ART COURSE DESCRIPTIONS

2D ART

Transition Level - Students are given the opportunity to develop skills in observation and the perception of things around us. Subjects include still-life, portrait, figure and landscape as well as topics to stimulate imagination and promote self-expression. Each exercise relates to the study of the Design Elements and Principles involving the use of a broad range of 2D media covering drawing, painting and collage. Students complete a work book including sketches, notes, evaluations and research assignments dealing with art produced by other cultures, past and present, as well as their own artistic heritage. Assessment: Folio of practical artworks, work book, analysis of artworks and research assignments. Excursions: Possible excursions to galleries, exhibitions (extra cost involved).

Advanced Level - Recommended requirements – Transition Level 2D ART. Students advance their skill level with a variety of media, including painting, drawing, printmaking and collage. They are encouraged to use their imagination, increase their capacity for self expression and to experiment with a variety of techniques while developing ideas for artworks. Students develop a work brief and take part in an artistic process involving sources of inspiration and motivation, investigating and exploring, selecting and refining leading up to a major artwork. A work book is used as a personal art diary recording the development of thought processes in written and visual form. This includes resource material, working drawings, notes and evaluations. Research deals with the study of artists working in 2D from past and present cultures in relation to practical tasks. Assessment: Folio of practical artworks, work book, analysis of artworks and research assignments. Excursions: Possible excursions to galleries, local artists (extra cost involved).

3D ART

Transition Level - Students learn the basic methods of hand building in ceramics: pinch, coil, slab and press mould, as well as simple embellishment with incising, carving, applied decoration, slips, oxides, stains and glazes. With sculpture, students learn basic techniques in carving, casting and construction including relief and free standing artworks. Students complete a work book including design sketches, notes, evaluations and research assignments dealing with the analysis of artworks from past and present cultures. Assessment: Folio of practical artworks, work book and research assignments. Excursions: Possible excursions to galleries, local artists (extra cost involved).

Advanced Level - Recommended requirements – Transition Level 3D ART. Students extend their study of ceramics and sculpture building on skills learnt in the Basic Level. In ceramics they investigate combinations of several methods, challenging their imagination and technical expertise, and they learn how to select appropriate decoration to best suit their artistic goals. Sculpture involves more demanding 3D exercises based on methods including carving, casting, building and construction. A work book is used as a personal art diary recording work briefs and the development of thought processes in written and visual form. This includes resource material, working drawings, notes and evaluations. Research deals with the study of artists working in 3D from past and present cultures. Assessment: Folio of practical artworks, work book and research assignments. Excursions: Possible excursions to galleries, local artists (extra cost involved).
DRAMA

Students study Drama for a semester.

Transition course –

During the first term, students study the origins of theatre, creating an ensemble presentation using Greek myths or legends as a focus.

Following this, students study performance skills; voice and breath, movement, characterisations, and script work in preparation for a class performance.

The major focus of the second term is the production of an original piece of theatre and involves brainstorming ideas, developing script drafts, refining, rehearsing, working collaboratively, presenting the production before an audience, then reflecting and evaluating on the process.

Finally students are introduced to the Non-Naturalistic acting style, and the work of theatrical exponents, Brecht and Artaud, and compare this with the more naturalistic style of Stanislavsky.

Assessment tasks

- 2 practical tasks (ensemble and class)
- script ideas/development
- written review, critically analysing own and the work of others
- written journal

Advanced course -

Students will expand on their knowledge of

- theatre terminology
- styles of theatre – e.g. commedia dell arte, melodrama
- interpretation and exploration of characterisation through expressive skills
- response to and adaptation of scripts
- adaptation of skills for different forms and styles of theatre
- play building
- and furthering their understanding of Non-Naturalism in preparation for the VCE Drama Course

Assessment Tasks

- 2 practical tasks (ensemble and class)
- Developing ideas for a theatrical presentation using own script
  (e.g. set and costume design, directors notes etc)
- 2 written reviews - providing critical evaluation of the work of self and others
- Written journal
FOOD STUDIES A

Transition level – Students investigate food safety and hygiene, demonstrating understanding of the concepts in practical classes. Seasonal produce is researched and used when planning for and designing meals and snacks. Throughout the course, students touch on Australia’s immigration history through food and discover how our eating patterns have been influenced by a multitude of cuisines. Principles of healthy eating will be revised and will underpin any meal and menu planning. Students will use a variety of appliances and cookery methods to produce a range of dishes, snacks and meals.

Advanced level – Students utilize and develop their skills and knowledge from previous units to further their competence in the kitchen. Regular use of more complex appliances and cookery methods will be used and the principles of healthy eating will be examined in more detail to apply in planning activities. A wide range of regional and international dishes will be investigated, designed, produced and finally evaluated.

