



Area of Study

**Design & Technologies**

2019 Handbook

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## Why study Design & Technology?

Design and Technology is intervention by design. It uses intellectual and practical resources and activities to create outcomes which expand human possibilities by addressing needs and the key pillars of sustainability. With its focus on design thinking, Design and Technology supports students to be innovative, reflective and critical in creating design solutions, while taking account of their impact on cultural, ethical, environmental and economic conditions.

Design and Technologies aims to develop knowledge, understanding and skills to ensure that students:

- Become critical users of technologies, and designers and producers of designed solutions
- Can investigate, generate and critique designed solutions for sustainable future
- Use design and systems thinking to generate innovative and ethical design ideas, and communicate these to a range of audiences
- Create designed solutions suitable for a range of contexts by creatively selecting and safely manipulating a range of materials, systems, components, tools and equipment
- Learn how to transfer the knowledge and skills from design and technologies to new situations
- Understand the roles and responsibilities of people in design and technologies occupations, and how they contribute to society

**Studying Design & Technology develops a range of skills including:**

- Literacy skills
- Numeracy skills
- Problem solving
- Innovation
- Cooperation
- Team work
- Creativity
- Practical skills – use of specific equipment

## Pathway Information: Technology

### Resistant Materials: Timber, Metal, Plastic

Year 10	Year 11	Year 12
Design & Technology Materials A	Product Design And Technology Unit 1	Product Design And Technology Unit 3
Design & Technology Materials B	Product Design And Technology Unit 2	Product Design And Technology Unit 4

### Non-Resistant Materials: Textiles

Year 10	Year 11	Year 12
Design & Technology Revamp, Reuse, Recycle	Product Design And Technology Unit 1	Product Design And Technology Unit 3
Design & Technology Textile Design	Product Design And Technology Unit 2	Product Design And Technology Unit 4

### Food Specialisations

Year 10	Year 11	Year 12
Design & Technology Food For Us (A)	Food Studies Unit 1	Food Studies Unit 3
Design & Technology Food For The Future: The Sustainable Table (B)	Food Studies Unit 2	Food Studies Unit 4

### Systems Engineering

YEAR 10	YEAR 11	YEAR 12
	Systems Engineering Unit 1	Systems Engineering Unit 3
	Systems Engineering Unit 2	Systems Engineering Unit 4

## Year 10 Curriculum

### Resistant Materials

#### Design & Technology - Materials A

**Semester:** Semester 1  
**Teacher:** Mr Szkwarek

**Course Content:**

This is a design problem solving based subject. Students will complete a range of projects that emphasise the “Design Brief” and the “Design Process”. Students will also be introduced to the concepts of brainstorming and lateral thinking. Whilst timber is the main material, students are encouraged to use plastics and metals.

**Assessed Coursework:**

Design folio which includes:

- Design brief
- Research
- Analysis of constraints and considerations
- Sketching & Drawing
- Costing
- Materials lists
- Risk assessment
- Production planning
- Production journal
- Evaluation

Your assessment will include workshop/tool skills and knowledge as well as an end of semester exam.

**Additional Information:**

This subject leads onto VCE Units 1 & 2 Product Design and Technology: Materials, and provides a pathway to a range of related fields such as industrial, product and interior design, engineering, fashion, jewellery, textile and ceramic design, architecture and furniture design. An understanding of design and its application can provide opportunities for students interested in undertaking further study in related fields in many forms of further study or employment.

## Design & Technology - Materials B

Semester: Semester 1  
Teacher: Mr Szkwarek

### Recommended Previous Studies:

Successful completion of Design and Technology A is preferred.

### Course Content:

Design and Technology B builds on the knowledge gained in Design and Technology A but focuses on folio refinement and preparation for VCE Product Design and Technology. There is more emphasis on sustainability in product design and the design elements and principles. Students are introduced to designing for a client to help them understand the importance of communication in the design process.

### Assessed Coursework:

Assessment for this area of study is heavily folio based. You will be assessed on the detail presented in your folio relevant to the course content (see Material A) and the quality of your final product. Your assessment will include workshop/tool skills and knowledge as well as an end of semester exam.

