consumerism and destabilising authoritarian regimes and fuelling popular change. The speed at which these ideas and movements were shared with global audiences changed the social, political and economic features of states. Democratic systems and authoritarian regimes also used social media as a method for communicating their ideas as well as suppressing challenge and dissent.

In many societies, individuals and groups emerged to challenge the ways that power structures were organised, distributed and used. Traditional attitudes to race, war, gender, sexuality, religion, the environment and human rights were questioned, challenged and in some cases remained the same and/or changed.

This area of study focuses on challenge and change in relation to at least one of the following themes: Decolonisation and self-determination movements, Terrorism campaigns, Regional conflicts, and/or Social and political movements.

- Decolonisation and self-determination movements, such as in Algeria, the Congo, Indonesia, India, Pakistan, Bangladesh, Cambodia, Laos, Malaya, Timor-Leste, Hong Kong and/or Macau, Papua New Guinea, the Iranian Revolution, the Middle East, Sudan and South Sudan, Oceania, the Caribbean states, Former Republics of the Soviet Union, and the Arab Spring

- Terrorist groups and their campaigns, such as EOKA (Cyprus), ETA (Spain), FLN (Algeria), Baader-Meinhof (West Germany), the Japanese Red Army, Black September, Palestinian Liberation Organisation, Irish Republican Army and Loyalist Paramilitaries, Shining Path, FARC, the Tamil Tigers, Al Jihad, Hezbollah, the Lord's Resistance Army, Al Qaeda, and Boko Haram

- Regional conflicts, such as the Arab–Israeli dispute, the anti-Apartheid movement in South Africa, the Northern Irish Troubles, the Cyprus dispute, USA War on Drugs, the breakup of the former Yugoslavia, the Somali Civil War, conflicts in Latin America, the Sri Lankan Civil war, the Gulf Wars, the Rwandan Genocide, and the Wars in Afghanistan.

- Social and political movements, such as civil rights campaigns in Australia, USA, South Africa or Northern Ireland, Aboriginal and Torres Strait Islander peoples' land rights, reconciliation and recognition, feminism and women's rights, the global protests of 1968, counterculture, 1969 Stonewall Riots and LGBTIQA+ rights movements, labour movements, democracy movements, environmentalism and climate change movements, nuclear non-proliferation, the peace movement, the Tiananmen Square pro-democracy protests 1989, the Arab Spring, religious rights and movements, and the Occupy movement.

Outcome 2

On completion of this unit the student should be able to explain the challenges to social, political and/or economic structures of power and evaluate the extent to which continuity and change occurred.

Units 3 and 4: Revolutions

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 in the collapse and destruction of an existing political order which results in extensive change to society. Revolutions are caused by the interplay of events, ideas, individuals and popular movements, and the interplay between the political, social, cultural, economic and environmental conditions. 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 regime attempts to create political, social, cultural and economic change and transformation based on the regime's ideology.

Change in a post-revolutionary society is not guaranteed or inevitable and continuities can remain from the pre-revolutionary society. The implementation of revolutionary ideology was often challenged 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 construct an argument about the past using historical sources (primary sources and historical interpretations) as evidence to analyse the complexity and multiplicity of the causes and consequences of revolution, and to evaluate the extent to which the revolution brought change to the lives of people. Students analyse the different perspectives and experiences of people who lived through dramatic revolutionary moments, and how society changed and/or remained the same. Students use historical interpretations to evaluate the causes and consequences of revolution and the extent of change instigated by the new regime.

In developing a course, teachers select two revolutions to be studied, one for Unit 3 and one for Unit 4 from the list below. The revolution selected in Unit 3, Area of Study 1, must be selected for Unit 3, Area of Study 2. The revolution selected in Unit 4, Area of Study 1, must be selected for Unit 4, Area of Study 2.

Area of Study 1

Ideology and conflict

- The French Revolution
- The Russian Revolution
- What were the significant causes of revolution?
- How did the actions of popular movements and particular individuals contribute to triggering a revolution?
- To what extent did social tensions and ideological conflicts contribute to the outbreak of revolution?

In this area of study students focus on the long-term causes and short-term triggers of revolution. They evaluate how revolutionary outbreaks were caused by the interplay of significant events, ideologies, individuals and popular movements, and how these were directly or indirectly influenced by the political, social, economic, cultural and environmental conditions of the time.

Students analyse significant events and evaluate how particular conditions profoundly influenced and contributed to the outbreak of revolution. They consider triggers such as, in America, colonial responses to the Boston Tea Party or, in France, the calling of the Estates-General.

Revolutionary ideologies emerged in opposition to the existing and dominant order, such as Marxism-Leninism in Russia and Sun Yixian's (Sun Yat-sen's) Three Principles of the People in China. These ideologies were utilised by individuals and popular movements to justify revolutionary action and change. In the American Revolution and French Revolution, students analyse the degree to which the influence of Enlightenment ideas were instrumental in promoting change in the American colonies and in French society. In Russia, they consider to what extent Marxist ideas challenged Tsarist Autocracy.

Revolutions can be caused by the motivations and the intended and unintended actions of individuals who have shaped and influenced the course of revolution. Individuals including
Louis XVI and Emmanuel Joseph Sieyès in France, and Tsar Nicholas II and Vladimir Lenin in Russia had a significant impact on the course of revolution. Popular movements such as the Sons and Daughters of Liberty in America and the Red Army in China showed that collective action could be transformed into revolutionary forces that could contribute to or hinder revolution as they sought to destroy the old order and/or established order.

Students evaluate historical sources about the causes of revolution and explain why differing emphases are placed on the role of events, ideas, individuals and popular movements.

The key knowledge for this area of study in Units 3 and 4 comes from the following timeframes:

- The French Revolution (1774–4 August 1789)
- The Russian Revolution (1896– 26 October 1917)

Outcome 1

On completion of this unit the student should be able to analyse the causes of revolution, and evaluate the contribution of significant events, ideas, individuals and popular movements.

The French Revolution from 1774 to 4 August 1789 (Accession of Louis XVI to the throne to the night of the 4 August 1789)

- the events and conditions that contributed to the outbreak of revolution, including involvement in the American War of Independence, revolt of the Notables 1787–88, Day of Tiles, economic collapse and bankruptcy, the calling of the Estates-General and their regulation, the 'Cahiers de Doléances', political pamphlets, the harvest crisis and food shortage, Réveillon Riots, the events of the Estates-General, the storming of the Bastille, the 'Great Fear', and the night of the 4 August 1789

- the ideas that played a significant role in challenging the existing order, including the attack on feudalism and Enlightenment ideas: the critique of privilege, the critique of absolute authority, attack on the Church and claims to popular sovereignty, and equality

- the role of individuals in challenging or maintaining the power of the existing order, including Louis XVI and Marie Antoinette, Emmanuel Joseph Sieyès, Marquis de Lafayette and Jacques Necker

- the contribution of popular movements in mobilising society and challenging the existing order, including the nobility, bourgeoisie, urban workers of Paris and peasants.

The Russian Revolution from 1896 to October 1917 (Coronation of Tsar Nicholas II to the announcement of the Soviet government on 26 October 1917)

- the events and conditions that contributed to the outbreak of revolution, including institutional weaknesses and tensions in Tsarist Russia, economic and social inequalities, the Russo-Japanese War, Bloody Sunday, the October Manifesto, the Fundamental Laws, limitations of the Dumas, World War One, the February Revolution, the effectiveness of the Provisional Governments, The Dual Authority, Lenin's return and his April Theses, the July Days, the Kornilov Affair, and the events of October 1917

- the ideas that played a significant role in challenging the existing order, including discontent with Tsarist autocracy, liberal ideas and reforms, Marxism and Marxism-Leninism

- the role of individuals in challenging or maintaining the power of the existing order, including Tsar Nicholas II and Tsarina Alexandra, Pyotr Stolypin, Grigori Rasputin, Alexander Kerensky, Vladimir Lenin and Leon Trotsky

- the contribution of popular movements in mobilising society and challenging the existing order, including workers' protests and peasants' uprisings, soldier and sailor mutinies, and the role of political parties: Socialist Revolutionaries, Bolsheviks and Mensheviks (SDs), Octobrists and Kadets.

Area of study: Unit 3 and Unit 4

Consequences of revolution

- What were the consequences of revolution?
- How did the new regime consolidate its power?
- What were the experiences of those who lived through the revolution?
- To what extent was society changed and revolutionary ideas achieved or compromised?

