

Bachelor of Agriculture

First Year Subjects

Semester 1

208-113 Production Systems I

Availability: Dookie

Credit points: 12.5

HECS-band: 2

Coordinator: Mr Neil McLeod

Contact: Twenty-four hours lectures, 48 hours practicals/tutorials (*Semester 1*).

Description: On completion of this subject, students should have gained a practical understanding of the management operations and options of summer and autumn components of the production cycle of the main agricultural industries of south-eastern Australia, and be conversant with the limitations, constraints and impacts which influence these. Topics covered include:

- history and development of Australian agriculture;
- annual production cycle;
- sustainability of these industries from economic, social, environmental and system-wide perspectives;
- introduction to and practice of the basic farm operational skills as they apply to the various agricultural enterprises and protected areas, including broadacre, dairy, production horticulture and pigs, and areas of conservation significance; and
- the place of agriculture in rural communities and factors affecting sustainability.

Group learning activities relating to enterprise practices will cover critical selection criteria (performance and efficiency measurements of harvesters, trucks, tractors, sprayers, tillage and sowing equipment, and timeliness costs) and machinery operations (cultivating, distributing, harvesting, handling, processing and storage).

Assessment: A 3-hour written examination (60%), and weekly assessment of practical performance (40%, equal weighting for participation, skills aptitude, and safety appreciation).

208-116 Environmental Engineering

Availability: Dookie

Credit points: 12.5

HECS-band: 2

Coordinator: Mr John Wellman

Contact: Sixteen hours lectures, 20 hours practicals/workshops, 24 hours tutorials (*Semester 2*).

Description: The objectives of this subject are to develop students' ability to:

- apply basic mathematics to environmental engineering practices;
- use engineering and scientific terms, units and quantities appropriately;
- explain basic engineering and scientific principles used in agriculture, horticulture and resource management;
- apply engineering and scientific principles to the practice of agriculture, horticulture and resource management;
- plan engineering projects for on site application; and
- explain the operation of state of the art equipment and technology used in agriculture, horticulture and resource management.

The content includes: units of measure; power and energy; mechanics; hydraulics; heat - thermal capacity, latent heat, calorific value, principles of refrigeration; light; strength of materials; principles of traction, drawbar performance, tractor stability; agricultural machinery management; ergonomics; geomatics and survey; hydraulics; water quality; water treatment and waste management. This content will allow presentation of the following mathematical areas: 2D and 3D mensuration; substitution and transposition of appropriate formulae; polynomial graphs and models up to degree 3; exponential functions and models; trigonometric modelling; rates of change; and introductory differential equations.

Assessment: A three-hour examination (60%), and four practical/tutorial reports of up to 4000 words in total (40%).

202-103 Biology for Land and Food Resources

See full subject details on page 1.

202-104 Information Technology and Communication

See full subject details on page 1.

Semester 2

208-115 Production Systems II

Availability: Dookie

Credit points: 12.5

HECS-band: 2

Coordinator: Mr Neil McLeod

Prerequisites: 208-113 Production Systems I.

Contact: Twenty-four hours of lectures and 48 hours of practicals/tutorials (*Semester 2*).

Description: This subject will follow on from Production Systems I in providing students with a range of knowledge, practical experiences and observations. On completion of this subject, students should have gained a practical understanding of the management operations and options of winter and spring components of the production cycle of the main agricultural industries of south-eastern Australia, and be conversant with the limitations, constraints and impacts which influence these.

Topics covered include:

- history and development of Australian agriculture;
- annual production cycle;
- sustainability of these industries from economic, social, environmental and system-wide perspectives;
- introduction to and practice of the basic farm operational skills as they apply to the various agricultural enterprises and protected areas, including broadacre, dairy, production horticulture and pigs, and areas of conservation significance; and
- the place of agriculture in rural communities and factors affecting sustainability.

Group learning activities relating to enterprise practices will cover farm safety (Environmental Health and Safety), lifting procedures, chemical safety; operation, maintenance and calibration of machinery; livestock feeding and handling; farm physical recording, integrating activity planning around a number of farm enterprises; fencing; costing of farm and management projects; chainsaw use and safety; basic concreting, welding systems and safety.

Assessment: A 3-hour written examination (60%), and weekly assessment of practical performance (40%, equal weighting for participation, skills aptitude, and safety appreciation). In addition, students will be required to successfully complete: a tractor safety and driving test; first aid; EH&S; and farm chemicals user courses.

202-101 Chemistry for Land and Food Resources

See full subject details on page 1.

202-106 Land Resources

See full subject details on page 2.