### Additional Information:

This subject could lead onto VCE Units 1 & 2 Design and Technology: Materials, and provide a pathway to a range of related fields such as industrial, product and interior design, engineering, fashion, jewellery, textile and ceramic design, architecture and furniture design. An understanding of design and its application can provide opportunities for students interested in undertaking further study in related fields in many forms of further study or employment.

## Non-Resistant Materials

### Design & Technology – Revamp, Reuse, Recycle

**Semester:** Semester 1  
**Teacher:** Miss Nelson

#### Course Content:

Students will examine the fashion and textiles industry, as well as skills in illustration, digital design, being an ethical consumer, marketing and sustainable garment production. A focus on how the textiles industry reflects the strategies of ethical consumerism and incorporates them into practice is the focus of this subject. Students will explore the physical and chemical characteristics of the textile/garment industry and produce garments which are a reflection of a reduction in our fashion footprint and reflect 'fairwear' ethics. Students will have a better understanding of why consideration of dyeing, laundering and disposal of 'garments' is pivotal to their decision making.

Students will participate in one theoretical and two practical classes per week with some blended classes. This unit of work is based on the Design and Technologies 9 & 10 Victorian Curriculum F – 10 and is designed to lead into Product Design and Technology: Textiles - Units 1 & 2 and Units 3 & 4.

#### Assessed Coursework:

Students will be assessed through the completion of the completion of the following:

- Booklet / Worksheets and Research Tasks
- Topic Tests
- Design brief Assessment Task
- Research Folio
- Practical Process Folio
- Practical Productions
- Examinations

#### Career Opportunities:

Textiles Technology may lead to tertiary studies in women's wear designer, menswear designer, fashion producer, apparel production, merchandising and marketing, quality control, art/creative director, textile designer, print designer, apparel distribution, fashion media, marketing, public relations, fashion journalism and fashion forecaster. Some students may start their own business, while others work in an established company locally or with larger international brands.

## Design & Technology - Textiles Design

Semester: Semester 2  
Teacher: Miss Nelson

### Course Content:

Students will examine the fashion and textiles industry, as well as skills in the elements and principles of design, fashion drawing, fabric manipulation, textile design and wearable art. Students are encouraged to participate in Textiles Technology: Ethical Consumerism (A); however, this is not a prerequisite for this subject. A focus on how the textiles industry works as well as how to design effectively in keeping with the fashion cycle and fashion forecasting is the focus of this subject. Students will explore the natural and man-made elements of design and put elements of this into practice in their practical items. They are encouraged to become industry leaders through a focus on innovation, experimentation, individual expression and the future of fashion. Students will have the opportunity to work on real-world projects with brands such as The Woolmark Company and Whitehouse Institute of Design.

The course is designed to provide students with outlook and ambition that extends beyond their schooling, cultivating a collaborative, enthused and global vision of design.

Students will participate in one theoretical and two practical classes per week with some blended classes. This unit of work is based on the Design and Technologies 9 & 10 Victorian Curriculum F -10 and is designed to lead into Product Design and Technology – Units 1 & 2 and Units 3 & 4.

### Assessed Coursework:

Students will be assessed through the completion of the following:

- Booklet / Worksheets and Research Tasks
- Topic Tests
- Design brief Assessment Task
- Practical Productions
- Examinations

### Career Opportunities:

Textiles Technology may lead to tertiary studies in women's wear designer, menswear designer, fashion producer, apparel production, merchandising and marketing, quality control, art/creative director, textile designer, print designer, apparel distribution, fashion media, marketing, public relations, fashion journalism and fashion forecaster. Some students may start their own business, while others work in an established company locally or with larger international brands.



## Food Specialisations

### Design & Technology – Food for Us (A)

**Semester:** Semester 1  
**Teacher:** Miss Nelson or Mrs McCormack

#### Course Content:

Food for Us provides students with the opportunity to develop their skills and knowledge to become competent in preparing and serving food required for a healthy lifestyle. This will enable them to make healthy food choices and consider the range of influences on these choices. They will develop the capacity to make decisions, solve problems and develop critical and creative responses to practical concerns of food preparation; food health and food safety, nutrition, properties and functions of food, food selection and issues faced by the food industry. They will choose appropriate cookery methods and learn effects of different production and cookery methods on the nutritional value of food.

