

B O A R D O F S T U D I E S
NEW SOUTH WALES

Technology Life Skills

Stage 6

Syllabus

Agriculture Life Skills
Design and Technology Life Skills
Food Technology Life Skills
Industrial Technology Life Skills
Information Processes and Technology Life Skills
Textiles and Design Life Skills
Technology Life Skills

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1 The Higher School Certificate Program of Study

The purpose of the Higher School Certificate program of study is to:

- provide a curriculum structure which encourages students to complete secondary education
- foster the intellectual, social and moral development of students, in particular developing their:
 - knowledge, skills, understanding and attitudes in the fields of study they choose
 - capacity to manage their own learning
 - desire to continue learning in formal or informal settings after school
 - capacity to work together with others
 - respect for the cultural diversity of Australian society
- provide a flexible structure within which students can prepare for:
 - further education and training
 - employment
 - full and active participation as citizens
- provide formal assessment and certification of students' achievements
- provide a context within which schools also have the opportunity to foster students' physical and spiritual development.

2 Rationale for Life Skills Courses in the Stage 6 Curriculum

The Government's White Paper for the Higher School Certificate, *Securing Their Future*, included a commitment to extend the curriculum and reporting arrangements that were established for the School Certificate to HSC students with special education needs. This was in recognition of the principle that the post-compulsory years of schooling should cater for all students who choose to participate.

Stage 6 Life Skills courses were developed for the small percentage of students with special education needs for whom the regular outcomes and content of Board Developed and/or Board Endorsed courses are not appropriate. Each course stresses the application of knowledge and understanding, skills, values and attitudes to a range of environments that will be accessed by students.

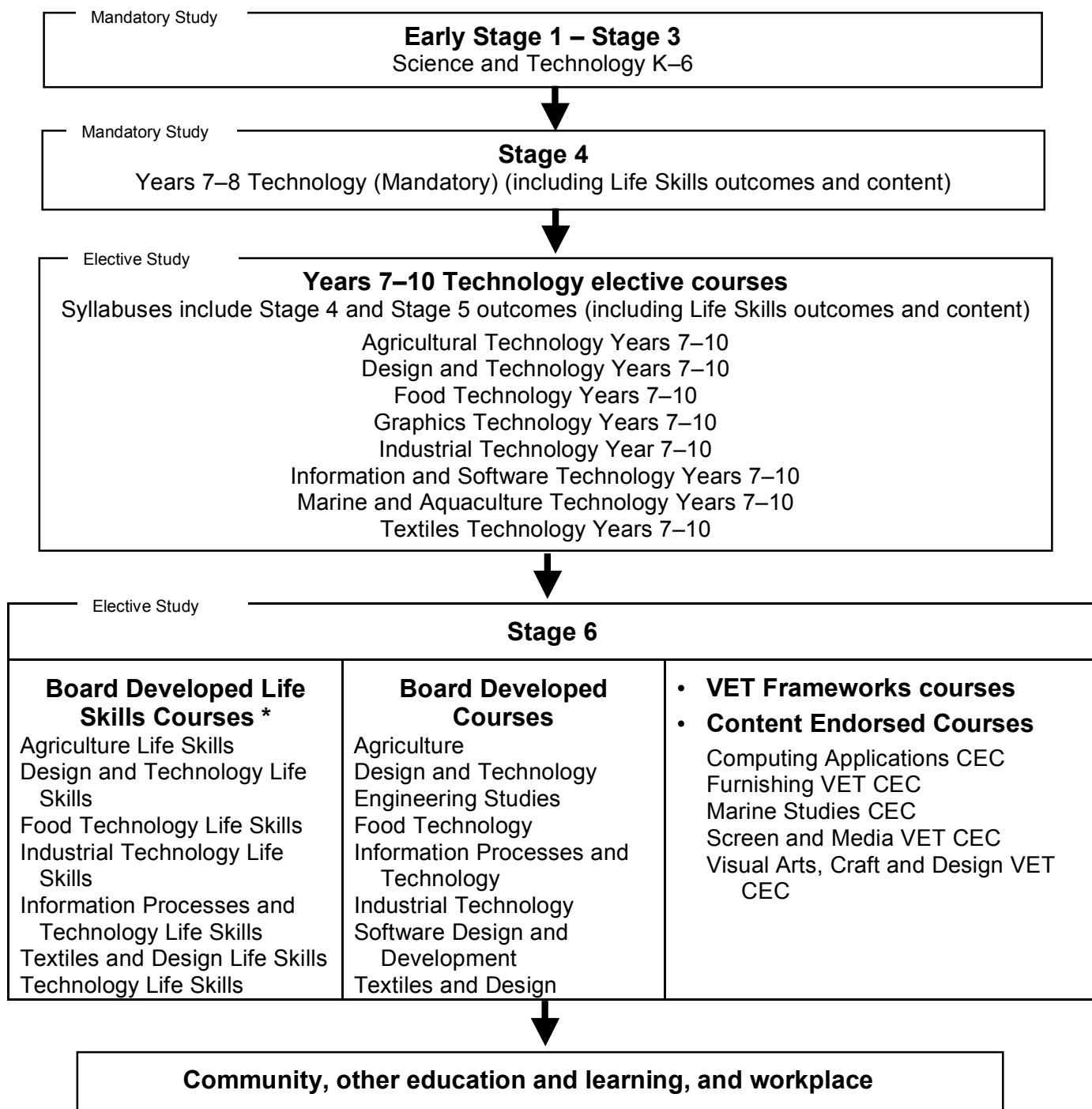
The Board has developed eight Stage 6 Life Skills syllabuses. The Stage 6 Life Skills courses included in each syllabus have Board Developed status and comprise a 2-unit Preliminary course and a 2-unit HSC course.

The Stage 6 Life Skills syllabuses are as follows:

- English Life Skills
- Citizenship and Society Life Skills
- Creative Arts Life Skills
- Mathematics Life Skills
- Personal Development, Health and Physical Education Life Skills
- Science Life Skills
- Technology Life Skills
- Work and the Community Life Skills.

The *Stage 6 Technology Life Skills Syllabus* (2010) replaces the *Stage 6 Technological and Applied Studies Life Skills Syllabus* (1999, amended 2007) and provides students undertaking Life Skills courses with additional curriculum options in the Technology Learning Area. The syllabus contains seven Stage 6 Life Skills courses – a specific course in each of *Agriculture*, *Food Technology*, *Design and Technology*, *Industrial Technology*, *Information Processes and Technology*, *Textiles and Design*, and the option to develop a course that draws on a range of outcomes and content across the technologies (*Technology Life Skills*).

3 Continuum of Learning for Stage 6 Technology Life Skills Students



*** Note**

- *Agriculture Life Skills, Design and Technology Life Skills, Food Technology Life Skills, Industrial Technology Life Skills, Information Processes and Technology Life Skills and Textiles and Design Life Skills* each involve the study of outcomes and content drawn from a single (corresponding) module.
- *Technology Life Skills* involves the study of outcomes and content drawn from any of the modules across the technologies.

4 Technology Life Skills in Stage 6

The *Stage 6 Technology Life Skills Syllabus* includes the following Board Developed Courses:

- Agriculture Life Skills
- Design and Technology Life Skills
- Food Technology Life Skills
- Industrial Technology Life Skills
- Information Processes and Technology Life Skills
- Textiles and Design Life Skills
- Technology Life Skills.

The *Agriculture Life Skills*, *Food Technology Life Skills*, *Design and Technology Life Skills*, *Industrial Technology Life Skills*, *Information Processes and Technology Life Skills*, *Textiles and Design Life Skills* courses **each** provide students with the opportunity for a more in-depth study within a particular technology, drawn from a single corresponding module.

The *Technology Life Skills* course provides students with the opportunity to study outcomes and content drawn from any of the modules across the technologies. If a student undertakes the *Technology Life Skills* course and other course(s) from the syllabus, the *Technology Life Skills* course must not duplicate any of the outcomes and content being undertaken in the other course(s) being studied.

Each of the courses comprises a 2 unit Preliminary course and a 2 unit HSC course.

As with the study of all Board Developed courses, exclusions apply to the study of Life Skills courses such that students may not study more than one 240-hour course in the same subject. For example a student cannot include both Stage 6 Food Technology Life Skills and Stage 6 Food Technology in the pattern of study for the award of the Higher School Certificate.

5 Stage 6 Life Skills Courses: Guidelines for Schools

HSC rules and requirements

As detailed in the Board of Studies *Assessment Certification and Examination (ACE) Manual*, the eligibility requirements for the Higher School Certificate are the same for all candidates. Students must:

- have gained the School Certificate or other qualification that the Board of Studies considers satisfactory
- have attended a government school, an accredited non-government school, a school outside NSW recognised by the Board or a college of TAFE
- have satisfactorily completed courses that comprise the pattern of study for the Higher School Certificate and
- have undertaken and made a serious attempt at the required forms of assessment for each course.

Patterns of study

To qualify for the Higher School Certificate, all students, including those studying Stage 6 Life Skills courses, must complete a Preliminary pattern of study comprising at least 12 units and an HSC pattern of study comprising at least 10 units. Both patterns must include:

- at least six units from Board Developed Courses
- at least two units of a Board Developed Course in English
- at least three courses of two units value or greater (either Board Developed or Board Endorsed Courses) and
- at least four subjects *.

To satisfy pattern of study requirements for the Higher School Certificate a student may count a maximum of six units from courses in Science in each study pattern.

Students with special education needs can meet the requirements of the HSC using Board Developed courses (including Life Skills courses and Industry Curriculum Framework courses/options) or a combination of Board Developed courses and Board Endorsed courses (including Content Endorsed courses).

This flexibility allows schools to develop a pattern of study that challenges each student according to his or her needs and that facilitates a successful transition from school to adult life.

Stage 6 Life Skills courses have no HSC examinations and results cannot be used in the calculation of a student's Australian Tertiary Admission Rank (ATAR).

* Note: Each course derived from the *Stage 6 Technology Life Skills Syllabus* is considered to be a separate subject for the purpose of the patterns of study.

Eligibility to enrol in Stage 6 Life Skills courses

Most students with special education needs will undertake regular course outcomes in Board Developed and/or Board Endorsed courses to meet the requirements of the Higher School Certificate. For a small percentage of students, in particular those with an intellectual disability, it may be determined that the regular Board Developed or Board Endorsed courses are not appropriate. For these students, it may be appropriate to develop a pattern of study that includes one or more Stage 6 Life Skills courses.

The decision to access one or more Stage 6 Life Skills courses is made collaboratively with the student, parents/carers and other significant individuals in the student's life (eg teachers, learning support personnel and community service providers).

In general, students enrolling in Stage 6 Life Skills courses will have completed at least four courses based on Life Skills outcomes and content in Stage 5.

In special circumstances, a student who has not undertaken at least four courses based on Life Skills outcomes and content in Stage 5 may wish to enrol in Life Skills courses for Stage 6. These special circumstances might include situations where:

- a student has attempted regular courses for the School Certificate but has experienced significant difficulty
- a student transfers from interstate or overseas
- a student has a deteriorating condition.

In these and similar circumstances, schools should only enrol students in Stage 6 Life Skills courses as a result of careful planning. The planning should establish why options other than Stage 6 Life Skills courses, such as accumulation or special provisions for the HSC examinations, are not appropriate.

The collaborative curriculum planning process

When entering students for Stage 6 Life Skills courses, the principal is certifying that the student is eligible and that the decision is the result of a collaborative curriculum planning process.

Collaborative curriculum planning is the process by which a team of people meet to discuss and make decisions about curriculum options that will lead to the award of the Higher School Certificate, and the adjustments that will enable a student with special education needs to access the curriculum and associated learning experiences.

When making decisions about curriculum options it is important to consider:

- the student's interests, strengths, goals and learning needs
- the support and/or adjustments that may be necessary for the student to access course work and demonstrate achievement of outcomes
- the transition needs of the student from school to adult life
- how the student's overall study pattern will meet the requirements for the award of the Higher School Certificate.

Principals are responsible for the manner in which this collaborative planning process is managed in schools. Consultation with the respective support personnel in schools is important when making decisions about the most appropriate curriculum options and adjustments for students with special education needs.

Schools do not need to send planning documentation to the Board of Studies.

