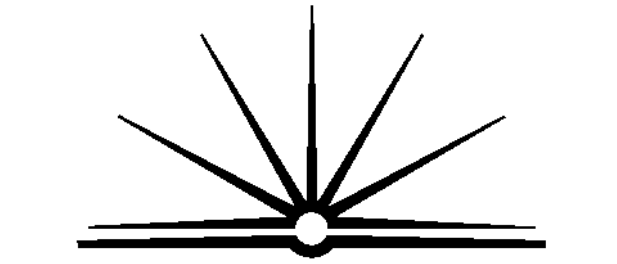

Food Technology

Stage 6
Syllabus

Amendments
2009

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Contents

1 The Higher School Certificate Program of Study

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

- provide a curriculum structure that 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 Food Technology in the Stage 6 Curriculum

For the purposes of the *Food Technology Stage 6 Syllabus*, food technology refers to knowledge and activities that relate to meeting food needs and wants. The provision and consumption of food are significant activities of human endeavour, with vast resources being expended across domestic, commercial and industrial settings. Food issues have a constant relevance to life. This concept underpins the subject and is reflected throughout the Preliminary and HSC courses.

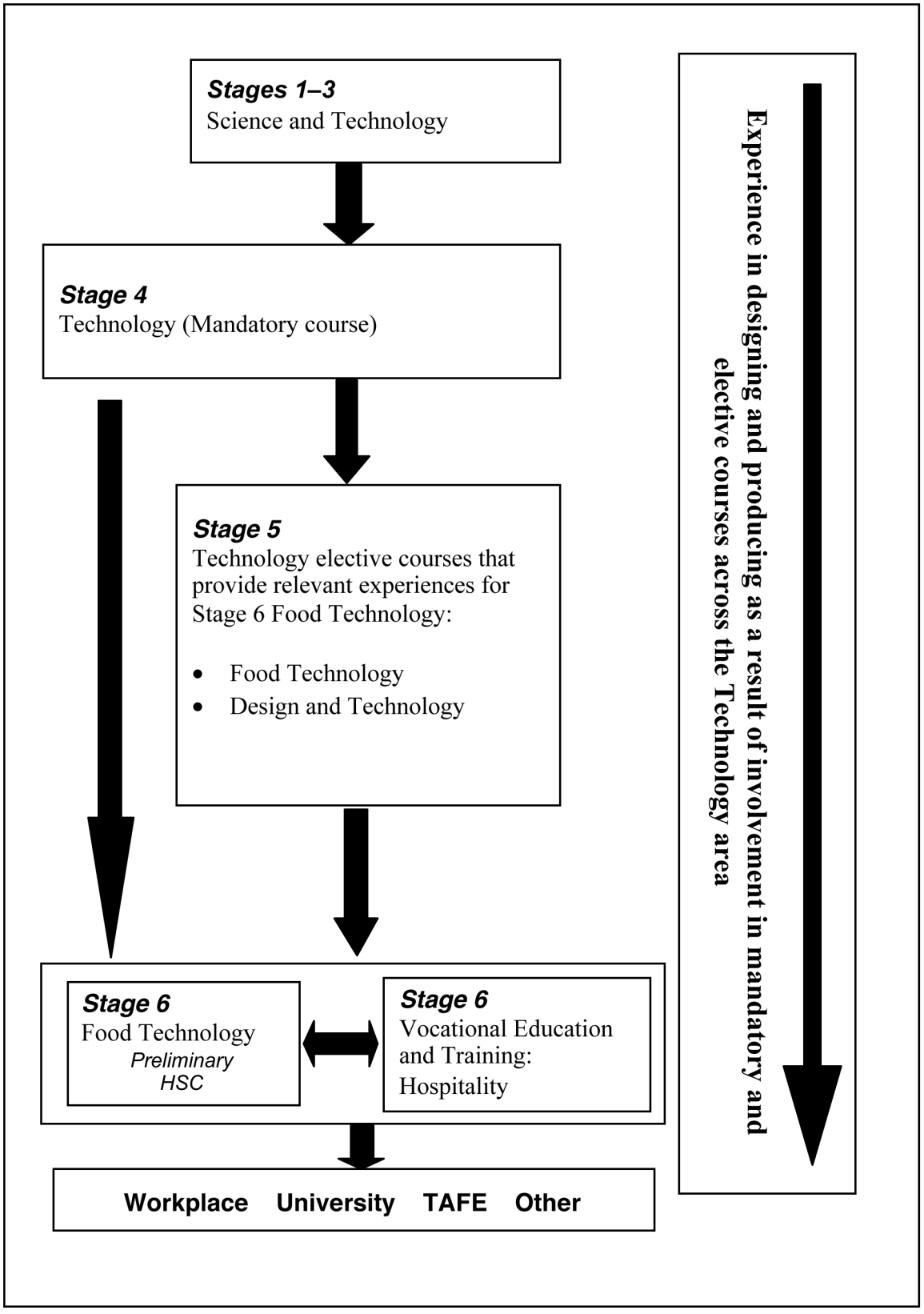
The syllabus provides students with a broad knowledge of food technology. The factors that influence food availability and selection are examined and current food consumption patterns in Australia investigated. Food handling is addressed with emphasis on ensuring safety and managing the sensory characteristics and functional properties of food to produce a quality product. The role of nutrition in contributing to the health of the individual and the social and economic future of Australia is explored. The structure of the Australian food industry is outlined and the operations of one organisation investigated. Production and processing practices are examined and their impact evaluated. The activities that support food product development are identified and the process applied in the development of a food product. Contemporary nutrition issues are raised, investigated and debated. This knowledge enables students to make informed responses to changes in the production to consumption continuum and exert an influence on future developments in the food industry as educated citizens and in their future careers.