Assessment: is varied and may include practical observations, class presentations, research assignments, written tests and presentation of a neat and up to date workbook. Participation in practical sessions, both as an individual and as a group member are assessed in regard to cooperation, teamwork, time and resource management and organisational skills.

Other: a container bought weekly to class to take home any leftover food items.

FOOD STUDIES B

Transition level - Students’ independent living skills are developed with a focus on all aspects of food preparation. Menus and dishes will be designed, ordered for, produced and evaluated throughout the course. Dishes prepared range from basic family fare, to food for special occasions and events. Healthy eating principles are reinforced and more advanced practical cookery techniques used and students begin to refine their food presentation.

Advanced level - Students entering this course may show a strong interest in continuing into VCE VET Hospitality. Skills and concepts from previous units are practised and developed and planning activities are more complex, bringing in pricing of meals and menus and dietary requirements. An emphasis is placed on food presentation.

Assessment: is based on the design brief and may also include practical observations, class presentations, research assignments, written tests and presentation of a neat and up to date workbook. Participation in practical sessions, both as an individual and as a group member are assessed in regard to cooperation, teamwork, time and resource management and organisational skills.

Other: a container bought weekly to class to take home any leftover food items.
FRENCH Semester 1

In this unit, Year 9 students will revise previously learnt vocabulary and grammar. New topics will include weekend and holiday activities, school subjects, food, likes and dislikes, more verbs in the present and past tenses, other grammar and general knowledge about France. Year 10 students will revise previous conversations and interviews. New topics will include young people in France, the French speaking African country of Burkina Faso, more tenses and grammar such as possessive adjectives and pronouns and general knowledge about France. Classroom activities will include listening and reading comprehensions, writing paragraphs, conversations, games, some geography and history of France, tests and online activities and competitions. Cultural understanding will be taught through these activities as well as map work, readers, movies, cooking and tasting French food.

FRENCH Semester 2

In this unit, Year 9 topics will include telling the time, daily routine at home and at school, travelling overseas, living in Paris, more grammar and verbs in present and past tenses and general knowledge about France. Year 10 will include more tenses and grammar, directions, prepositions, travelling, life in Paris, young people in France and general knowledge about France and other French speaking countries. Classroom activities will include listening and reading comprehensions, writing paragraphs, conversations and interviews, games, some geography and history of France, tests and online activities and competitions. Cultural understanding will be taught through these activities as well as DVD programs, readers, movies, cooking and tasting French food.
GRAPHIC COMMUNICATION

**Transition** - Students develop techniques and understanding in a range of graphic design applications. They apply skills to generate and refine ideas incorporating the ‘design process’ and conventional and creative graphics, including two-dimensional and three-dimensional drawing and computer applications. They will design company identity themes, packaging and advertising, redesign products, investigate what inspires and drives design, and use computer software to enhance presentations. Students are encouraged to complete this unit before the ‘challenging’ unit.

Assessment: Satisfactory completion of work requirements including a folio of development and concepts, as well as final presentations for design briefs, plus a written task each term.

**Challenging** – Students will extend their skills through a range of tasks including short term and extended design briefs. They will explore and develop ideas for design solutions with a focus on improving their flair and imagination in producing visual communications. Using a range techniques, media and materials in the design process and the exploration of a range of presentation techniques and computer applications are explored. Appropriate consideration is given to the use of design elements and principles. Topics include advertising, marketing techniques, product design, environmental design and corporate design. Students discuss and evaluate their own work and the work of professional designers, using appropriate terminology to describe and appraise their work. They compare the past and present context of design and explore changing trends in Australian design.

Assessment: Satisfactory completion of work requirements including a folio of class work, final presentations and a research task.

COMPUTER DESIGN

**Transition** - Students learn how to design and apply graphics using a range of software including ‘Microsoft’, ‘Photoshop’, ‘TurboCAD’, ‘Google SketchUP’, and a range of freeware products. They will have a range of design tasks where they will utilise the design development process. Emphasis will be on general design composition, photo manipulation, 2D and 3D modelling and animation; exploring how design elements and principles effectively communicate to an audience. Specifically students will develop skills in using the computer to assist in creativity, building confidence and skill when applying graphics to the related topics and other subjects.

Assessment: Satisfactory completion of set work, including final presentations and research tasks.
HPE ADVANCED UNITS

PERSONAL TRAINING – Advanced

Students will be introduced to a range of basic exercises and methods that can be used both within and outside the gym environment. Students develop an understanding of correct techniques, common faults, spotting procedures and gain skills in movement analysis. The subject is both theoretical and practical.

Assessment: Completion of work requirements, including an investigation/ programming assignment, written and verbal tests – application to skills development and practice exercises, and use of appropriate safety procedures.

Other: Sports Uniform – black shorts, black tracksuit pants, College PE top, black fleece jacket, runners (not skate shoes), suitable hat for Term 1 and Term 4

*Students will also be training while participating in the subject.