Through the design and preparation of food specific to modern day contexts, students will apply knowledge of the characteristics and sensory principles of food to preparing a range of dishes which are in keeping with today's dietary climate and reflect social change.

This work will assist students to undertake work in various hospitality enterprises where food is prepared and served, as well as making valued decisions which impact their overall health and wellbeing. This unit of work will assist students in the study of Food Studies for VCE.

Students will complete a design brief assignment, including a production that incorporates authentic ingredients and processes.

#### Assessed Coursework:

Students will be assessed through the completion of the following:

- Booklet / Worksheets and Research Tasks
- Topic Tests
- Design Brief Assessment Task
- Practical Productions
- End of semester Exam

#### Career Opportunities:

Food Technology may lead to tertiary studies in Applied Science, Education, Nutrition, Health, Dietetics, Nursing, Child Care, Food Technology, Consumerism, or Hospitality.

## Design & Technology – Food for the Future (B)

**Semester:** Semester 2  
**Teacher:** Miss Nelson or Mrs McCormack

### Course Content:

Food for the Future provides students with the knowledge and understanding of current and future Food trends and concerns. They will build the skills to access and assess nutritional information that can support the food choices they make, and further reflect the three pillars of sustainability. They will learn how to apply this knowledge including that of alternative foods, ethical aspects, economic and legal factors to make appropriate food selections and correct food preparation methods.

By examining attitudes and behaviours regarding healthy living, students are given opportunities to learn about where their food comes from, how it is produced, and how they can prepare it. They also develop understanding of contemporary technology-related food issues such as convenience foods, highly processed foods, food packaging and food transport.

This subject will enable students to develop the capacity to make decisions, solve problems and develop critical and creative responses to practical concerns of providing foods to individuals and families.

Practical cooking reflects these strategies and incorporates them into daily meals, snack alternatives, and promotes nutritious food choices and healthy methods of cooking. Students will participate in one practical and two theory classes per week with some blended classes.

This subject is based on the applied science of foods and is designed to lead into both Health and Human Development and Food Studies for VCE.

### Assessed Coursework:

Students will be assessed through the completion of the following:

- Booklet / Worksheets and Research Tasks
- Topic Tests
- Design Brief Assessment Task
- Practical Productions
- End of semester Exam

### Career Opportunities:

Food Technology may lead to tertiary studies in Applied Science, Education, Nutrition, Health, Dietetics, Nursing, Child Care, Food Technology, Consumerism, or Hospitality.

## VCE Curriculum

# Resistant Materials

### Product Design & Technology – Materials Unit 1

**Semester:** Semester 1  
**Teacher:** Mr Szkwarek

**Recommended Previous Studies:**

Successful completion of Design & Technology: Materials at Year 10 is recommended.

**Course Content:**

The Product Design and Technology (Wood, Metal, Plastics) study takes students through the Product Design Process. It is a study of sustainable product redevelopment, materials and design, planning and production procedures and collaborative design. Students work on both individual tasks and in Unit 2, collaborative tasks. It is an opportunity to be creative and innovative with a range of materials and learn about design development while developing practical skills and improving organizational and time management skills.

**Assessed Coursework:**

In Unit 1 students focus on the analysis, modification and improvement of a product with consideration of sustainability. It is common for designers in Australia to use products from overseas as inspiration when redeveloping products for the domestic market. Sustainable redevelopment refers to designers and makers ensuring products serve social, economic and environmental needs. Students gain an understanding of the importance of generating economic growth through design and manufacturing in Australia whilst aiming for a positive social and environmental impact.

In Area of Study 1 students consider the sustainability of an existing product and acknowledge the intellectual property (IP) rights of the original designer. Coloured, annotated design options are developed with a focus on relevant design factors. Working drawings and production plans are developed and the risk management process teaches students to safely complete their projects.

**The two compulsory assessment tasks for this unit are:**

- a design folio that contains a design brief, evaluation criteria, research, visualisations and design options, working drawings, scheduled production plan, risk assessment and evaluation report
- product and records of production and modifications

**Additional Information:**

This subject is for students who enjoy designing and creating practical projects. It will suit students who are gathering work for a folio for presentation purposes to enrol in a design course. It will also suit students who intend to pursue a career/trade where materials such as wood, metal, plastic and glass are used.