In this area of study students focus on the consequences of the revolution and evaluate the extent to which the consequences of the revolution maintained continuity and/or brought about change to society. The success of the revolution was not guaranteed or inevitable. Students analyse the significant challenges that confronted the new regime after the initial outbreak of revolution. They evaluate the success and outcomes of the new regime's responses to these challenges, and the extent to which the revolution resulted in dramatic and wide-reaching political, social, cultural and economic change, progress or decline.

As new political regimes attempted to consolidate power, post-revolutionary regimes were often challenged by those who opposed change. They may have unleashed civil war and counter-revolutions, making the survival and consolidation of the revolution the principle concern of the revolutionary state. Challenges such as the creation of a new political system in America and the Civil War in Russia had profound consequences for the revolutionaries trying to establish a new order. Revolutionary ideologies were sometimes modified and compromised as the leaders became more authoritarian and responded to opposition with violence. In some cases there were policies of terror and repression, and the initiation of policies of social control as a strategy to maintain power. This was seen in The Terror in France and in China with the Great Proletarian Cultural Revolution.

Individuals such as George Washington in America had the task of leading the Continental Army to victory. Vladimir Lenin and Leon Trotsky in Russia attempted to create significant changes to the system of government and the fabric of society. These revolutionary leaders could not predict some of the consequences of their social, political, economic and cultural actions. This often resulted in opposition, unforeseen reactions and unintended consequences.

In analysing the past, students examine the historical perspectives of those who lived in the post-revolutionary society and their experiences of everyday conditions of life that were affected by the revolution, such as the peasants and workers in Russia and the Red Guards in China.

Students evaluate historical sources about the success and outcomes of the revolution, the new regime's consolidation of power, the degree to which they achieved and/or compromised their revolutionary ideology, and the extent of continuity and change in the society.

The revolution selected for Area of Study 2 in Unit 3 and Unit 4 must be the same revolution that was chosen for Area of Study 1 in Unit 3 and Unit 4. The key knowledge for this area of study in Units 3 and 4 comes from the following timeframes:

- The French Revolution (5 August 1789–1795)
- The Russian Revolution (26 October 1917–1927)

Outcome 2

On completion of this unit the student should be able to analyse the consequences of revolution and evaluate the extent of continuity and change in the post-revolutionary society.

The French Revolution from 5 August 1789 to 1795 (August Decrees to the dissolution of the Convention Year III)

- the challenges the new regime faced in attempting to consolidate its power, including October Days, reforms to the church, the Flight to Varennes, hostility of foreign powers and the Papacy, the scale of the reforms envisaged by the Revolution, economic challenges, the outbreak and course of war, counter-revolution, Federalist Revolts, changes to laws and taxes, the introduction of popular sovereignty and representative governments

- the changes and continuities in political, social, cultural and economic conditions that influenced leaders to compromise and/or achieve their revolutionary ideals, including the August Decrees and the Declaration of Rights of Man and Citizen, political divisions over the aims of the revolution, revolutionary government and The Terror, de-Christianisation and the rise of the sans culottes

- the role of significant individuals that influenced and changed society, including Louis XVI, Georges Danton, Jean-Paul Marat, Maximilien Robespierre and Marquis de Lafayette

- the diverse revolutionary experiences of social groups and their responses to the challenges and changes to the conditions of everyday life, including bourgeoisie, parish priests and other clergy, urban workers, women, peasants and the nobility

- the extent of continuity and change in French society 1774–1795.

The Russian Revolution from 26 October 1917 to 1927 (Early Sovnarkom decrees to the end of the NEP)

- the challenges the new regime faced in attempting to consolidate its power, including the initial problems faced by the Sovnarkom, the Constituent Assembly and its dissolution, the Treaty of Brest-Litovsk, the Civil War, Red and White Terror, the policies of State Capitalism and War Communism, and Kronstadt Revolt

- the changes and continuities in political, social, cultural and economic conditions that influenced leaders to compromise and/or achieve their revolutionary ideals, including the role of the Cheka, issuing of New Decrees, State Capitalism, War Communism, the 1921 Famine, the Tenth Party Congress, the effects of the NEP, artistic experimentation, initiatives in education, and women's rights

- the role of significant individuals that influenced and changed society including Vladimir Lenin, Leon Trotsky, Felix Dzerzhinsky and Alexandra Kollontai

- the diverse revolutionary experiences of social groups and their responses to the challenges and changes to the conditions of everyday life, including nobles, peasants, workers, the bourgeoisie and women

- the extent of continuity and change in Russian society 1896–1927.

Contribution to final assessment

Unit 3

Outcomes	Marks allocated	Assessment tasks
Outcome 1 Analyse the causes of revolution, and evaluate the contribution of significant events, ideas, individuals and popular movements.	50	Each of the following four assessment tasks must be completed over Units 3 and 4:
Outcome 2 Analyse the consequences of revolution and evaluate the extent of continuity and change in the post-revolutionary society.	50	• a historical inquiry • evaluation of historical sources • extended responses • an essay. Teachers may choose to select one or more assessment tasks for each outcome. The assessment tasks may be undertaken in any order.
Total marks	**100**	

Contribution to final assessment

Unit 4

Outcomes	Marks allocated	Assessment tasks
Outcome 1 Analyse the causes of revolution, and evaluate the contribution of significant events, ideas, individuals and popular movements.	50	Each of the following four assessment tasks must be completed over Units 3 and 4:
Outcome 2 Analyse the consequences of revolution and evaluate the extent of continuity and change in the post-revolutionary society.	50	• a historical inquiry • evaluation of historical sources • extended responses • an essay. Teachers may choose to select one or more assessment tasks for each outcome. The assessment tasks may be undertaken in any order.
Total marks	**100**	

The presumption of innocence

Laws, including criminal law, aim to achieve social cohesion and protect the rights of individuals. Criminal law is aimed at maintaining social order. When a criminal law is broken, a crime is committed which is punishable and can result in criminal charges and sanctions.

In this unit, students develop an understanding of legal foundations, such as the different types and sources of law, the characteristics of an effective law, and an overview of parliament and the courts. Students are introduced to and apply the principles of justice. They investigate key concepts of criminal law and apply these to actual and/or hypothetical scenarios to determine whether an accused may be found guilty of a crime. In doing this, students develop an appreciation of the manner in which legal principles and information are used in making reasoned judgments and conclusions about the culpability of an accused. Students also develop an appreciation of how a criminal case is determined, and the types and purposes of sanctions. Students apply their understanding of how criminal cases are resolved and the effectiveness of sanctions through consideration of recent criminal cases from the past four years.

Area of Study 1

Legal foundations

This area of study provides students with foundational knowledge of laws and the Australian legal system. Students explore the role of individuals, laws and the legal system in achieving social cohesion and protecting the rights of individuals. Students consider the characteristics of an effective law, and sources and types of law. They examine the relationship between parliament and the courts in law-making, and the reasons for a court hierarchy in Victoria, they also develop an understanding of the principles of justice.

Outcome 1

On completion of this unit the student should be able to describe the main sources and types of law, and evaluate the effectiveness of laws.
To achieve this outcome the student will draw on key knowledge and key skills outlined in Area of Study 1.

Area of Study 2

Proving guilt

The presumption of innocence is a fundamental principle of criminal law and provides a guarantee that an accused is presumed innocent until proven guilty beyond reasonable doubt. In this area of study, students develop an understanding of the purposes of and key concepts in criminal law, as well as the types of crime. They also investigate two criminal offences in detail. For each offence, students consider actual and/or hypothetical scenarios in which an accused has been charged with the offence, use legal reasoning to determine possible culpability and explain the impact of the offence on individuals and society.

Outcome 2

On completion of this unit the student should be able to explain the purposes and key concepts of criminal law, and use legal reasoning to argue the criminal culpability of an accused based on actual and/or hypothetical scenarios.
To achieve this outcome the student will draw on key knowledge and key skills outlined in Area of Study 2.

Area of Study 3

Sanctions

The criminal justice system determines the guilt of an accused, and imposes sanctions on offenders. In this area of study, students investigate key concepts in the determination of a criminal case, including the institutions that enforce criminal law, the purposes and types of sanctions, and alternative approaches to sentencing such as the Drug Court, Koori Courts and diversion programs. Students compare approaches to sentencing in Victoria to one other Australian jurisdiction. Through an investigation of criminal cases from the past four years, students apply their knowledge to discuss the effectiveness of sanctions and the ability of the Victorian criminal justice system to achieve the principles of justice.