Opportunities exist for students to develop skills relating to food that are relevant and transferable to other settings. Such skills include the ability to research, analyse and communicate. Students also develop the capability and competence to experiment with and prepare food as well as design, implement and evaluate solutions to a range of food situations.

The syllabus is inclusive of the needs, interests and aspirations of both genders and provides opportunities and challenges for students of all abilities to deal with food products and systems. In order to be a relevant and meaningful learning experience, which fully extends students' understanding and application of food technology, programs developed from this syllabus must take into consideration the life experiences, values, learning styles and characteristics of both male and female students. The knowledge, skills and attitudes gained during the course will have applications to, and provide benefits for, both vocational and general life experiences.

With the knowledge, skills and attitudes gained through the study of this syllabus, young men and women will have the potential to contribute positively to their own future and to the social, economic and ecological future of Australia.

3 Continuum of Learning for Food Technology Stage 6 Students



4 Aim

Food Technology Stage 6 aims to develop an understanding about food systems and skills that enable students to make informed decisions and carry out responsible actions. Students will also develop an appreciation of the importance of food to the wellbeing of the individual and to the social and economic future of Australia.

5 Objectives

Students will develop:

1. knowledge and understanding about food systems in the production, processing and consumption of food and an appreciation of their impact on society

2. knowledge and understanding about the nature of food and human nutrition and an appreciation of the importance of food to health

3. skills in researching, analysing and communicating food issues

4. skills in experimenting with and preparing food by applying theoretical concepts

5. skills in designing, implementing and evaluating solutions to food situations.

6 Course Structure

The following schematic diagram provides an overview of the arrangement of components in the Preliminary course and HSC course for Stage 6 Food Technology.