School planning for the implementation of Stage 6 Life Skills courses

When it has been decided that a student should undertake one or more Stage 6 Life Skills courses, school planning to support the student in the learning process should:

- involve appropriate personnel in the design and implementation of the student's overall study pattern for the Higher School Certificate
- select the Life Skills outcomes and content appropriate to the student's needs that will form the basis of the student's study in the Stage 6 Life Skills course(s)
- identify the most appropriate contexts for the student to demonstrate achievement of outcomes, eg school, community or workplace
- estimate the time needed for addressing outcomes and content
- identify the resources required to assist the school in meeting the needs of the student
- plan teaching strategies that are appropriate to the age and abilities of the student
- identify adjustments that may be required to enable the student to access the Life Skills outcomes and content and demonstrate achievement of outcomes
- identify strategies for monitoring the student's progress
- include ongoing collaborative planning to assist the student's successful transition through school to adult life.

Schools may develop integrated programs that address outcomes from selected Stage 6 Life Skills courses to meet the needs of individual students. Schools will assess the student's achievement of Life Skills outcomes from these courses for recording on the HSC Profile of Student of Achievement.

Satisfactory completion of Stage 6 Life Skills courses

A student will be considered to have completed a Stage 6 Life Skills course satisfactorily if, in the principal's view, the student has:

- followed the course developed or endorsed by the Board
- applied themselves with diligence and sustained effort to the set tasks and experiences provided in the course by the school
- achieved some or all of the course outcomes.

A Stage 6 Life Skills course comprises 240 hours indicative time – Preliminary course (120 hours) and HSC course (120 hours). Indicative time is the time expected for a typical student to achieve the objectives and outcomes of the course.

6 Aim

The aim of the *Stage 6 Technology Life Skills Syllabus* is to provide opportunities for students to engage with a range of technologies and acquire knowledge, understanding and skills which are transferable and facilitate lifelong learning.

Students will experience success in a diverse range of practical and creative activities using a variety of resources, materials, tools and techniques to solve problems and meet identified needs.

The syllabus modules provide students with opportunities to use a range of technologies in the context of a design process. These technologies may be used for researching, designing, manipulating and producing products, systems and environments.

7 Objectives

In studying one or more courses from the *Stage 6 Technology Life Skills Syllabus*, students will develop knowledge, understanding, skills, values and attitudes that reflect their priorities, needs and interests in the context of a design process. The objectives for each course will vary according to the selected outcomes and content. Teachers have the flexibility to determine the focus of a course of study and the depth to which outcomes and content are studied, based on the priorities, needs and interests of students.

Module 1: Agriculture

Students will:

- 1 develop knowledge and understanding of a design process
- 2 develop knowledge and skills in a range of technologies for a variety of purposes in an agricultural enterprise
- 3 develop knowledge and understanding of the production process used in agricultural enterprises
- 4 apply knowledge, understanding and skills in the production, management and marketing of agricultural products
- 5 develop an appreciation of past and current issues impacting on Australian agricultural enterprises

Module 2: Design and Technology

Students will:

- 1 develop knowledge and understanding of a design process
- 2 develop knowledge and skills in a range of technologies for a variety of purposes and in the production of a design project
- 3 develop knowledge and understanding of the factors that impact on design
- 4 develop skills in the application of design processes to design, produce and evaluate quality design projects and satisfy identified needs
- 5 develop knowledge, understanding and appreciation of the interrelationship between design, technology, the individual, society and the environment

Module 3: Food Technology

Students will:

- 1 develop knowledge and understanding of a design process
- 2 develop knowledge and skills in a range of technologies for a variety of purposes and in the production of a design project

- 3 develop knowledge and understanding of the properties and characteristics of food for a range of applications
- 4 develop an understanding of the nature of food, nutrition and the relationship of food to health
- 5 develop skills in the selection and use of food, equipment and techniques to produce a variety of food items
- 6 develop an appreciation of the significant role of food in society

Module 4: Industrial Technology

Students will:

- 1 develop knowledge and understanding of a design process
- 2 develop knowledge and skills in a range of technologies for a variety of purposes and in the production of a project in a selected focus area
- 3 develop knowledge and understanding of a focus area industry
- 4 develop skills in producing quality products in a focus area industry
- 5 develop an appreciation of the relationships between technology, the individual, society and the environment

Module 5: Information Processes and Technology

Students will:

- 1 develop knowledge and understanding of a design process
- 2 develop knowledge and skills in a range of technologies for a variety of purposes and in the production of a design project
- 3 develop knowledge and understanding of the functional requirements of information systems for a range of applications
- 4 apply knowledge and understanding of the nature and performance of information systems
- 5 develop skills in the selection and use of tools and processes to produce and care for an information system for an identified need
- 6 develop an appreciation of social and ethical issues and the significance of information systems in society

Module 6: Textiles and Design

Students will:

- 1 develop knowledge and understanding of a design process
- 2 develop knowledge and skills in a range of technologies for a variety of purposes and in the production of a design project
- 3 develop knowledge and understanding of the functional and aesthetic requirements of textiles for a range of applications
- 4 apply knowledge and understanding of the properties and performance of textiles
- 5 develop skills in the selection and use of textile materials, equipment and techniques to produce and care for textile items
- 6 develop an appreciation of the significance of textiles in society

8 Course Structure

The *Stage 6 Technology Life Skills Syllabus* contains seven courses. Students may undertake more than one course drawn from the *Stage 6 Technology Life Skills Syllabus*.

The structure of each course is detailed in the table below.

Course	Units	Indicative hours	Structure
Agriculture Life Skills	2	120 hours preliminary	Outcomes and content are selected from the <i>Agriculture</i> module (Module 1)
	2	120 hours HSC	
Design and Technology Life Skills	2	120 hours preliminary	Outcomes and content are selected from the <i>Design and Technology</i> module (Module 2)
	2	120 hours HSC	
Food Technology Life Skills	2	120 hours preliminary	Outcomes and content are selected from the <i>Food Technology</i> module (Module 3)
	2	120 hours HSC	
Industrial Technology Life Skills	2	120 hours preliminary	Outcomes and content are selected from the <i>Industrial Technology</i> module (Module 4)
	2	120 hours HSC	
Information Processes and Technology Life Skills	2	120 hours preliminary	Outcomes and content are selected from the <i>Information Processes and Technology</i> module (Module 5)
	2	120 hours HSC	
Textiles and Design Life Skills	2	120 hours preliminary	Outcomes and content are selected from the <i>Textiles and Design</i> module (Module 6)
	2	120 hours HSC	
Technology Life Skills	2	120 hours preliminary	Outcomes and content are selected from any of the modules across the technologies
	2	120 hours HSC	

If a student undertakes the *Technology Life Skills* course and other course(s) from the syllabus, the *Technology Life Skills* course must not duplicate any of the outcomes and content being undertaken in the other course(s) being studied.

Outcomes and content are selected for each course based on the student's priorities, needs and interests.

The content points form the basis of the learning opportunities for students. Any examples provided with the content points are suggested learning experiences only. Teachers may use the examples provided or develop other examples to meet the particular needs of individual students.

Course	Course Description
Agriculture Life Skills	This module provides opportunities for students to engage in the study of agricultural enterprises. Practical skills are developed in designing, producing and evaluating agricultural products in the context of an agricultural enterprise.
Design and Technology Life Skills	This module provides opportunities for students to engage in a design process and explore and develop technologies in the context of a design project. Design projects will involve the design, production and evaluation of a product, system or environment.
Food Technology Life Skills	This module provides opportunities for students to engage in a design process through the development of food products in a variety of settings. Practical skills are developed through the care and safe handling of equipment, food preparation activities, and through the design, production and evaluation of food solutions.
Industrial Technology Life Skills	<p>This module provides opportunities for students to study a focus area industry and engage in a design process. Industry study and design projects should be selected from one of the following focus areas:</p> <ul style="list-style-type: none"> • Automotive Technologies • Electronics Technologies • Graphics Technologies • Metal and Engineering Technologies • Multimedia Technologies • Timber Products and Furniture Technologies. <p>Practical skills are developed in designing, producing and evaluating in the context of an Industrial Technology project.</p>
Information Processes and Technology Life Skills	This module provides opportunities for students to engage in the study of information processes and technology and the roles that information systems play in society. They will gain an appreciation of the nature of information, its ethical use and its impact on many aspects of life. Practical skills are developed in using information processes and technology to address needs.
Textiles and Design Life Skills	<p>This module provides opportunities for students to engage in a design process in developing a design project. Practical skills are developed in the design, selection, production, evaluation and care of textiles in the context of a design project.</p> <p>Design projects should be selected from one or more of the following focus areas:</p> <ul style="list-style-type: none"> • apparel • furnishings • costume • textile arts • non-apparel.
Technology Life Skills	Technology Life Skills provides opportunities for students to engage in a design process across a range of technologies. The course of study is based on outcomes and content selected from

	any of the Agriculture, Design and Technology, Food Technology, Industrial Technology, Information Processes and Technology and Textiles and Design modules. Teachers have the flexibility to select outcomes and content from the modules based on the priorities, interests and needs of students.
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9 Objectives and Outcomes

Module 1: Agriculture

Objectives Students will	Outcomes	
	A student	
1. develop knowledge and understanding of a design process	ALS1	recognises that a process is used in agricultural enterprises
	ALS2	explores factors that influence agricultural enterprises
2. develop knowledge and skills in a range of technologies for a variety of purposes in an agricultural enterprise	ALS3	demonstrates awareness that technology can be used for a variety of purposes in agricultural enterprises
	ALS4	demonstrates skills in the context of an agricultural enterprise
	ALS5	uses a design process in the context of an agricultural enterprise
3. develop knowledge and understanding of the production process used in agricultural enterprises	ALS6	explores a farm as an agricultural enterprise
	ALS7	identifies animals and plants in agricultural enterprises
	ALS8	investigates environmental factors that affect agricultural enterprises
4. apply knowledge, understanding and skills in the production, management and marketing of agricultural products	ALS9	participates in the production process in an agricultural enterprise
	ALS10	demonstrates safe practices in the use and care of equipment and materials, and in the treatment and care of animals and plants
	ALS11	investigates marketing strategies for agricultural products
5. develop an appreciation of past and current issues impacting on Australian agricultural enterprises	ALS12	demonstrates an awareness of responsible agricultural practices
	ALS13	explores technological innovation and current issues in producing and marketing agricultural products

Module 2: Design and Technology

Objectives Students will	Outcomes	
	A student	
1. develop knowledge and understanding of a design process	DTLS1	recognises that a process is used to develop design solutions
	DTLS2	explores factors that influence the development of design solutions
2. develop knowledge and skills in a range of technologies for a variety of purposes and in the production of a design project	DTLS3	demonstrates awareness that technology can be used for a variety of purposes in a design process
	DTLS4	demonstrates skills and techniques in the context of a design project
	DTLS5	uses a design process in the production of a project

3. develop knowledge and understanding of the factors that impact on design	DTLS6	explores the features of a range of designs
	DTLS7	identifies materials, technologies and techniques for a range of applications
	DTLS8	evaluates the suitability of design for a range of applications
4. develop skills in the application of design processes to design, produce and evaluate quality design projects and satisfy identified needs	DTLS9	selects and uses materials, tools and techniques in producing a design project
	DTLS10	demonstrates safe practices in the use and care of tools and in the implementation of techniques
5. develop knowledge, understanding and appreciation of the interrelationship between design, technology, the individual, society and the environment	DTLS11	identifies and explores relationships between design and technology, the individual, society and the environment

Module 3: Food Technology

Objectives Students will	Outcomes A student	
1. develop knowledge and understanding of a design process	FTLS1	recognises that a process is used to develop food design solutions
	FTLS2	explores factors that influence the development of food design solutions
2. develop knowledge and skills in a range of technologies for a variety of purposes and in the production of a design project	FTLS3	demonstrates awareness that technology can be used for a variety of purposes in a food design process
	FTLS4	demonstrates skills and techniques in the context of a food project
	FTLS5	uses a design process in the production of a food project
3. develop knowledge and understanding of the properties and characteristics of food for a range of applications	FTLS6	identifies the sensory characteristics and functional properties of a range of food items
	FTLS7	evaluates the suitability of the sensory characteristics and functional properties of food items for a range of applications
4. develop an understanding of the nature of food, nutrition and the relationship of food to health	FTLS8	recognises the nutritional value of a variety of foods
	FTLS9	applies knowledge of the nutritional value of foods to meet a range of dietary and lifestyle needs
	FTLS10	recognises the impact of food on health and makes informed food choices