Outcome 3

On completion of this unit the student should be able to explain the key concepts in the determination of a criminal case, discuss the principles of justice in relation to experiences of the criminal justice system, and discuss the ability of sanctions to achieve their purposes.

To achieve this outcome the student will draw on key knowledge and key skills outlined in Area of Study

Wrongs and rights

Criminal law and civil law aim to protect the rights of individuals. When rights are infringed, a case or dispute may arise which needs to be determined or resolved, and sanctions or remedies may be imposed. This unit focuses on the enforcement of criminal law and civil law, the methods and institutions that may be used to determine a criminal case or resolve a civil dispute, and the purposes and types of sanctions and remedies and their effectiveness.

Area of Study 1

Civil liability

The criminal justice system determines the guilt or otherwise of an accused, and imposes sanctions on a guilty person. In this area of study students investigate key concepts in the determination of a criminal case, including the institutions that enforce criminal law, and the purposes and types of sanctions and approaches to sentencing. Through an investigation of two criminal cases from the past four years, either decided or still being decided, students explore the extent to which the principles of justice were or could be achieved.

Outcome 1

On completion of this unit the student should be able to explain the purposes and key concepts of civil law, and apply legal reasoning to argue the liability of a party in civil law based on actual and/or hypothetical scenarios.
To achieve this outcome the student will draw on key knowledge and key skills outlined in Area of Study 1.

Area of Study 2

Remedies

Remedies may be available to a wronged party where there has been a breach of civil law. In this area of study, students develop an appreciation of how civil disputes are resolved, including the methods and institutions available to resolve disputes, and the purposes and types of remedies. Through an investigation of civil cases from the past four years, students apply their knowledge to discuss the effectiveness of remedies and the ability of the civil justice system to achieve the principles of justice.

Outcome 2

On completion of this unit the student should be able to explain the key concepts in the resolution of a civil dispute, discuss the principles of justice in relation to experiences of the civil justice system, and discuss the ability of remedies to achieve their purposes.
To achieve this outcome the student will draw on key knowledge and key skills outlined in Area of Study 2.

Area of Study 3
Human Rights

The protection of rights is fundamental to a democratic society. Rights are protected in Australia through the Australian Constitution, the Victorian Charter of Human Rights and Responsibilities and through common law and statute law, including in relation to discrimination and equal opportunity. In this area of study, students examine the ways in which human rights are protected in Australia and consider possible reforms to the protection of human rights. Students investigate one human rights issue in Australia, such as in relation to the right to vote, the right to freedom of religion, or the rights of First Nations peoples.

Outcome 3

On completion of this unit the student should be able to explain one contemporary human rights issue in Australia, and evaluate the ways in which rights are protected in Australia.
To achieve this outcome the student will draw on key knowledge and key skills outlined in Area of Study 3.

Rights and Justice

The Victorian justice system, which includes the criminal and civil justice systems, aims to protect the rights of individuals and uphold the principles of justice: fairness, equality and access. In this unit, students examine the methods and institutions in the criminal and civil justice system, and consider their appropriateness in determining criminal cases and resolving civil disputes. Students consider the Magistrates' Court, County Court and Supreme Court within the Victorian court hierarchy, as well as other means and institutions used to determine and resolve cases.

Students explore topics such as the rights available to an accused and to victims in the criminal justice system, the roles of the judge, jury, legal practitioners and the parties, and the ability of sanctions and remedies to achieve their purposes. Students investigate the extent to which the principles of justice are upheld in the justice system. Throughout this unit, students apply legal reasoning and information to actual and/or hypothetical scenarios.

Area of Study 1

The Victorian Criminal Justice System

The purposes of the Victorian criminal justice system are to determine whether an accused person is guilty beyond reasonable doubt of an offence for which they are charged, and to impose sanctions when a person is guilty of committing a crime. The system includes the courts (the Magistrates' Court, County Court and Supreme Court) and institutions such as Victoria Legal Aid and community legal centres available to assist an accused and victims of crime.

In this area of study, students explore the criminal justice system, key personnel, and the use of plea negotiations to determine a criminal case. Students investigate the rights of the accused and of victims, and explore the purposes and types of sanctions and sentencing considerations. They consider the impact of time, costs and cultural differences on the ability of the criminal justice system to achieve the principles of justice. Students synthesise and apply legal principles and information relevant to the criminal justice system to actual and/or hypothetical scenarios.

Outcome 1

On completion of this unit the student should be able to explain the key principles in the criminal justice system, discuss the ability of sanctions to achieve their purposes and evaluate the ability of the criminal justice system to achieve the principles of justice during a criminal case.
To achieve this outcome the student will draw on key knowledge and key skills outlined in Area of Study 1.

Area of Study 2

The Victorian Criminal Justice System

One of the aims of the Victorian civil justice system is to restore a wronged party to the position they were originally in before a breach of civil law occurred. There are a range of institutions in Victoria that aim to help parties resolve a civil dispute, including courts (the Magistrates' Court, County Court and Supreme Court), Consumer Affairs Victoria, and the Victorian Civil and Administrative Tribunal.

In this area of study, students consider the factors relevant to commencing a civil claim, examine the institutions and methods used to resolve a civil dispute and explore the purposes and types of remedies. Students consider the impact of time and costs on the ability of the civil justice system to achieve the principles of justice. Students synthesise and apply legal principles and information relevant to the civil justice system to actual and/or hypothetical scenarios.

Outcome 2

On completion of this unit the student should be able to explain the key principles in the civil justice system, discuss the ability of remedies to achieve their purposes and evaluate the ability of the civil justice system to achieve the principles of justice during a civil dispute.

To achieve this outcome the student will draw on key knowledge and key skills outlined in Area of Study 2.

External assessment

The level of achievement for Units 3 and 4 is also assessed by an end-of-year examination, which will contribute 50 per cent to the study score.

Outcomes	Marks allocated	Assessment tasks
Outcome 1 On completion of this unit the student should be able to explain the key principles in the criminal justice system, discuss the ability of sanctions to achieve their purposes and evaluate the ability of the criminal justice during a criminal case.	50	The student's performance on each outcome will be assessed using one or more of the following:
Outcome 2 On completion of this unit the student should be able to explain the key principles in the civil justice system, discuss the ability of remedies to achieve their purposes and evaluate the ability of the civil justice system to achieve the principles of justice during a civil dispute.	50	• A case study • Structured questions • An essay • A report • A folio of exercise
Total marks	**100**	

The People and the Law

The study of Australia's laws and legal system includes an understanding of institutions that make and reform our laws. In this unit, students explore how the Australian Constitution establishes the law-making powers of the Commonwealth and state parliaments, and how it protects the Australian people through structures that act as a check on parliament in law-making.

Students develop an understanding of the significance of the High Court in protecting and interpreting the Australian Constitution. They investigate parliament and the courts, and the relationship between the two in law-making, and consider the roles of the individual, the media and law reform bodies in influencing changes to the law, and past and future constitutional reform. Throughout this unit, students apply legal reasoning and information to actual and/or hypothetical scenarios.

Area of Study 1

The people and the law-makers

The Australian Constitution establishes Australia's parliamentary system and provides mechanisms to ensure that parliament does not make laws beyond its powers. Parliament is the supreme law-making body, and courts have a complementary role to parliament in making laws. Courts can make laws through the doctrine of precedent and through statutory interpretation when determining cases.

In this area of study, students examine the ways in which the Australian Constitution acts as a check on parliament in law-making, and factors that affect the ability of parliament and courts to make law. They explore the relationship between parliament and courts in law-making and consider the capacity of both institutions to make law.

Outcome 1

On completion of this unit the student should be able to discuss the ability of parliament and courts to make law and evaluate the means by which the Australian Constitution acts as a check on parliament in law-making.

To achieve this outcome the student will draw on key knowledge and key skills outlined in Area of Study 1.

Area of Study 2

The people and reform

Laws should reflect the needs of society, but they can become outdated. Individuals and groups can actively participate to influence change to laws, and law reform bodies (including the Victorian Law Reform Commission, parliamentary committees, and Royal Commissions) can investigate and make recommendations for change. Laws can be changed by parliament and the courts, while constitutional reform requires a referendum.

