



Area of Study

**Science**

2022 Handbook

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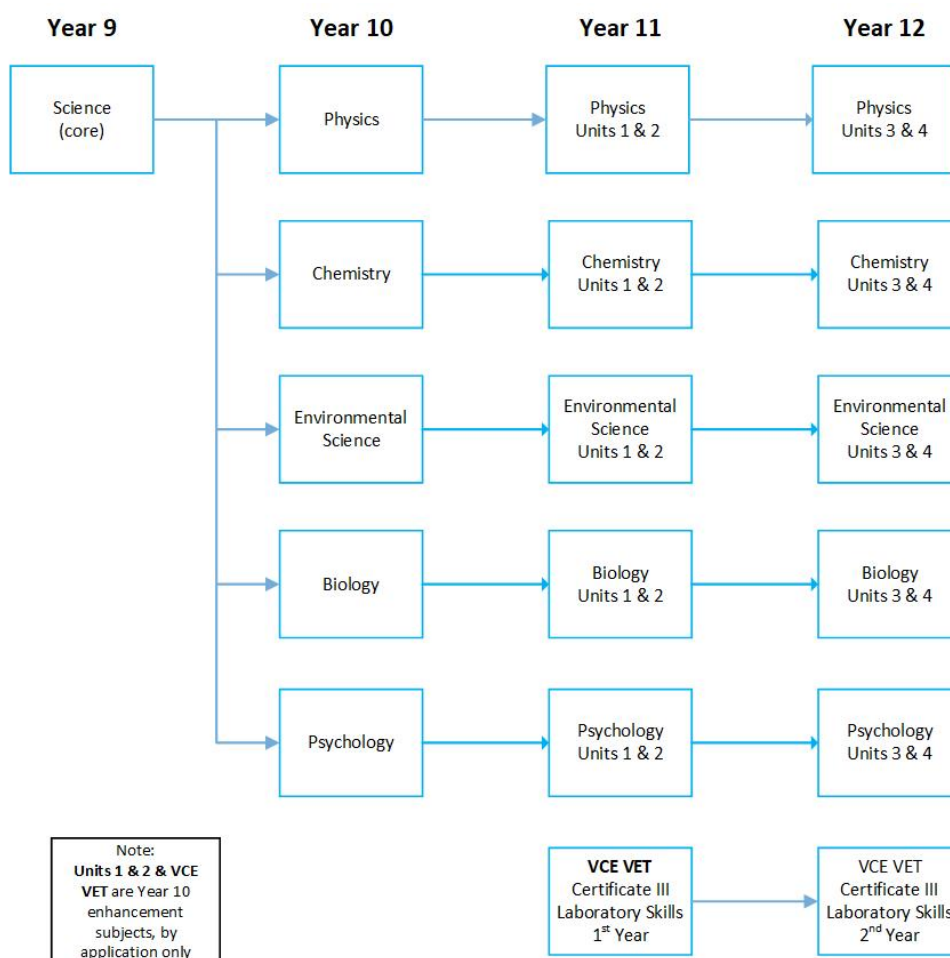
## Why Study Science?

The study of Science allows you to develop the knowledge needed to make informed decisions on scientific issues, as well as being scientifically literate in daily life. This is an area of increasing importance in a world where information and misinformation is easily shared.

The Science curriculum promotes a greater understanding of the world around you by providing a systematic way of exploring important questions about the biological, physical and technological world. Science also fosters growth in a range of interdisciplinary areas including literacy, numeracy, communication and critical thinking.

There are five science pathways offered 10-12 at Lavalla: Physics, Chemistry, Environmental Science, Biology and Psychology. To learn more these pathways, including tertiary courses and careers they can lead to, please refer to the 'Where does this subject lead to' for each area of science. These are positioned with the year 10 Science subjects in this handbook.

## Pathways



Students are encouraged to use <https://delta.vtac.edu.au/CourseSearch/prerequisiteplanner.htm> to research what University courses require science subjects as a prerequisite.

## Year 10 Curriculum

### *Year 10 Science – Physics*

**Semester:** Semester 1 or 2

**Teacher:** Mr Judd

**Recommended Previous Studies:**

Successful completion of Year 9 Science is required, and aptitude in maths is recommended.

**Course Content:**

- How electrical circuits work
- The measurement of motion
- Energy conversions
- The Big Bang Theory

This course explores series and parallel circuits and investigates a range of electrical components. Students will complete a practical investigation on Ohm's Law and examine the safety features of household electrical circuits.

Newton's laws of Motion are also investigated, where students derive motion equations by producing and analysing motion graphs. Motion software is used and a practical investigation is designed and implemented.