A non-graded assessment will be the student’s fitness level.

INTRO TO VCE PE (SEMESTER 2) – Advanced (Year 10)

This unit is highly recommended for any student intending to do PE in Year 11 & 12. Students will participate in 2 theory and 2 practical classes per week. Areas of study will include:

- Body systems and the effect of exercise on these systems.
- Motivation for participation in physical activity
- Skill development
- Coaching

Assessment: Completion of work requirements, including unit tests – application to skills development and practice exercises, completion of theory and/or project work and use of appropriate safety procedures.
HEALTH AND FIRST AID – Advanced

Students investigate issues relating to themselves, their development and safety within the community. This is achieved through:

- completing and being assessed for the Occupational Health and Safety Certificate (level 2)
- evaluating community programs addressing health and safety issues
- investigating better personal decision making skills, including alcohol and drug use.
- focus on healthy lifestyle practices, nutrition and healthy eating.

Assessment: Participation in class activities and completion of workbook to satisfactorily complete work requirements.

INTRO TO VCE HHD (SEMESTER 2) – Advanced (Year 10)

This unit is highly recommended to students who intend to study HHD in VCE. The following areas of study will be covered:

- What is HHD?
- Adolescent health and development
- Adult health and development
- Healthcare
- Careers in Health
HEALTH AND HUMAN PURSUITS

Students identify and describe a range of social and cultural factors that influence the development of personal identity and values:

- identify the rights and responsibilities associated with developing greater independence, including those related to sexual relationships
- describe mental health issues relevant to young people
- review perceptions of challenge, risk and safety and demonstrate understanding of appropriate assertiveness and resilience strategies
- analyse health outcomes of personal behaviours and community actions
- identify the health services and products provided by government and non-government bodies and analyse how these can be used to support the health needs of young people
- identify strategies that address current trends that affect food consumption in Australia

Assessment: Unit tests, Project work, Class participation, Health Careers Project.

STRIKING SPORTS – Transition

Students concentrate on improving skill levels, showing an understanding of game strategy and umpiring as well as developing co-operation, teamwork, sportsmanship and safety awareness. Students examine factors which influence community decisions to promote and support sporting, recreation and leisure activities. Pursuits are chosen from the following areas: swimming, hockey, indoor cricket, lacrosse, baseball, softball, badminton and tennis.

Assessment: Completion of work requirements – skills development and participation, application to team games and strategies/umpiring, completion of theory and/or project work and use of appropriate safety procedures.

Other: School sports uniform – runners (not skate shoes), suitable hat for Term 1 and Term 4.

BALL GAMES – Transition

Students concentrate on improving their skill level, learning about game strategy and umpiring as well as developing co-operation, teamwork, sportsmanship and safety awareness. Students will be actively involved in a range of ball games to be chosen from: volleyball, basketball, football codes, European handball, speedball, korfball, netball and lawn bowls. Students examine factors which influence community decisions to promote and support sporting, recreation and leisure activities.

Assessment: Completion of work requirements – knowledge of rules and umpiring skills, completion of theory and/or project work and use of appropriate safety procedures.

Other: School sports uniform – runners (not skate shoes), suitable hat for Term 1 and Term 4.
yr 9/10 Indonesian sem 1

Year 9 students study Indonesian food, animals and their habitats, pets and farm animals. Traditional stories and a written project about Indonesian animals deepens cultural understanding. Year 10 students study Indonesian transport and destinations, sports, hobbies and entertainment. Both year levels take part in cooking Indonesian meals, an excursion to Melbourne zoo, an Indonesian restaurant, and an Asian shopping precinct. Classroom activities included games, listening comprehensions, written exercises, role plays, interviews, written projects and tests.

yr 9/10 Indonesian sem 2

Year 9 students study schooling in Indonesia, traditional and modern transport, giving and taking directions, map reading, sport, leisure activities and entertainment. Year 10 students study Indonesia’s seasons, weather and natural environment, then famous tourist attractions in Java. Classroom activities include games, listening comprehensions, written exercises and projects, role plays, interviews, and tests.
MEDIA STUDIES

In this unit students analyse the role different kinds of media play in our society; including print, advertising, internet, television and film. They investigate the communicative power of print, voice and image; both still and moving, through issues including storytelling, advertising, and relevant current events developing and discussing a wide knowledge of media language. Finally they will learn to use digital software to edit, add effects, apply transitions and add titles and music to for a short movie or documentary.

Assessment: Assessment is based on assignments and projects as stated in work requirements.
MUSIC TECHNOLOGY – Transition

In this course the students experiment with sound and study the influences of music in advertising and film. The students will learn a variety of sound editing and recording techniques. These skills will be used to create soundscapes for small film clips. There is also a compositional element to this course. The students will be required to compose and record their own music using a variety of loops software.