202-250 Quantitative Skills for Land and Food

See full subject details on page 3.

Second Year subjects

Semester 1

202-202 Experimental Design/Statistical Methods

See full subject details on page 2.

208-211 Plant Communities in Action

Availability: Dookie

Credit points: 12.5

HECS-band: 2

Coordinator: Mr John Wellman

Contact: Twenty-four hours lectures, 36 hours practicals/tutorials (*Semester 1*).

Description: This subject should provide students with a basic understanding of the physiological principles and processes that underpin the performance of plant communities (native and crop) particularly in response to their edaphic environment. The basic mechanisms underlying nutrient, water and carbon acquisition will be considered as well as growth co-ordination at a plant and community level. The impact of abiotic and biotic stresses on the performance of plants and communities will also be considered in relation to current and future stresses such as climate change.

These principles of plant community operation should be demonstrated to students through field measurements of the productivity and limiting factors of crops and native communities.

At the completion of this subject students should have developed a knowledge of plants and how they act in communities, and an ability to analyse the

behaviour of plants and plant communities in the field in relation to natural and managerial intervention and recommend actions.

Assessment: A three-hour exam (50%), a practical report equivalent to 2000 words (25%) and an assignment of 2000 words (25%).

Prescribed texts: Atwell B., Kriedemann P. and Turnbull C. (Eds.) (1999), *Plants in Action*, McMillan, Melbourne.

208-120 Accounting for Rural Enterprises

See full subject details on page 1.

Semester 2

207-101 Economics of Resource Use

See full subject details on page 2.

208-230 Soils, Water and Catchment Dynamics

Availability: Dookie

Credit points: 12.5

HECS-band: 2

Coordinator: Mr John Wellman

Contact: Twenty-four hours of lectures and 36 hours of practicals/tutorials (*Semester 2*).

Description: This subject should identify the importance of soil and water in the landscape as key components of both natural ecosystems and production systems. Knowledge of soil properties and behaviour will be applied to understanding cycling of water and nutrients, with emphasis on catchment-scale management using decision-support techniques.

The objective of this subject is to enable students to understand:

- basic soil properties and identification of soil types;
- the effect of soil management practices on soil properties and catchment health;
- data acquisition, storage, retrieval, and utilisation in decision-support systems for catchment monitoring and management;
- catchment-scale environmental mapping techniques, including remote data sensing, global positioning systems and GIS;
- hydrography of surface and subsurface water movement, stream flow, flooding and droughts and their impact on agricultural production and natural resource management;
- the hydrological cycle: precipitation; evaporation;
- runoff and drainage; catchment processes; farm-level water management, including irrigation;
- water balances at large (basin) and small (farm) scales;
- land degradation processes and their management - accelerated soil acidification, sodicity, salinity and erosion; remedial measures; and
- the impact of soil management on water quality, and especially nutrients and salts.

Assessment: Three-hour examination (50%) and two assignments equivalent to 3000 words (each worth 25%). Note: this subject shares substantial material with 202-203 Soil and Water Resources.

208-231 Management of Rural Enterprises

Availability: Dookie

Credit points: 12.5

HECS-band: 2

Coordinator: Dr Dennis O'Brien

Contact: Three 1-hour lectures per week and 2-hours of tutorial per week (*Semester 2*).

Description: This subject introduces the business cost concepts and frameworks from both the traditional and contemporary perspectives as well as systems for measuring and controlling costs. Internal control concepts are also addressed along with inventory planning and control approaches as they relate to rural processing industries.

Topics include:

- manager's role in cost management;
- costs - terms and concepts;
- cost behaviour - cost - volume - profit relationships;
- job order costing - concepts and applications in rural industries;
- process costing - concepts and applications in rural industries;
- activity based costing concepts;
- activity based costing rural applications;
- quality cost management;
- cost estimation and benchmarking;
- concept of internal control/systems for controlling costs; and
- inventory planning; and Inventory control.

Assessment: A 3-hour end-of-semester examination (60%), an assignment of up to 2000 words (20%) and assessment of tutorial problem sheets (20%, equivalent to a total of 2000 words).

Third Year Subjects

Semester 1

202-302 Human Resource Management

See full subject details on page 3.

208-328 Biodiversity and Genetics

Availability: Dookie

Credit points: 12.5

HECS-band: 2

Coordinator: Ms Cheryl O'Dwyer

Prerequisites: 202-103 Biology for Land and Food Resources, 202-101 Chemistry for Land and Food Resources, 208-211 Plants Communities in Action.

Contact: 24 hours of lectures and 36 hours of practicals/tutorials (*Semester 1*).