Preliminary Course	HSC Course
Core strands (100% total)	**Core strands (100% total)**
Food Availability and Selection (30%) • Influences on food availability • Factors affecting food selection	**The Australian Food Industry (25%)** • Sectors of the AFI • Aspects of the AFI • Policy and legislation
	Food Manufacture (25%) • Production and processing of food • Preservation • Packaging, storage and distribution
Food Quality (40%) • Safe storage of food • Safe preparation and presentation of food • Sensory characteristics of food • Functional properties of food	**Food Product Development (25%)** • Factors which impact on food product development • Reasons for and types of food product development • Steps in food product development • Marketing plans
Nutrition (30%) • Food nutrients • Diets for optimum nutrition	**Contemporary Nutrition Issues (25%)** • Diet and health in Australia • Influences on nutritional status

7 Objectives and Outcomes

7.1 Table of Objectives and Outcomes

Objectives	Preliminary Outcomes	HSC Outcomes
Students will develop: 1. knowledge and understanding about food systems in the production, processing and consumption of food and an appreciation of their impact on society	A student: P 1.1 identifies and discusses a range of historical and contemporary factors which influence the availability of particular foods P 1.2 accounts for individual and group food selection patterns in terms of physiological, psychological, social and economic factors	A student: H1.1 explains manufacturing processes and technologies used in the production of food products H1.2 examines the nature and extent of the Australian food industry H1.3 justifies processes of food product development and manufacture in terms of market, technological and environmental considerations H1.4 evaluates the impact of the operation of an organisation within the Australian Food Industry on the individual, society and environment
2. knowledge and understanding about the nature of food, human nutrition and an appreciation of the importance of food to health	P 2.1 explains the role of food nutrients in human nutrition P 2.2 identifies and explains the sensory characteristics and functional properties of food	H2.1 evaluates the relationship between food, its production, consumption, promotion and health
3. skills in researching, analysing and communicating food issues	P 3.1 assesses the nutrient value of meals/diets for particular individuals and groups P 3.2 presents ideas in written, graphic and oral form using computer software where appropriate.	H3.1 investigates operations of one organisation within the Australian food industry H3.2 independently investigates contemporary nutrition issues
4. skills in experimenting with and preparing food by applying theoretical concepts	P4.1 selects appropriate equipment, applies suitable techniques, and utilises safe and hygienic practices when handling food P4.2 plans, prepares and presents foods which reflect a range of the influences on food selection P4.3 selects foods, plans and prepares meals/diets to achieve optimum nutrition for individuals and groups P4.4 applies an understanding of the sensory characteristics and functional properties of food to the preparation of food products	H4.1 develops, prepares and presents food using product development processes H4.2 applies principles of food preservation to extend the life of food and maintain safety
5. skills in designing implementing and evaluating solutions to food situations	P 5.1 generates ideas and develops solutions to a range of food situations	H5.1 develops, realises and evaluates solutions to a range of food situations

7.2 Key Competencies

Food Technology Stage 6 provides a context within which to develop general competencies essential for students to become effective learners and make a positive contribution to their community.

During the course students learn to:

- source, select and sequence information about food issues developing competence in collecting, analysing and organising information
- debate, describe, discuss and explain food issues in written, graphic and oral form, developing competency in communicating ideas and information
- plan, prepare and present foods and meals to meet a range of needs developing competence in planning and organising activities
- cooperate with individuals and groups developing competence in working with others and teams
- design, implement and evaluate solutions to food situations, developing competence in solving problems
- evaluate the nutritional requirements and assess the nutritional value of meals/diets for individuals and groups, developing competence in using mathematical ideas and techniques
- experiment with and prepare foods using appropriate materials and equipment developing competence in using technology.

The course structure and pedagogy provide extensive opportunities to develop the key competencies.

8 Content: Food Technology Stage 6 Preliminary Course

8.1 Food Availability and Selection

Communities endeavour to obtain an adequate supply of food. Throughout human history, the availability of food has been determined by local and/or external influences. Selection of food is influenced by physiological and psychological factors as well as broader social and economic factors.

Outcomes

A student:

P1.1 identifies and discusses a range of historical and contemporary factors which influence the availability of particular foods

P1.2 accounts for individual and group food selection patterns in terms of physiological, psychological, social and economic factors

P4.2 plans, prepares and presents foods which reflect a range of the influences on food selection.