Energy conversions will also be explored in this subject including gravitational, kinetic, potential and elastic energy. The origins of the universe will be wound back to the beginning of time itself, following the Big Bang model.

**Assessed Coursework:**

Assessment in this subject will include:

- Topic tests
- Practical reports
- Research tasks
- Exam

**Where does Physics lead to?**

Post-secondary Education: Engineering, Architecture, Building, Design, Science, Mathematics, Science, Information Technology, Robotics, Mechatronics, Astronomy, Astrophysics, Optics, Physics, Radiation Medicine, Aviation, etc.

Employment: Pilot, Engineer, Quantity Surveyor, Architect, Mineralogist, Scientist, Medical Imaging Technologist, Biophysicist, Astronomer, Geologist, Surveyor, Survey Assistant, Avionics Technician, Mechanic, Marine Surveyor, Geoscience Technician, Radiologist, Physicist...

Life Skills: Physics as a discipline is principally about understanding how things works and using that knowledge for the betterment of society. Students who study physics gain a stronger understanding of how to think scientifically and how to approach problems in a systematic fashion.

*Students who enjoy Physics could also consider studying Mathematical Methods, Specialist Mathematics, Chemistry or System Engineering.*

## *Year 10 Science - Chemistry*

**Semester:** Semester 1 or 2  
**Teacher** [Ms Jarvie](#)

### **Recommended Previous Studies:**

Successful completion of Year 9 Science is required and an aptitude in maths is recommended for studies in chemistry.

### **Course Content:**

This Unit introduces students to how the elements of the Periodic Table are organised and the periodic trends that occur. Students will explore the physical structure and chemical properties of elements, learn about the types of reactions that can occur as well as the types of bonding that hold molecules and lattices together.

Students will have the opportunity to engage in practical activities that complement the theory covered in the classroom which will enable them to practise scientific report writing.

### **Assessed Coursework:**

Assessment in this subject will include:

- Topic Tests
- Practical Reports
- Extended Investigation
- Exam

### **Where does Chemistry lead to?**

Post-secondary Education: Science, Engineering, Medicine, Veterinary Science, Pharmacy, Forensic Science, Agronomy, Agricultural Science, Nano Technology, Environmental Science, Biomedical Science, Applied Science (Med Radiations), Nuclear Medicine, Dentistry, Meteorology, etc.

Employment: Medical Practitioner, Engineer, Pathologist, Radiologist, Teacher, Geneticist, Environmental Scientist, Agricultural Scientist, Chemist, Anaesthetist, Laboratory Technician, Meteorologist...

Life Skills: Chemistry is the branch of science that deals with the identification of the substances of which matter is composed; the investigation of their properties and the ways in which they interact. As such, the study of Chemistry will enable you to have a deeper understanding of what is happening in the world around you.

*Students who enjoy Chemistry could also consider studying Biology, Environmental science, Mathematical Methods or Specialist Mathematics*

## *Year 10 Science – Environmental Science*

**Semester:** Semester 1 or 2

**Teacher:** [Ms McAllister](#)

**Recommended Previous Studies:**

Successful completion of Year 9 Science is required.

**Course Content:**

This unit explores a range of Earth sciences looking at the Earth itself, the life that exists on it, and how we can manage human impacts that change and reshape it.

- How does the earth reshape itself with plate tectonics?
- How does the biosphere support all life on Earth and what are the challenges to biodiversity?
- How do humans influence the cycling of matter? How does this contribute to climate change?
- What solutions are being investigated to help reduce carbon and greenhouse gas emissions?

Students explore how plates move over time. This includes the evidence for this movement and phenomena such as volcanos and earthquakes.

Next, the focus shifts to how the biosphere supports all life on Earth, the importance of crucial cycles of matter, such as the water and carbon cycles, and the impact of humans on these cycles. This includes the enhanced greenhouse effect and how this contributes to a changing climate over time and the impacts of this on biodiversity.

Finally, contemporary solutions to these issues are explored by investigating new and developing technologies to help reduce carbon and greenhouse emissions and promote biodiversity on a local and global scale.

**Assessed Coursework:**

Assessment in this subject will include:

- Topic tests
- Practical Reports
- Environmental solutions research presentation
- Exam

**Where does Environmental Science lead to?**

Post-secondary Education: Environmental Science and Engineering, Urban Planning, Agricultural Science, Applied Science, Conservation and Land Management, Sport and Recreation, Anthropology, Geography, Biological Sciences, International Development Studies...

