**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** |