Students learn about:	Students learn to:
Influences on food availability • historical changes to the availability of food, including: – global migration of cultural groups – use of foods native to Australia • technological developments influential on food availability, including: – production and manufacturing processes and equipment techniques – storage and distribution techniques – marketplace practices • social, economic and political influences on food availability, including: – effects of poverty and affluence – type and state of the economy – government policy, eg taxation, embargoes, subsidies, war, export strategies	• outline the historical changes to food availability in Australia • debate the issue of social justice in relation to food consumption in developed and developing regions of the world
Factors affecting food selection • physiological factors, including: – hunger, appetite, satiety – nutritional requirements, eg age, gender, size, activity level – reactions to food, eg appearance, odour, taste, allergy – psychological factors, including: – values, beliefs, habits, attitudes, emotions, self-concept, experiences • social factors, including: – traditions and culture – lifestyle, eg employment, education, household structures, roles, geographic location, interests – social interaction, eg peer group, family hospitality – media • economic factors, including: – the marketplace (retail and purchasing practices) – resource availability such as food processing equipment and food preparation skills – occupation and finances	• explain how various factors influence selection of food by individuals and groups • prepare foods that reflect various factors influencing food selection • investigate current food consumption and expenditure patterns in Australia • analyse the eating patterns of a selected group to identify influences on food selection

8.2 Food Quality

Quality food products result from safe and hygienic handling of food in domestic, commercial and industrial settings. The sensory characteristics and functional properties of food determine the most appropriate storage, preparation and presentation techniques used.

Outcomes

A student:

P2.2 identifies and explains the sensory characteristics and functional properties of food

P3.2 presents ideas in written, graphic and oral form using computer software where appropriate

P4.1 selects appropriate equipment, applies suitable techniques and utilises safe and hygienic practices when handling food

P4.4 applies an understanding of the sensory characteristics and functional properties of food to the preparation of food products.

Students learn about:	Students learn to:
Safe storage of food • methods of storing foods to maintain quality such as dry storage, cold storage and freezing	• describe methods of storing foods to maintain sensory characteristics and ensure safety
Safe preparation and presentation of food • equipment and utensils to produce quality food products across a range of settings	• select appropriate equipment and utensils to produce quality food products across a range of settings
• safe and hygienic work practices when handling food	• implement safe and hygienic work practices when handling food
• preparation methods to produce food products across a range of settings	• select and apply suitable preparation methods to produce quality food products and plate meals for service across a range of settings
• layout of food for visual appeal, including styling for photography and plating for service	• style foods for photography
Sensory characteristics of food • sensory characteristics of foods, including appearance, odour, taste (flavour) and texture (mouth feel)	• identify sensory characteristics that constitute quality in a variety of foods
• sensory assessment of a variety of foods	• evaluate the appeal of foods using sensory assessment
Functional properties of food • functional properties of food, including: – the role of proteins in denaturing, coagulation, gelation, foaming and browning – the role of carbohydrates in gelatinising, dextrinising, caramelising and crystallising – the role of fats in emulsifying and aerating	• explain some of the functional properties of food • identify the factors that affect the functional properties of food
• factors that affect the functional properties of food, including: – oxygen – temperature – acidity – agitation – enzymes – addition of other ingredients	• investigate through experimentation the factors that affect the functional properties of foods • prepare a range of foods which demonstrate the functional properties of food

8.3 Nutrition

Nutrition is a significant factor contributing to the health of the individual and to the economic and social future of the people of Australia. Planning diets to meet the requirements of particular individuals, preparing foods that are nutritious and assessing the nutritional value of products requires knowledge of nutrition and skills in food preparation.

Outcomes

A student:

P2.1 explains the role of food nutrients in human nutrition

P3.1 assesses the nutrient value of meals/diets for particular individuals and groups

P3.2 presents ideas in written, graphic and oral form using computer software where appropriate

P4.3 selects foods, plans and prepares meals/diets to achieve optimum nutrition for individuals and groups

P5.1 generates ideas and develops solutions to a range of food situations.