## Product Design & Technology – Materials Unit 2

Semester: Semester 2  
Teacher: Mr Szkwarek

### Recommended Previous Studies:

Successful completion of Product Design & Technology: Materials Unit 1: Sustainable Product Redevelopment is preferred.

### Course Content:

In Unit 2 students work in teams to design and develop a product in a product range or contribute to the design, planning and production of a group product. They focus on factors including end-user/s' needs and wants; function, purpose and context for product design; aesthetics; materials and sustainability; and the impact of these factors on a design solution. Teamwork encourages communication between students and mirrors professional design practice where designers often work within a multi-disciplinary team to develop solutions to design problems. Students may choose to use Computer Aided Drawing and new technologies such as Computer Numerically Controlled (CNC) milling and laser milling machines to design and make their products. Students investigate historical or contemporary design movements or styles and trends to gain an appreciation of human centred design.

### Assessed Coursework:

In Area of Study 1, students work both individually and as members of a small design team to address a problem, need or opportunity and consider user-centred design factors. They design a product within a range, based on a theme, or a component of a group product. They research and refer to a chosen design style or movement. In Area of Study 2 the finished product is evaluated.

### The two compulsory assessment tasks for this unit are:

- a design folio that contains a design brief, evaluation criteria, research, visualisations and design options, working drawings, scheduled production plan, and evaluation report
- product and records of production and modifications

### Additional Information:

This subject is for students who enjoy creating and making finished products. It will suit students who are gathering work for a folio for presentation purposes to enrol in an art or design course. It will also suit students who intend to pursue a career / trade involving design and creativity that will further their studies in the building, drafting, industrial design, craft and education or forestry fields. No prior experience is required, but some skills in wood or metal work would be beneficial.

## Product Design & Technology – Materials Units 3 & 4

**Semester:** Semester 1 & 2

**Teacher:** Mr Szkwarek

### **Recommended Previous Studies:**

Students should aim to successfully complete VCE Product Design & Technology Units 1 & 2.

### **Course Content:**

The Unit 3 students design and make a product that meets the needs and expectations of a client and/or end user. Students gain an understanding of how the design process is influenced by a range of factors. A Design Folio will be developed in Term 1 and must be completed towards the end of Term 2. Students examine how a range of factors, including new and emerging technologies such as 3D printing, and how CNC Machining, international and Australian standards influence the design and development of products within industrial manufacturing settings. They consider issues associated with obsolescence and gain knowledge of sustainability models used in industry. In the role of designer, students judge the suitability and viability of design ideas referring to the design brief and evaluation criteria in collaboration with a client and/or an end user. As with all folio based subjects, development work must be completed during study time and for homework. There are set tasks that need to be completed for home study as well as pre-reading of the text book in readiness for theory classes. Basic project management skills are developed during Unit 3.

The Design Folio created during Unit 3 is the student's greatest asset in Unit 4. This is the build phase. During this Unit the student uses materials, tools, and a range of equipment to make a product. Once the product is completed, students evaluate the effectiveness and efficiency of techniques they use and the quality of their product with reference to evaluation criteria and client and/or end-user feedback.

### **Assessed Coursework:**

Assessment for this Unit involves school assessed coursework (3 SAC tasks) the SAT (Folio and Product) and the VCE exam.

## Non-Resistant Materials

### Product Design & Technology – Textiles Unit 1

Semester: Semester 1  
Teacher: Miss Nelson

#### **Recommended Previous Studies:**

Successful completion of Design & Technology: (Textiles) (A) or (B) at Year 10 is recommended.

#### **Course Content:**

The Product Design and Technology (Textiles) study takes students through the Product Design Process. It is a study of sustainable product redevelopment, materials and design, planning and production procedures and collaborative design. Students work on both individual tasks and in Unit 2, collaborative tasks. It is an opportunity to be creative and innovative with textiles and design development while developing practical skills and improving organizational and time management skills.

#### **Assessed Coursework:**

In Unit 1 students focus on the analysis, modification and improvement of a product design with consideration of sustainability. It is common for designers in Australia to use products from overseas as inspiration when redeveloping products for the domestic market. Sustainable redevelopment refers to designers and makers ensuring products serve social, economic and environmental needs. Generating economic growth for design and manufacturing in Australia with the redevelopment of existing products so they have a positive social and minimal environmental impact.