Employment: Agricultural Scientist, Environmental Scientist, Forester, Ecologist, Engineer, Hydrologist, Agronomist, Researcher, Landscape Architect, Park Ranger, Town Planner, Geologist, Government Agencies/Advisor, Non-government Organisations, Botanist, Marine Scientist, Surveyor, Landscaper...

Life Skills: Develops an understanding of the relationship between people and their impact upon the environment from a scientific perspective.

*Students who enjoy Environmental Science should also consider studying Biology, Geography and Outdoor & Environmental Studies.*

## *Year 10 Science - Biology*

**Semester:** Semester 1 or 2  
**Teacher:** Ms Swasbrick or Mrs Williams

### **Recommended Previous Studies:**

Successful completion of Year 9 Science is required.

### **Course Content:**

Ever wondered why you have your father's eyes but your mother's hair colour?

This subject introduces students to the role of DNA and genetics in the inheritance of our physical characteristics. Students will explore how physical traits are passed from parent to offspring and learn about patterns of inheritance as well as how DNA directs cell growth and synthesis of proteins.

Students also explore how traits can be selected for in nature as well as the scientific evidence for evolution.

The ethical and biological implications of genetic abnormalities are explored in a research task based on designer babies and students will also have the opportunity to engage in practical activities to reinforce theory covered in the classroom.

### **Assessed Coursework:**

Assessment in this subject will include:

- Topic tests
- Practical reports
- Research task
- Exam

### **Where does Biology lead to?**

Post-secondary Education: Science, Nursing, Para medicine, Medicine, Scientific Research, Physiotherapy, Allied Health, Science Education, Medical Imaging, Ecology, Zoology, Animal Studies, Veterinary Science, Agriculture, Pharmacy.

Employment: Scientist, Medical Doctor, Nurse, Paramedic, Researcher, Immunologist, Environmental Scientist, Physiotherapist, Osteopath, Sports Scientist, Doctor, Dentist, Microbiologist, Science Teacher, Pharmacist, Zoologist, Agronomist, Occupational Therapist, Veterinarian, Speech Pathologist, Pathologist, Pharmaceutical Industry, Geneticist, Genetic Counsellor, Sports Scientist.

Life Skills: Biology promotes a deep understanding of the how the human body functions, which underlies how to live a healthy lifestyle. It also promotes an understanding of the structure and function of living things. Students build an understanding of the interconnectedness of all living things and the environment.

*Students who enjoy Biology could also consider studying Health and Human Development, Environmental Science, Physical Education, Psychology, VET Allied Health or VET Laboratory Skills.*

## *Year 10 Science – Psychology*

**Semester:** Semester 1 or 2  
**Teacher:** [Mrs Robertson](#), [Ms McCann](#) or [Mr Volosinas](#)

**Recommended Previous Studies:**

Successful completion of Year 9 Science is required.

**Course Content:**

- How the nervous system functions including the structure and functions of the brain
- How conditions and diseases of the brain and nervous system impact people and society
- Ethical considerations of psychological research

In this subject, students will study the structure and function of the brain and nervous system. They will also investigate injuries, conditions and diseases of the brain and nervous system using case studies and profiles.

Past studies such as Milgram's research into obedience to authority and Zimbardo's Stanford prison experiment will be reviewed in the context of the ethical guidelines that govern psychologists' research / experiments today.

An understanding of human behaviours will be gained through learning and applying scientific research methods in a student designed investigation.

**Assessed Coursework:**

Assessment in this subject will include:

- Topic tests
- Practical Reports
- Research tasks
- Student Designed Investigation
- Exam

**Where does Psychology lead to?**

Post-secondary Education: Science, Applied Science, Arts, Criminology, Forensic Science, Social Work, Education/Teaching, Community Services, Health, Youth Work, Nursing, Business, Counselling, Early Childhood Education/Child Care, etc.

Employment: Teacher, Psychologist, Youth Worker, Community Services, Human Services and Welfare, Sport and Training, Market Research, Nursing, Business Management, Human Resources Management, Child Care, Counselling, Social Work, Criminologist...

Life Skills: This subject builds skills that allow the individual to investigate and enquire scientifically, communicate psychological information and apply their psychological understanding to life.

*Students who enjoy psychology should also consider studying, Biology and Health and Human Development.*



## VCE Curriculum

### *Physics Unit 1*

**Semester:** Semester 1  
**Teacher:** Mr Judd

**Recommended Previous Studies:**

Successful completion of Introduction to Methods & Physics at Year 10 is recommended.

**Course Content:**

The Unit 1 course poses the question: What ideas explain the physical world? This unit focuses upon the topics of *Thermodynamics and Climate Change*, *Electricity* and *Origins of the atom*.