Students learn about:	Students learn to:
Food nutrients	
• food nutrients: carbohydrates, proteins, lipids, vitamins, minerals and water	• identify food nutrients
• structure of carbohydrates, proteins and lipids	• identify types of carbohydrates, proteins, lipids and vitamins
• sources of carbohydrates, proteins, lipids, vitamins, minerals and water	• identify the nutrient composition of various foods
• functions of carbohydrates, proteins, lipids, vitamins, minerals and water in the body	• explain the functions of food nutrients in human nutrition
• significant interrelationships between nutrients, including: – iron and vitamin C – iron and fibre – calcium and phosphorous – calcium and vitamin D – calcium and fibre – calcium and lactose – folate and vitamin B12 – sodium and potassium	• combine foods to demonstrate nutritionally beneficial interrelationships between foods
• digestion, absorption and metabolism of food	• describe the process of digestion, absorption and metabolism of food
Diets for optimum nutrition	
• nutritional requirements throughout the life cycle	• investigate the recommended dietary intake of energy, protein, vitamins and minerals for particular individuals and groups using appropriate data such as RDI tables in print or electronic format
• current food selection guides and nutritional information that assist in planning and evaluating meals/diets	• select foods to provide a balanced intake of nutrients for particular individuals and groups to meet a variety of nutritional needs
• preparation techniques to produce nutritious foods	• use suitable preparation methods to optimise the nutritional value of foods • assess meals/diets in regard to meeting nutritional needs throughout the life cycle • plan, prepare, present and evaluate meals/diets that address the needs for optimal nutrition throughout the life cycle

9 Content: Food Technology Stage 6 HSC Course

9.1 The Australian Food Industry

The Australian food industry has developed in response to changes in our physical, social, technological, economic and political environment. This is evident in the structure, operations and products of the Australian food industry. The industry contributes significantly to the gross domestic product and is a major employer.

Outcomes

A student:

H1.2 examines the nature and extent of the Australian food industry

H1.4 evaluates the impact of the operation of an organisation within the Australian food industry on the individual, society and environment

H3.1 investigates operations of one organisation within the Australian food industry.

Students learn about:	Students learn to:
Sectors of the Australian food industry • sectors of the agri-food chain in the Australian food industry, including agriculture and fisheries, food processing/manufacturing, food service and catering, food retail	• identify sectors within the Australian food industry • plan and prepare foods/meals that reflect sectors of the Australian food industry
• emerging technologies in food production, manufacturing and packaging including biotechnology in genetically modified foods, ecologically sustainable production methods, such as organic farming	• investigate an emerging technology in ONE sector of the Australian food industry • discuss the potential risks and benefits of using emerging technologies in food production and manufacture
Aspects of the Australian food industry • operation of organisations within the Australian food industry with particular attention to: – levels of operation and mechanisation, including household, small business, large companies, multinationals – research and development – quality assurance – consumer influences such as value added foods – impact on the – environment including waste management, packaging practices, production techniques, and transportation – economy, eg generation of profit and changes in employment – society including lifestyle changes, – career opportunities and working conditions	• describe the activities carried out in ONE organisation within the food industry • evaluate the impact of the operation of an organisation on individuals, society and the environment
Policy and legislation • advisory groups that have a role in formulating and implementing policy and legislation • government policies and legislation (local, state, federal) that impact on the Australian food industry including legislative requirements for labelling	• explain career opportunities and working conditions, including gender issues within the Australian food industry • identify significant government policies and legislation and explain their impact upon the Australian food industry

9.2 Food Manufacture

Developments in food manufacture have an impact on society and the environment. A knowledge and understanding of food manufacturing processes informs choices and encourages responsible patterns of consumption.

Outcomes

A student:

H1.1 explains manufacturing processes and technologies used in the production of food products

H4.2 applies principles of food preservation to extend the life of food and maintain safety.