In this area of study, students investigate the need for law reform and the means by which individuals and groups can influence change in the law. Students draw on examples of individuals, groups and the media influencing law reform, as well as examples from the past four years of inquiries of law reform bodies. Students examine the relationship between the Australian people and the Australian Constitution, the reasons for and processes of constitutional reform, the successful 1967 referendum and calls for future constitutional reform, such as that articulated by the 2017 Uluru Statement from the Heart.

Outcome 2

On completion of this unit the student should be able to explain the reasons for law reform and constitutional reform, discuss the ability of individuals to change the Australian Constitution and influence a change in the law, and evaluate the ability of law reform bodies to influence a change in the law.
To achieve this outcome the student will draw on key knowledge and key skills outlined in Area of Study 2.

Contribution to final assessment

School-assessed Coursework for Unit 3 will contribute 25 per cent to the study score

Outcomes	Marks allocated	Assessment tasks
Outcome 1 On completion of this unit the student should be able to explain the ability of parliament and courts to make law and evaluate the means by which the Australia Constitution acts as a check on parliament in law making.	60	The student's performance on each outcome will be assessed using one or more of the following:
Outcome 2 On completion of this unit the student should be able to explain the reasons for law reform and constitutional reform, discuss the ability of individuals to change the Australian Constitution and influence a change in the law, and evaluate the ability of law reform bodies to influence a change in the law	40	• A case study • Structured questions • An essay • A report • A folio of exercise
Total marks	**100**	

External assessment

The level of achievement for Units 3 and 4 is also assessed by an end-of-year examination.

The examination will contribute 50 per cent to the study score.

Source: VCE Legal Studies Study Design to be implemented in 2024.

Area of Study 1

Reading Practices

In this area of study students consider how language, structure and stylistic choices are used in different literary forms and types of text. They consider both print and non-print texts, reflecting on the contribution of form and style to meaning. Students reflect on the degree to which points of view, experiences and contexts shape their own and others' interpretations of text.

Students closely examine the literary forms, features and language of texts. They begin to identify and explore textual details, including language and features, to develop a close analysis response to a text.

Outcome 1

On completion of this unit the student should be able to respond to a range of texts through close analysis.

Area of Study 2

Exploration of Literary Movements and Genres

In this area of study students explore the concerns, ideas, style and conventions common to a distinctive type of literature seen in literary movements or genres. Examples of these groupings include literary movements and/or genres such as modernism, epic, tragedy and magic realism, as well as more popular, or mainstream, genres and subgenres such as crime, romance and science fiction.

Students explore texts from the selected movement or genre, identifying and examining attributes, patterns and similarities that locate each text within that grouping. Students engage with the ideas and concerns shared by the texts through language, settings, narrative structures and characterisation, and they experiment with the assumptions and representations embedded in the texts.

Students must study at least one complete text alongside multiple samples of other texts from the selected movement or genre.

Outcome 2

On completion of this unit the student should be able to explore conventions common to a selected movement or genre, and engage with the ideas, concerns and representations from at least one complete text alongside multiple samples of other texts considered characteristic of the selected movement or genre.

Area of Study 1

Voices of Country

In this area of study students explore the voices, perspectives and knowledge of Aboriginal and Torres Strait Islander authors and creators. They consider the interconnectedness of place, culture and identity through the experiences, texts and voices of Aboriginal and Torres Strait Islander peoples, including connections to Country, the impact of colonisation and its ongoing consequences, and issues of reconciliation and reclamation.

Students examine representations of culture and identity in Aboriginal and Torres Strait Islander peoples' texts and the ways in which these texts present voices and perspectives that explore and challenge assumptions and stereotypes arising from colonisation. Students acknowledge and reflect on a range of Australian views and values (including their own) through a text(s). Within that exploration, students consider stories about the Australian landscape and culture.

Outcome 1

On completion of this unit the student should be able to explore and reflect on the voices, perspectives and knowledge in the texts of Aboriginal and Torres Strait Islander authors and creators.

Area of Study 2

The text in its context

In this area of study students focus on the text and its historical, social and cultural context. Students reflect on representations of a specific time period and/or culture within a text. Students explore the text to understand its point of view and what it reflects or comments on. They identify the language and the representations in the text that reflect the specific time period and/or culture, its ideas and concepts. Students develop an understanding that contextual meaning is already implicitly or explicitly inscribed in a text and that textual details and structures can be scrutinised to illustrate its significance.

Students develop the ability to analyse language closely, recognising that words have historical and cultural import.

Outcome 2

On completion of this unit the student should be able to analyse and respond to the representation of a specific time period and/or culture explored in a text and reflect or comment on the ideas and concerns of individuals and groups in that context.

Area of Study 1

Adaptations and transformations

In this area of study students focus on how the form of a text contributes to its meaning. Students explore the form of a set text by constructing a close analysis of that text. They then reflect on the extent to which adapting the text to a different form, and often in a new or reimagined context, affects its meaning, comparing the original with the adaptation. By exploring an adaptation, students also consider how creators of adaptations may emphasise or minimise viewpoints, assumptions and ideas present in the original text.

Outcome 1

On completion of this unit the student should be able to analyse aspects of a text, drawing on close analysis of textual detail, and then discuss the extent to which meaning changes when that text is adapted to a different form.

Area of Study 2

Developing Interpretations

In this area of study students explore the different ways we can read and understand a text by developing, considering and comparing interpretations of a set text.

Students first develop their own interpretations of a set text, analysing how ideas, views and values are presented in a text, and the ways these are endorsed, challenged and/or marginalised through literary forms, features and language. These student interpretations should consider the historical, social and cultural context in which a text is written and set. Students also consider their own views and values as readers.

Students then explore a supplementary reading that can enrich, challenge and/or contest the ideas and the views, values and assumptions of the set text to further enhance the students' understanding. Examples of a supplementary reading can include writing by a teacher, a scholarly article or an explication of a literary theory. A supplementary reading that provides only opinion or evaluation of the relative merits of the text is not considered appropriate for this task.

Informed by the supplementary reading, students develop a second interpretation of the same text, reflecting an enhanced appreciation and understanding of the text. They then apply this understanding to key moments from the text, supporting their work with considered textual evidence.

Outcome 2

On completion of this unit the student should be able to develop interpretations of a set text informed by the ideas, views and values of the set text and a supplementary reading.

Outcomes	Marks allocated	Assessment tasks
Outcome 1	20	A written interpretation of a text, supported by close textual analysis, using a key passage.
Analyse aspects of a text, drawing on close analysis of textual detail, and then discuss the extent to which meaning changes when that text is adapted to a different form.	30	An analysis of how textual form influences meaning. Students may: • Compare a dramatised version of a scene or scenes from a text with the original text and a supplementary reading. • Compare a print text with the text's adaption into another form
Outcome 2 Develop interpretations of a set text informed by the ideas, views and values of the set text and a supplementary reading.	50	Part A: An initial interpretation of the text's views and values within its historical, social and cultural context. Part B: A written response that compares/interweaves and analyses an initial interpretation with a subsequent interpretation, using a key moment from the text.
Total marks	**100**	

At least one assessment task in either Unit 3 or 4 must include the language modes of speaking and listening.

Area of Study 1

Creative Responses to Texts

In this area of study students focus on the imaginative techniques used for creating and recreating a literary work. Students use their knowledge of how the meaning of texts can change as context and form change to construct their own creative transformations of texts. They learn how authors develop representations of people and places, and they develop an understanding of language, voice, form and structure. Students draw inferences from the original text in order to create their own writing. In their adaptation of the tone and the style of the original text, students develop an understanding of the views and values explored.

Students develop an understanding of the various ways in which authors craft texts. They reflect critically on the literary form, features and language of a text, and discuss their own responses as they relate to the text, including the purpose and context of their creations.

Outcome 1

On completion of this unit the student should be able to respond creatively to a text and comment critically on both the original text and the creative response.

Area of Study 2

Close analysis of Texts

In this area of study students focus on a detailed scrutiny of the language, style, concerns and construction of texts. Students attend closely to textual details to examine the ways specific passages in a text contribute to their overall understanding of the whole text. Students consider literary forms, features and language, and the views and values of the text. They write expressively to develop a close analysis, using detailed references to the text.

Outcome 2

On completion of this unit the student should be able to analyse literary forms, features and language to present a coherent view of a whole text.