Students will apply thermodynamic principles to analyse, interpret and explain changes in thermal energy, and describe the environmental impact of human activities with reference to thermal effects and climate science concepts. They will also investigate and apply a basic DC circuit model to simple battery-operated devices and household electrical systems, apply mathematical models to analyse circuits, and describe the safe and effective use of electricity by individuals and the community.

**Assessed Coursework:**

In Physics Unit 1, student progress will be monitored and assessed through the use of:

- Topic tests
- Practical reports
- Research assignments
- An examination

**Additional Information:**

See 'Where does Physics lead to' in the year 10 Physics section of this guide for information on future pathways involving Physics.

Students are encouraged to use <https://delta.vtac.edu.au/CourseSearch/prerequisiteplanner.htm> to research what University courses require science subjects as a prerequisite.

## *Physics Unit 2*

**Semester:** Semester 2  
**Teacher:** Mr Judd

### **Recommended Previous Studies:**

Successful completion of VCE Physics Unit 1 is recommended.

### **Course Content:**

The Unit 2 course poses the question: “What do experiments reveal about the physical world?” This unit focuses upon the topics of “Motion”, “Student Options” and “Practical Investigation”.

Students will analyse and mathematically model the motion of particles and bodies and then choose from twelve options for Area of Study 2. Each topic is based on a different observation of the physical world, and include: What are stars? Beyond Earth’s Solar System, Forces on the human body, AC to DC conversion, Aerodynamics, Energy from the nucleus, Radiation and the human body, Particle accelerators, Motion in ball sports and Electrical signals in the human body.

Students then design and undertake an investigation of a physics question related to the scientific inquiry process, drawing conclusions based on evidence from their collected data.

### **Assessed Coursework:**

In Physics Unit 2, student progress will be monitored and assessed through the use of:

- Topic tests
- Student designed practical investigation
- Practical reports
- Research assignment
- An examination

### **Additional Information:**

See ‘Where does Physics lead to’ in the year 10 Physics section of this guide for information on future pathways involving Physics.

Students are encouraged to use <https://delta.vtac.edu.au/CourseSearch/prerequisiteplanner.htm> to research what University courses require science subjects as a prerequisite.

## *Physics Units 3 & 4*

**Semester:** Semesters 1 & 2

**Teacher:** Mr Judd

### **Recommended Previous Studies:**

Successful completion of VCE Physics Units 1 & 2 and VCE Mathematics Units 1 & 2 is highly recommended

### **Course Content:**

Unit 3 poses the question: “How do fields explain motion and electricity?” In answering this focus question, students consider three additional questions:

1. *How do things move without contact?* Students examine the similarities and differences between fields: gravitational, electric and magnetic.
2. *How are fields used to move electrical energy?* Students use models of electricity and magnetism to explain how electricity is produced and delivered to homes.
3. *How fast can things go?* Students study Newton’s laws of motion and Einstein’s theory of special relativity.

Unit 4 poses the question: “How can two contradictory models explain both light and matter?” In answering this focus question, students consider two additional questions:

1. *How can waves explain the behaviour of light?* Students examine wave theory to describe transfers of energy.
2. *How are light and matter similar?* Students examine the development of theories to describe light and matter.

Students undertake a student-designed practical investigation in relation to waves, fields, or motion.

### **Assessed Coursework:**

In these Units, student progress can be monitored and assessed through the use of:

- annotations of at least two practical activities from a practical logbook
- a report of a student investigation
- a report of a physics phenomenon
- data analysis
- media analysis/response
- design, building, testing and evaluation of a device or model
- an explanation of the operation of a device or model
- a proposed solution to a scientific or technological problem
- a response to structured questions
- a reflective learning journal or blog related to selected activities or in response to an issue
- a test (short answer and extended response)

**External Assessment:** Students are required to sit a 2.5 hour end of year examination

### **Additional Information:**

See ‘Where does Physics lead to’ in the year 10 Physics section of this guide for information on future pathways involving Physics.

Students are encouraged to use <https://delta.vtac.edu.au/CourseSearch/prerequisiteplanner.htm> to research what University courses require science subjects as a prerequisite.

## *Chemistry Unit 1*

**Semester:** Semester 1

**Teacher:** [Ms Jarvie](#)

**Recommended Previous Studies:**

Successful completion of Year 10 Chemistry and Year 10 Introduction to Maths Methods is recommended.

**Course Content:**

This unit begins with analysing the trends of the periodic table and using these to explain the properties of matter. The role of mathematics in chemistry is highlighted with the introduction and application of the mole concept. The diversity of materials is explained using the structure and properties of metals, ionic compounds and molecular substances. Organic chemistry is also introduced in this Unit.

