**Sample Course Outline**

Food Science and Technology

ATAR Year 12

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# 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
 |
|  | * 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
 |
| 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
 |
|  | * 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
 |
|  | * 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** |