Outcomes	Marks allocated	Assessment tasks
Outcome 1 Respond creatively to a text and comment critically on both the original text and the creative response.	40	A creative response to a text. Students may: • Submit an original piece of writing, presented in a manner consistent with the style and context of the original text. • Recreate or network an aspect of the text, such as adding to the text, recasting a part of the text in another setting or form, or presenting an episode in the text from another point of view.
	20	A close analysis of a key passage from the original text, which includes reflections on connections between the creative response and the original text.
Outcome 2 Analyse literary forms, features and language to present a coherent view of a whole text.	40	A close analysis of a text, supported by an examination of textual details, based on a selection of passages.
Total marks	**100**	

At least one assessment task in either Unit 3 or 4 must include the language modes of speaking and listening.

General Mathematics Units 1 and 2 cater for a range of student interests, provide preparation for the study of VCE General Mathematics at the Units 3 and 4 level and contain assumed knowledge and skills for these units.

General Mathematics Units 1

The areas of study for Unit 1 of General Mathematics are 'Data analysis, probability and statistics', 'Algebra, number and structure', 'Functions, relations and graphs' and 'Discrete mathematics'.

In undertaking these units, students are expected to be able to apply techniques, routines and processes involving rational and real arithmetic, sets, lists, tables and matrices, diagrams and geometric constructions, algorithms, algebraic manipulation, recurrence relations, 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.

Area of Study 1

Data analysis, probability and statistics

In this area of study students cover types of data, display and description of the distribution of data, summary statistics for centre and spread, and the comparison of sets of data.

Area of Study 2

Algebra, number and structure

In this area of study students cover the concept of a sequence and its representation by rule, table and graph, arithmetic or geometric sequences as examples of sequences generated by first-order linear recurrence relations, and simple financial and other applications of these sequences.

Area of Study 3

Functions, relations and graphs

In this area of study students cover linear function and relations, their graphs, modelling with linear functions, solving linear equations and simultaneous linear equations, line segment and step graphs and their applications.

Area of Study 4

Discrete mathematics

In this area of study students cover the concept of matrices and matrix operations to model and solve a range of practical problems, including population growth and decay.

Outcomes

For each unit the student is required to demonstrate achievement of three outcomes. As a set these outcomes encompass all of the selected areas of study for each unit. For each of Unit 1 and Unit 2, the outcomes apply to the content from the areas of study selected for that unit.

Outcome 1

On completion of this unit the student should be able to 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.

Outcome 2

On completion of this unit the student should be able to apply mathematical processes in non-routine contexts, including situations with some open-ended aspects requiring investigative, modelling or problem-solving techniques or approaches, and analyse and discuss these applications of mathematics.

Outcome 3

On completion of this unit the student should be able to apply computational thinking and use numerical, graphical, symbolic and statistical functionalities of technology to develop mathematical ideas, produce results and carry out analysis in situations requiring investigative, modelling or problem-solving techniques or approaches.

General Mathematics Units 2

The areas of study for Unit 2 of General Mathematics are 'Data analysis, probability and statistics', 'Discrete mathematics', 'Functions, relations and graphs' and 'Space and measurement'.

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, networks and geometric constructions, algorithms, 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.

Area of Study 1

Data analysis, probability and statistics

In this area of study students cover association between two numerical variables, scatterplots, and lines of good fit by eye and their interpretation.

Area of Study 2

Discrete mathematics

In this area of study students cover the use of graphs and networks to model and solve a range of practical problems, including connectedness, shortest path and minimum spanning trees.

Area of Study 3

Functions, relations and graphs

In this area of study students cover direct and inverse variation, transformations to linearity and modelling of some non-linear data.

Area of Study 4

Space and measurement

In this area of study students cover units of measurement, accuracy, computations with formulas for different measures, similarity and scale in two and three dimensions, and their practical applications involving simple and composite shapes and objects, trigonometry, problems involving navigation and Pythagoras' theorem and their applications in the plane.

Outcomes

For each unit the student is required to demonstrate achievement of three outcomes. As a set these outcomes encompass all of the selected areas of study for each unit. For each of Unit 1 and Unit 2, the outcomes apply to the content from the areas of study selected for that unit.

Outcome 1

On completion of this unit the student should be able to 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.

Outcome 2

On completion of this unit the student should be able to apply mathematical processes in non-routine contexts, including situations with some open-ended aspects requiring investigative, modelling or problem-solving techniques or approaches, and analyse and discuss these applications of mathematics.

Outcome 3

On completion of this unit the student should be able to apply computational thinking and use numerical, graphical, symbolic and statistical functionalities of technology to develop mathematical ideas, produce results and carry out analysis in situations requiring investigative, modelling or problem-solving techniques or approaches.

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.

Mathematical Methods Units 1

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'. At the end of Unit 1, students are expected to have covered the content outlined in each area of study, with the exception of 'Algebra' which extends across Units 1 and 2. This content should be presented so that there is a balanced and progressive development of skills and knowledge from each of the four areas of study with connections between and across the areas of study being developed consistently throughout both Units 1 and 2. In undertaking this unit, 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, graphs and differentiation 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 and statistical functionality of technology for teaching and learning mathematics, for working mathematically, and in related assessment, is to be incorporated throughout the unit as applicable.

Area of Study 1

Functions, relations and graphs

In this area of study 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. The behaviour of functions and their graphs is explored in a variety of modelling contexts and theoretical investigations.

Area of Study 2

Algebra

This area of study supports students' work in the 'Functions and graphs', 'Calculus' and 'Probability and statistics' areas of study, and content is to be distributed between Units 1 and 2. In Unit 1 the focus is on the algebra of polynomial functions of low degree and transformations of the plane.

Area of Study 3

Calculus

In this area of study 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.

Area of Study 4

Data Analysis, probability and statistics

In this area of study students cover the concepts of experiment (trial), outcome, event, frequency, probability and representation of finite sample spaces and events using various forms such as lists, grids, Venn diagrams and tables. They also cover introductory counting principles and techniques and their application to probability.

Outcomes

For this unit the student is required to demonstrate achievement of three outcomes. As a set these outcomes encompass all of the areas of study for the unit.

Outcome 1

On completion of this unit the student should be able to 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.
To achieve this outcome, the student will draw on knowledge and skills outlined in all the areas of study.

Outcome 2

On completion of this unit the student should be able to 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.
To achieve this outcome, the student will draw on knowledge and skills outlined in one or more areas of study.

Outcome 3

On completion of this unit the student should be able to 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.
To achieve this outcome, the student will draw on knowledge and skills outlined in all the areas of study.

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'. At the end of Unit 2, students are expected to have covered the material outlined in each area of study. Material from the 'Functions and graphs', 'Algebra', 'Calculus', and 'Probability and statistics' areas of study should be organised so that there is a clear progression of skills and knowledge from Unit 1 to Unit 2 in each area of study.

In undertaking this unit, 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, graphs, differentiation and anti-differentiation 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 and statistical functionality of technology for teaching and learning mathematics, for working mathematically, and in related assessment, is to be incorporated throughout the unit as applicable.

Area of Study 1

Functions, relations and graphs

In this area of study 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. . The behaviour of functions and their graphs is to be explored in a variety of modelling contexts and theoretical investigations.

Area of Study 2

Algebra, number and structure

This area of study supports students' work in the 'Functions and graphs', 'Calculus' and 'Probability and statistics' areas of study. In Unit 2 the focus is on the algebra of some simple transcendental functions and transformations of the plane. This area of study provides an opportunity for the revision, further development and application of content prescribed in Unit 1, as well as the study of additional algebra material introduced in the other areas of study in Unit 2 as follows:

- use of inverse functions and transformations to solve equations of the form $Af(bx) + c = k$, where $A, b, c, k \in R$ and $A, b \neq 0$ and f is sine, cosine, tangent or a^x, using exact or approximate values on a given domain
- index (exponent) laws and logarithm laws, including their application to the solution of simple exponential equations
- numerical approximation of roots of cubic polynomial functions using Newton's method.

Area of Study 3

Calculus

In this 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.

Area of Study 4

Data analysis, probability and Statistics

In this area of study students cover the use of lists, tables and diagrams to calculate probabilities, including consideration of complementary, mutually exclusive, conditional and independent events involving one, two or three events (as applicable), including rules for computation of probabilities for compound events.

Outcomes

For this unit the student is required to demonstrate achievement of three outcomes. As a set these outcomes encompass all of the areas of study for the unit.

Outcome 1

On completion of this unit the student should be able to 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.
To achieve this outcome the student will draw on key knowledge and key skills outlined in all the areas of study.

Outcome 2

On completion of this unit the student should be able to 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.
To achieve this outcome the student will draw on key knowledge and key skills outlined in all the areas of study.