**Assessment Procedures:**

In Chemistry Unit 1, student progress will be monitored and assessed through the use of:

- Topic tests
- Research tasks / poster presentation
- Practical report
- An examination

**Additional Information:**

See 'Where does Chemistry lead to' in the year 10 Chemistry section of this guide for information on Future pathways involving chemistry.

Students are encouraged to use <https://delta.vtac.edu.au/CourseSearch/prerequisiteplanner.htm> to research what University courses require Chemistry as a prerequisite.

## *Chemistry Unit 2*

**Semester:** Semester 2

**Teacher:** [Ms Jarvie](#)

**Recommended Previous Studies:**

Successful completion of VCE Chemistry Unit 1 is recommended.

**Course Content:**

This unit focuses on the unique properties of water and how substances interact with it. Acid base reactions and redox reactions in water are investigated. Students are introduced to more complex chemical calculations as volumetric and instrumental techniques are introduced to qualitatively and quantitatively measure and analyse substances in water.

**Assessed Coursework:**

In Chemistry Unit 2, student progress will be monitored and assessed through the use of:

- Topic tests
- Practical report
- An extended practical investigation / poster presentation
- An examination

**Additional Information:**

See 'Where does Chemistry lead to' in the year 10 Chemistry section of this guide for information on future pathways involving chemistry.

Students are encouraged to use <https://delta.vtac.edu.au/CourseSearch/prerequisiteplanner.htm> to research what University courses require Chemistry as a prerequisite.

## *Chemistry Units 3 & 4*

**Semester:** Semesters 1 & 2

**Teacher:** [Ms Jarvie](#)

**Recommended Previous Studies:**

Successful completion of VCE Chemistry Units 1 & 2 and Mathematical Methods Units 1 & 2 is recommended.

**Course Content:**

Students will continue to develop their understanding and use of the language and mathematics of Chemistry. Complex chemical calculations are a major component of this course.

Unit 3: Students compare fuels quantitatively and evaluate energy resources. Knowledge of the electrochemical series is used to design, construct and test galvanic cells. Reaction rate and equilibrium principles predict how the rate and extent of reactions can be optimised.

Unit 4: Students investigate the structural features, bonding, typical reactions and uses of the major families of organic compounds including those found in food. They process data from instrumental analyses of organic compounds to confirm or deduce organic structures. Volumetric analyses are used to determine the concentration of organic chemicals in mixtures.

**Assessed Coursework:**

Unit 3 student progress will be monitored and assessed through:

- Student-designed Investigation
- Practical Report
- Test

Unit 4 student progress will be monitored and assessed through:

- Structured scientific poster
- Practical Report
- Test

**External Assessment:** Students are required to sit a 2.5 hour end of year examination.

**Additional Information:**

See 'Where does Chemistry lead to' in the year 10 chemistry section of this guide for information on future pathways involving chemistry.

Students are encouraged to use <https://delta.vtac.edu.au/CourseSearch/prerequisiteplanner.htm> to research what University courses require Chemistry as a prerequisite.

## *Environmental Science Unit 1*

**Semester:** Semester 1

**Teacher:** [Mrs McAllister](#)

**Recommended Previous Studies:**

Successful completion of Year 10 Environmental science is useful but **not** essential.

**Course Content:**

In this unit students examine the processes and interactions occurring within and between Earth's four interrelated systems – the atmosphere, biosphere, hydrosphere and lithosphere. They focus on how ecosystem functioning can influence many local, regional and global environmental conditions such as plant productivity, soil fertility, water quality and air quality. Students explore how changes that have taken place throughout geological and recent history are fundamental to predicting the likely impact of future changes. They consider a variety of influencing factors in achieving a solutions-focused approach to responsible management of challenges related to natural and human-induced environmental change.

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 ecosystem components, monitoring and/or change. It draws on the key science skills and key knowledge from Area of Study 1 and/or Area of Study 2.

**Assessed Coursework:**

For outcome 1 and 2, at least one task selected from:

- a laboratory or fieldwork activity involving the generation, analysis and evaluation of primary data, presented as a report or scientific poster
- reflective annotations from a logbook of practical activities
- analysis of data/results including generation of appropriate graphical representations and formulation of generalisations and conclusions
- analysis and evaluation of a case study or a response to an issue or media article
- a designed solution to an environmental issue or challenge
- evaluation of stakeholder perspectives in environmental management
- There will also be an end of Semester Exam

For outcome 3

- a report of a student-adapted or student-designed scientific investigation using an appropriate format such as a scientific poster, an article for a scientific publication, a practical report, an oral presentation, a multimedia presentation or a visual representation.