Assessment: Satisfactory completion of work requirements based on practical participation and development of course work.

MUSIC TECHNOLOGY – Advanced

Recommended requirements: Music Technology (Transition) and any middle school music workshop classes would be an advantage.

This is the final music course/workshop for the middle school. It utilises all the skills learnt in the above-mentioned units. Further sound editing, recording skills and composition skills are learnt. The students will choose a major project for this unit. It may be in a recording or composition capacity and will require further editing skills for the final product.

Assessment: Satisfactory completion of work requirements based on practical participation and further development of course work.
MUSIC

Transition Level: In this course students will build on performance and technical skills on a variety of instruments. Keyboard is used as a visual learning tool to assist in understanding chords, scales, improvisation and other music concepts. Students will work at their own pace through theory grades as well as on a range of melodic, rhythmic and aural levels. Composition and song writing is commenced using music computer programmes and chosen instruments. Students will listen and analyse music as well as study specific music genres.
Assessment: Satisfactory completion of work requirements, performance evaluations and a Styles of Music assignment.

Advanced Level: This utilises all skills from the previous unit. Further performance and music skills will be developed with emphasis on playing, technique and music style. Students will compose their own songs using melody, chords and lyrics. A more in depth study of specific music styles and music history will also be undertaken.
Assessment: Satisfactory completion of work requirements, performance evaluations and a major Styles/History of Music assignment.
PERFORMANCE SPORTS – Transition

Students concentrate and develop their skills and understanding of the sports covered during the inter school sports program. This includes sports such as Swimming, Athletics and Cross Country as well as the various sports covered in Round Robin. The students will train and develop their understanding and skill level of the sports as well as actively promoting participation in the various sports throughout the school.

Assessment: Completion of work requirements – skills development and participation, application to team games and strategies/umpiring, completion of theory and/or project work and use of appropriate safety procedures.

Other: School sports uniform – runners (not skate shoes), suitable hat for Term 1 and Term 4.

Performance Sports – New Subject

Why introduce it?

With numbers dropping in participation in Round Robin, Swimming and Aths this gives us a chance to refocus in the middle school to build up their skills and confidence in interschool sports. We would hope the flow of this would lead to greater participation in the above activities and increase connectedness to the school.
Project 109

Students undertake four challenges.

Challenge 1 - Creating a Team Identity.

Throughout the course we will complete team building activities as well as explore strengths and weaknesses as an individual operating in a team. The group create the team’s identity, explore their values and what will be their mission for the year. From this their logo is developed.

Challenge 2 - The $20 Boss Challenge.

Students will be given a loan of $20 each to be used to develop a business, selling a product or providing a service. They complete modules on entrepreneurs, how to come up with an idea, working out a target market, market surveys and essentials of marketing. Along with this, each business will have to maintain financial records, donate part of their profits to charity and repay, with $1 interest, the loan.

Challenge 3 - Urban Challenge

We celebrate the team’s efforts with an Urban Challenge incorporating the Amazing Race. Students will have the option of using their profits from the $20 Boss Challenge and/or borrow the money from home.

Challenge 4 - Individual Challenge

Students then have the opportunity to embark on another project that driven by and chosen by each individual student. The project is completed during Project times either at school or it can be arranged that the student works on it off campus with a mentor if needed.

Students will present at an Expo at the end of the course to celebrate achievements and to acknowledge their community partners and mentors.
General Statement

“Science is a way of thinking much more than it is a body of knowledge.” Carl Sagan

Our practical and relevant learning program has been designed to ensure that students are energised and enthused to learn more about their environment and the processes that occur within it. Since human life began, people have yearned to learn more about the wonders of the natural world - which is exactly what Science is all about. Today’s exciting developments in science and technology permeate every aspect of our lives and we aim to instil in our students a desire and an ability to think and to wonder.

Science at Mansfield Secondary College follows the AusVELS Curriculum from Years 7 to 10. This is organised into three areas:

• Science as a human endeavour – which focuses on the nature and influence of Science
• Science inquiry skills – which focuses on skills essential for working and thinking scientifically

AND

• Science understanding – which focuses on the important science concepts from across different the areas of science including Biology, Chemistry, Physics, Geology and Psychology.

Flow Chart

<table>
<thead>
<tr>
<th>Year 7</th>
<th>Year 8</th>
<th>Year 9</th>
<th>Year 10</th>
<th>VCE</th>
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<tbody>
<tr>
<td>All students complete the same course.</td>
<td>All students complete the same course.</td>
<td>Life Science A</td>
<td>Life Science B</td>
<td>Biology</td>
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<td>Physical Science A</td>
<td>Physical Science B</td>
<td>Chemistry</td>
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<td>Applied Biology</td>
<td>Applied Engineering</td>
<td>Physics</td>
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Note
- Choose 4 units during Years 9 and 10
- Physical Science B is required for VCE Chemistry and Physics
- Life Science A or Applied Biology/Chemistry plus Life Science B is recommended for VCE Biology
Accelerated Program

Year 10 students who have been nominated based on their Year 9 results can choose to apply to complete VCE Psychology Unit 1 and/or 2. Our preference is for students to progress through all of the 7-10 science courses and be extended through the variety of programs and opportunities offered beyond the classroom.

