**Sample Course Outline**

Plant Production Systems

ATAR Year 12

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# Sample course outline

# Plant Production Systems – ATAR Year 12

## Unit 3 and Unit 4

#### Semester 1

| **Week** | **Syllabus content** |
| --- | --- |
| 1 | * Course description and assessment
* Revision, update on key concepts from Year 11
 |
| 2–4 | Systems ecology* comparison of natural, agricultural and urban ecosystems, including the energy flow and recycling of matter
* conservation of biodiversity and natural ecosystems
* climate change and possible impacts on production systems
 |
| 5–7 | Plant structure and function* utilisation of the net products of photosynthesis
* transpiration and its controls
* absorption and translocation of nutrients
* plant hormones and their role in plant physiology, including gibberellins, ethylene, cytokinins and auxins
* manipulating plant processes by managing plant growing conditions
* the use of plant hormones in manipulating end products
* use of synthetic hormones in weed control

Investigating plant production* develop hypotheses to test, based on prior information
* design and conduct an investigation considering aspects of experimental design, including variables, controls, randomisation and replication
* analyse and interpret data, including use of standard deviation and standard error
* present data using appropriate methods
* draw conclusions based on experimental data and validate from other sources
* evaluate experimental design, including possible bias and experimental error, and propose areas for future investigation
 |
| 8–11 | Plant environment * determining the availability of water in growing media and soil water management
* production records used in nutrition management
* decision making involved in fertiliser selection, including soil and crop type, stage of growth, cost, availability, and application method
* designing a plant nutrition program
* management of plant nutrition and soil water throughout the growing season
* nutrient application to reduce environmental impacts
 |
| 12–14 | Plant health * economic principles of pest and disease control, including thresholds and economic injury levels of pests
* the relationship between modes of action of pesticides to their effectiveness, and to resistance risk
* the development of pesticide resistance
* avoiding and managing pesticide resistance
* management strategies for pest and disease outbreak on a local, national and international level
* comparing the effectiveness of different pest control methods
 |
| 15 | Examination revision  |
| 16 | Semester 1 Examination |

#### Semester 2

| **Week** | **Syllabus content** |
| --- | --- |
| 1–4 | Sustainable production* intergenerational equity, ensuring that the wellbeing of future generations (social, economic and environmental factors) are not compromised by the activities of the current generation
* duty of care in the workplace
* planning for sustainability: balancing short-term needs with long-term improvement of resources
* establishing short-term and long-term enterprise goals
* optimising production through new technologies
* managing the conflicting demands of social, environmental and economic factors, also known as the ‘triple bottom line’
* responding to the impacts of climate change on production systems
* assessment and management of risk, including probabilities, consequences, avoidance and mitigation
 |
| 5–7 | Breeding and improvement* sources of genetic diversity, including seed banks
* breeding technologies, including genetically modified organisms (GMO)
* steps in breeding new plant varieties
* developing cultivars for specific environments and markets
* impact of breeding technologies and related ethical issues
 |
| 8–10 | Economics, finance and markets* comparative advantage of Australian producers in the international market
* importance of the global economy to Australian plant production, including major markets and competitors
* use budgets and gross margins to compare profitability of management decisions
* use market information to plan production and marketing
* use financial records to guide decision making
* maintaining Australian global competitiveness
* protection strategies for Australian markets, including quarantine and tariffs
* altering production systems in response to consumer trends
 |
| 11–14 | Produce for purpose* identify variations in product quality and quantity and causes, including variety, weather, nutrition, handling and transport
* effect of product variation on financial return
* evaluate on-farm practices to meet quality assurance criteria
* propose adaptations to production systems to improve efficiency or to meet changed circumstances
* evaluate new technologies to optimise production
 |
| 15 | Examination revision  |
| 16 | Semester 2 Examination |