**Additional Information**

See 'Where does Environmental Science lead to' in the year 10 Environmental Science section of this guide for information on future pathways involving Environmental Science.

Students are encouraged to use <https://delta.vtac.edu.au/CourseSearch/prerequisiteplanner.htm> to research what University courses require Environmental Science as a prerequisite.

## *Environmental Science Unit 2*

**Semester:** Semester 2

**Teacher:** [Mrs McAllister](#)

### **Recommended Previous Studies:**

Completion of VCE Unit 1 Environmental Science is recommended.

### **Course Content:**

In this unit students consider pollution as well as food and water security as complex and systemic environmental challenges facing current and future generations. They examine the characteristics, impacts, assessment and management of a range of pollutants that are emitted or discharged into Earth's air, soil, water and biological systems, and explore factors that limit and enable the sustainable supply of adequate and affordable food and water.

A student-directed investigation is to be undertaken in Area of Study 3. The investigation explores how science can be applied to address Earth's capacity to sustain life in the context of the management of a selected pollutant and/or the maintenance of food and/or water security. The investigation draws on the key science skills and key knowledge from Area of Study 1 and/or Area of Study 2.

### **Assessed Coursework:**

For outcome 1 and 2, at least one task selected from:

- a laboratory or fieldwork activity involving the generation, analysis and evaluation of primary data, presented as a report or scientific poster
- reflective annotations from a logbook of practical activities
- analysis of data/results including generation of appropriate graphical representations and formulation of generalisations and conclusions
- analysis and evaluation of a case study or a response to an issue or media article
- a designed solution to an environmental issue or challenge
- evaluation of stakeholder perspectives in environmental management.
- There will also be an end of Semester Exam

For outcome 3:

- A response as to how science can be applied in the management of a selected pollutant or in securing food and/or water, communicated in an appropriate format for a specified audience, chosen from:

### **Additional Information**

See 'Where does Environmental Science lead to' in the year 10 Environmental Science section of this guide for information on future pathways involving Environmental Science.

Students are encouraged to use <https://delta.vtac.edu.au/CourseSearch/prerequisiteplanner.htm> to research what University courses require Environmental Science as a prerequisite.



## *Environmental Science Units 3 & 4*

**Semester:** Semester 1 & 2

**Teacher:** [Mrs McCann](#)

**Recommended Previous Studies:**

Successful completion of VCE Environmental Science Units 1 & 2 is recommended.

**Course Content:**

**Unit 3:** How can biodiversity and development be sustained?

Students focus on environmental management through the application of sustainability principles. They explore the value of the biosphere to all living things by examining the concept of biodiversity and the ecosystem services important for human health and well-being. They analyse the processes that threaten biodiversity and evaluate biodiversity management strategies for a selected threatened endemic animal or plant species. Students use a selected environmental science case study with reference to sustainability principles and environmental management strategies to explore management, including impacts on the atmosphere, biosphere, hydrosphere and lithosphere.

**Unit 4:** How can climate change and the impacts of human energy use be managed?

Students explore different factors that contribute to the variability of Earth's climate and that can affect living things, human society and the environment at local, regional and global scales. Students compare sources, availability, reliability and efficiencies of renewable and non-renewable energy resources in order to evaluate the suitability and consequences of their use in terms of upholding sustainability principles. They analyse various factors that are involved in responsible environmental decision-making and consider how science can be used to inform the management of climate change and the impacts of energy production and use.

Students design a scientific investigation involving biodiversity, environmental management, climate change and/or energy use. This is presented in a scientific poster format.

**Assessed Coursework:**

School Assessed Coursework:

- presentation of recommendations using evidence-based decision-making
- designed or practical response to a real or theoretical environmental issue
- analysis of a case study
- Evaluation of a response to an environmental challenge.
- Unit 3 School-assessed Coursework: 20 per cent
- Unit 4 School-assessed Coursework: 30 per cent

External Assessment:

- hour end of year written examination
- End-of-year examination: 50 per cent

**Additional Information**

See 'Where does Environmental Science lead to' in the year 10 Environmental Science section of this guide for information on future pathways involving Environmental Science. Students are encouraged to use <https://delta.vtac.edu.au/CourseSearch/prerequisiteplanner.htm> to research what University courses require Environmental Science as a prerequisite.

## *Biology Unit 1*

**Semester:** Semester 1

**Teacher:** [Mrs Swasbrick](#), [Mrs Williams](#)

**Recommended Previous Studies:**

Successful completion of Biology at Year 10 is recommended.