Students learn about:	Students learn to:
Production and processing of food • quality and quantity control in the selection of raw materials for food processing • role of food additives in the manufacturing process • characteristics of equipment used in different types of production and the factors influencing their selection • production systems used in the manufacture of food, eg small scale, large scale, manual, automated, computerised	• describe processes that transform raw materials into manufactured food products • describe the processing techniques, equipment, storage and distribution systems used in industry and compare with those used domestically
• quality management considerations in industrial practices to achieve safe foods for public consumption, eg hazard analysis and critical control point (HACCP); work health and safety and hygiene	• identify critical control points and describe quality control procedures in food production systems • identify food safety hazards and risks
Preservation • reasons for preserving foods, eg safety, acceptability, nutritive value, availability and economic viability • causes of food deterioration and spoilage: – environmental factors (infestation, oxygen, light and water) – enzymatic activity – microbial contamination (mould, yeast and bacteria) • principles behind food preservation techniques, including temperature control and restriction of moisture, exclusion of air and pH • preservation processes, including canning, drying, pasteurising, freezing and fermenting	• prepare food using the principles of food preservation to ensure a safe product
Packaging, storage and distribution • functions of packaging and types of materials available • current developments in packaging, including active packaging; modified atmosphere packaging; sous vide • storage conditions and distribution systems at various stages of food manufacture	• investigate, through experimentation, the suitability of packaging materials for different food products

9.3 Food Product Development

Food product development is an integrated system involving expertise in the fields of marketing and manufacture. The food product development process applies knowledge and skills developed through study of a range of areas, including nutrition, food properties and food manufacture.

Outcomes

A student:

H1.3 justifies processes of food product development and manufacture in terms of market, technological and environmental considerations

H4.1 develops, prepares and presents food using product development processes.

Students learn about:	Students learn to:
Factors which impact on food product development • external factors (macro-environment) that impact on food product development, including the: – economic environment – political environment – ecological environment – technological environment • internal factors (micro-environment) that impact on food product development, including: – personnel expertise – production facilities – financial position – company image	• analyse commercial practices in terms of a food company's response to the macro and micro environments • conduct a SWOT analysis to identify strengths, weaknesses, opportunities and threats
Reasons for and types of food product development • drivers of the development of food products: – market concerns such as health, dietary considerations and the environment – consumer demands such as convenience foods and cost – societal changes including increasing ageing population, single person households and longer working hours – technological developments such as processing equipment and packaging materials – company profitability such as increasing market share • types of food product development: – line extensions – me toos – new to world	
Steps in food product development • design brief based on project aims and development criteria: – idea generation and screening – market research – product specifications – feasibility study – production process development – development of a prototype – testing product prototype, eg sensory evaluation, consumer testing, packaging tests, storage trials	• describe different types of food products on the market • develop a food product that meets a consumer need
Marketing plans • product planning • price structure • place and distribution system • promotional program	• plan suitable strategies for the marketing of a specific food product

9.4 Contemporary Nutrition Issues

The decisions people make have social, economic, health and environmental consequences. Raising, investigating and debating contemporary nutrition issues enable individuals to make informed decisions and respond appropriately.

Outcomes

A student:

H2.1 evaluates the relationship between food, its production, consumption, promotion and health

H3.2 independently investigates contemporary nutrition issues

H5.1 develops, realises and evaluates solutions for a range of food situations.