5. develop skills in the selection and use of food, equipment and techniques to produce a variety of food items	FTLS11	selects and uses appropriate ingredients, equipment and techniques in producing quality food items
	FTLS12	uses hygienic and safe practices in the selection, handling and storage of food
	FTLS13	demonstrates safe practices in the use of equipment and appliances
6. develop an appreciation of the significant role of food in society	FTLS14	identifies and explores factors that contribute to the quality and role of food in society

Module 4: Industrial Technology

Objectives Students will	Outcomes A student	
1. develop knowledge and understanding of a design process	ITLS1	recognises that a process is used to develop design solutions
	ITLS2	explores factors that influence design
2. develop knowledge and skills in a range of technologies for a variety of purposes and in the production of a project in a selected focus area	ITLS3	demonstrates awareness that technology can be used for a variety of purposes in a design process
	ITLS4	demonstrates skills and techniques in the context of a project
	ITLS5	uses a design process in the production of a project
3. develop knowledge and understanding of a focus area industry	ITLS6	explores a range of industrial products and their features
	ITLS7	identifies materials and technologies for a range of applications
	ITLS8	investigates marketing strategies for industrial products
4. develop skills in producing quality products in a focus area industry	ITLS9	selects and uses appropriate materials, tools and processes in the production of a project
	ITLS10	demonstrates safe practices in the use and care of tools
5. develop an appreciation of the relationships between technology, the individual, society and the environment	ITLS11	identifies and explores relationships between a focus area industry, the individual, society and the environment

Module 5: Information Processes and Technology

Objectives Students will	Outcomes A student	
1. develop knowledge and understanding of a design process	IPTLS1	recognises that a process is used to develop information systems
	IPTLS2	explores factors that influence the design of information systems

2. develop knowledge and skills in a range of technologies for a variety of purposes and in the production of a design project	IPTLS3	demonstrates awareness that technology can be used for a variety of purposes in the design of information systems
	IPTLS4	demonstrates skills and techniques in the context of an information systems project
	IPTLS5	uses a design process in the production of an information systems project
3. develop knowledge and understanding of the functional requirements of information systems for a range of applications	IPTLS6	explores a range of information systems technology
	IPTLS7	evaluates the suitability of information technology for a range of applications
4. apply knowledge and understanding of the nature and performance of information systems	IPTLS8	demonstrates knowledge and understanding of information processes within information systems
	IPTLS9	demonstrates knowledge and understanding of the relationship between information processes
5. develop skills in the selection and use of tools and processes to produce and care for an information system for an identified need	IPTLS10	selects and uses appropriate technology for information processes
	IPTLS11	selects and uses appropriate tools and techniques in using and caring for information systems
	IPTLS12	demonstrates safe practices in the use of information systems technology
6. develop an appreciation of social and ethical issues and the significance of information systems in society	IPTLS13	identifies and explores relationships between information systems, the individual, society and the environment

Module 6: Textiles and Design

Objectives Students will	Outcomes A student	
1. develop knowledge and understanding of a design process	TDLS1	recognises that a process is used to develop textile design solutions
	TDLS2	explores factors that influence textile design
2. develop knowledge and skills in a range of technologies for a variety of purposes and in the production of a design project	TDLS3	demonstrates awareness that technology can be used for a variety of purposes in a textile design process
	TDLS4	demonstrates skills and techniques in the context of a textile project
	TDLS5	uses a design process in the production of a textile project
3. develop knowledge and	TDLS6	explores a range of textiles and their features
	TDLS7	identifies textiles for a range of applications

understanding of the functional and aesthetic requirements of textiles for a range of applications	TDLS8	evaluates the suitability of textile features for a range of applications
4. apply knowledge and understanding of the properties and performance of textiles	TDLS9	selects fabrics, yarns and fibres for a specific purpose
5. develop skills in the selection and use of textile materials, equipment and techniques to produce and care for textile items	TDLS10	selects and uses appropriate materials, equipment and techniques in producing textile items
	TDLS11	selects and uses appropriate equipment and techniques in caring for textile items
	TDLS12	demonstrates safe practices in the use of equipment
6. develop an appreciation of the significance of textiles in society	TDLS13	identifies and explores factors that contribute to the quality and value of textiles in society

10 Modules

Module 1: Agriculture

Module description

This module provides opportunities for students to engage in the study of agricultural enterprises. Practical skills are developed in designing, producing and evaluating agricultural products in the context of an agricultural enterprise.

Objective 1

Students will develop knowledge and understanding of a design process.

Outcomes

- ALS1 recognises that a process is used in agricultural enterprises
ALS2 explores factors that influence agricultural enterprises

Content

Students:

- identify steps in a process for producing an agricultural product including:
 - identifying a need
 - generating ideas
 - exploring and researching the ideas (market research, feasibility study)
 - choosing a preferred idea
 - planning steps for producing the product
 - experimenting
 - producing the product
 - evaluating the process used to produce the product

- explore factors that influence agricultural enterprises such as:
 - location
 - weather
 - soil
 - water
 - types of vegetation
 - accessibility to materials and services
 - selection of product(s) to be produced (eg plant/animal type)
 - finance.

Objective 2

Students will develop knowledge and skills in a range of technologies for a variety of purposes in an agricultural enterprise.

Outcomes

- ALS3 demonstrates awareness that technology can be used for a variety of purposes in agricultural enterprises
- ALS4 demonstrates skills in the context of an agricultural enterprise
- ALS5 uses a design process in the context of an agricultural enterprise

Content

Students:

- engage in a design process to develop an agricultural product
 - identify a need
 - generate ideas
 - research process and results
 - undertake experiments
 - make decisions
 - produce an agricultural product
 - manage the process
 - evaluate the agricultural product
 - evaluate the process used to produce the product

- use techniques to communicate during a design process:
 - individual communication form or system
 - pictures/photographs
 - videos
 - computer graphics
 - discussions
 - diagrams
 - flow charts
 - object drawing
 - Computer Aided Design
 - written communication

- document the steps during a design process

- gather and communicate data using a range of technology such as:
 - scientific equipment for experimentation
 - the internet for research
 - data collation and reporting software.

Objective 3

Students will develop knowledge and understanding of the production process used in agricultural enterprises.

Outcomes

- ALS6 explores a farm as an agricultural enterprise
ALS7 identifies animals and plants in agricultural enterprises
ALS8 investigates environmental factors that affect agricultural enterprises

Content

Students:

- identify a range of farms, eg producing:
 - meat (beef, lamb, chicken, pork)
 - fibre (wool, alpaca)
 - dairy
 - crops (sugar, grain)
 - flowers, plants or trees
 - fish
 - poultry
- identify plant types and animal breeds used in agricultural enterprises
- identify some of the established rural industries such as:
 - eggs
 - chicken meat
- experience aspects of a farm by visiting a selected farm or farms
- identify the farm as an agricultural enterprise including:
 - the physical and biological environment of a farm (eg fences, water)
 - an enterprise production cycle (eg planting, growing, harvesting)
 - the cycle of activities associated with production on a farm (eg timing of shearing, ploughing etc)
 - the physical resources of a farm
 - agricultural record-keeping
 - measures of performance on farms (eg quality, quantity of produce)
 - problems associated with production on a farm (eg climate, disease, soil, finance, human resources)
 - the role of the farm manager
- gather information on the physical resources of a farm, such as soil, vegetation, topography
- identify environmental factors that affect plant production (eg temperature, sunlight, climate, soil type, drainage, rainfall, wind, water, pests, humidity, salinity, pH)
- identify environmental factors that affect animal production (eg climate, temperature, shade, wind, water, rainfall, soil type)

- investigate living things that affect plant production (eg insects, birds, bacteria, fungi, plant viruses)
- experiment to show the effects of environmental factors (such as sunlight, temperature, water) on crops (eg compare the effects of sunlight on the germination of crops)
- use measuring devices to collect data relating to yield or growth for an aspect of plant or animal production such as:
 - size and yield of a particular variety of tomato
 - comparative growth of bean plants in response to different fertilizers
- identify land degradation problems on farms such as:
 - soil erosion from clearing
 - loss of soil nutrients (overuse, wind)
- identify practices that contribute to long-term environmental sustainability such as:
 - replanting
 - water use
 - recycling
- recognise technology used in management and production on the farm and in marketing the products of the farm
- undertake a case study of an agricultural enterprise.

Objective 4

Students apply knowledge, understanding and skills in the production, management and marketing of agricultural products

Outcomes

- ALS9 participates in the production process in an agricultural enterprise
ALS10 demonstrates safe practices in the use and care of equipment and materials, and in the treatment and care of animals and plants
ALS11 investigates marketing strategies for agricultural products

Content

Students:

- explore agricultural products and their uses such as:
 - food
 - natural fibres
 - food colourings and flavourings
 - fragrances
 - cosmetics
 - leather
 - timber
 - essential oils
 - flowers

- identify the raw agricultural sources used to produce a range of products such as:
 - bread (from wheat)
 - sugar (from sugar cane)
 - milk (from cows, goats)
 - jumper (from sheep, alpaca)
 - smoked salmon (from salmon)
 - salt (from sea water)
 - pepper (from pepper plant)
 - leather/skin (from cow, sheep, crocodile)
 - socks (from cotton plant, bamboo tree, sheep)
 - eggs (from hens, quails or ducks)

- participate in an agricultural production process
eg – seed planting

- identify farm management practices such as:
 - resource management (time, finances, skills, materials)

- plan for an enterprise production cycle

- use a plan for an enterprise production cycle

- experiment with production techniques such as:
 - depth of planting/spacing
 - growing conditions
 - feed

- soil type
- shade/light
- identify and demonstrate care requirements for animals including:
 - animal welfare requirements (see the NSW DET's policy and guidelines on animal welfare)
(https://www.det.nsw.edu.au/policies/curriculum/schools/animal_welf/PD20040029.shtml)
(<http://www.schools.nsw.edu.au/animalsinschools>)
- demonstrate skills in the care of plants during a production process
- gather data using appropriate instruments to measure environmental factors, such as:
 - weather/temperature
 - soil/quality
- calculate measures of performance in agricultural production
- investigate farm technology such as:
 - technology used in management and production on the farm
 - technology used in marketing the products of the farm
- identify different marketing strategies used in agricultural enterprises, such as strategies for:
 - an existing agricultural product
 - a new/innovative agricultural product
- identify the impact of consumers on marketing
- develop promotional material for marketing an agricultural product
- select transport, handling and packaging methods for marketing a chosen agricultural product
- identify potential hazards in agricultural workplaces such as:
 - unsafe machinery
 - chemicals
- use safe work practices in the agricultural workplace
- apply OHS practices in handling and using a variety of materials
 - eg – using a mask and gloves when handling prepared potting mixes, fertilisers, pesticides and herbicides
 - handling and using hand tools, power tools and appliances
 - handling and using machines
 - working with materials and substances sensitive to temperature, light or air or dangerous if mixed with other substances
 - ensuring guards and devices are in place
 - identifying emergency stop procedures before use of machinery
- use and care for machinery, appliances and tools appropriately and safely:
 - in accordance with design and manufacturers' instructions
 - identifying maintenance and repair requiring professional attention.

Objective 5

Students will develop an appreciation of past and current issues impacting on Australian agricultural enterprises.

Outcomes

ALS12 demonstrates an awareness of responsible agricultural practices

ALS13 explores technological innovation and current issues in producing and marketing agricultural products

Content

Students:

- explore one or more ethical issues related to agricultural production such as:
 - battery hens
 - use of pesticides
- recognise the impact of European and Aboriginal practices on the development of Australian agriculture
- compare agricultural practices of today with traditional Aboriginal land management practices
- identify agricultural products used by Aboriginal people
- identify the impact of agriculture in an identified region
- identify social aspects surrounding agriculture such as:
 - the changing role of the family farm in Australian agriculture
 - the interaction between agriculture and Australian society
- explore the research process used for the identification and/or development of agricultural products such as:
 - tea tree oil
 - kangaroo meat
 - alpaca fibre
- research innovations in agricultural production such as:
 - genetically modified foods and their production systems
 - disease control in crops
- identify a product where value adding and niche marketing strategies have been used to vary marketing opportunities.