**Course Content:**

*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. This includes understanding the requirements and cellular processes that cells use to sustain life. Students focus on cell growth, replacement and death and the role of stem cells in differentiation. 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

Students design and conduct a scientific investigation related to function and regulation of cells or systems, drawing a conclusion based on evidence from generated primary data.

**Areas of Study:**

- How do cells function?
- How do plant and animal systems function?
- How do scientific investigations develop understanding of how organisms regulate their functions?

**Assessed Coursework:**

- Experimental Log book
- Topic tests
- Bioinformatics exercise
- Student designed investigation
- Exam

**Additional information**

Students are encouraged to use <https://delta.vtac.edu.au/CourseSearch/prerequisiteplanner.htm> to research what University courses require Biology as a prerequisite.

See 'Where does Biology lead to' in the year 10 Biology section of this guide for information on future pathways involving Biology.

## *Biology Unit 2*

**Semester:** Semester 2

**Teacher:** [Mrs Swasbrick](#), [Mrs Williams](#)

**Recommended Previous Studies:**

Successful completion of VCE Biology Unit 1 is recommended.

**Course Content:**

*Unit 2: 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 meiosis, and learn how epigenetics and the environment influences the expression of genes. Patterns of inheritance are explored through pedigree charts and the outcomes genetic crosses are predicted.

Students analyse the advantages and disadvantages of asexual and sexual 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

**Assessed Coursework:**

- Laboratory journal
- Topic tests
- Exam
- Bioinformatics exercise
- Field work activities
- Student directed investigation of an issue

**Additional information**

Students are encouraged to use <https://delta.vtac.edu.au/CourseSearch/prerequisiteplanner.htm> to research what University courses require Biology as a prerequisite.

See 'Where does Biology lead to' in the year 10 Biology section of this guide for information on future pathways involving Biology.

## *Biology Units 3 & 4*

**Semester:** Semesters 1 & 2  
**Teacher:** Mr Rathbone or Mrs Swasbrick

**Recommended Previous Studies:**

Successful completion of VCE Biology Units 1 & 2 is recommended.

**Course Content:**

**Unit 3** - How do cells maintain life?

In this Unit students investigate the workings of the cell from several perspectives. They explore the relationship between DNA and proteins as key molecules in cellular processes.

Students analyse the structure and function of DNA and proteins and examine the biological consequences of manipulating DNA and applying bio-technologies

**Unit 4** – 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.

**Assessed Coursework:**

In the study of VCE Biology the student's level of achievement will be determined by School-assessed Coursework as specified in the VCE Biology study design and external assessment.

School Assessed Coursework:

- Biological case study
- Data analysis task
- Comparison and evaluation of the findings of 3 practical activities
- Analysis of a contemporary bioethical issue
- Unit 3 School-assessed Coursework: 20 per cent
- Unit 4 School-assessed Coursework: 30 per cent

External Assessment:

- 2.5 hour end of year written examination
- End-of-year examination: 50 per cent

**Additional information**

See 'Where does Biology lead to' in the year 10 Biology section of this guide for information on future pathways involving Biology.

Students are encouraged to use <https://delta.vtac.edu.au/CourseSearch/prerequisiteplanner.htm> to research what University courses require Biology as a prerequisite.

## *Psychology Unit 1*

**Semester:** Semester 1  
**Teacher:** [Mrs McCann](#) or [Mr Volosinas](#)

**Recommended Previous Studies:**  
Successful completion of Year 10 Psychology

**Course Content:**  
The discipline of Psychology is introduced as the scientific study of behaviour and mental processes.

The three outcomes for this unit are:

- How does the brain function?
- What influences psychological development?
- Student-directed research investigation

Students learn about key science skills and how they are applied in psychological research, including adherence to prescribed ethical principles. They study the structure and function of the brain and nervous system, including neuronal functioning and brain plasticity, and psychological development, including attachment in infants, cognitive and psychosocial development across the lifespan, as well as mental health and mental disorders, with a focus on schizophrenia.

**Assessed Coursework:**  
Assessment tasks contribute 60% towards the final grade, and may be selected from the following: For Outcomes 1 and 2

- a report of a practical activity involving the collection of primary data
- a research investigation involving the collection of secondary data
- a brain structure modelling activity
- a logbook of practical activities
- analysis of data/results including generalisations/conclusions
- media analysis/response
- problem solving involving psychological concepts, skills and/or issues
- a test comprising multiple choice and/or short answer and/or extended response
- a reflective learning journal/blog related to selected activities or in response to an issue

For Outcome 3

- a report of an investigation into brain function and/or development that can be presented in various formats, for example digital presentation, oral presentation, or written report.