Programs for Academic Enrichment and Extension

Mansfield Secondary College provides many opportunities for high achieving students to be extended and enriched. Students at each year level are identified using our data or through teacher recommendation. Parents will be notified and will be expected to take a key role in this process.

Students at each level are nominated to take part in the Australasian Science Competition.

Students will also be invited to take part in or apply for the following programs:

Year 7  
Big Science Competition  

Year 8  
Big Science Competition  

Year 9  
Science Experience  
Big Science Competition  

Year 10  
Australian and New Zealand Brain Bee Challenge  
http://www.abbc.edu.au/  
Big Science Competition  
The Amazing Spaghetti Machine Contest (Melbourne School of Engineering - Melbourne University)
http://www.eng.unimelb.edu.au/spaghettimachine/about/

**Acceleration to VCE**

**Year 11**

National Youth Science Forum Rotary and ANU

http://www.nysf.edu.au/

Rotary Murray Darling School of Freshwater Research

Big Science Competition

Science at Year 7 and 8

How many hearts does an octopus have? Why aren’t all plants black? Why don’t alligators ever need dentures? What is the acceleration rate of a jumping flea? How many years ago was the hydrogen in our body created? Why don’t we fall off the Earth?

Year 7

At the start of the year the students are introduced to the need for safe accurate work practices in the science laboratory. Students are encouraged to work scientifically by collecting, manipulating and presenting data in appropriate ways, drawing conclusions and relating them to the aim of the investigation being undertaken.

In Semester 1, the students investigate the biological areas of habitats and interactions in addition to classification. Students also study the chemistry and properties of substances (particularly water) and mixtures. Field work is conducted each year at the Year 7 Camp with a focus on macro invertebrates and data collection.

In Semester 2, the students investigate the physical science areas of forces and simple machines. Students study the six simple machines, how they are adapted and used in everyday life and in the construction of more complex machines. Critical thinking and problem solving is incorporated through a 4 week robotics program where students construct and program simple robots. Students also explore how the relative positions of the Earth, sun and moon affect daily life on Earth.

Year 8

The students are encouraged to work scientifically by selecting and using a range of equipment, collecting data accurately, manipulating and presenting data in appropriate ways, drawing conclusions and relating them to the aim of the investigation being undertaken.

In Semester 1, the key topics of living systems, growth and reproduction are investigated. In Semester 2, the concept of energy underlines the key topics of the use of energy, physical and chemical change; elements, compounds and mixtures; rocks and mining. An investigation into cells at the end of the year leads into Year 9 Biology. Students finish off the year with a study of forensics.
Science at Year 9 and Year 10

**Life Science A**

A detailed study into plant and animal cell structure leads into an understanding of cell signalling and transport of materials across and within cells. The students are introduced to the role of the nervous and endocrine systems in maintaining homeostasis and responding to stimuli. Brain structure and function is explored and incorporates some of the exciting developments of neuroscience. In the study of ecology, structural adaptations to habitat are explored and an introduction to the biochemical processes of photosynthesis and respiration leads to a study of the carbon cycle.

**Physical Science A**

The light and optics unit aims to develop students' understanding of reflection, refraction and lenses, and is focused around the function and structure of the mammalian eye and visual system. Students also explore sources of light, the sun and stars and the wave nature of light across the electromagnetic spectrum. The study of Chemistry at Mansfield Secondary College builds on the students' prior knowledge of the Periodic Table. It aims to strengthen students' understanding of atomic structure and the relationships between element groups. This knowledge is applied, in particular, to an examination of bonding and basic chemical reactions.

**Life Science B**

Biological sciences: Looks at the transmission of heritable characteristics (genes) from one generation to the next. What is DNA and how does it work? The theory of evolution by natural selection explains the diversity of living things and is supported by a range of scientific evidence. A detailed study into the human immune system and lymphatic system is also undertaken. This unit is strongly recommended for students who are interested in completing VCE Biology.

**Physical Science B**

Chemical sciences: The atomic structure and properties of elements are used to organise them in the Period Table; a study of valencies is also included which enables students to write chemical formulae and balance equations. Different types of chemical reactions are used to produce a range of products and can occur at different rates.

Earth and space sciences: The universe contains features including galaxies, stars and solar systems and the Big Bang theory can be used to explain the origin of the universe.