Module 2: Design and Technology

Module description

This module provides opportunities for students to engage in a design process and explore and develop technologies in the context of a design project. Design projects will involve the design, production and evaluation of a product, system or environment.

Objective 1

Students will develop knowledge and understanding of a design process.

Outcomes

DTLS1 recognises that a process is used to develop design solutions

DTLS2 explores factors that influence the development of design solutions

Content

Students:

- identify steps in a design process including:
 - identifying a need
 - exploring ideas
 - choosing a preferred idea
 - planning steps for producing the design project
 - selecting materials, tools and techniques
 - producing the design project
 - evaluating the design project
 - compiling a design portfolio of the steps during a design process
- explore factors that influence the design and the making of design projects such as:
 - technology
 - function (specific purpose)
 - aesthetics (enhancing the appearance of the design)
 - available resources (skills, tools, materials, time and money)
 - ergonomics
 - OHS
 - short-term and long-term environmental consequences (resources used, waste products)
 - social appropriateness
 - quality.

Objective 2

Students will develop knowledge and skills in a range of technologies for a variety of purposes and in the production of a design project.

Outcomes

- DTLS3 demonstrates awareness that technology can be used for a variety of purposes in a design process
- DTLS4 demonstrates skills and techniques in the context of a design project
- DTLS5 uses a design process in the production of a project

Content

Students:

- engage in a design process to produce a design project
 - research areas of need (eg new and better solutions, requirements of end-users)
 - use an identified area of need or inspiration to generate ideas
 - develop ideas (eg research materials, processes and production methods, market research, criteria for success)
 - use gathered information to refine ideas
 - experiment by testing ideas and selected techniques
 - use technology throughout the process
 - modify and improve a design
 - produce the design project
 - manage the process (eg time management, safety)
 - document the process
 - evaluate the design process
 - evaluate the project against the need and intended use
- experiment with a range of technology appropriate to a design project
- investigate a range of techniques used for generating ideas such as:
 - mind mapping
 - sketching
 - modelling
 - group work/collaboration
- use technology to gain information related to a design project
- explore a range of techniques for communicating ideas such as:
 - modelling
 - visualising
 - prototypes
- use techniques to communicate during a design process such as:
 - individual communication form or system
 - pictures/photographs
 - videos
 - computer graphics

- discussions
 - object drawing
 - Computer Aided Design
 - written communication
-
- use a portfolio to document the steps during a design process.

Objective 3

Students will develop knowledge and understanding of the factors that impact on design.

Outcomes

DTLS6	explores the features of a range of designs
DTLS7	identifies materials, technologies and techniques for a range of applications
DTLS8	evaluates the suitability of design for a range of applications

Content

Students:

- compare a range of products for their aesthetic features
 - eg – select a product that is personally appealing (colour, texture, layout)
 - identify products that would appeal to a particular audience
- compare a range of products for their functional features
 - eg – select a product according to size, shape
 - identify most useful product for a specific purpose
- recognise that the design of a product, system or environment is related to its function and intended purpose
- consider the design of everyday products, systems or environments and/or completed design projects in meeting their intended use, considering, for example:
 - function
 - finish
 - appeal
 - usefulness
 - durability
 - stability
 - ergonomics
 - construction
 - safety
 - materials used
- compare a range of products in relation to their environmental impact, considering, for example:
 - packaging/materials
 - power use
 - waste management
 - biodegradability
- explore processes used by designers
- identify a range of tools appropriate to a design project
- identify materials appropriate to the production of a design project
- identify techniques appropriate to the development and production of a design project
- explore the design processes used in the development and production of a product within an industrial or commercial setting

- evaluate a completed design project
 - eg – using focus questions such as:
 - does the project meet the identified need?
 - what changes, if any, need to be made?
 - do I like it?

- evaluate a design project in terms of marketability, considering for example:
 - presentation
 - size
 - shape
 - colour
 - packaging
 - price/cost
 - safety
 - impact on individuals, society, the environment.

Objective 4

Students will develop skills in the application of design processes to design, produce and evaluate quality design projects and satisfy identified needs.

Outcomes

DTLS9	selects and uses materials, tools and techniques in producing a design project
DTLS10	demonstrates safe practices in the use and care of tools and the implementation of techniques

Content

Students:

- compare the properties of a range of materials, for example:
 - strength
 - absorbency
 - transparency
 - rigidity
- identify factors to be considered when selecting resources, for example :
 - safety
 - ethical issues
 - environmental issues
- explore and access materials such as:
 - plastics
 - timbers
 - textiles
- identify the use of a range of tools such as:
 - hand tools
 - power tools
 - small appliances
 - machinery
 - computer equipment
- select materials according to their properties, for an intended use
- use appropriate materials and tools when designing and producing a design project
- experiment with materials, tools and techniques
- use a range of techniques appropriate to a design project, for example:
 - ideas-generating techniques
 - market research techniques
 - communication and presentation techniques
 - construction techniques
- explore and compare marketing strategies used for a range of design solutions

- plan a marketing strategy for a design project
- plan promotional materials for a design project
- identify risk factors in the design and production of a design project
- apply OHS requirements
- use and care for machinery, appliances and tools appropriately and safely:
 - in accordance with design and manufacturers' instructions
 - identifying maintenance and repair requiring professional attention.

Objective 5

Students will develop knowledge, understanding and appreciation of the interrelationship between design, technology, the individual, society and the environment.

Outcomes

DTLS11 identifies and explores relationships between design and technology, the individual, society and the environment

Content

Students:

- investigate a range of professions and career opportunities in design such as:
 - interior design
 - jewellery design
 - landscape design
 - environmental design
 - fashion design
 - architectural design
- research the work of a designer and the focus of their work
- investigate an industrial or commercial design project
- explore the research process used for the identification and development of design projects
- explore influences on designing and producing products such as:
 - cultural diversity
 - social trends
 - nature of work
 - technological change
 - ethics
- explore the impact of design and innovation on aspects of society such as:
 - ethical
 - environmental
 - sustainability
 - intellectual property
 - new materials
 - ergonomics
- explore examples of innovation (eg past, current, emerging) and their contribution to society
- identify factors that influence the success or failure of an innovation, such as:
 - timing
 - marketing
 - cost/finance
 - production/supply

- investigate the impact of design and new and emerging technologies on individuals, society and the environment, such as the impact on:
 - personal values
 - social interactions and relationships
 - cultural beliefs
 - sustainability
 - safety and health
 - community needs and expectations
 - individual needs
 - equity
 - ethical issues
 - legal issues.

Module 3: Food Technology

Module description

This module provides opportunities for students to engage in a design process through the development of food products in a variety of settings. Practical skills are developed through the care and safe handling of equipment, food preparation activities, and through the design, production and evaluation of food solutions.

Objective 1

Students will develop knowledge and understanding of a design process

Outcomes

- FTLS1 recognises that a process is used to develop food design solutions
FTLS2 explores factors that influence the development of food design solutions

Content

Students:

- identify steps in a design process when producing a food product including:
 - generating ideas
 - exploring and researching the ideas (market research, feasibility study)
 - choosing a preferred idea
 - planning steps to produce a food prototype
 - testing and evaluating the prototype through, for example sensory evaluation, consumer testing, packaging tests
 - making the food product
 - evaluating the food product

- explore factors that influence the development of food products such as:
 - consumer demand and trends (eg convenience, health, cost)
 - market concerns and trends (eg health, the environment)
 - technological developments (eg processing equipment, packaging materials)
 - globalisation (eg global migration, the multicultural impact on consumer and market trends).

Objective 2

Students will develop knowledge and skills in a range of technologies for a variety of purposes and in the production of a design project

Outcomes

- FTLS3 demonstrates awareness that technology can be used for a variety of purposes in a food design process
- FTLS4 demonstrates skills and techniques in the context of a food project
- FTLS5 uses a design process in the production of a food project

Content

Students:

- recognise the use of technology in food production and preparation such as:
 - fresh, canned, frozen, dried, puréed (fruit, vegetables and legumes)
 - fresh, powdered, UHT/long life, canned, grated/shredded, frozen (dairy products)
 - fresh, frozen, dried, smoked, marinated, processed (meat and fish)
- explore and identify technology used in food production such as:
 - techniques, ingredients, machinery, skills used in food processing
 - emerging and innovative technologies
- engage in a design process to produce a food product for a specific purpose (such as a nutritious snack food for an individual, school canteen or party, or a convenience food for a family/group)
 - identify a need
 - generate ideas
 - research process and results
 - undertake experiments
 - make decisions
 - develop a prototype
 - test and evaluate the prototype
 - make the food product
 - manage the process
 - evaluate the food product
- use techniques to communicate during a design process such as:
 - individual communication form or system
 - pictures/photographs
 - videos
 - computer graphics
 - discussions
 - object drawing
 - Computer Aided Design
 - written communication
- document the steps during a design process.

Objective 3

Students will develop knowledge and understanding of the properties and characteristics of food for a range of applications.

Outcomes

- FTLS6 identifies the sensory characteristics and functional properties of a range of food items
- FTLS7 evaluates the suitability of the sensory characteristics and functional properties of food items for a range of applications

Content

Students:

- explore the sensory characteristics of a variety of foods such as their:
 - taste/flavour
 - texture
 - appearance/colour
 - odour
- identify the sensory characteristics of a variety of food items such as:
 - taste (eg sour, salty, sweet, bitter)
 - texture (eg crisp, smooth, oily, rough, prickly)
 - appearance (eg colour, size, shape)
 - odour (eg freshness, distinctive smell)
- use sensory assessment techniques (eg select preferred taste/texture/appearance/odour, group similarities, compare and contrast, rank) to evaluate the appeal of foods according to their sensory characteristics
- explore changes to the sensory characteristics of food due to their functional properties being affected by preparation or processing, for example:
 - the texture and appearance (sensory characteristics) of eggs change as a result of foaming (preparation-beating) due to the role of proteins (functional properties)
 - the texture, taste, appearance and odour (sensory characteristics) of rice change as a result of water absorption (preparation-boiling) due to the role of carbohydrates (starch) (functional properties)
 - the texture, taste, appearance and odour (sensory characteristics) may change as a result of freezing, canning and smoking (processing)
- identify the functional properties of food such as:
 - the role of proteins in foaming
 - the role of carbohydrates in caramelising
 - the role of starch in thickening
- prepare a range of foods which demonstrate the functional properties of food
 - eg – toast bread
 - poach or boil an egg
 - beat egg whites for an omelette or pavlova
 - heat sugar for caramelising

- store food items according to their functional properties, such as:
 - airtight containers for dry cereal products
 - refrigeration for perishable foods
 - freezer storage for frozen foods.

Objective 4

Students will develop an understanding of the nature of food, nutrition and the relationship of food to health.