Students learn about:	Students learn to:
Diet and health in Australia • physical effects and economic costs of malnutrition (under and over nutrition) and diet related disorders • nutritional considerations for specific groups • the role of the individual, community groups, the food industry, government organisations and private agencies in promoting health • the production/manufacture of nutritionally modified foods to meet consumer demand including a range of functional foods such as fortified foods • the role of 'active non-nutrients' in the diet, eg phytochemicals, probiotics and fibre • the role of supplements in the diet	• explain the consequences of malnutrition • independently investigate and report on the health of a group in Australia and develop a strategy to promote optimum health through good nutrition for this group • plan diets and prepare foods/meals to address dietary requirements of specific groups • discuss the relationship between nutritionally modified foods and health • discuss the role of 'active non-nutrients' in the diet • debate the role of dietary supplements in a balanced diet
Influences on nutritional status • health and the role of diet in the development of conditions, including obesity, diabetes, cardiovascular disease, food sensitivity/intolerance/allergies • lifestyle and the effect of cultural and social practices on nutritional status • media and ethical issues related to advertising practices on food consumption such as the promotion of 'health' foods and 'fast' foods	• describe the relationship between nutrient intake and dietary disorders • discuss ethical issues related to the responsible advertising of food products

10 Course Requirements

The *Food Technology Stage 6 Syllabus* includes a Preliminary course of 120 hours (indicative time) and an HSC course of 120 hours (indicative time).

There is no prerequisite study for the Preliminary course. Completion of the Preliminary course is a prerequisite to the study of the HSC course.

In order to meet the course requirements, students must **learn about** food availability and selection, food quality, nutrition, the Australian food industry, food manufacture, food product development and contemporary nutrition issues.

It is a mandatory requirement that students undertake practical activities. Such experiential learning activities are specified in the **learn to** section of each strand.

11 Post-school Opportunities

The study of Food Technology Stage 6 provides students with knowledge, understanding and skills that form a valuable foundation for a range of courses at university and other tertiary institutions.

In addition, the study of Food Technology Stage 6 assists students to prepare for employment and full and active participation as citizens. In particular, there are opportunities for students to gain recognition in vocational education and training. Teachers and students should be aware of these opportunities.

11.1 Recognition of Student Achievement in Vocational Education and Training (VET)

Wherever appropriate, the skills and knowledge acquired by students in their study of HSC courses should be recognised by industry and training organisations. Recognition of student achievement means that students who have satisfactorily completed HSC courses will not be required to repeat their learning in courses in TAFE NSW or other Registered Training Organisations (RTOs).

Registered Training Organisations, such as TAFE NSW, provide industry training and issue qualifications within the Australian Qualifications Framework.

The degree of recognition available to students in each subject is based on the similarity of outcomes between HSC courses and industry training packages endorsed within the Australian Qualifications Framework (AQF). Training packages are documents that link an industry's competency standards to AQF qualifications. More information about industry training packages can be found on the National Training Information Service (NTIS) website (www.ntis.gov.au).

Recognition by TAFE NSW

TAFE NSW conducts courses in a wide range of industry areas, as outlined each year in the TAFE NSW Handbook. Under current arrangements, the recognition available to students of Food Technology in relevant courses conducted by TAFE is described in the HSC/TAFE Credit Transfer Guide. This guide is produced by the Board of Studies and TAFE NSW and is distributed annually to all schools and colleges. Teachers should refer to this guide and be aware of the recognition available to their students through the study of Food Technology Stage 6. This information can be found on the TAFE NSW website (www.tafensw.edu.au/mchoice).

Recognition by other Registered Training Organisations

Students may also negotiate recognition into a training package qualification with another Registered Training Organisation. Each student will need to provide the RTO with evidence of satisfactory achievement in Food Technology Stage 6 so that the degree of recognition available can be determined.

12 Assessment and Reporting

Advice on appropriate assessment practice in relation to the Food Technology syllabus is contained in *Assessment and Reporting in Food Technology Stage 6*. That document provides general advice on assessment in Stage 6 as well as the specific requirements for the Preliminary and HSC courses. The document contains:

- suggested components and weightings for the internal assessment of the Preliminary course
- mandatory components and weightings for the internal assessment of the HSC course
- the HSC examination specifications, which describe the format of the external HSC examination.

The document and other resources and advice related to assessment in Stage 6 Food Technology are available on the Board's website at (www.boardofstudies.nsw.edu.au/syllabus_hsc).