Physical sciences: Energy conservation in a system can be explained by describing energy transfers and transformations. The motion of objects can be described and predicted using the laws of physics. This unit is a requirement for VCE Chemistry and/or Physics.
Applied Science

These units aim to address the question:

“How do we sustain and develop modern society?”

Applied Biology

Using the school’s kitchen garden, students explore plant systems; transport, growth and reproduction and plant hormone responses. Structural adaptations of plants and animals is linked to the planting calendar appropriate for this region. A detailed study into plant and animal cell structure leads into and understanding of cell signalling and transport of materials across and within cells. This unit has a strong practical focus; students will be planting and maintaining the garden each week and conducting scientific investigations either in the laboratory or small plots within the garden. Students have the opportunity to continue on to Applied Chemistry to harvest their produce and study the chemistry around food production. Applied Biology covers similar content and skills as Life Science A, the main differences being Life Science A focusses on humans and Applied Biology completes a lot of the ‘lab’ work outside in the garden and in the hospitality centre.

Applied Chemistry

This unit can be studied on its own or as a continuation of Applied Biology. Using the produce from the kitchen garden, students explore the chemistry of food preserving and processing either in the laboratory or in the school’s kitchen. A detailed study into the chemistry of photosynthesis and cellular respiration includes the structure and function of biomolecules, trace elements and energy production. Carbon and electrochemistry are explored in terms of horticultural applications. The microbiology of the garden is utilised to study composting and fermentation; students make fermented foods such as yoghurt, breads and distilled alcohol. Soap making and skin care and makeup products are made, with an understanding of the chemistry involved, using garden derived materials such as herbs and oils.

Applied Engineering

In this unit the direct application of science, technology and engineering skills and knowledge within a real context is covered. Students work together in workshop investigations that focus on the efficiency of energy storage and usage systems in a domestic context. The engineering and technology component involves creating models and structures such as housing, energy transformers, bridges and transport alternatives using the design process. Students are encouraged to work as a team, model scientific ideas and explore scientific rationale for energy use in the future.

Outcomes

Outcomes for Year 9 and 10 Units include the ability to formulate hypotheses that can be investigated scientifically, to design and carryout experiments and longer investigations and then to draw accurate conclusions based on data collected and analysed. There is
also an emphasis on working collaboratively and being about to communicate scientific ideas through oral presentations, visual presentations and via formal scientific reports.

VCE Science

Our team of senior Science teachers come with extensive experience and proven results. Science continues to provide many opportunities for students post VCE.

Please select the appropriate page below to find unit descriptions for VCE Science.

Biology

Rationale

Biology seeks to understand and explore the nature of life, past and present. Despite the diversity of organisms and their many adaptations for survival in various environments, all life forms share a degree of relatedness and a common origin. The study explores the dynamic relationships between organisms and their interactions with the non-living environment. It also explores the processes of life, from the molecular world of the cell to that of the whole organism, that maintain life and ensure its continuity.

Pathways

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

Unit 1: How do living things stay alive?

Students examine the cell as the structural and functional unit of life, from the single celled to the multicellular organism, and the requirements for sustaining cellular processes in terms of inputs and outputs. They analyse types of adaptations that enhance the organism’s survival in a particular environment and consider the role homeostatic mechanisms play in maintaining the internal environment. Students investigate how a diverse group of organisms form a living interconnected community that is adapted to, and utilises, the abiotic resources of its habitat.

Unit 2: How is continuity of life maintained?

In this unit students focus on cell reproduction and the transmission of biological information from generation to generation. They examine the process of DNA replication and compare cell division in both prokaryotic and eukaryotic organisms. The role of stem
cells in the differentiation, growth, repair and replacement of cells in humans is examined, and their potential use in medical therapies is considered. Students analyse patterns of inheritance, interpret pedigree charts and predict outcomes of genetic crosses. They consider the role of genetic knowledge in decision making about the inheritance of autosomal dominant, autosomal recessive and sex-linked genetic conditions. In this context the uses of genetic screening and its social and ethical issues are examined.

Unit 3 - This course will be replaced in 2017

Signatures of Life

This unit investigates the molecules and biochemical processes that are indicators of life. Students examine the synthesis of biomolecules, the structure of DNA, the function of genes and the role of proteins in cell functioning. How cells communicate with each other at the molecular level in regulating cellular activities; how they recognize ‘self’ and ‘non-self’ in detecting possible agents of attack and how the body protects itself from infection are also investigated.

Unit 4 - This course will be replaced in 2017

Continuity and Change

This unit begins with evidence for evolution of life forms over time. Students explore hypotheses that explain how changes to species have come about. Students investigate the information obtained by studying genomes and the resultant insights into gene expression and regulation.