In Area of Study 1 students consider the sustainability of an existing product and acknowledge the intellectual property (IP) rights of the original designer. Working drawings (also known as flats, trade sketches, assembly or technical drawings) are used to present the preferred design option.

#### **The two compulsory assessment tasks for this unit are:**

- a design folio that contains a design brief, evaluation criteria, research, visualisations and design options, working drawings, scheduled production plan, and evaluation report
- product and records of production and modifications

#### **Additional Information:**

This subject is for students who enjoy designing and creating finished textile products. It will suit students who are gathering work for a folio for presentation purposes to enrol in an art or design course. It will also suit students who intend to pursue a career/trade involving fashion design and creativity. No prior experience is required, but some skills in textiles would be beneficial.

## Product Design & Technology – Textiles Unit 2

**Semester:** Semester 2  
**Teacher:** Miss Nelson

### **Recommended Previous Studies:**

Successful completion of Product Design & Technology: (Textiles) Unit 1: Sustainable Product Redevelopment is preferred.

### **Course Content:**

In Unit 2 students work in teams to design and develop a textile item in a product range or contribute to the design, planning and production of a group textile product. They focus on factors including end-user/s' needs and wants; function, purpose and context for product design; aesthetics; materials and sustainability; and the impact of these factors on a design solution. Teamwork encourages communication between students and mirrors professional design practice where designers often work within a multi-disciplinary team to develop solutions to design problems. Students also use digital technologies to facilitate teams to work collaboratively online using a range of Web 2.0 tools. In this unit students gain inspiration from an historical or a contemporary design movement or style and its defining factors such as ideological or technological change, philosophy or aesthetics.

### **Assessed Coursework:**

In Area of Study 1, students work both individually and as members of a small design team to address a problem, need or opportunity and consider user-centred design factors. They design a product within a range, based on a theme, or a component of a group product. They research and refer to a chosen design style or movement. In Area of Study 2 the finished product is evaluated.

### **The two compulsory assessment tasks for this unit are:**

- a design folio that contains a design brief, evaluation criteria, research, visualisations and design options, working drawings, scheduled production plan, and evaluation report
- product and records of production and modifications

### **Additional Information:**

This subject is for students who enjoy designing and creating finished textile products. It will suit students who are gathering work for a folio for presentation purposes to enrol in an art or design course. It will also suit students who intend to pursue a career/trade involving fashion design and creativity. No prior experience is required, but some skills in textiles would be beneficial.

## Product Design & Technology – Textiles Units 3 & 4

**Semester:** Semesters 1 & 2

**Teacher:** Miss Nelson

### Recommended Previous Studies:

Students should aim to successfully complete VCE Product Design & Technology: Textiles - Units 1 & 2.

Unit 3: Applying the product design process

Unit 4: Product development and evaluation

### Course Content:

The Unit 3 students design and make a product that meets the needs and expectations of a client and/or end user. Students gain an understanding of how the design process is influenced by a range of factors. A Design Folio will be developed in Term 1 and must be completed towards the end of Term 2. Students examine how a range of factors, including new and emerging technologies such as 3D printing, and how CNC Machining, international and Australian standards influence the design and development of products within industrial manufacturing settings. They consider issues associated with obsolescence and gain knowledge of sustainability models used in industry. In the role of designer, students judge the suitability and viability of design ideas referring to the design brief and evaluation criteria in collaboration with a client and/or an end user. As with all folio based subjects, development work must be completed during study time and for homework. There are set tasks that need to be completed for home study as well as pre-reading of the text book in readiness for theory classes. Basic project management skills are developed during Unit 3.

The Design Folio created during Unit 3 is the student's greatest asset in Unit 4. This is the build phase. During this Unit the student uses materials, tools, and a range of equipment to make a product. Once the product is completed, students evaluate the effectiveness and efficiency of techniques they use and the quality of their product with reference to evaluation criteria and client and/or end-user feedback.

### Assessed Coursework:

Assessment for this Unit involves school assessed coursework (3 SAC tasks) the SAT (Folio and Product) and the VCE exam.



