Government of **Western Australia**
School Curriculum and Standards Authority

SAMPLE COURSE OUTLINE

FOOD SCIENCE AND TECHNOLOGY
ATAR YEAR 12

Sample course outline

Food Science and Technology – ATAR Year 12

Unit 3 – Food diversity and equity
Unit 4 – The future of food

Semester 1

Week	Syllabus content

1–2	**Macronutrients**
	• food sources and impact of macronutrient and water intake on health
	  ▪ protein – complete and incomplete
	  ▪ carbohydrates – starches, sugars, and fibre or cellulose
	  ▪ lipids – saturated fats and oils, and unsaturated fats and oils
	• digestion of macronutrients
	  ▪ digestive tract
	  ▪ associated organs of digestion
	  ▪ mechanical digestion
	  ▪ chemical digestion

3	**Micronutrients**
	• food sources and impact of micronutrient intake on health
	  ▪ fat-soluble vitamins – A, D, E and K
	  ▪ water-soluble vitamins – B2 (riboflavin), B9 (folate), B12 (cobalamin) and C
	  ▪ minerals – calcium, iron, sodium and potassium
	• purpose of the Nutrient Reference Values (NRV) and the Recommended Dietary Intakes (RDI)
	• advantages and disadvantages of the consumption of micronutrient supplements

4–5	**Diet-related health**
	• the effect of the consumption of functional foods on health
	  ▪ digestive system
	  ▪ cardiovascular system
	  ▪ neural development
	  ▪ skeletal structure
	  ▪ blood sugar levels glycaemic index
	• role of phytochemicals in promoting health
	  ▪ phytoestrogens
	  ▪ antioxidants
	  ▪ probiotics
	• diet-related health conditions
	  ▪ food allergies – nuts, eggs, seafood
	  ▪ food intolerances – gluten, lactose
	• modification of food to meet the nutritional needs of individuals with a diet-related health condition
	  ▪ food allergies
	  ▪ food intolerances
	• health conditions caused by the inability of the body to digest or absorb or metabolise nutrients
	  ▪ diabetes
	  ▪ coeliac
	  ▪ lactose intolerance

6–7	**Health and wellbeing**
	• national health priority areas and role in improving health in Australia
	• influences on health and wellbeing
	  ▪ genetics – gender, race, family history
	  ▪ lifestyle – exercise, smoking, illicit drugs
	  ▪ diet

Week	Syllabus content
	• use of food selection models and the *Australian Dietary Guidelines* to evaluate the nutritional needs of population groups ▪ anaemia ▪ osteoporosis ▪ malnutrition ▪ obesity ▪ cardiovascular disease ▪ diabetes **Task 1: Test – Nutrition**
8–9	**Influences on the properties of food** • the effect of preservation methods on food ▪ sensory properties ▪ physical properties ▪ chemical properties • the function of natural food components in food processing ▪ protein – albumin, gluten ▪ carbohydrates – starch, sugar ▪ lipids – fats, oils • factors that impact on the properties of food ▪ processing techniques ▪ equipment and storage ▪ environment ▪ ingredients ▪ additives – thickeners, anti-caking agents, humectants, colourings and flavourings, preservatives, and artificial sweeteners • *Australia New Zealand Food Standards Code* requirement for the use of additives in food and for product recall **Task 2: Properties of food**
10–11	**Functional properties and food processing** • functional properties and how they determine the performance of food ▪ dextrinisation ▪ caramelisation ▪ crystallisation ▪ emulsification ▪ gelatinisation ▪ oxidation ▪ denaturation ▪ coagulation ▪ leavening ▪ aeration ▪ rancidity • how and why food processing techniques are used to control the performance of food ▪ temperature – heat, cold ▪ exposure to air ▪ pH level ▪ addition of chemicals – salt, sugar ▪ removal of moisture ▪ manipulation • Australian Standard metric measurement

Week	Syllabus content

12–14	**Production analysis**
	• recipe adaptation
	  ▪ nutrition
	  ▪ portions
	  ▪ cost
	• product proposal
	  ▪ consumer profile
	  ▪ product purpose
	  ▪ product specifications that include at least two functional properties
	• the technology process to produce a food product with at least two functional properties that meet product proposal specification
	  ▪ investigate
	  ▪ devise
	  ▪ produce
	  ▪ evaluate
	• analysis of food product
	  ▪ product's compliance with the proposal
	  ▪ product's sensory properties
	  ▪ effectiveness of the processing techniques selected
	  ▪ purpose of the functional properties selected
	Task 3: Production analysis