Entry

There are no prerequisites for entry to Units 1, 2 and 3. However, students who enter the study at Unit 3 may need to do preparatory work based on Unit 1 and Unit 2, as specified by the teacher. Students must undertake Unit 3 prior to undertaking Unit 4. It is strongly recommended that students doing 3/4 Biology also do 3/4 Chemistry.

Assessment

Satisfactory Completion
Demonstrated achievement of the set of outcomes specified for the unit.

Levels of Achievement

Units 1 and 2
Individual schools determine levels of achievement.

Units 3 and 4
School assessed coursework, an end-of-year examination.

Unit 3 school-assessed coursework: 20 per cent
Chemistry

Rationale

VCE Chemistry enables students to examine a range of chemical, biochemical and geophysical phenomena through the exploration of the nature of chemical processes. Students develop a range of inquiry skills involving practical experimentation and research, analytical skills including critical and creative thinking and communication skills.

Pathways

VCE Chemistry provides pathways to a number of careers in chemistry but in addition is applied in many fields including agriculture, bushfire research, dentistry, dietetics, education, engineering, environmental sciences, forestry, horticulture, medicine, metallurgy, meteorology, pharmacy, sports science, toxicology, veterinary science and viticulture.

Unit 1: How can the diversity of materials be explained?

This unit consists of The Periodic Table and Materials and focuses on:

The relationship between the position of elements in the periodic table and their properties, the investigation of the structures and properties of metals and ionic compounds and the calculation of mole quantities. The properties of carbon lattices and molecular substances, the use of systematic naming of organic compounds and the design of polymers for a specific purpose is also explored. Students have the opportunity to investigate a selected research question related to materials.

Unit 2: What makes water such a unique chemical?

This unit consists of the physical and chemical properties of water, the reactions that occur in water and various methods of water analysis and focuses on:

The relationship between the special properties of water and its structure and bonding, the use of analytical techniques to analyse water samples and the practical quantitative investigation of an aspect of water quality.

Unit 3 - This course will be replaced in 2017
**Chemical Pathways**
This unit consists of Chemical analysis and Organic chemical pathways and focuses on:
- The use of a variety of analytical techniques to analyse products in the laboratory
- The investigation of systematic organic chemistry

**Unit 4 -** This course will be replaced in 2017

**Chemistry at Work**
This unit consists of Industrial chemistry and supplying and using energy and focuses on:
- The factors that affect the rate and extent of a chemical reaction
- The use of different energy resources

Design and performance of experiments is important in the course.

**Entry**
There are no prerequisites for entry to Units 1, 2 and 3. Students who enter the study at Unit 2 or 3 may need to undertake preparatory work. Students must undertake Unit 3 prior to undertaking Unit 4 and in view of the sequenced nature of the study it is advisable that students undertake Units 1 to 4.

**Assessment**

**Satisfactory Completion**
Demonstrated achievement of the set of outcomes specified for the unit.

**Levels of Achievement**

**Units 1 and 2**
Individual schools determine levels of achievement.

**Units 3 and 4**
School assessed coursework, an end-of-year examination.

Unit 3 school-assessed coursework: 20 per cent
Unit 4 school-assessed coursework: 20 per cent
Unit 3 and 4 examination: 60 per cent
Physics

Rationale

Physics is a natural science based on observations, experiments, measurements and mathematical analysis with the purpose of finding quantitative explanations for phenomena occurring from the subatomic scale through to the planets and galaxies in the Universe. Physics seeks to understand and explain the physical world. It examines models and ideas used to make sense of the world and which are sometimes challenged as new knowledge develops. By looking at the way matter and energy interact through observations, measurements and experiments, physicists gain a better understanding of the underlying laws of nature. The study explores atomic physics, electricity, fields, mechanics (motion) thermodynamics, quantum physics and waves. Students also have options for study related to astrophysics, bioelectricity, biomechanics, electronics, flight, medical physics, nuclear energy, nuclear physics, optics, sound and sports science.

Pathways

VCE Physics provides for continuing study pathways within the discipline and leads to a range of careers. Physicists may undertake research and development in specialist areas including acoustics, astrophysics and cosmology, atmospheric physics, computational physics, education, energy research, engineering, instrumentation, lasers and photonics, medical physics, nuclear science, optics, pyrotechnics and radiography. Physicists also work in cross-disciplinary areas such as bushfire research, climate science, forensic science, geology, materials science, neuroscience and sports science.

Unit 1: What ideas explain the physical world?

Students use thermodynamic principles to explain phenomena related to changes in thermal energy. They apply thermal laws when investigating energy transfers within and between systems, and assess the impact of human use of energy on the environment. Students examine the motion of electrons and explain how it can be manipulated and utilised. They explore current scientifically accepted theories that explain how matter and energy have changed since the origins of the Universe.

Unit 2: What do experiments reveal about the physical world?