Description: This subject should give students an understanding of the applications of animals and plant genetics in conservation management and food and fibre production, covering both indigenous and domestic species. Students will investigate the importance of biodiversity, the philosophy of genetic modification, genetic engineering, gene pool control, the use of genetically modified organisms in food and fibre production and in the protection of endangered species.

Topics include:

- heritability and normal variation in populations;
- process of speciation;
- mutations and hybridization;
- breeding, cross-breeding, composite breeds, hybrid vigour;
- animal and wildlife management and use of stud books;
- domestic animal breeding programs and artificial insemination;
- vegetation provenances and their importance;
- use of seedbanks and seedbank resource inventory;
- resistance to disease and the environmental adaptation of organisms;
- plant propagation and breeding; and
- genetic engineering, genetically modified organisms, crops and food.

Assessment: Three-hour examination (50%), assignment equivalent to 3000 words (25%), practical report equivalent to 3000 words (25%).

Semester 2

202-303 Industry Project

See full subject details on page 4.

202-304 Resource Mgt & Agric Systems Analysis

See full subject details on page 7.

Year Long Subjects

202-301 Industry Project

See full subject details on page 4.

202-001 Industry Placement#

See full subject details on page 3.

Fourth Year Subjects

Semester 1

208-411 Research Philosophies and Statistics

See full subject details on page 4.

Year Long subjects

202-401 Honours Research Project

See full subject details on page 5.

202-402 Honours Research Project

See full subject details on page 5.

202-403 Honours Research Project (MYE)

See full subject details on page 5.

Elective Subjects**First year****207-103 Ecology**

See full subject details on page 1.

208-107 Vineyard and Winery Operations I

See full subject details on page 5.

208-101 Farm Animal Biology

See full subject details on page 5.

Second Year, Semester 1**208-203 Ecology & Management of Grazing Systems**

See full subject details on page 6.

208-206 Vineyard and Winery Operations II

See full subject details on page 7.

Second Year, Semester 2**207-202 Australian Flora**

See full subject details on page 1.

208-207 Animal Management and Production

See full subject details on page 7.

208-208 Crop Production

See full subject details on page 7.

Summer Semester**208-205 Australia in the Wine World**

See full subject details on page 6.

Third Year**207-211 Australian Fauna**

See full subject details on page 2.

208-204 Special Studies**Credit points: 12.5****HECS-band: 2****Coordinator:** Mr Chris Laird**Prerequisites:** This subject is available to students who have completed all 100 and 200 level core subjects of their course.**Contact:** Thirty-six hours lectures, 36 hours tutorials and presentations or equivalent (*Summer semester*).**Description:** The subject encourages independent, critical thought and self-directed enquiry. Students should develop their ability to plan work and use available time effectively. This is an individualised subject, which enables students to pursue studies in areas of agriculture and related fields, not otherwise covered in the normal subjects offered within the degree structure. Students who complete this subject should be able to demonstrate:

- in-depth knowledge of a specific contemporary topic in agriculture and land management;
- the ability to analyse and report on the topic in a manner appropriate to the methodology developed; and
- an advanced capability for development of processes for acquisition, management, analysis, integration and interpretation of data and information.

Assessment: The assessment structure for each student is specified in the study proposal and must be approved by the subject coordinator. It would normally consist of two assignments (each 5000 words) and an oral report (30 minutes) on a completed activity or investigation.**208-212 Agribusiness Marketing****Availability:** Dookie campus.**Credit points: 12.5****HECS-band: 2****Coordinator:** Ms Ros Gall**Prerequisites:** 207-101 Economics of Resource Use or 316-102 Introductory Microeconomics.**Contact:** Block mode over one week in the mid-semester break, with subsequent in-semester reading and assessment (*Semester 2, repeat Summer*).**Description:** This subject approaches agribusiness marketing by ensuring students are familiar with the relationship of the Australian agribusiness sector with the global environment, and the importance of these relationships and international trade to the sector and the economy. Students thus develop an understanding of the complex system required to supply food products to the final consumer. Building on economic concepts, this subject introduces students to the economic importance of marketing activities.

The subject includes:

- the evolution of marketing and its impact on the marketing of agricultural products (from commodity marketing to branded product);
- basic marketing concepts of price, promotion, place and product, with marketing developed as the physical distribution and economic link between producers and consumers;
- the potential of marketing to add value by providing form, place, time and possession utility;
- environmental analysis of the factors, both internal and external, that impact on the success of the agribusiness firm;
- marketing channels, including the factors contributing to marketing efficiency, an awareness of the alternative channels for marketing food and fibre products, and the impact of power relationships in the agribusiness channel;
- the importance of quality and grading/classification to agricultural marketing;
- analysis of consumer needs as well as consumer and industrial buyer behaviour in food marketing; and
- contemporary issues in marketing of Australia's major food and fibre products, including food safety, genetically modified foods, and ethically and socially responsible production and marketing.