15	**Food safety management**
	• apply the principles of the HACCP system to manage food safety
	  ▪ 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
	• *Food Act 2008* (WA) and the role of state and local authorities to ensure food for sale is safe and suitable for human consumption
	• *Occupational Safety and Health Act 1984* and the consequences of unsafe work environments and practices for employers and employees
	  ▪ economic
	  ▪ social

16	**Task 4: Semester 1 Examination**

Semester 2

Week	Syllabus content
1–2	**Promoting food** • marketing mix strategies and the influence on consumers ▪ product ▪ price ▪ place ▪ promotion • analysis of the marketing mix used to promote a food product ▪ product ▪ price ▪ place ▪ promotion • consumer concerns related to food promotion ▪ advertising directed at children ▪ product placement in supermarkets • implications of the *Australian Association of National Advertisers (AANA) Code for Advertising and Marketing Communications to Children*, on advertising and marketing food and beverage products in Australia **Task 5: Food promotion**
3–4	**Food consumption patterns** • factors that influence food consumption patterns in Australia ▪ social ▪ economic ▪ environmental ▪ ethical ▪ political • the impact of commercially processed food on the consumer ▪ food safety ▪ food availability ▪ extend shelf life ▪ convenience ▪ alter sensory properties ▪ health ▪ distribution and storage ▪ price • mathematical concepts – data, graphs, tables, simple ratio, percentages
5–6	**Sustainable food production** • environmental issues that impact sustainable production of food commodities ▪ water use ▪ land use ▪ chemical use ▪ energy use ▪ waste disposal • biotechnology in food systems ▪ microorganisms ▪ yeasts ▪ genetic modification • the process of genetic modification in food production • benefits of genetic modification ▪ improved yield ▪ improved nutrition ▪ resistance to environmental conditions ▪ improved sensory properties ▪ lower commodity prices for the consumer

Week	Syllabus content
	• risks of genetic modification ▪ impact on health ▪ impact on environment ▪ antibiotic resistance • *Australia New Zealand Food Standards Code* for food produced using gene technology **Task 6: Sustainable food production**
7–8	**Product development** • factors that influence the development of new food products ▪ population growth ▪ changing demographics ▪ health ▪ convenience ▪ cost ▪ technology • innovative developments that increase the availability of food ▪ value-added food ▪ functional food ▪ genetically modified food ▪ food safety procedures ▪ packaging • product development using line extensions, 'me too' products and innovative products • adaptations used to produce new products ▪ commodities ▪ processing techniques ▪ presentation or packaging ▪ equipment and technology ▪ quantities
9	**Technologies and new food products** • technologies used to develop new food products ▪ ultrafiltration ▪ micro-encapsulation ▪ nanotechnology ▪ high pressure processing ▪ membrane technology ▪ packaging – modified atmosphere (vacuum, gas, barrier specific), aseptic, active and intelligent
10–12	**New product proposal** • recipe adaptation ▪ commodities ▪ processing techniques ▪ presentation or packaging • devise a product proposal for a new food product ▪ consumer profile ▪ product purpose ▪ product specifications • the technology process to produce a new food product that responds to a consumer need ▪ investigate ▪ devise ▪ produce ▪ evaluate

Week	Syllabus content
	• analysis of food product in relation to product proposal ▪ features of the product and its suitability to the consumer group ▪ quantitative method (survey) ▪ qualitative method (sensory evaluation) ▪ draw conclusions ▪ make recommendations **Task 7: New product proposal**
13–15	**Our food supply** • environmental influences on the sustainability of food production in Australia ▪ farming practices ▪ climate changes ▪ water availability ▪ land degradation • influences on the global food supply ▪ trade restrictions – embargos, tariffs, subsidies ▪ government policies – free trade agreements, fair trade ▪ ownership concentration within the food industry – multi-national companies ▪ natural disasters and the potential loss of infrastructure ▪ land ownership • influences on the distribution of global food resources ▪ production of biofuels ▪ population growth and population distribution ▪ food production and distribution ▪ food prices ▪ demand for meat and dairy • consequences of global food inequity ▪ under-nutrition ▪ over-nutrition ▪ political instability
16	**Task 8: Semester 2 Examination**