## Food Specialisations

### Food Studies Unit 1

**Semester:** Semester 1  
**Teacher:** Mrs McCormack

#### Recommended Previous Studies:

There are no prerequisite subjects, however students will benefit from having completed Food specialisations, Food for Us or Food for the Future, in Year 10.

#### Course Content:

This unit focuses on food from historical and cultural perspectives. Students investigate the origins and roles of food through time and across the world. Students explore how humanity has historically sourced its food, examining the general progression from hunter-gatherer to rural-based agriculture, to today's urban living and global trade in food. Students consider the origins and significance of food through inquiry into particular food-producing regions of the world. Students will also focus on Australia. They look at Australian indigenous food prior to European settlement and how food patterns have changed since, particularly through the influence of food production, processing and manufacturing industries and immigration. Students investigate cuisines that are part of Australia's culinary identity today and reflect on the concept of an Australian cuisine. They consider the influence of technology and globalisation on food patterns. Throughout this unit students complete topical and contemporary practical tasks to enhance, demonstrate and share their learning with others.

#### Assessed Coursework:

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

- 2 Major Assessment Tasks
- Practical Productions and Evaluations

## Food Studies Unit 2

Semester: Semester 2  
Teacher: Mrs McCormack

### Recommended Previous Studies:

There are no prerequisite subjects, however students will benefit from having completed Food Specialisations: Food for Us or Food for the Future, in Year 10.

### Course Content:

In this unit students investigate food systems in contemporary Australia. Students focus on commercial food production industries, and look at food production in small-scale domestic settings, as both a comparison and complement to commercial production. Students gain insight into the significance of food industries to the Australian economy and investigate the capacity of industry to provide safe, high-quality food that meets the needs of consumers. Students use practical skills and knowledge to produce foods and consider a range of evaluation measures to compare their foods to commercial products. They consider the effective provision and preparation of food in the home, and analyse the benefits and challenges of developing and using practical food skills in daily life. In demonstrating their practical skills, students design new food products and adapt recipes to suit particular needs and circumstances. They consider the possible extension of their role as small-scale food producers by exploring potential entrepreneurial opportunities.

### Assessed Coursework:

In this Unit, student progress will be monitored and assessed through the use of;

- Major Design and Development Tasks
- Practical Productions and Evaluations

### Career Opportunities:

Food Technology may lead to tertiary studies in Applied Science, Education, Nutrition, Health, Dietetics, Nursing, Child Care, Food Technology, Consumerism, or Hospitality.

## Food Studies Units 3 & 4

**Semester:** Semesters 1 & 2

**Teacher:** Mrs McCormack

### Recommended Previous Studies:

There are no prerequisite subjects, though students will benefit from having studied Let's Do Food or Creative Catering in Year 10 or Units 1 & 2 Food Studies.

### Course Content:

Unit 3: This Unit investigates the many roles and everyday influences of food including influences on food choice: how communities, families and individuals change their eating patterns over time and how our food values and behaviours develop within social environments

Students will:

- explore the science of food: our physical need for it and how it nourishes and sometimes harms our bodies.
- investigate the physiology of eating and appreciating food, and the microbiology of digestion.
- investigate the functional properties of food and the changes that occur during food preparation and cooking.
- analyse the scientific rationale behind the Australian Dietary Guidelines and the Australian Guide to Healthy Eating
- develop their understanding of diverse nutrient requirements.
- inquire into the role of food in shaping and expressing identity and connectedness and the ways in which food information can be filtered and manipulated.
- investigate behavioural principles that assist in the establishment of lifelong, healthy dietary patterns.

The practical component of this unit enables students to understand food science terminology and to apply specific techniques to the production of everyday food that facilitates the establishment of nutritious and sustainable meal patterns.

Unit 4: In this Unit students examine debates about global and Australian food systems. Students will focus on issues about the environment, ecology, ethics, farming practices, the development and application of technologies, and the challenges of food security, food safety, food wastage, and the use and management of water and land. Students research a selected topic, seeking clarity on current situations and points of view, considering solutions and analysing work undertaken to solve problems and support sustainable futures.

