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 and Unit 4 – The future of food

Semester 1

|  |  |
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| 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 (ascorbic acid)   + 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 processes 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 Hazard Analysis Critical Control Point (HACCP) management 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. * *Work Health and Safety Act 2020* and the consequences of unsafe work environments and practices for employers and employees:   + economic   + social. |
| **16** | **Task 4: Semester 1 Examination** |

Semester 2

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| 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**   * factors affecting the sustainability of food production in Australia:   + farming practices   + climate change   + 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** |