In the core component of this unit students investigate the ways in which forces are involved both in moving objects and in keeping objects stationary. Students will then choose one of twelve options related to astrobiology, astrophysics, bioelectricity, biomechanics, electronics, flight, medical physics, nuclear energy, nuclear physics, optics, sound and sports science.
Unit 3 - This course will be replaced in 2017

Motion in one and two dimensions and Electronics and photonics

This unit focuses on the ideas that underpin much of the technology found in areas such as communications, engineering, commerce and industry. Motion in one and two dimensions is introduced and applied to moving objects on Earth and in space. Circuit models are applied to further aspects of electricity and electronics, and the operation and use of photonic devices are introduced.

Unit 4 - This course will be replaced in 2017

Electric power and Interactions of light and matter

This unit focuses on the development and limitations of models in explaining physical phenomena. A field model of electromagnetism is applied to the generation of electricity, and the development of models that explain the complex interactions of light and matter are considered.

Assessment

Satisfactory Completion
Demonstrated achievement of the set of outcomes specified for the unit.

Levels of Achievement

Units 1 and 2
Individual schools determine levels of achievement.

Units 3 and 4
School assessed coursework, an end-of-year examination.

Unit 3 school-assessed coursework: 20 per cent
Unit 4 school-assessed coursework: 20 per cent
Unit 3 and 4 examination: 60 per cent

Psychology

Rationale

VCE Psychology explores the connection between the brain and behaviour by focusing on the interplay between genetics and environment, individual differences and group dynamics, sensory perception and awareness, memory and learning, and mental health. Students examine classical and contemporary research and the use of imaging
technologies, models and theories to understand how knowledge in psychology has evolved and continues to evolve in response to new evidence and discoveries.

Pathways

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

Unit 1: How are behaviour and mental processes shaped?

Human development involves changes in thoughts, feelings and behaviours. In this unit students investigate the structure and functioning of the human brain and the role it plays in the overall functioning of the human nervous system. Students explore brain plasticity and the influence that brain damage may have on a person’s psychological functioning. They consider the complex nature of psychological development, including situations where psychological development may not occur as expected.

Unit 2: How do external factors influence behaviour and mental processes?

A person’s thoughts, feelings and behaviours are influenced by a variety of biological, psychological and social factors. In this unit students investigate how perception of stimuli enables a person to interact with the world around them and how their perception of stimuli can be distorted. They evaluate the role social cognition plays in a person’s attitudes, perception of themselves and relationships with others. An extended student practical investigation related to internal and external influences on behaviour is undertaken in this unit.

Unit 3 – This course will be replaced in 2017

The Conscious Self

This unit examines the basis of consciousness, behavior and memory. Brain imaging technologies are explored and students study the structure and functioning of the human brain and nervous system. Students investigate the retention of experiences and learning and the factors that affect retention and recall of information. Techniques for improving and manipulating memory are outlined.
Unit 4 - This course will be replaced in 2017

Brain, Behaviour and Experience

This unit focuses on the interrelationship between learning, the brain and its response to experiences. Students investigate learning as a mental process, exploring different types of learning. Mental health and mental illness are investigated and students learn to distinguish between normal or universal experiences and chronic conditions such as schizophrenia.

Entry

There are no prerequisites for entry in Units 1, 2 & 3. Students must undertake Unit 3 prior to undertaking Unit 4. However, students who enter the study at unit 3 may need to undertake preparatory work.

Assessment

Satisfactory Completion
Demonstrated achievement of the set of outcomes specified for the unit.

Levels of Achievement

Units 1 and 2
Individual schools determine levels of achievement.

Units 3 and 4
School assessed coursework, an end-of-year examination.

Unit 3 school-assessed coursework: 20 per cent
Unit 4 school-assessed coursework: 20 per cent
Unit 3 and 4 examination: 60 per cent
Textiles

**Transition: Clothing Production**
Students investigate clothing styles and properties of various fabrics and fibres suitable for their lifestyle through research assignments. Students develop sewing skills and designs, self-evaluate and plan the management of resources before the construction of garments/products.
Assessment: Completion of workbook requirements, research assignments and constructed garments/products.
Other: Patterns, fabrics and notions for projects will involve additional costs or to be supplied by the student.

**Advanced: FASHION DESIGN**
Students compile a design folio of garments containing: a design brief, production drawings, design research and alterations. Students investigate fashion trends and develop their ideas for garment production. Design of clothing items involves production drawings, fashion folio work, basic exercises in pattern drafting and construction of garments. Students investigate a clothing issue in an assignment and evaluate their work projects according to set criteria.
Assessment: Student must have completed the transition unit ‘Clothing Production’ before undertaking this course. Completion of workbook requirements, research assignments and garment productions from their own designs and drafts.
Other: Patterns, fabrics and notions for projects will involve additional costs or to be supplied by the student.