



Year 12 – General Food Science and Technology

This course is developed using the WA Curriculum as a guide. The order of the content and the time in which they are covered are only a guide. Circumstances may result in changes during the year. Kambalda West District High School reserves the right to alter the order the objectives are taught and time over which they are taught.

The Food Science and Technology General course provides opportunities for students to explore and develop food-related interests and skills. Students organise, implement and manage production processes in a range of food environments and understand systems that regulate food availability, safety and quality. Knowledge of the sensory, physical, chemical and functional properties of food is applied in practical situations. Students investigate the food supply chain and value-adding techniques applied to food to meet consumer and producer requirements. Principles of dietary planning, adapting recipes, and processing techniques, are considered for specific nutritional needs of demographic groups. Occupational safety and health requirements, safe food handling practices, and a variety of processing techniques, are implemented to produce safe, quality food products.

Vocabulary & Grammar

Below is a list of science words and phrases that students should know: the meaning of; and be able to spell; by the end of the course:

<ul style="list-style-type: none">• active packaging• additives• aeration• anaerobic breakdown• aseptic packaging• biotechnology• caramelisation• chemical properties• coagulation• commodity• consumer• cross contamination• crystalisation• demographic group• denaturation• design brief/specification/task• dextrinisation• emulsification• emerging foods• enzymes• enzymatic activity• environmental factors• ethics• fair trade	<ul style="list-style-type: none">• fermentation• food and beverage advertising practices• food allergy• food distribution• food diversity• food handling practices• food hygiene• food intolerance• food miles• food poisoning• food processes• food products• food security food service• food spoilage• food systems• food sustainability• fortification• functional foods• functional properties• gelatinisation• genetically modified foods	<ul style="list-style-type: none">• globalisation• Hazard Analysis Critical Control Point (HACCP) system• high pressure processing• innovation• leavening agent• local food• macronutrients• market research• membrane technology• microbial food spoilage• micro-encapsulation• micronutrients• mise-en-place• Modified atmosphere packaging (MAP)• modified foods• nanotechnology• Occupational Safety and Health (OSH) Act• oxidation• pasteurisation	<ul style="list-style-type: none">• physical properties• preservation• primary food processing• processing techniques• rancidification• secondary food processing• sensory properties• service• stabilisers• staple foods• sustainability• sustainable food processing and production practices• systems• technology process• ultrafiltration• vacuum packaging• value-adding• waste management• workflow or production plan
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There is an expectation that students will make every effort to correctly use capitals, full stops, commas, semi colons, apostrophes, question marks and exclamation marks.

Topics

The Year 12 syllabus is divided into two units, each of one semester duration, which are typically delivered as a pair. Unit 3 focusses on *Food science*, while Unit 4 focuses on *The undercover story*. For each unit, the content is organised into the following three topics:

Nature of food

- This topic covers three areas of development:
 - Food as a commodity - Food commodities come from many different sources and can be classified as either animal or plant and raw or processed. The continuous supply of food is achieved through safe and efficient primary and secondary processes that convert raw food into quality food products.
 - Properties of food - Foods are complex mixtures of substances composed of nutrients and chemical compounds. These mixtures, and how they are combined and processed, give foods their sensory and physical properties.
 - Nutrition - Ensuring a balanced diet appropriate to individual needs requires an understanding of food values, the food source, the role of specific macronutrients in the body and the balance required for optimal health. Food selection models, Australian Dietary Guidelines and goal setting are used to achieve nutritional health and evaluate food intake.

Processing food

- This topic encompasses food products and processing systems.
 - The technology process is implemented to develop and create food products, services and systems. Product proposals are used to guide the technology process and evaluate the final outcome.
 - Food production skills include a range of precision cuts, mise-en-place strategies, accurate measurement, selecting and adapting recipes, accurate food orders, production plans, service management and safe operational practices when working with food and equipment.
 - Food handling skills and processing techniques are used to improve physical appearance, palatability, digestibility and the nutritional value of food products.