Outcomes

FTLS8 recognises the nutritional value of a variety of foods

FTLS9 applies knowledge of the nutritional value of foods to meet a range of dietary and lifestyle needs

FTLS10 recognises the impact of food on health and makes informed food choices

Content

Students:

- demonstrate an understanding that the human body needs a range of foods for good health including:
 - breads, cereals, rice, pasta and/or noodles
 - vegetables, legumes
 - fruit
 - milk, yoghurt, cheese
 - butter, oil, margarine
 - meat, fish, poultry, eggs, nuts, alternatives
- recognise that foods have different nutritional values, for example:
 - fruit is more nutritious than chocolate
 - a milkshake is more nutritious than cola
 - wholegrain bread is more nutritious than white bread
- recognise the role of food nutrients for health such as:
 - proteins and minerals for growth and development
 - proteins and vitamins for maintenance and repair
 - carbohydrates and fat for energy
 - water for hydration
- select a range of foods suitable for a healthy diet
- explore the value and/or use of dietary supplements
- use current food models to evaluate their daily diet
(<http://www.health.gov.au>)
(<http://www.nutrition.com>)
- use information found on food labels to assess the nutritional value and health impact of a range of foods including:
 - nutrition panel on packaging
 - order of list of contents
 - symbols
 - terms used on labels for marketing such as 'lite', 'low fat', 'salt reduced'
 - food traces
 - food additives

- identify the possible effects of foods on the body including:
 - energy
 - weight
 - skin condition
 - dental health
 - digestion
 - allergic reactions

- recognise factors affecting food choice such as:
 - nutrition
 - cost
 - socioeconomic factors
 - convenience
 - taste
 - mass media/marketing
 - environmental impact
 - culture
 - peer influence
 - individual preference
 - special diet
 - technological developments (eg nutrient enriched food)

- recognise that individuals require different amounts of food depending on their lifestyle, nutritional needs and age such as:
 - adolescents
 - athletes
 - young children
 - women/men
 - older people

- survey the eating habits of a specific group such as:
 - adolescents
 - young children

- identify traditional food sources used by Indigenous Australian communities such as:
 - bush foods
 - food sources used for medicinal purposes

- plan and prepare nutritious meals for a range of purposes such as:
 - breakfast, lunch and dinner
 - special occasion (eg party, BBQ, formal dinner, buffet, picnic)
 - special dietary requirements (eg diabetic, food sensitivity/intolerance/allergies)

- compare the nutritional value of a selection of convenience and take-away food options

- apply knowledge of nutrition to personal food choices.

Objective 5

Students will develop skills in the selection and use of food, equipment and techniques to produce a variety of food items

Outcomes

FTLS11 selects and uses appropriate ingredients, equipment and techniques in producing quality food items

FTLS12 uses hygienic and safe practices in the selection, handling and storage of food

FTLS13 demonstrates safe practices in the use of equipment and appliances

Content

Students:

- prepare a shopping list for a specific recipe or planned menu
- identify outlets to buy a range of quality ingredients such as:
 - supermarket
 - specialty shops, delicatessen, fruit and vegetable shop
 - fish market
 - farmers' market
- consider quality, quantity and price when purchasing food items
 - eg – buying vegetables and fruit in season
 - choosing to buy in bulk
 - comparing unit value/pricing
 - buying items on special
 - considering the use-by date or best-before date on goods
 - comparing prices of similar goods and generic brands
- identify the purpose of equipment (utensils, crockery, cutlery) in preparing and serving food such as:
 - chopping board for cutting up vegetables
 - wooden spoon to mix batter
 - grater for grating
 - cutlery and crockery for serving and eating food
 - microwave to defrost or reheat foods quickly
 - oven to bake
- identify and use food preparation techniques and methods specific to a recipe
- experiment with food preparation techniques for a specific purpose
- demonstrate time management skills in the preparation of food
 - eg – identify tasks which should be completed in advance
 - follow order and time sequence outlined in a recipe
 - follow own plans to meet time frame for a meal
 - allow time for preparation and cleaning up
- use specialty equipment appropriately and safely such as:
 - chef's knife for chopping

- paring knife for peeling fruit and vegetables
- pizza cutter
- ice-cream scoop
- ladle for hot soup
- use appliances appropriately and safely
 - eg – in accordance with instructions
 - using appropriate amounts of food and liquid
 - providing adequate attention and supervision
 - using appropriate cookware and covers
- recognise risk factors for health in the preparation, serving and storing of food such as:
 - hygiene and cleanliness
 - cross-contamination
 - storage
 - shelf-life
- identify and discard food that is unsafe for consumption using:
 - appearance (eg mould, shrivelled, rust, damage, colour)
 - smell (eg sour, offensive)
 - evidence of contamination (eg foreign objects, tamper)
 - infestation (eg weevils)
 - best-before or use-by date
- discriminate between the shelf-life of different kinds of food such as:
 - dry food in opened and unopened containers
 - frozen and thawed food
 - cooked food for reheat
 - food in sealed or open packets
- store food appropriately and safely considering:
 - container
 - level of moisture
 - temperature for storage
 - kinds of food such as fresh, frozen, thawed, dried
- care for equipment appropriately including:
 - washing (eg dishwasher or by hand)
 - cleaning (eg products, cloths, scourers)
 - following the instructions for use
- care for appliances including:
 - cleaning and cleaning products
 - maintenance
 - repair or service required by a professional
- apply OHS requirements
- use protective clothing as required, such as:
 - aprons
 - oven mitts
- apply knowledge of hygiene and safe-handling in the production of food.

Objective 6

Students will develop an appreciation of the significant role of food in society.

Outcomes

FTLS14 identifies and explores factors that contribute to the quality and role of food in society

Content

Students:

- demonstrate an understanding that food is a basic human need
- recognise the social aspects of food preparation and consumption such as:
 - lifestyle
 - beliefs and traditions
 - social occasions
- explore and research foods eaten in other cultures
- explore cultural influences on preparing and serving food in terms of, for example:
 - courses
 - food presentation
 - table settings
- plan meals with appropriate patterns as suited to a particular culture
- apply knowledge of cultural and/or social practices in preparing and serving food in terms of, for example:
 - courses
 - food presentation
 - table settings
- investigate the availability and selection of food for a culture
- research the significance and role of food in Indigenous Australian cultures such as:
 - occurrence of and availability of resources
 - respect for and management of resources
 - knowledge of geographic location and seasonal indicators/relationships
 - traditions and spirituality
 - food preparation techniques
 - occasions/gatherings (eg middens, corroborees)
- investigate food and health industry careers
- visit, or do a virtual tour of, a food manufacturer
- identify the effect of food manufacturing on, for example:
 - individual decision-making
 - the industry
 - the environment.

Module 4: Industrial Technology

Module Description

This module provides opportunities for students to study a focus area industry and engage in a design process. Industry study and design projects should be selected from one of the following focus areas:

- Automotive Technologies
- Electronics Technologies
- Graphics Technologies
- Metal and Engineering Technologies
- Multimedia Technologies
- Timber Products and Furniture Technologies.

Practical skills are developed in designing, producing and evaluating in the context of an Industrial Technology project.

Objective 1

Students will develop knowledge and understanding of a design process.

Outcomes

- ITLS1 recognises that a process is used to develop design solutions
ITLS2 explores factors that influence design

Content

Students:

- identify steps in a design process including:
 - identifying a need
 - exploring ideas
 - choosing a preferred idea
 - planning steps for producing the Industrial Technology project
 - selecting tools, equipment and materials
 - producing the Industrial Technology project
 - evaluating the Industrial Technology project
 - compiling a portfolio of the steps during the project
- explore factors that influence the design and making of products in an industry such as:
 - technology
 - function (specific purpose)
 - aesthetics (enhancing the appearance of the design)
 - available resources (skills, tools, materials, time and money)
 - environmental impact (resources used, waste products)
- identify the features of a product to meet an identified need such as:
 - aesthetics
 - function
 - materials
 - ergonomics

- size
 - strength
 - cost
 - durability
 - portability
 - maintenance
 - safety
-
- compare design solutions according to their features.

Objective 2

Students will develop knowledge and skills in a range of technologies for a variety of purposes and in the production of a project in a selected focus area.

Outcomes

- ITLS3 demonstrates awareness that technology can be used for a variety of purposes in a design process
- ITLS4 demonstrates skills and techniques in the context of a project
- ITLS5 uses a design process in the production of a project

Content

Students:

- recognise that the design of a product is related to its function and intended purpose
- engage in a design process to produce an Industrial Technology project
 - research areas of need
 - use an identified area of need to generate ideas
 - develop ideas
 - use gathered information to refine ideas
 - experiment by testing ideas and selected techniques
 - use technology throughout the process
 - create, modify and improve a design
 - produce the Industrial Technology project
 - manage and record the process
 - evaluate the project against the need and intended use
- use techniques to communicate during a design process, for example:
 - individual communication form or system
 - pictures/photographs
 - videos
 - samples
 - prototypes
 - models
 - computer graphics
 - discussions
 - object drawings
 - Computer Aided Design
 - written communication
- use a portfolio to document the steps during a design process.

Note: Design projects should relate to the focus area studied (Objective 4).

Objective 3:

Students will develop knowledge and understanding of a focus area industry.

Outcomes

- ITLS6 explores a range of industrial products and their features
- ITLS7 identifies materials and technologies for a range of applications
- ITLS8 investigates marketing strategies for industrial products

Industry Study

Students will study the organisation and management of an individual business in the selected focus area.

Content

Students:

- explore the range of products produced by businesses in the focus area
- explore the features of a range of industry manufactured products
- investigate the organisation and structure of a business including:
 - physical location(s)
 - resources (human, non-human)
 - financial management
 - production
 - marketing
 - workplace environment(s)
- identify and consider the range of resources, processes and techniques used by a business
- recognise the effects of business practices on the environment in terms of, for example:
 - sustainability
 - pollution
 - recycling/reusing
- identify a range of marketing strategies for industrial products
- experience aspects of a workplace, such as:
 - culture
 - work practices
 - working environments
 - employment opportunities
- identify relevant OHS legislative requirements for the industry.

Objective 4

Students will develop skills in producing quality products in a focus area industry.

Outcomes

ITLS9 selects and uses appropriate materials, tools and processes in the production of a project

ITLS10 demonstrates safe practices in the use and care of tools

Design projects should be produced within the context of one of the following focus areas:

- Automotive Technologies
- Electronics Technologies
- Graphics Technologies
- Metal and Engineering Technologies
- Multimedia Technologies
- Timber Products and Furniture Technologies

Content specific to focus areas

Focus Area: Automotive Technologies

Note: All repairs/modifications made to motor vehicles must conform to government statutory regulations and guidelines.

Content

Students:

- use a design process in producing an automotive project
- identify different fuel types such as petrol, diesel, oils, gas
- identify different engine types and their uses such as:
 - single cylinder 2 stroke
 - single cylinder 4 stroke
 - 4 cylinder
 - diesel
- identify the engine and its related components such as:
 - engine operation
 - piston assembly
 - cylinder heads
 - cylinder blocks
 - cylinder sleeves
 - valve and valve trains
 - crankshaft assembly
- identify the function of engine components

- dismantle and reassemble a variety of engine components and/or chassis and related components
- for the systems (cooling, fuel, exhaust, ignition, electrical, braking, suspension, steering):
 - identify the components
 - outline the operations and/or principles
 - use basic fault-finding techniques
 - conduct basic routine maintenance
 - carry out basic repairs

Cooling system components such as:

- radiator
- water pump
- radiator hoses
- thermostat
- fan
- coolant

Fuel system principles such as:

- the carburettor system
- the fuel injection system

Intake and exhaust systems principles such as:

- types of air cleaners
- components of an exhaust system

Manual transmission principles such as:

- purpose of transmission
- types of gears

Ignition system components such as:

- battery
- distributor
- spark plugs

Electrical system principles and components such as:

- electrical circuit diagrams
- electrical symbols
- lamp bulbs
- headlights
- exterior lights

Braking system principles such as:

- drum brakes
- disc brakes
- parking brakes

Suspension system principles such as:

- leaf springs
- coil springs

- shock absorbers

Steering system components such as:

- steering boxes
- power steering
- four wheel steering

- identify and carry out basic body panel repairs
- select and apply appropriate finishes such as:
 - spray painting
 - trim and accessories
- identify types of wheels and tyres for their intended use
- maintain and care for wheels and tyres
- research motor vehicle design such as the use of materials and aerodynamics (body shape, wind resistance)
- apply OHS requirements
 - eg – use equipment in accordance with design and instructions
 - workplace practices such as Personal Protective Equipment (PPE), signage, safe work practices
 - risk management
- care for and maintain a vehicle following manufacturer's instructions
 - eg – washing and polishing
 - servicing
 - checking oil and coolant/water
 - rust prevention
 - tyre pressure
 - garaging/protection
- apply government and statutory regulations during any vehicle modification including:
 - Australian Design Rule (ADR) 37
 - Emission Control for Light Vehicles
 - child restraint design
 - registration
 - insurance
- accurately complete forms for registration and insurance of a motor vehicle
- develop promotional material for marketing an automotive project
- use and care for tools and machinery appropriately and safely:
 - in accordance with design and manufacturers' instructions
 - identifying maintenance and repair requiring professional attention.