Outcome 3

On completion of this unit the student should be able to 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.
To achieve this outcome the student will draw on key knowledge and key skills outlined in all the areas of study.

- Specialist Mathematics Units 1 and 2 provide a course of study for students who wish to undertake an in-depth study of mathematics, with an emphasis on concepts, skills and processes related to mathematical structure, modelling, problem-solving, reasoning and proof. This study has a focus on interest in the discipline of mathematics and investigation of a broad range of applications, as well as development of a sound background for further studies in mathematics and mathematics related fields.

- Mathematical Methods Units 1 and 2 and Specialist Mathematics Units 1 and 2, taken in conjunction, provide a comprehensive preparation for Specialist Mathematics Units 3 and 4. Study of Specialist Mathematics Units 3 and 4 also assumes concurrent study or previous completion of Mathematical Methods Units 3 and 4.

- The areas of study for Specialist Mathematics Units 1 and 2 are 'Algebra, number and structure', 'Data analysis, probability and statistics', 'Discrete mathematics', 'Functions, relations and graphs' and 'Space and measurement'.

Specialist Mathematics Unit 1

- At the end of Unit 1 students are expected to have covered the material in the areas of study: 'Algebra, number and structure' and 'Discrete mathematics'. Concepts from these areas of study will be further developed and used in Unit 2 and also in Units 3 and 4.

- In undertaking this unit, students are expected to be able to apply techniques, routines and processes involving rational, real and complex arithmetic, sets, lists, tables and matrices, diagrams, graphs, logic gates and geometric constructions, algorithms, algebraic manipulation, recurrence relations, equations and graphs, with and without the use of technology. They are expected to be able to construct proofs and develop and interpret algorithms to solve problems. They should have facility with relevant mental and by-hand approaches to estimation and computation. The use of numerical, graphical, geometric, symbolic 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.

Area of Study 1

Algebra, number and structure

In this area of study students cover the development of formal mathematical notation, definition, reasoning and proof applied to number systems, graph theory, sets, logic, and Boolean algebra, and the development of algorithms to solve problems.

Area of Study 2

Discrete mathematics

In this area of study students cover the study of sequences, series, and first-order linear difference equations, combinatorics, including the pigeon-hole principle, the inclusion-exclusion principle, permutations and combinations, combinatorial identities, and matrices.

Outcome 1

On completion of this unit the student should be able to 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.

To achieve this outcome the student will draw on key knowledge and key skills outlined in all the areas of study.

Outcome 2

On completion of this unit the student should be able to apply mathematical processes in non-routine contexts, including situations with some open-ended aspects requiring investigative, modelling or problem-solving techniques or approaches, and analyse and discuss these applications of mathematics.

To achieve this outcome the student will draw on key knowledge and key skills outlined in all the areas of study.

Outcome 3

On completion of this unit the student should be able to apply computational thinking and use numerical, graphical, symbolic and statistical functionalities of technology to develop mathematical ideas, produce results and carry out analysis in situations requiring investigative, modelling or problem-solving techniques or approaches.

To achieve this outcome the student will draw on key knowledge and key skills outlined in all the areas of study.

Specialist Mathematics Unit 2

The areas of study for Specialist Mathematics Units 1 and 2 are 'Algebra, number and structure', 'Data analysis, probability and statistics', 'Discrete mathematics', 'Functions, relations and graphs' and 'Space and measurement'.

At the end of Unit 2 students are expected to have covered the material in the areas of studies: 'Data analysis, probability and statistics', 'Space and measurement', 'Algebra, number and structure' and 'Functions, relations and graphs'.

In undertaking this unit, students are expected to be able to apply techniques, routines and processes involving rational, real and complex arithmetic, sets, lists, tables, vectors and matrices, diagrams and geometric constructions, algorithms, algebraic manipulation, equations and graphs, with and without the use of technology. They are expected to be able to construct proofs and develop and interpret algorithms to solve problems. They should have facility with relevant mental and by-hand approaches to estimation and computation. The use of numerical, graphical, geometric, symbolic 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.

Area of Study 1

Data analysis, probability and statistics

In this area of study students cover the study of linear combinations of random variables and the distribution of sample means of a population, with the use of technology to explore variability of sample means.

Area of Study 2

Space and measurement

In this area of study students cover trigonometry and identities, rotation and reflection transformations of the plane and vectors for working with position, shape, direction and movement in the plane and related applications.

Area of Study 3

Algebra, number and structure

In this area of study students cover the arithmetic and algebra of complex numbers, including polar form, regions and curves in the complex plane and introduction to factorisation of quadratic functions over the complex field.

Area of Study 4

Functions, relations and graphs

In this area of study students cover an introduction to partial fractions; reciprocal and inverse circular functions and their graphs and simple transformations of these graphs; locus definitions of lines, parabolas, circles, ellipses and hyperbolas and the Cartesian, parametric and polar forms of these relations.

Outcome 1

On completion of this unit the student should be able to 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.

To achieve this outcome the student will draw on key knowledge and key skills outlined in all the areas of study.

Outcome 2

On completion of this unit the student should be able to apply mathematical processes in non-routine contexts, including situations with some open-ended aspects requiring investigative, modelling or problem-solving techniques or approaches, and analyse and discuss these applications of mathematics.

To achieve this outcome the student will draw on key knowledge and key skills outlined in all the areas of study.

Outcome 3

On completion of this unit the student should be able to apply computational thinking and use numerical, graphical, symbolic and statistical functionalities of technology to develop mathematical ideas, produce results and carry out analysis in situations requiring investigative, modelling or problem-solving techniques or approaches.

To achieve this outcome the student will draw on key knowledge and key skills outlined in all the areas of study.

General Mathematics Units 3 and 4

General Mathematics Units 3 and 4 focus on real-life application of mathematics and consist of the areas of study 'Data analysis, probability and statistics' and 'Discrete mathematics'.

Unit 3 comprises Data analysis and Recursion and financial modelling, and Unit 4 comprises Matrices and Networks and decision mathematics.

Assumed knowledge and skills for General Mathematics Units 3 and 4 are contained in General Mathematics 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 key skills for the outcomes of General Mathematics Units 3 and 4.

In undertaking these units, students are expected to be able to apply techniques, routines and processes involving rational and real arithmetic, sets, lists, tables and matrices, diagrams, networks, algorithms, algebraic manipulation, recurrence relations, equations and graphs. They should have facility with relevant mental and by-hand approaches to estimation and computation. The use of numerical, graphical, geometric, symbolic statistical and financial functionality of technology for teaching and learning mathematics, for working mathematically, and in related assessment, is to be incorporated throughout each unit as applicable.

Area of Study 1

Data analysis, probability and statistics

Students cover data types, representation and distribution of data, location, spread, association, correlation and causation, response and explanatory variables, linear regression, data transformation and goodness of fit, times series, seasonality, smoothing and prediction.

Area of Study 2

Discrete mathematics - Recursion and financial modelling

Students cover the use of first-order linear recurrence relations and the time value of money (TVM) to model and analyse a range of financial situations, and using technology to solve related problems involving interest, appreciation and depreciation, loans, annuities and perpetuities.

Area of Study 3

Matrices

Students cover the definition of matrices, different types of matrices, matrix operations, transition matrices and the use of first-order linear matrix recurrence relations to model a range of situations and solve related problems.

Area of Study 4

Networks and decision mathematics

Students cover the definition and representation of different kinds of undirected and directed graphs, Eulerian trails, Eulerian circuits, bridges, Hamiltonian paths and cycles, and the use of networks to model and solve problems involving travel, connection, flow, matching, allocation and scheduling.

Outcomes

For each unit the student is required to demonstrate achievement of three outcomes. As a set these outcomes encompass all of the areas of study for each unit. For each of Unit 3 and Unit 4 the outcomes as a set apply to the content from the areas of study covered in that unit.

Outcome 1

On completion of this unit the student should be able to 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.

Outcome 2

On completion of this unit the student should be able to apply mathematical processes in non-routine contexts, including situations with some open-ended aspects requiring investigative, modelling or problem-solving techniques or approaches, and analyse and discuss these applications of mathematics.

Outcome 3

On completion of this unit the student should be able to apply computational thinking and use numerical, graphical, symbolic and statistical functionalities of technology to develop mathematical ideas, produce results and carry out analysis in situations requiring investigative, modelling or problem-solving techniques or approaches.