Food in society

- This topic encompasses two areas of development:
 - Food issues – Beliefs and values that relate to needs, wants, lifestyles, health and living standards underpin food issues of individuals and communities. Factors influencing food choices are often guided by cost, availability, family values, peer group and nutritional needs. Media, advertising and marketing practices also influence food choices, particularly those made by adolescents. These choices impact health, some of which are not desirable.
 - Laws and regulatory codes – These relate to the legal processes which regulate the interaction between consumers and food-related enterprises. They include consumer associations work to influence policy, legislation and practices. Food handling practices, including the prevention of cross contamination, use of clean equipment and safe storage of raw and processed foods are regulated for health and safety of consumers and personnel in the food-related industry is another area of focus. Food labelling and packaging of raw and processed food and beverages in Australia is designed to protect and inform consumers when making food choices is also covered in this area.



COURSE OUTLINE 2022
GENERAL FOOD SCIENCE AND TECHNOLOGY YEAR 12

Semester 1 – UNIT 1

Week	Topics/Syllabus	Assessment	Resources
Term 1			
1	<p>Laws and regulatory codes</p> <ul style="list-style-type: none"> • role of Food Standards Australia New Zealand (FSANZ) • objectives of Food Act 2008 (WA) • purpose of the Occupational Safety and Health Act 1984 • Australia New Zealand Food Standards Code for food labelling requirements <ul style="list-style-type: none"> ○ nutrition information panel ○ percentage labelling ○ name or description of the food ○ food recall information ○ information for allergy sufferers ○ date marking ○ ingredients list ○ country of origin ○ barcode ○ weights and measures ○ use and storage information ○ mandatory warnings and information ○ genetically modified content ○ legibility ○ categories of food exempt from food labelling laws 		
2-4	<p>Nutrition</p> <ul style="list-style-type: none"> • food sources and role of micronutrients for health <ul style="list-style-type: none"> ○ fat-soluble vitamins: A and D ○ water-soluble vitamins: B1 (thiamine), B2 (riboflavin), B3 (niacin) and C ○ minerals: calcium, iron and sodium • effects of under-consumption of nutrients on health <ul style="list-style-type: none"> ○ anaemia ○ osteoporosis ○ malnutrition ○ constipation 	Task 1: Test – Nutrition for health	
5	<p>Food as a commodity</p> <ul style="list-style-type: none"> • the economic cost of raw and processed food products • the development and use of varieties of food commodities, such as apples and potatoes, to: <ul style="list-style-type: none"> ○ alter sensory and physical properties ○ alter nutritional content ○ improve yield 		
6-8	<p>Properties of food</p> <ul style="list-style-type: none"> • functional properties that determine the performance of food <ul style="list-style-type: none"> ○ caramelisation ○ crystallisation ○ emulsification ○ leavening ○ aeration ○ oxidation ○ rancidity 	Task 2: Functional properties of food	
9-10	Processing techniques		

	<ul style="list-style-type: none"> • investigate wet processing techniques and dry processing techniques <ul style="list-style-type: none"> ◦ suitable food commodities ◦ effect on nutrition ◦ heat transfer ◦ sensory properties ◦ cost of ingredients and energy • functional properties that determine the performance of food <ul style="list-style-type: none"> ◦ dextrinisation ◦ denaturation ◦ coagulation ◦ gelatinisation 		
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Term 2

1-2	<p>Devise food products</p> <ul style="list-style-type: none"> • effects of over-consumption of nutrients on health <ul style="list-style-type: none"> ◦ obesity ◦ cardiovascular disease ◦ Type 2 diabetes • devise food products <ul style="list-style-type: none"> ◦ interpret and adapt recipes ◦ devise food orders ◦ devise production plans ◦ apply preparation and processing techniques ◦ cost recipes 	Task 3: Meals for Health	
3	<p>Food issues</p> <ul style="list-style-type: none"> • societal influences on food choices <ul style="list-style-type: none"> ◦ lifestyle ◦ culture ◦ religion ◦ health promotion campaigns ◦ advertising • economic influences on food choices <ul style="list-style-type: none"> ◦ competition in the marketplace ◦ product availability ◦ consumer resources 		
4-6	<p>Heat and eat meals</p> <ul style="list-style-type: none"> • the technology process to produce a food product that demonstrates a wet processing technique and a dry processing technique based on a product proposal <ul style="list-style-type: none"> ◦ investigate ◦ devise ◦ produce ◦ evaluate • devise food products <ul style="list-style-type: none"> ◦ trial recipes • evaluate the food product <ul style="list-style-type: none"> ◦ product's compliance with the proposal ◦ product's sensory properties ◦ selection of processing techniques ◦ selection of equipment and resources ◦ time requirements 	Task 4: Externally set task Task 5: Heat and eat meals	