Focus Area: Electronics Technologies

Note: any project using or developing voltages in excess of 32V must be inspected and approved in writing as safe by a qualified and accredited person in accordance with appropriate Australian Standards. All projects need to conform to government and statutory regulations and guidelines including occupational health and safety requirements.

Content

Students:

- demonstrate an understanding of electrical safety in a range of contexts such as:
 - home
 - workplace
 - industry/commercial
- use a design process in producing an electronics project
- recognise power sources
- identify safety issues with power sources
- identify the basic electrical principles such as:
 - electrical potential
 - current flow (AC/DC)
 - resistance
 - power
 - electromagnetism
 - units and measurement
- apply knowledge of electronics in a range of settings
 - eg – setting up an entertainment system
 - connecting a car audio system
 - connecting a security alarm system
 - maintaining home electronics (such as fuses)
- identify relevant electronic materials and use them safely such as:
 - tin, lead and/or lead-free materials for soldering
- use appropriate tools and equipment
- identify components such as:
 - conductors
 - semi-conductors
 - insulators
 - resistors
 - inductive coils and relays
 - peripherals
 - capacitors
- recognise component layouts
- identify schematic diagrams

- recognise circuit symbols
- recognise parallel and series circuits
- apply basic knowledge to complete simple circuits
- use different circuit assembly techniques (eg soldering)
- select and use appropriate circuit testing equipment
- experiment with examples and applications of conductors, insulators and resistors
- use and care for tools and equipment appropriately and safely:
 - in accordance with design and manufacturers' instructions
 - identifying maintenance and repair requiring professional attention
- apply OHS requirements, for example:
 - use equipment in accordance with design and instructions
 - workplace practices such as Personal Protective Equipment (PPE), signage, safe work practices
 - risk management
- develop promotional material for marketing an electronics project.

Focus Area: Graphics Technologies

Content

Students:

- use a design process in producing a graphics project
- sketch outlines of a range of products (eg using freehand, computer software)
- develop sketches into a variety of 2D and 3D drawings
- identify drawing types such as:
 - pictorial
 - isometric
 - oblique
 - perspective
 - orthogonal
- identify and use drawing instruments for an intended purpose
- research features of Computer Aided Design (CAD) programs
- use CAD programs to produce drawings for a variety of purposes
- identify presentation principles and techniques such as:
 - composition/balance
 - colour
 - rendering
 - modelling
- recognise and apply principles of composition and balance in developing well presented drawings
- use colour and rendering techniques as a means of defining texture, shape and colour of materials
- identify and practise orthogonal drawing to illustrate the shape and features of a variety of objects
- construct pictorial drawings of simple product parts using mechanical and/or CAD techniques
- identify engineering drawings for a specific project
- identify examples of Australian architectural styles
- research and sketch examples of early Australian architectural styles and/or details
- identify architectural drawings such as plans, elevations, architectural details
- construct pictorial drawings of simple architectural details using mechanical and CAD techniques

- investigate the influences of American and European architectural styles and details on Australian architecture
- use a range of materials to construct simple models of design
- present drawings using a range of materials and equipment appropriate to the processes undertaken such as:
 - information and communication technology (ICT) to communicate a design solution
 - mechanical drafting equipment
 - photocopier
 - mediums (eg cardboards, papers, paints, pencils)
 - printers
 - laminators
- use and care for equipment appropriately and safely:
 - in accordance with design and manufacturers' instructions
 - identifying maintenance and repair requiring professional attention
- apply OHS requirements
 - eg – use equipment in accordance with design and instructions
 - workplace practices such as Personal Protective Equipment (PPE), signage, safe work practices
 - risk management
- develop promotional material for marketing a graphics project.

Focus Area: Metal and Engineering Technologies

Note: Teachers must adequately supervise the design and manufacture of projects where welding is involved. Design of welded projects must consider loadings and weld positioning. The structural design should be such that the welds do not carry the full load.

Content

Students:

- use a design process in producing a metal and engineering project
- identify the properties of a range of ferrous and non-ferrous metals in common usage such as:
 - strength
 - durability
 - ductility
 - malleability
 - lustre
 - hardness
- recognise and use a range of ferrous and non-ferrous metals
- identify a range of metals such as:
 - copper
 - brass
 - steel
 - silver
 - gold
 - aluminium
- investigate the suitability of a particular metal for an application such as:
 - copper for wires
 - brass for taps
 - steel for building construction
 - gold for jewellery
 - aluminium for window frames
- recognise the use of the various shapes and forms of ferrous and non-ferrous metals for particular applications such as:
 - sheet for cars/appliances
 - wire for fences
 - tube for pipes
- apply skills and processes used for a variety of metals
 - eg – marking out
 - cutting
 - machining
 - fabricating
 - joining
 - modifying properties
 - colouring and finishing
- consider a range of techniques to be used in producing a metal and engineering project

- use various shapes and sections of metals in producing a project
- select and use appropriate processes in the production of a design project
- use and care for tools and machinery appropriately and safely:
 - in accordance with design and manufacturers' instructions
 - identifying maintenance and repair requiring professional attention
- apply OHS requirements
 - eg – use equipment in accordance with design and instructions
 - workplace practices such as Personal Protective Equipment (PPE), signage, safe work practices
 - risk management
- develop promotional material for marketing a metal and engineering project

Focus Area: Multimedia Technologies

Content

Students:

- use a design process in producing a multimedia project
- explore a selection of commercially produced multimedia software such as:
 - computer games
 - animation software
- select and use multimedia software in the context of a project
- identify computers and related hardware components such as:
 - plug and socket types
- recognise computer hardware typically used in multimedia computer systems such as:
 - processor speed
 - RAM
 - graphics cards
 - storage
 - motherboards
 - screen type and resolution
 - sound cards
- identify multimedia software and related memory, processing and storage requirements
- apply the procedures associated with the correct use of a computer system
- identify and connect input and output devices such as:
 - input devices (eg keyboard, mouse, joystick, game controller, graphics tablet, microphone, scanners)
 - output devices (eg screens, printers (ink-jet and laser), projectors, internal and external storage devices)
- use a range of printers and scanners in conjunction with specific multimedia software
- use a range of storage devices in conjunction with specific multimedia software such as:
 - USB drives
 - compact disc
 - digital video disc
 - hard drives
- set up and operate basic still and video cameras for use in small media production
- identify and use communication devices such as:
 - modems
 - ethernet
 - bluetooth
 - wireless
 - infra-red
 - firewire
 - USB

- investigate and use a range of software suitable for the creation, editing and publishing of multimedia projects
- manipulate and integrate data between a range of software applications
- produce and manipulate digital images
- identify and use planning processes related to a range of multimedia presentations such as storyboarding
- apply principles of design in the planning and production of multimedia presentations
- recognise the features of multimedia presentations used to target a range of audiences
- demonstrate an understanding of ethical practice and the responsible use of multimedia technologies
- research the history, development and use of the internet, in terms of, for example:
 - targeted audience
 - type and appropriate usage
 - website design
 - age controls on usage
 - censorship of website material
- use and care for equipment appropriately and safely:
 - in accordance with design and manufacturers' instructions
 - identifying maintenance and repair requiring professional attention
- apply OHS requirements
 - eg – use equipment in accordance with design and instructions
 - workplace practices such as Personal Protective Equipment (PPE), signage, safe work practices
 - risk management
- develop promotional material for marketing a multimedia project.

Focus Area: Timber Products and Furniture Technologies

Content

Students:

- use a design process in producing a timber or furniture project
- explore the properties, characteristics and aesthetic features of a selection of timbers such as:
 - grain direction
 - texture
 - colour
 - strength
 - durability
 - weight
 - hardness
- identify the various parts of a tree such as:
 - bark
 - growth ring
 - pith
- recognise timber defects such as:
 - splits
 - warping
 - bowing
 - knots
- recognise different sources of timber such as:
 - plantation
 - recycled/reused
 - exotic
 - native/imported
- recognise manufactured boards such as:
 - plywoods
 - medium density fibreboards (MDF)
 - particle boards
- identify and select materials for a project, such as:
 - timber
 - hardware
 - adhesives
 - paints and finishes
 - upholstery materials
 - metal
 - glass
 - plastic
- identify and select appropriate fittings and allied materials for a project such as:
 - screws
 - nails

- nuts
- bolts
- hinges
- handles
- knobs
- staples/staple gun

- identify purposes for a range of tools and machinery such as:
 - hand tools
 - power tools
 - machines

- select tools and machinery appropriate to the materials and techniques being used for a project

- select and use appropriate construction techniques
 - eg – measuring and marking
 - cutting
 - assembly of parts
 - joining/gluing
 - sanding
 - drilling
 - preparing surface
 - finishing

- use timber industry terms in relation to timber selection such as:
 - grade
 - sizes of timber boards
 - manufactured boards

- use and care for equipment appropriately and safely:
 - in accordance with design and manufacturers' instructions
 - identifying maintenance and repair requiring professional attention

- apply OHS requirements
 - eg – using tools and machinery in accordance with design and instructions
 - workplace practices such as Personal Protective Equipment (PPE), signage, safe work practices
 - risk management
 - working with materials and substances sensitive to temperature, light or air or dangerous if mixed with other substances

- develop promotional material for marketing a timber and furniture project.

Objective 5

Students will develop an appreciation of the relationships between technology, the individual, society and the environment.

Outcomes

ITLS11 identifies and explores relationships between a focus area industry, the individual, society and the environment

Content

Students:

- identify environmental factors that affect the design and development of products such as:
 - available resources
 - alternative resources
 - limitations on resources
 - recycling/reusing
 - pollution
 - government legislation
- recognise the environmental issues specific to the focus area industry
- recognise the sociological factors relating to a business such as:
 - workplace culture
 - personnel issues
- research the impact of the focus area industry on a community
- investigate the impact of off-shore manufacture on the focus area industry
- research consumer demand for a focus area industry product through, for example:
 - school-based survey
 - published survey results
- identify innovative and emerging technologies in the focus area industry
- explore entry level training requirements for the focus area industry
- investigate focus area industry careers

Module 5: Information Processes and Technology

Module description

This module provides opportunities for students to engage in the study of information processes and technology and the roles of information systems in society. They will gain an appreciation of the nature of information technology, its ethical use and its impact on many aspects of life. Practical skills are developed in using information processes and technology to address needs.

Objective 1

Students will develop knowledge and understanding of a design process.

Outcomes

IPTLS1 recognises that a process is used to develop information systems
IPTLS2 explores factors that influence the design of information systems

Content

Students:

- identify steps in a design process of an information system including:
 - identifying a need/problem and user(s)
 - defining the requirements
 - exploring ideas
 - choosing a preferred idea (making decisions)
 - developing a project plan for producing the design project
 - selecting tools and equipment
 - producing the design project
 - testing and evaluating the design project
 - compiling a design portfolio of the steps during a design process
- explore factors that influence the design and making of an information system such as:
 - information technology
 - function (specific purpose)
 - environment
 - cost
 - available resources (skills, tools, materials, time and cost)
 - environmental impact (resources used, waste products)
- explore how features of a product meet an identified need, such as:
 - function
 - materials
 - ergonomics
 - cost
 - security
 - maintenance
 - safety
 - training.

Objective 2

Students will develop knowledge and skills in a range of technologies for a variety of purposes and in the production of a design project.

Outcomes

- IPTLS3 demonstrates awareness that technology can be used for a variety of purposes in the design of information systems
- IPTLS4 demonstrates skills and techniques in the context of an information systems project
- IPTLS5 uses a design process in the production of an information systems project

Content

Students:

- recognise the purpose of a range of information systems
- recognise the use of technology in the design of a range of information systems
- engage in a design process to produce an information system
 - use identified area of need or problem to generate an idea
 - define the requirements
 - research/explore idea
 - make decisions
 - develop a project plan
 - select tools and equipment for information processes
 - test and evaluate the design solution
- demonstrates team work skills, for example:
 - listening
 - cooperation
 - shared responsibilities
 - task allocation
 - problem-solving
 - decision-making
- use techniques to communicate during a design process such as:
 - individual communication form or system
 - pictures/photographs
 - reports
 - charts
 - journals
 - diagrams
 - videos
 - computer graphics
 - discussions
 - object drawing
 - Computer Aided Design
 - written communication
- use a design portfolio to document the steps during a design process.