School-based assessment

The award of satisfactory completion for a unit is based on whether the student has demonstrated the set of outcomes specified for the unit. Teachers should use a variety of learning activities and assessment tasks to provide a range of opportunities for students to demonstrate the key knowledge and key skills in the outcomes.

Unit 3

School-assessed Coursework for Unit 3 will contribute 24 per cent to the study score.

The **Application task** is a guided investigation of a given data set with several variables. The task has three components of increasing complexity:

- the construction, description and interpretation of data plots, including smoothed plots where time series data is used
- the calculation and interpretation of summary statistics, including seasonal indices and their application where time series data is used
- the modelling of linear associations, or trends where time series data is used, including the use of data transformation as appropriate.

The application task is to be of 4–6 hours' duration over a period of 1–2 weeks.

Outcomes	Marks allocated	Assessment tasks
Outcome 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	10 Application task 5 Modelling or problem-solving task 1
Outcome 2 Apply mathematical processes in non-routine contexts, including situations with some open-ended aspects requiring investigative, modelling or problem-solving techniques or approaches, and analyse and discuss these applications of mathematics.	30	20 Application task 10 Modelling or problem-solving task 1
Outcome 3 Apply computational thinking and use numerical, graphical, symbolic and statistical functionalities of technology to develop mathematical ideas, produce results and carry out analysis in situations requiring investigative, modelling or problem-solving techniques or approaches.	15	10 Application task 5 Modelling or problem-solving task 1
Total marks	**60**	

The Modelling or problem-solving task 1 is to relate to ***Recursion and financial modelling.***
The modelling or problem-solving task is to be of 2–3 hours' duration over a period of 1 week.

Unit 4

School-assessed Coursework for Unit 4 will contribute 16 per cent to the study score.

Outcomes	Marks allocated	Assessment tasks
Outcome 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.	10	5 Modelling or problem-solving task 2 5 Modelling or problem-solving task 3
Outcome 2 Apply mathematical processes in non-routine contexts, including situations with some open-ended aspects requiring investigative, modelling or problem-solving techniques or approaches, and analyse and discuss these applications of mathematics.	20	10 Modelling or problem-solving task 2 10 Modelling or problem-solving task 3
Outcome 3 Apply computational thinking and use numerical, graphical, symbolic and statistical functionalities of technology to develop mathematical ideas, produce results and carry out analysis in situations requiring investigative, modelling or problem-solving techniques or approaches.	10	5 Modelling or problem-solving task 2 5 Modelling or problem-solving task 3
Total marks	**40**	One of the modelling or problem-solving tasks is to relate to **Matrices** and the other modelling or problem-solving task is to relate to **Networks and decision mathematics.** Each modelling or problem-solving task is to be of 2-3 hours' duration over a period of 1 week

School-assessed Coursework for Unit 4 will contribute 16 per cent to the study score.

External assessment

The level of achievement for Units 3 and 4 is also assessed by two end-of-year examinations.

The examinations will contribute 60 per cent to the study score. Each examination will contribute 30 per cent to the study score.

Examination 1

This examination comprises multiple-choice questions covering all areas of study. The examination is designed to assess students' knowledge of mathematical concepts, models and techniques and their ability to reason, interpret and apply this knowledge in a range of contexts.

Examination 2

This examination comprises written response questions covering all areas of study. The examination will be 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.

Mathematical Methods Units 3 and 4

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 'Algebra, number and structure', 'Data analysis, probability and statistics', 'Calculus', and 'Functions, relations and graphs', which must be covered in progression from Unit 3 to Unit 4, with an appropriate selection of content for each of Unit 3 and Unit 4. 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 key skills for the outcomes of Mathematical Methods Units 3 and 4.

For Unit 3 a selection of content would typically include the areas of study 'Functions, relations and graphs' and 'Algebra, number and structure', applications of derivatives and differentiation, and identifying and analysing key features of the functions and their graphs from the 'Calculus' area of study. For Unit 4, a corresponding selection of content would typically consist of remaining content from 'Functions, relations and graphs', 'Algebra, number and structure' and 'Calculus' areas of study, and the study of random variables, discrete and continuous probability distributions, and the distribution of sample proportions from the 'Data analysis, probability and statistics' area of study. For Unit 4, the content from the 'Calculus' area of study would be likely to include the treatment of anti-differentiation, integration, the relation between integration and the area of regions specified by lines or curves described by the rules of functions, and simple applications of this content, including to probability distributions of continuous random variables.

The selection of content from the areas of study should be constructed so that there is a development in the complexity and sophistication of problem types and mathematical processes used (modelling, transformations, graph sketching and equation solving) in application to contexts related to these areas of study. There should be a clear progression of skills and knowledge from Unit 3 to Unit 4 in an area of study.

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, algorithms, algebraic manipulation, equations, graphs, differentiation, anti-differentiation, integration and inference, 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 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.

Area of Study 1

Functions, relations and graphs

In this area of study 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. The behaviour of functions and their graphs is to be explored in a variety of modelling contexts and theoretical investigations.

Area of Study 2

Algebra, number and structure

In this area of study students cover the algebra of functions, including composition of functions, inverse functions and the solution of equations. They also study the identification of appropriate solution processes for solving equations, and systems of simultaneous equations, presented in various forms. Students also cover recognition of equations and systems of equations that are solvable using inverse operations or factorisation, and the use of graphical and numerical approaches for problems involving equations where exact value solutions are not required, or which are not solvable by other methods. This content is to be incorporated as applicable to the other areas of study.

Area of Study 3

Calculus

In this area of study students cover graphical treatment of limits, continuity and differentiability of functions of a single real variable, and differentiation, anti-differentiation and integration of these functions. This material is to be linked to applications in practical situations.

Area of Study 4

Data analysis, probability and statistics

In this area of study students cover discrete and continuous random variables, their representation using tables, probability functions (specified by rule and defining parameters as appropriate); the calculation and interpretation of central measures and measures of spread; and statistical inference for sample proportions. 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.

Outcomes

For each unit the student is required to demonstrate achievement of three outcomes. As a set these outcomes encompass all of the areas of study for each unit. For each of Unit 3 and Unit 4 the outcomes as a set apply to the content from the areas of study covered in that unit.

Outcome 1

On completion of this unit the student should be able to 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.

Outcome 2

On completion of this unit the student should be able to apply mathematical processes in non-routine contexts, including situations with some open-ended aspects requiring investigative, modelling or problem-solving techniques or approaches, and analyse and discuss these applications of mathematics.

Outcome 3

On completion of this unit the student should be able to apply computational thinking and use numerical, graphical, symbolic and statistical functionalities of technology to develop mathematical ideas, produce results and carry out analysis in situations requiring investigative, modelling or problem-solving techniques or approaches.

School-based assessment

The award of satisfactory completion for a unit is based on whether the student has demonstrated the set of outcomes specified for the unit. Teachers should use a variety of learning activities and assessment tasks to provide a range of opportunities for students to demonstrate the key knowledge and key skills in the outcomes.

Unit 3

School-assessed Coursework for Unit 3 will contribute 20 per cent to the study score.

Outcomes	Marks allocated	Assessment tasks
Outcome 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	**Application tasks** A function and calculus-based mathematical investigation of a practical or theoretical context involving content from two or more areas of study, with the following three components of increasing complexity:
Outcome 2 Apply mathematical processes in non-routine contexts, including situations with some open-ended aspects requiring investigative, modelling or problem-solving techniques or approaches, and analyse and discuss these applications of mathematics.	20	• Introduction of the context through specific cases or examples • Consideration of general features of the context • Variation or further specification of assumption or conditions involved in the context to focus on a particular feature or aspect related to the context.
Outcome 3 Apply computational thinking and use numerical, graphical, symbolic and statistical functionalities of technology to develop mathematical ideas, produce results and carry out analysis in situations requiring investigative, modelling or problem-solving techniques or approaches.	15	The application task is to be of 4–6 hours' duration over a period of 1–2 weeks.
Total marks	**50**	

Unit 4

School-assessed Coursework for Unit 4 will contribute 20 per cent to the study score.