END OF SEMESTER 1

Semester 2 – UNIT 2

Week	Topics/Syllabus	Assessment	Resources
Term 2			
7-8	Food as a commodity <ul style="list-style-type: none"> • the food supply chain <ul style="list-style-type: none"> ◦ production ◦ processing ◦ packaging ◦ storage ◦ distribution of food commodities • the concept of value-adding to food <ul style="list-style-type: none"> ◦ changes to nutritional content ◦ additional processing of food ◦ presentation and service ◦ packaging 		
9-10	Dietary planning <ul style="list-style-type: none"> • dietary planning <ul style="list-style-type: none"> ◦ Healthy Eating Pyramid (Nutrition Australia May 2015) ◦ Australian Guide to Healthy Eating ◦ Australian Dietary Guidelines • the nutritional needs of demographic groups, such as adolescents and adults • modification and fortification of foods by altering nutrient content • influences on the nutritional wellbeing of individuals <ul style="list-style-type: none"> ◦ lifestyle ◦ cultural traditions • devise food products <ul style="list-style-type: none"> ◦ interpret and adapt recipes 	Task 6: Dietary Planning	
Term 3			
1-3	Food processing techniques <ul style="list-style-type: none"> • food processing techniques used to control the performance of food <ul style="list-style-type: none"> ◦ application of heat ◦ application of cold ◦ exposure to air ◦ addition of acid ◦ addition of alkali ◦ manipulation • devise food products <ul style="list-style-type: none"> ◦ interpret and adapt recipes ◦ devise food orders ◦ devise production plans ◦ apply preparation and processing techniques ◦ cost recipes 	Task 7: Food processing techniques	
4	Preserving food <ul style="list-style-type: none"> • reasons for preserving food <ul style="list-style-type: none"> ◦ extend shelf life ◦ preserve nutritional value ◦ out of season availability ◦ palatability ◦ convenience ◦ economics ◦ reduce waste 		
5-7	Processing systems and food preservation <ul style="list-style-type: none"> • causes of food spoilage and contamination <ul style="list-style-type: none"> ◦ environmental factors, such as oxygen, light, heat, water, infestation ◦ enzymatic activity on food ◦ microbial contamination of food, such as mould, yeast, bacteria • principles of food preservation 	Task 8: Food preservation	

	<ul style="list-style-type: none"> ○ control of temperature, such as pasteurisation, ultra-high temperature treatment, freezing, and canning or bottling ○ anaerobic breakdown of organic substances or nutrients, such as fermentation ○ addition of chemicals, such as salt, sugar, acid, and artificial preservative ○ removal of moisture through dehydration and evaporation ○ removal of oxygen through vacuum packing 		
8	<p>Food issues</p> <ul style="list-style-type: none"> ● factors that influence food choices <ul style="list-style-type: none"> ○ location ○ income ○ supply and demand ○ environmental impact ○ advertising and marketing ● sponsorship, tokens and free gifts, and super-sizing techniques used to market food products 		
9	<p>Laws and regulatory codes</p> <ul style="list-style-type: none"> ● principles of the HACCP system <ul style="list-style-type: none"> ○ conduct a hazard analysis ○ identify critical control points ○ establish critical limits for each critical control point ○ establish critical control point monitoring requirements ○ establish corrective actions ○ verify procedures ○ establish record keeping procedures ● regulation of food safety in Australia <ul style="list-style-type: none"> ○ state authorities ○ local authorities ● <i>Occupational Safety and Health Act 1984</i> and the rights and responsibilities of employers and employees in food environments 	<p>Task 9: Test – Laws and regulatory codes</p>	
10 (continued T4, W1-2)	<p>A preserved food product</p> <ul style="list-style-type: none"> ● the technology process to produce a preserved food product, based on a product proposal <ul style="list-style-type: none"> ○ investigate ○ devise ○ produce ○ evaluate ● devise food products <ul style="list-style-type: none"> ○ develop, produce and evaluate prototypes ● evaluate the preserved food product <ul style="list-style-type: none"> ○ product's compliance with the proposal ○ product's use in another food product ○ product's sensory properties ○ selection of processing techniques ○ selection of equipment and resources ○ time requirements 		

Term 4

1-2 Continued from Term 3, Week 10.