A written examination contributes 40% towards the final grade for this unit

### **Additional information**

See 'Where does Psychology lead to' in the year 10 Psychology section of this guide for information on future pathways involving Psychology.

Students are encouraged to use <https://delta.vtac.edu.au/CourseSearch/prerequisiteplanner.htm> to research what University courses require Psychology as a prerequisite.

## *Psychology Unit 2*

**Semester:** Semester 2  
**Teacher:** [Mrs McCann](#) or [Mr Volosinas](#)

**Recommended Previous Studies:**  
Successful completion of Unit 1 Psychology.

### **Course Content:**

The three outcomes for this unit are:

- What influences a person's perception of the world?
- How are people influenced?
- Student-directed practical investigation

Students develop key science skills and how they are applied in psychological research, including adherence to prescribed ethical principles. The processes involved in sensation and perception are studied, in particular vision and taste, including the biological, psychological and social factors that impact on these senses. They are introduced to social psychology, focusing on social cognition and social influences on behaviour, including attributions, attitudes and stereotyping that may lead to prejudice and discrimination. Classic experiments on the effects of status and power, conformity and obedience on individual behaviour are studied, as well as factors that influence helping behaviour and bullying, including positive and negative effects of the media.

### **Assessed Coursework:**

Assessment tasks contribute 60% towards the final grade, and may be selected from the following:

*For Outcomes 1 and 2*

- a report of a practical activity involving the collection of primary data
- a research investigation involving the collection of secondary data
- a logbook of practical activities
- analysis of data/results including generalisations/ conclusions
- media analysis/response
- problem solving involving psychological concepts, skills and/or issues
- a test comprising multiple choice and/or short answer and/or extended response
- a reflective learning journal/blog related to selected activities or in response to an issue

*For Outcome 3*

- a report of an investigation into internal and/or external influences on behaviour that can be presented in various formats, for example digital presentation, oral presentation, scientific poster or written report

A written examination contributes 40% towards the final grade for this unit.

### **Additional information**

See 'Where does Psychology lead to' in the year 10 Psychology section of this guide for information on future pathways involving Psychology.

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## *Psychology Units 3 & 4*

**Semester:** Semesters 1 & 2  
**Teacher:** [Mrs McCann](#) or [Mr Volosinas](#)

**Recommended Previous Studies:**

Completion of VCE Psychology Units 1 and/or 2 is HIGHLY recommended.

**Course Content:**

The outcomes for Unit 3 are:

- How does the nervous system enable psychological functioning?
- How do people learn and remember?

The outcomes for Unit 4 are:

- How do levels of consciousness affect mental processes and behaviour?
- What influences mental wellbeing?
- Practical investigation

Key science skills in the conducting of research, analysing and interpreting data, and reporting findings are developed; ethical standards and guidelines are integrated throughout the course.

**Unit 3:** Students learn about the various divisions of the nervous system and their role in responding to, processing and integrating information, the role of the neuron and neurotransmitters in the functioning of the nervous system and the effects of interference to neurotransmitter function, illustrated by Parkinson's disease; also stress as a bio-psychological process, including models of stress and coping strategies. The neural basis of learning and memory is studied, followed by models to explain learning, and process and reliability of memory.

**Unit 4:** This unit addresses consciousness as a psychological construct, contrasting normal waking consciousness with altered states, including sleep. Mental health is studied with reference to factors that contribute to the development and progression of mental disorders and ethical implications of research into mental health. The bio-psychosocial framework is applied to explain specific phobia and its management. A practical investigation on a research topic related to mental processes and psychological functioning is undertaken, whereby students devise and conduct an experiment, analyse and evaluate the gathered data, and finally report their research on a scientific poster.

**School-based assessment:**

School Assessed Coursework for Units 3 and 4 contribute 40% to the Study Score. Tasks may be

- annotations of at least two practical activities from a practical logbook
- evaluation of research
- a report of a student investigation
- media analysis/response
- a reflective blog/learning journal related to selected activities or in response to an issue
- a test

Compulsory task for Unit 4 - Outcome 3:

- a structured scientific poster according to the VCAA template

**External assessment:** An end-of-year examination that contributes 60% to the final Study Score.

**Additional information**

See 'Where does Psychology lead to' in the year 10 Psychology section of this guide for information on future pathways involving Psychology.

Students are encouraged to use <https://delta.vtac.edu.au/CourseSearch/prerequisiteplanner.htm> to research what University courses require psychology as a prerequisite.

## VET Program

### *Certificate III in Laboratory Skills – MSL30118*

For further course information refer to the VET handbook which is located on the Lavalla Catholic College website or alternatively contact [Mrs Howard](#) the VET Adviser.