Outcomes	Marks allocated	Assessment tasks
Outcome 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	8 Modelling or problem-solving tasks 1 7 Modelling or problem-solving tasks 2
Outcome 2 Apply mathematical processes in non-routine contexts, including situations with some open-ended aspects requiring investigative, modelling or problem-solving techniques or approaches, and analyse and discuss these applications of mathematics.	20	10 Modelling or problem-solving tasks 1 10 Modelling or problem-solving tasks 2
Outcome 3 Apply computational thinking and use numerical, graphical, symbolic and statistical functionalities of technology to develop mathematical ideas, produce results and carry out analysis in situations requiring investigative, modelling or problem-solving techniques or approaches.	15	7 Modelling or problem-solving tasks 1 8 Modelling or problem-solving tasks 2
Total marks	**50**	One of the modelling or problem solving tasks is to be related to the **Probability and statistics** are of study. The modelling or problem solving tasks are to be of 2-3 hours duration over a period of 1 week.

External assessment

The level of achievement for Units 3 and 4 is also assessed by two end-of-year examinations.

Examination 1 will contribute 20 per cent to the study score and Examination 2 will contribute 40 per cent to the study score.

Examination 1

This examination comprises short-answer and some extended-answer questions covering all areas of study in relation to Outcome 1. It is designed to assess students' knowledge of mathematical concepts, their skills in carrying out mathematical algorithms without the use of technology and their ability to apply concepts and skills.

Examination 2

This examination comprises multiple-choice questions and extended-answer questions covering all areas of the study in relation to all three outcomes, with an emphasis on Outcome 2. The examination is designed to assess students' ability to understand and communicate mathematical ideas, and to interpret, analyse and solve both routine and non-routine problems.

Specialist Mathematics Units 3 and 4 consist of the areas of study: 'Algebra, number and structure', 'Calculus', 'Data analysis, probability and statistics', 'Discrete mathematics', 'Functions, relations and graphs', and 'Space and measurement'. The development of course content should highlight mathematical structure, reasoning and proof and applications across a range of modelling contexts with an appropriate selection of content for each of Unit 3 and Unit 4. The selection of content for Unit 3 and Unit 4 should be constructed so that there is a balanced and progressive development of knowledge and skills with connections among the areas of study being developed as appropriate across Unit 3 and Unit 4.

Specialist Mathematics Units 3 and 4 assumes familiarity with the key knowledge and key skills from Mathematical Methods Units 1 and 2; the key knowledge and key skills from Specialist Mathematics Units 1 and 2; and concurrent study or previous completion of Mathematical Methods Units 3 and 4. Together these cover the assumed knowledge and skills for Specialist Mathematics Units 3 and 4, which are drawn on as applicable in the development of content from the areas of study and key knowledge and key skills for the outcomes.

For Unit 3 a selection of content would typically include content from the 'Discrete mathematics', 'Functions, relations and graphs', 'Algebra, number and structure', 'Space and measurement' and 'Calculus' areas of study. In Unit 4 the corresponding selection of content would typically consist of the remaining content from the 'Discrete mathematics', 'Calculus', and 'Space and measurement' areas of study and the content from the 'Data analysis, probability and statistics' area of study.

In undertaking these units, students are expected to be able to apply techniques, routines and processes involving rational, real and complex arithmetic, sets, lists, tables and vectors, diagrams and geometric constructions, algorithms, algebraic manipulation, equations, graphs, differentiation, anti-differentiation and integration and inference, 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 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.

Area of Study 1

Discrete mathematics - Logic and proof

In this area of study students cover the development of mathematical argument and proof. This includes conjectures, connectives, quantifiers, examples and counter-examples, and proof techniques including mathematical induction. Proofs will involve concepts from topics such as: divisibility, inequalities, graph theory, combinatorics, sequences and series including partial sums and partial products and related notations, complex numbers, matrices, vectors and calculus. The concepts, skills and processes from this area of study are to be applied in the other areas of study.

Area of Study 2

Functions, relations and graphs

In this area of study students cover rational functions and other simple quotient functions, curve sketching of these functions and relations, and the analysis of key features of their graphs including intercepts, asymptotic behaviour and the nature and location of stationary points and points of inflection and symmetry.

Area of Study 3

Algebra, number and structure - Complex numbers

In this area of study students cover the algebra of complex numbers, including polar form, factorisation of polynomial functions over the complex field and an informal treatment of the fundamental theorem of algebra.

Area of Study 4

Calculus

In this area of study students cover the advanced calculus techniques for analytical and numerical differentiation and integration of a broad 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, and modelling with differential equations drawing from a variety of fields such as biology, economics and science.

Area of Study 5

Space and measurement

In this area of study 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 their parametric and Cartesian equations; vector kinematics in one, two and three dimensions; vector, parametric and Cartesian equations of lines and planes.

Area of Study 6

Data analysis, probability and statistics

In this area of study students cover the study of linear combinations of random variables and introductory statistical inference with respect to the mean of a single population, the determination of confidence intervals, and hypothesis testing for the mean using the distribution of sample means.

Outcomes

For each unit the student is required to demonstrate achievement of three outcomes. As a set these outcomes encompass all of the areas of study for each unit. For each of Unit 3 and Unit 4 the outcomes as a set apply to the content from the areas of study covered in that unit.

Outcome 1

On completion of this unit the student should be able to 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.

Outcome 2

On completion of this unit the student should be able to apply mathematical processes in non-routine contexts, including situations with some open-ended aspects requiring investigative, modelling or problem-solving techniques or approaches, and analyse and discuss these applications of mathematics.

Outcome 3

On completion of this unit the student should be able to apply computational thinking and use numerical, graphical, symbolic and statistical functionalities of technology to develop mathematical ideas, produce results and carry out analysis in situations requiring investigative, modelling or problem-solving techniques or approaches.

School-based assessment

The award of satisfactory completion for a unit is based on whether the student has demonstrated achievement of the set of outcomes specified for the unit. Teachers should use a variety of learning activities and assessment tasks to provide a range of opportunities for students to demonstrate the key knowledge and key skills in the outcomes.

Unit 3

School-assessed Coursework for Unit 3 will contribute 20 per cent to the study score.

Outcomes	Marks allocated	Assessment tasks
Outcome 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	**Application tasks** A mathematical investigation of a practical or theoretical context involving content from two or more areas of study, with the following three components of increasing complexity: with the following three components of increasing complexity:
Outcome 2 Apply mathematical processes in non-routine contexts, including situations with some open-ended aspects requiring investigative, modelling or problem-solving techniques or approaches, and analyse and discuss these applications of mathematics.	20	• Introduction of the context through specific cases or examples • Consideration of general features of the context • Variation or further specification of assumption or conditions involved in the context to focus on a particular feature or aspect related to the context.
Outcome 3 Apply computational thinking and use numerical, graphical, symbolic and statistical functionalities of technology to develop mathematical ideas, produce results and carry out analysis in situations requiring investigative, modelling or problem-solving techniques or approaches.	15	The application task is to be of 4–6 hours' duration over a period of 1–2 weeks.
Total marks	**50**	

Unit 4

School-assessed Coursework for Unit 4 will contribute 20 per cent to the study score.

Outcomes	Marks allocated	Assessment tasks
Outcome 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	8 Modelling or problem-solving tasks 1 7 Modelling or problem-solving tasks 2
Outcome 2 Apply mathematical processes in non-routine contexts, including situations with some open-ended aspects requiring investigative, modelling or problem-solving techniques or approaches, and analyse and discuss these applications of mathematics.	20	10 Modelling or problem-solving tasks 1 10 Modelling or problem-solving tasks 2
Outcome 3 Apply computational thinking and use numerical, graphical, symbolic and statistical functionalities of technology to develop mathematical ideas, produce results and carry out analysis in situations requiring investigative, modelling or problem-solving techniques or approaches.	15	7 Modelling or problem-solving tasks 1 8 Modelling or problem-solving tasks 2
Total marks	**50**	One of the modelling or problem-solving tasks is to address the **Data analysis, probability and statistics** area of study. Each modelling or problem-solving task is to be of 2-3 hours' duration over a period of 1 week.

External assessment

The level of achievement for Units 3 and 4 is also assessed by two end-of-year examinations. Examination 1 will contribute 20 per cent to the study score and Examination 2 will contribute 40 per cent to the study score.

Examination 1

This examination comprises short-answer and some extended-answer questions covering all areas of study in relation to Outcome 1. It is designed to assess students' knowledge of mathematical concepts, their skills in carrying out mathematical algorithms without the use of technology and their ability to apply concepts and skills.

Examination 2

This examination comprises multiple-choice questions and extended-answer questions covering all areas of the study in relation to all three outcomes, with an emphasis on Outcome 2. The examination is designed to assess students' ability to understand and communicate mathematical ideas, and to interpret, analyse and solve both routine and non-routine problems.