END OF SEMESTER 2



ASSESSMENT OUTLINE 2022

GENERAL FOOD SCIENCE AND TECHNOLOGY YEAR 12

A number of assessments will be used throughout the term to identify the students understanding in the course and be used to determine a grade. Student achievement will be reported using the following descriptors.

Semester 1

Assessment Type SCSA Weighting	Task Description	KWDHS Weighting	Set/Due Date
5%	Task 1: Test – Nutrition for Health (Response) An in-class test on food sources and the role of micronutrients, such as fat-soluble vitamins, water-soluble vitamins and minerals for health; and the effects of under-consumption of nutrients on health, considering anaemia, osteoporosis, malnutrition and constipation.	5%	<i>Set: Term 1, Week 4 Due: Term 1, Week 4</i>
15%	Task 2: Functional properties of food (Investigation) Investigate, through practical food processing, the functional properties that determine the performance of food, such as caramelisation, crystallisation, emulsification, and relate application to recipes and menu planning.	15%	<i>Set: Term 1, Week 6 Due: Term 1, Week 8</i>
10%	Task 3: Meals for health (Production) Devise food products and processing techniques to demonstrate how to overcome the effects of over-consumption of nutrients, specifically related to obesity, cardiovascular disease and Type 2 diabetes.	10%	<i>Set: Term 2, Week 1 Due: Term 2, Week 2</i>
15%	Task 4: Externally set task A task set by the SCSA based on the following content from Unit 3. 50 minutes is allowed for this task. The 2022 task will cover properties of food (caramelisation and crystallisation), investigating wet processing techniques and dry processing techniques (suitable food commodities, effect on nutrition, heat transfer, sensory properties, cost of ingredients and energy), the technology process to produce a food product that demonstrates a wet processing technique and a dry processing technique based on a product proposal (investigate, devise, produce, evaluate) and evaluating the food product (selection of equipment and resources).	15%	<i>Set: Term 2, Week 4 Due: Term 2, Week 4</i>
10%	Task 5: Heat and eat meals (Production) Use the technology process to produce a food product that demonstrates wet and dry processing techniques based on a product proposal.	10%	<i>Set: Term 2, Week 4 Due: Term 2, Week 6</i>

Semester 2

Assessment Type SCSA Weighting	Task Description	KWDHS Weighting	Set/Due Date
15%	Task 6: Dietary planning (Investigation) Investigate the nutritional needs of a selected demographic group; use dietary planning strategies, modification and fortification of foods to devise food products relevant for the demographic group.	15%	<i>Set: Term 2, Week 9 Due: Term 2, Week 10</i>
10%	Task 7: Food processing techniques (Production) Implement food processing techniques that can be used to control the performance of food and guide in devising food products for specific purposes.	10%	<i>Set: Term 3, Week 1 Due: Term 3, Week 3</i>
10%	Task 8: Food preservation (Production) Implement a variety of processing systems to preserve food, noting the causes of food spoilage and contamination; process food using the principles of food preservation.	10%	<i>Set: Term 3, Week 5 Due: Term 3, Week 7</i>
10%	Task 9: Test – Laws and regulatory codes (Response) An in-class test based on the regulation of food safety in Australia, including the principles of the HACCP system.	10%	<i>Set: Term 3, Week 9 Due: Term 3, Week 9</i>

It is expected that all assessments will be completed to the best of your ability and be submitted by the deadlines set. Please make yourself aware of the Assessment Policy as failure to meet deadlines has severe consequences.

Grade	Description	The student demonstrates achievement that:
A	Excellent	has greatly exceeded the expected standard. Achievement is well beyond what is expected at this year level.
B	Good	exceeds the expected standard.
C	Satisfactory	at the expected standard.
D	Limited	is below the expected standard.
E	Very Low	is below the minimum acceptable for this year level.

Student Signature: _____

Parent/Guardian Signature: _____