Objective 3

Students will develop knowledge and understanding of the functional requirements of information systems for a range of applications

Outcomes

IPTLS6 explores a range of information systems technology

IPTLS7 evaluates the suitability of information technology for a range of applications

Content

Students:

- explore a range of information systems such as:
 - personal (databases, word prediction software, speech-generating devices, screen-reading software)
 - group (school records, booking systems)
- identify a range of information systems used for daily living such as:
 - communication (mobile phones, speech generating devices, email)
 - transaction processing (online shopping or payment of bills, EFTPOS, borrowing library books)
 - information and decision support (internet sites)
 - multimedia (eg YouTube, Facebook)
- identify a range of information systems used in the workplace such as:
 - communication (fax, teleconferencing, videoconferencing)
 - manufacturing (assembly line)
 - manage information (database to record work hours)
- identify the end-users of a variety of information systems
- recognise information systems as a set of information processes requiring participants, users, data/information and information technology
- identify the environment, purpose, participants and users for a range of information systems
- identify data represented in a digital format such as:
 - online newspapers
 - digital photos
 - digital video
- explore information systems with a range of purposes, such as to:
 - communicate
 - process transactions
 - provide users with information
 - help with decision-making
 - manage information
 - automate a manufacturing process
- use a range of information systems

- identify information processes:
 - collecting
 - organising
 - analysing
 - storing and retrieving
 - processing
 - transmitting/receiving
 - displaying
- identify tools for collecting information such as:
 - hardware (scanner, digital camera, microphone, video, keyboard, speech input)
 - software (internet, online form, database)
 - non-computer-based (forms, interviews, tallying)
- identify the digital form of data collected using a range of hardware such as:
 - images
 - audio
 - video
 - text
 - numeric
- identify tools for organising information, for example:
 - software (word processing and desktop publishing, paint and draw, animation software, spreadsheets, software changing from one format to another)
 - non-computer based (forms, tallying)
- identify a range of computer and non-computer tools for analysing information such as:
 - hardware (storage space for fast processing)
 - software (spreadsheet and data management software for sorting, searching/selecting data, charting and graphing)
 - non-computer-based (searching manual filing systems)
- identify a range of computer and non-computer tools for storing and retrieving data, for example:
 - software (file management software, database management systems, internet browser)
 - non-computer-based (paper-based, libraries)
- recognise the role of hardware in efficient transmitting, receiving and processing such as:
 - RAM capacity
 - large storage capacity
 - fast processing speed
- identify a range of non-computer tools for displaying information and data such as:
 - storyboarding
 - pen and paper
 - posters
- explore a range of hardware for displaying information such as:
 - screens

- printers
- speakers and speech-generating devices
- digital and analogue for video.

Objective 4

Students will apply knowledge and understanding of the nature and performance of information systems.

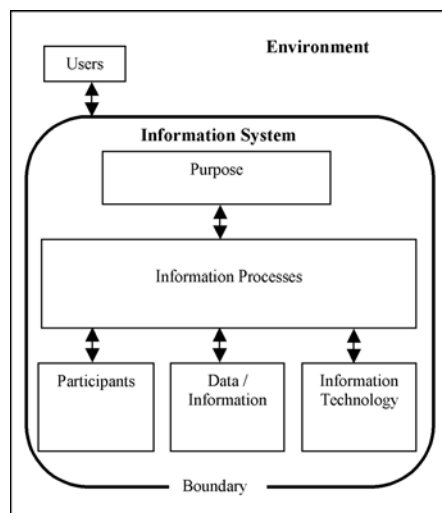
Outcomes

- IPTLS8 demonstrates knowledge and understanding of information processes within information systems
- IPTLS9 demonstrates knowledge and understanding of the relationship between information processes

Content

Students:

- identify the information processes within an information system including:
 - collecting
 - organising
 - analysing
 - storing and retrieving
 - transmitting and receiving
 - displaying
- recognise data as image, audio, video, text and or numbers
- recognise uses for digital data such as:
 - newspapers on the internet
 - telephone system
 - video on DVD
 - facsimile
- recognise the relationship between the information process within an information system (see diagram below).



Objective 5

Students will develop skills in the selection and use of tools and processes to produce and care for an information system for an identified need.

Outcomes

- IPTLS10 selects and uses appropriate technology for information processes
IPTLS11 selects and uses appropriate tools and techniques in using and caring for information systems
IPTLS12 demonstrates safe practices in the use of information systems technology

Content

Students:

- use a range of technology for a variety of purposes such as:
 - personal
 - social
 - recreational
 - vocational
- identify data to be collected
- collect information using appropriate tools
- identify an appropriate format for organising a set of data such as:
 - alphabetic
 - date
- use a variety of software to organise information such as:
 - word processing
 - desktop publishing
 - spreadsheets
- analyse information using software analysis features
 - eg – searching/selecting data
 - sorting
 - charts/graphs
 - modelling/simulations
- use hardware and associated software to store and retrieve information/data such as:
 - network
 - flash device
 - hard disk
- edit information/data using appropriate software
 - eg – edit video data using animation software
 - edit audio data using mixing software
 - edit text data using word processing software, desktop publishing software
 - edit numeric software using spreadsheets and database management systems
 - edit image data using paint and draw, animation software
- send data or information using a range of communication packages

- eg – send a fax from a computer to a fax machine
 - send an email with an attachment
- use non-computer tools to send information such as:
 - telephone
 - radio
- compare and contrast a range of communication systems
- format a text document using appropriate:
 - fonts
 - spacing
 - layout
- design and develop a simple web page
- undertake a mail merge from a database
- identify risk factors when using information technology
 - privacy
 - security
 - accuracy of data
 - potential loss of data
 - power surges
 - ergonomics
 - workplace issues
- apply OHS requirements
 - eg – use equipment in accordance with design and instructions
 - use safe work practices
 - undertake risk management.

Objective 6

Students will develop an appreciation of social and ethical issues and the significance of information systems in society.

Outcomes

IPTLS13 identifies and explores relationships between information systems, the individual, society, and the environment

Content

Students:

- explore the impact of information systems on the environment
- investigate the impact of rapid changes in technology on society
- investigate the changes to an industry (eg manufacturing) due to increasing use of technology
- investigate appropriate displays for particular audiences such as:
 - people with vision impairments
 - children
- identify social and ethical issues arising from the processing of information such as:
 - privacy of the individual
 - security of data and information
 - accuracy of data and information
 - data quality
 - the changing nature of work
 - appropriate use of information
 - health and safety
 - copyright laws
- identify innovative and emerging technologies in information technology systems
- explore the effect of communication technology on interpersonal relationships
- use communication skills and cooperative work practices in the production of an information systems project
- recognise the need for responsible use of information technology
- investigate information technology industry careers.

Module 6: Textiles and Design

Module description

This module provides opportunities for students to engage in a design process in developing a design project. Practical skills are developed in the design, selection, production, evaluation and care of textiles in the context of a design project.

Design projects should be selected from one or more of the following focus areas:

- apparel
- furnishings
- costume
- textile arts
- non-apparel.

Objective 1

Students will develop knowledge and understanding of a design process.

Outcomes

TDLS1 recognises that a process is used to develop textile design solutions

TDLS2 explores factors that influence textile design

Content

Students:

- identify steps in a design process including:
 - identifying a need or inspiration
 - exploring ideas
 - choosing a preferred idea
 - planning steps for producing the design project
 - selecting tools, equipment and materials
 - producing the design project
 - evaluating the design project
 - compiling a design portfolio of the steps during a design process
- explore factors that influence the design and making of a textile project such as:
 - function (specific purpose)
 - aesthetics (enhancing the appearance of the design)
 - available resources (skills, tools, materials, time and cost)
 - environmental impact (resources used, waste products)
- identify the requirements of a textile item to meet an identified need, for example:
 - an oven mitt needs to be heat resistant, easy to wash, easy to use, fit a range of hand sizes
 - a swimming costume needs to be quick drying, non-transparent, comfortable, attractive
 - an apron for domestic purposes needs to be durable, non-flammable and easy to clean and an apron for industry purposes needs to meet industry standards.

Objective 2

Students will develop knowledge and skills in a range of technologies for a variety of purposes and in the production of a design project.

Outcomes

- TDLS3 demonstrates awareness that technology can be used for a variety of purposes in a textile design process
- TDLS4 demonstrates skills and techniques in the context of a textile project
- TDLS5 uses a design process in the production of a textiles project

Content

Students:

- recognise the use of technology in the design of a range of textile items such as:
 - marking and measuring tools, Computer Aided Design (tools and machinery)
 - sketching, modelling, proto-typing (techniques)

- recognise the use of technology in the production of a textiles project such as:
 - manual sewing machine, computerised sewing machine, overlocker (tools and machinery)
 - cutting, gluing, stitching, hemming, overlocking, felting, quilting, patchworking, fabric decoration techniques (eg beading, embroidering) (techniques)

- engage in a design process to produce a textiles project:
 - use an inspiration or an identified area of need to generate an idea
 - research areas of inspiration or need
 - develop ideas
 - use gathered information to refine ideas
 - experiment by testing ideas and selected techniques
 - determine solutions
 - make item
 - evaluate item against intended use

- use techniques to communicate during a design process such as:
 - individual communication form or system
 - pictures/photographs
 - videos
 - samples
 - computer graphics
 - discussions
 - object drawing
 - fashion drawing
 - Computer Aided Design
 - written communication

- use a portfolio to document the steps during a design process.

Objective 3

Students will develop knowledge and understanding of the functional and aesthetic requirements of textiles for a range of applications.

Outcomes

TDLS6 explores a range of textiles and their features

TDLS7 identifies textiles for a range of applications

TDLS8 evaluates the suitability of textile features for a range of applications

Content

Students:

- identify features of fibres and yarns such as:
 - texture
 - strength
 - length
 - twist

- select textiles for their function such as:
 - comfort (including absorbency)
 - colour in a safety uniform
 - durability (including strength and abrasion resistance)

- select textiles for their aesthetics such as:
 - lustre
 - surface enhancement
 - texture
 - vertical and horizontal lines/fabric prints
 - resistance to fading, pilling

- consider the influence of function in the design of a range of textile items such as:
 - weather (raincoat)
 - age (soft furnishings)
 - safety (protective clothing)
 - occasion (theatrical costume)

- consider the influence of aesthetics in the design of a range of textile items such as:
 - elements of design (line and direction, shape and size, colour, texture)
 - principles of design (emphasis and proportion)

- experiment with textile features for an intended use

- examine factors determining appropriate design features for a range of applications such as:
 - colour
 - manufacturing techniques
 - application of decoration

- identify features of textiles suitable for personal use and individual body shapes such as:
 - colour combinations

- style
 - activity
 - occasion
 - protection
-
- applies knowledge of textiles to personal decision-making.

Objective 4

Students will apply knowledge and understanding of the properties and performance of textiles.

Outcomes

TLS9 selects fabrics, yarns and fibres for a specific purpose

Content

Students:

- recognise common types of fibres and fabrics such as:
 - calico (fabric)
 - wool (natural fibre)
 - polyester (man-made fibre)
 - cotton/polyester sheeting (natural fibre/man-made fibre)
 - denim (fabric)
 - fleecy knit (fabric)
 - felt (fabric)
- recognise differences between fibres, yarns and fabrics
- select fabrics for intended uses such as:
 - fabrics commonly used in clothing and household items
 - fabrics commonly used in industry or commercial applications
- select fibres and yarns for intended uses such as:
 - yarns for knitting a piece of clothing
 - yarns for weaving a fabric
 - fibres for wadding in a cushion
 - fibres for spinning into a yarn
- identify features of fabrics that affect their intended use such as:
 - absorbency
 - strength
 - flammability
 - ease of care
 - durability
 - texture/feel
 - stability, woven or knitted (stretch)
- select fabrics according to their features and intended use
- research the production of a natural and/or man-made fibre, and its properties for an intended use such as:
 - wool, from sheep to end use
 - cotton, from plant to end use
 - hemp, from plant to end use
 - polyester, from chemicals to end use.

Objective 5

Students will develop skills in the selection and use of textile materials, equipment and techniques to produce and care for textile items.