Students will also focus on individual responses to food information and misinformation and the development of food knowledge, skills and habits to empower consumers to make discerning food choices. Students consider how to assess information and draw evidence-based conclusions. They apply this methodology to navigate contemporary food fads, trends and diets. They practise and improve their food selection skills by interpreting food labels and analysing the marketing terms used on food packaging reflecting the Australian Dietary Guidelines and the Australian Guide to Healthy The practical component of this unit provides students with opportunities to apply their responses to environmental and ethical food issues, and to extend their food production repertoire.

### Assessed Coursework:

- Unit 3 School-assessed Coursework: 30 %
- Unit 4 School-assessed Coursework: 30 %
- End-of-year examination: 40 %.

**Additional Information:**

This study may provide a foundation for pathways to food science and technology, consumer science, home economics, child care and education, community services and aged care, the hospitality and food manufacturing industries, and nutrition and health studies.

# Systems Engineering

## Systems Engineering Unit 1

**Semester:** Semester 1

**Teacher:** Mr Caffrey

### Recommended Previous Studies:

At standard or better Year 9 Maths, with an Introduction to Physics or Introduction to Maths Methods at Year 10 level or preferably both will be very beneficial.

### Course Content:

This unit focuses on the principles that influence the design and operation of simple and complex mechanical devices. Students will gain a theoretical understanding of how mechanical systems work and then apply this knowledge through a folio based production of a working model. Basic mathematical calculations associated with simple mechanical principles such as gear ratio, velocity ratio, mechanical advantage and movement such as speed, acceleration and forces are covered in a consideration of systems in society. Simulation and CAD software aids students understanding.

### Assessed Coursework:

The assessment consists of a series of short tests, orthogonal drawing task, design work, research assignment and the submission of a design folio.

### Career Pathways:

Students undertake this subject if they are interested in careers that are technology based, such as the various branches of engineering – civil, electrical, electronic, and mechanical and so forth. Students contemplating apprenticeships, especially in the areas of electro-technology, electricians, diesel fitting, auto-mechanics and instrument fitting would also find this subject a useful introduction to these fields.

### Additional Information:

This is a VCE subject and while there is a significant amount of hands-on work in the course, there is also theory work which some students could find challenging, especially if they have a deficiency in the mathematical area.

## Systems Engineering Unit 2

**Semester:** Semester 2

**Teacher:** Mr Caffrey

**Recommended Previous Studies:**

At standard or better Year 9 Maths, with an Introduction to Physics or Introduction to Maths Methods at Year 10 level or preferably both will be very beneficial.

**Course Content:**

This unit focuses on understanding the fundamental principles of electrical and electronic circuits. Students apply their knowledge by producing basic operational systems, such as simple micro-processor units, printed circuit boards and programmable controlled devices. The systems should employ a level of integration between mechanical and electronic components. Basic electronic theory as related to components such as resistors, capacitors, transistors and diodes in series and parallel circuits is covered.

**Assessed Coursework:**

The assessment consists of a series of short tests, design work, research assignment and the submission of several tasks in a design folio.

## Systems Engineering Units 3 & 4

Semester: Semesters 1 & 2

Teacher: Mr Caffrey

### Recommended Previous Studies:

Completion of Systems Engineering Units 1 and/or 2 is highly recommended.

### Course Content:

In these Units students focus on how mechanical and electro-tech systems are combined to form a controlled integrated technological system. A major focus of the year is the design and construction of a controlled integrated system, which could be anything from a hover-craft to a wind turbine or radio controlled car or boat. This design and construction task is based on a folio assessment and simulates real world engineering processes, with use of computer aided design and simulation programs. Students also investigate sources and types of energy that enable engineered technological systems to function and basic theory of how mechanical and electrical/electronic systems are integrated in practice.

### Assessed Coursework:

The assessment consists of short tests consisting of calculations based on engineering principles, two SAC tasks, which involve research into Renewable Energy Technologies and New and Emerging Technologies, as well as the design and construction of a working model in a folio format. The design task extends over the first three terms.

### Career Pathways:

Students undertake this subject if they are interested in careers that are technology based, such as the various branches of engineering – civil, electrical, electronic, and mechanical and so forth.

Students contemplating apprenticeships, especially in the areas of electro-technology, electricians, diesel fitting, auto-mechanics and instrument fitting would also find this subject a useful introduction to these fields.