Outcomes

- TLS10 selects and uses appropriate materials, equipment and techniques in producing textile items
- TLS11 selects and uses appropriate equipment and techniques in caring for textile items
- TLS12 demonstrates safe practices in the use of equipment

Content

Students:

- identify textile equipment and the characteristics that could make them dangerous such as:
 - scissors (sharpness)
 - iron (temperature)
 - sewing machine (electrical connections, weight)
- carry and transfer textiles equipment safely
 - eg – pass scissors
 - handle pins and needles
 - carry a heavy sewing machine
 - handle an iron
- care for textile items by using suitable laundering and cleaning techniques
 - eg – hand wash
 - machine wash
 - dry
 - dry clean
 - steam
 - press
- repair a textile item
 - eg – sew on buttons
 - mend a hem
 - darn holes in a garment
 - use patches and glues
- use equipment to clean and care for a variety of textiles
 - eg – recognise clothes, home furnishings and floor coverings that require cleaning and care
 - identify appropriate cleaning and care techniques for clothing, home furnishings and floor coverings
 - identify and interpret symbols and directions on care labels
 - use washing machines, clothes dryers and irons in accordance with the care label instructions
- use a range of appliances, equipment and cleaning products safely and appropriately

- eg – clean lint filter and ensure appropriate ventilation before using a washing machine or clothes dryer
- select correct temperature
- set controls
- demonstrate safe ironing techniques
 - adjust ironing board to correct height
 - iron at correct temperature
 - turn off iron when not in use
- use and care for textiles equipment and appliances appropriately and safely:
 - in accordance with design and manufacturers' instructions
 - identifying maintenance and repair requiring professional attention
- store equipment appropriately
 - eg – returning pins and needles to containers
- select and use appropriate equipment to produce a textile project
- use safe techniques in the context of a textile project
 - eg – apply safe cutting out procedures
 - cut out on a flat surface
 - ensure fabric scissors are used
 - check pattern layout before cutting
 - use safe sewing machine techniques
 - thread machine before making electrical connection
 - refrain from sewing over pins
 - raise machine foot and needle before removing fabric from machine
- use appropriate material and techniques to produce a textile item
 - eg – choose fabric, threads and any fasteners such as buttons or studs
 - measure and cut fabric
 - cut out fabric to a pattern
 - secure/pin correct fabric pieces together
 - use hand or machine sewing to assemble pieces
 - finish stitch to secure
 - press item.

Objective 6

Students will develop an appreciation of the significance of textiles in society.

Outcomes

TLS13 identifies and explores factors that contribute to the quality and value of textiles in society

Content

Students:

- recognise influences on the quality of textiles such as:
 - design
 - fabric quality
 - quality of manufacture
 - cost
 - availability of resources

- recognise factors contributing to the value of textiles such as:
 - uniqueness
 - heritage
 - handcrafted
 - designer label
 - culture
 - religion
 - social significance

- identify the influence of marketing and trends on selection of textile items such as:
 - types of advertising
 - peer influence
 - shopping environments
 - labels and brand names

- investigate the influence of culture on the design and production of textiles such as:
 - self-expression and communication between people
 - textile art forms
 - religious practices
 - resources available
 - equipment used
 - geographic location

- research the work of a designer from one or more of the following:
 - apparel designers
 - interior designers
 - costume designers
 - textile art designers
 - non-apparel designers

- identify sources of inspiration for designers

- identify the factors that determine the success or failure of designers

- explore changing fashion trends in society
- visit or undertake a virtual tour of a textile manufacturer
- identify the impact of textile design and manufacturing on, for example:
 - individual decision-making
 - the industry (employment, skills, imports/exports)
 - the environment
- identify innovative and emerging technologies in the manufacture of textiles.

11 Employability Skills

The employability skills build on and replace the Mayer key competencies (developed in 1992) which attempted to describe generic competencies for effective participation in work.

The Business Council of Australia (BCA) and the Australian Chamber of Commerce and Industry (ACCI), in consultation with other peak employer bodies, produced the *Employability Skills for the Future* report which was officially released in May 2002. The report indicated that business and industry required a broader range of skills than those in the Mayer Key Competencies Framework and recommended the following eight employability skills:

- communication
- teamwork
- problem-solving
- initiative and enterprise
- planning and organising
- self-management
- learning
- technology.

These employability skills are developed through the objectives, modules, outcomes and content of each of the Stage 6 Technology Life Skills courses, in ways which address individual student needs. The development of employability skills may also contribute to effective participation in other post-school environments, such as further education and community living.

12 Assessment and Reporting

12.1 Assessment

Assessment involves collecting evidence and reflecting on the student's achievement in relation to the Life Skills outcomes selected for a particular course.

The content points listed with each outcome not only form the basis of the learning opportunities for students, but also provide opportunities for teachers to make judgements about student achievement in relation to outcomes.

Assessment should take account of the individual ways in which students demonstrate achievement in relation to outcomes. To cater for such individuality, a range of assessment strategies should be used. Such assessment strategies may include:

- observation of engagement in learning experiences such as:
 - design creation and development activities
 - practical tasks
 - selecting and using technology
 - group work
 - discussions
 - observation of a physical response
- responses using augmentative and alternate communication (AAC) systems
- responses using assistive technology
- videos and photographs
- interviews and role-plays
- investigations
- class debates
- visual displays
- exhibitions
- oral/written reports
- presentations including oral, PowerPoint, multimedia
- completed design projects
- recording of activities and learning in a portfolio, book, diary or journal.

Evidence of achievement in relation to outcomes can be based on ongoing observations during teaching and learning or from assessment tasks specifically designed to assess individual student achievement at particular points.

Students may demonstrate the achievement of outcomes across a range of situations or environments including the school, home, community and workplace. Assessment should reflect the student's ability to generalise the knowledge, skills, and values and attitudes to a range of environments. Stage 6 Life Skills courses have no HSC examinations and results cannot be used in the calculation of a student's ATAR.

Students entered for Stage 6 Life Skills courses may achieve the designated outcomes independently or with support. The information following is designed to assist teachers in determining whether outcomes have been 'achieved independently' or 'achieved with support'.

An outcome should be considered as 'achieved independently' if there is evidence that a student can demonstrate the achievement of an outcome either:

- without adjustments
or
- with the adjustments that enable the student to access course work and/or demonstrate achievement during assessment opportunities. These adjustments will have been determined through the collaborative curriculum planning process.

Examples of such adjustments might include:

- the positioning of a student in a classroom
- additional time to communicate
- use of assistive technology
- provision of accessible/alternate formats, eg large print or Braille
- provision of a reader or writer.

Some students will only be able to demonstrate achievement if they are provided with additional support. This type of adjustment is provided when a student requires assistance to demonstrate the achievement of an outcome. In such cases an outcome should be considered as 'achieved with support'.

Examples of additional support include:

- verbal prompts
- visual prompts
- physical assistance
- provision of partial responses.

Provision has been made in the Profile of Student Achievement for teachers to record where an outcome has been achieved independently or with support.

12.2 Reporting

Life Skills courses are reported on the Higher School Certificate Record of Achievement without a mark and with the notation *Refer to the Profile of Student Achievement*.

The Profile of Student Achievement is a permanent record of all Life Skills outcomes achieved by the student during Stage 6 and will be issued by the school before he or she leaves school.

Schools use the profile to report on student achievement of the syllabus outcomes identified in the planning process, indicating whether the student has achieved the designated outcomes independently or with support.

Before the student leaves school, the Profile of Student Achievement is verified by the school principal as a true and accurate record of the Life Skills outcomes demonstrated by the student.

More detailed information on reporting using the Profile of Student Achievement can be found on the Board's website.

13 Glossary

Design	Process that uses a combination of aesthetic and functional components to create solutions for an identified need
Design project	A main learning activity in which a design process is followed and culminates in a design solution and documentation
Emerging technology	The new materials, tools and techniques that are the foundation of new designs
Product	Manufactured goods or items
Renewable	Resources that are able to be replaced within a time span that is relevant to humans
Resource	Something used to achieve a goal or purpose; can be human or non-human
Sustainability	Meeting the needs of the present without making it difficult for future generations to meet their needs, ensuring that the resources used can be replenished
Technology	Incorporates the tools, materials, techniques, design, management and communication strategies to meet identified needs
 <i>Agriculture</i>	
Agriculture	The range of activities aimed at producing food, fibre and other plant and animal derivatives to meet demands of society
Animal production	The raising of animals in order to acquire products used by society, eg raising sheep to produce meat and wool
Enterprise	An agricultural activity aimed at producing a particular commodity, eg the growing of carnations to produce cut flowers
Plant production	The growing of plants in order to acquire products used by society, eg the growing of cotton to be used as fibre for clothing
Seasonal indicators	An aspect of Indigenous knowledge systems (sometimes called Traditional Ecological Knowledge) about the diversity of and interactions between plants, animals, climate, landforms, watercourses and other features of the environment in a given place. Among other things, this knowledge alerts people to the availability of food and medicinal sources
 <i>Food Technology</i>	
Functional properties	A food's functional properties control what happens to it when it is prepared or cooked
Sensory characteristics	Food triggers our senses. Factors such as appearance, odour, taste and texture combine to help us make the decision about whether we want to eat a particular food item.

Industrial Technology

Capacitor	Stores an electric charge
Ferrous metal	A metal which contains iron such as mild steel, tool steel and stainless steel
Isometric drawing	This type of drawing shows more of the top edge of the object
Oblique drawing	This type of drawing is used to show the front view of an object. The oblique lines are usually drawn at 45 degrees to the horizontal
Orthogonal drawing	This type of drawing has a number of 2D views. The drawing contains details such as dimensions, materials to be used, construction
Non-ferrous metal	A metal which does not contain iron, eg aluminium, copper
Perspective drawing	This type of drawing is based on the fact that lines appear to converge and meet at a vanishing point
Pictorial drawing	This type of drawing shows three dimensions from one view. There are three types of pictorial drawings: isometric, oblique and perspective
Resistor	Controls the current in a circuit
Schematic diagrams	Circuit designs and other systems can be drawn diagrammatically using standard symbols to represent components
Soldering	Joining metals by melting a non-ferrous alloy into the parts of the join. The chemical used to provide a good bond between the solder and the metal is called 'flux'
Welding	Joining pieces of metal by melting the ends of them and providing a molten pool of metal at the join

Information Processes and Technology

Data	The raw material used by information processes
Display	Used in a broad sense to include all output from an information system. Includes printed, video and audio output and electronic signals that control a device
Environment	Everything that influences and is influenced by the information system
Information	The output displayed by an information system
Information processes	<p>Computer-based and non-computer-based activities such as:</p> <ul style="list-style-type: none"> • collecting – the process by which data is entered into or captured by a computer system, including: <ul style="list-style-type: none"> ○ deciding what data is required ○ how it is sourced ○ how it is encoded for entry into the system • organising – the process by which data is structured into a form appropriate for the use of other information processes, such as

	<p>the format in which data will be represented</p> <ul style="list-style-type: none"> • analysing – the process by which data is interpreted, transforming it into information • storing and retrieving – the process by which data and information is saved and later accessed • processing – a procedure that manipulates data and information • transmitting and receiving – the process that sends and receives data and information within and beyond information systems • displaying – the process that controls the format of information presented to the participant or user
Information system	A set of information processes, requiring participants, data/information and information technology, which is built to satisfy a purpose
Information technology	Hardware and software used in information processes
Internet	A network of computers around the world
Participant	A class of user who carries out the information processes within an information system
Purpose	A statement identifying who the information system is for and what it is intended to achieve
Users	People who use information systems to carry out tasks within an organisation

Textiles and Design

Abrasion resistance	Ability to withstand rubbing or wear-and-tear
Aesthetics	Design that enhances appearance for a specific purpose
Apparel	An item that can be worn, is functional and can be easily cleaned
Costume	Clothing related to a particular culture, historical period or occasion, eg for a dance, party or theatre performance
Fibre	Fine threadlike, with a length at least one hundred times greater than the width
Furnishings	Textile items for the interior of the home, office or boat. Examples include cushions, bed linen, curtains
Non-apparel	Textile items that are functional, eg tents, sleeping bags, toys, umbrella
Stability	Inability to shrink or stretch
Textile arts	Textile item that is highly decorative: wall-hanging, cushions, wearable art