Assessment: A three-hour examination (60%), and two assignments equivalent to 3000 words (each worth 20%).**Prescribed texts:** D J Schaffner, W R Schroder, and M D Earle, *Food Marketing: An International Perspective*, McGraw-Hill, 1998.**207-305 Revegetation and Landscape Restoration**

See full subject details on page 2.

207-328 Working with Community Groups

See full subject details on page 8.

207-330 GIS and Remote Sensing

See full subject details on page 3.

208-303 Animal Production Systems

See full subject details on page 8.

208-307 Plant Pathology

See full subject details on page 9.

208-308 Irrigation and Water Management

See full subject details on page 9.

208-316 Oenology**Availability:** Dookie campus**Credit points: 12.5****HECS-band: 2****Coordinator:** Mr David Hodgson**Prerequisites:** 208-107 Vineyard and Winery Operations I and 208-206 Vineyard and Winery Operations II**Contact:** Three hours lectures and two hours practical per week (*Semester 2*).**Description:** This subject gives detailed coverage of wine production and processing.

The subject content includes:

- history of viticulture and winemaking in Australia;
- production of wine in cool climate;
- characteristics, composition and technological importance of grape juice;
- chemistry and microbiology of wine production;
- fundamentals of winemaking;
- wine quality and defects and factors affecting;
- analytical and quality control techniques;

- evaluation of wine types and styles; and
- waste management and by-product utilisation.

Assessment: Two assignments of 2000 words (25%), three practical reports (25%) and 3-hour final exam (50%).

208-329 Viticulture

Availability: Dookie campus.

Credit points: 12.5

HECS-band: 2

Coordinator: Mr Geoff Bath

Prerequisites: 208-107 Vineyard and Winery Operations I and 208-206 Vineyard and Winery Operations II

Semester: Semester 1

Description: The objectives of this subject are to enable students to:

- prepare management strategies to maximise the quality and yield of grapevines taking into account environmental and management influences;
- explain the commercial influences on vineyard establishment and operation;
- describe major weather differences and evaluate the suitability of cultivations for different purposes and locations; and
- actively evaluate trends and developments in viticulture, with particular reference to technology, management and marketing aspects, and then to develop proposals from their evaluations.

The content includes:

- the distribution and structure of viticultural production throughout the world, the pattern and trend of Australia's viticulture industry, and its association with other areas of primary production;
- grape grower and affiliated organisations;
- vineyard site selection with regard to the nature of grape production, soil type, climatic and weather patterns, pest and disease problems;
- vineyard establishment and design; selection of cultivars and rootstocks for wine, table and dried fruit; strategies for spacing, planting and training, and their interaction with trellis construction and design;
- crop management through pruning, irrigation, frost control, soil management, and canopy management;
- techniques for improving grape quality through canopy configuration and its influence on development and maturation; and
- the assessment of fruit maturity and yield estimation.

Comparative management strategies as seen through annual work programs for table grape, wine and dried fruit production.

Assessment: Three-hour examination (50%), a practical test (10%) and two assignments equivalent to 2500 words (each worth 20%).

208-333 Whole Farm Planning

Credit points: 12.5

HECS-band: 2

Prerequisites: This subject is only available to students who have completed all first- and second-year level core subjects in their course.

Contact: Offered as a five-day block to be completed during the mid-semester break (*Semester 2, repeat Summer*).

Description: The content includes examination of whole farm planning philosophy and theory and the application of whole farm planning. The subject aims to develop an understanding of the principles involved in the holistic approach to whole farm planning. Students are required to apply the basic principles of whole farm planning to a reference farm and prepare a whole farm plan. Students should also develop the rudimentary skills involved in the collaborative processes in leadership, particularly those related to problem-solving techniques in whole farm planning.

Assessment: One 2.5-hour examination (50% of final marks) and the preparation and presentation of a whole farm plan in both written and oral format (50% of final marks). The written component will consist of a 2000-word report and an overlay poster of the Whole Farm Plan.

208-336 Production Horticulture

Credit points: 12.5

HECS-band: 2

Coordinator: Mr John Wellman

Contact: Three hours lectures per week, plus practicals, tutorials and excursions (*Semester 1*).

Description: The objective of this subject is to enable students to:

- develop management strategies for selected horticultural crops that integrate environmental influences, site characteristics and maxim crop value;
- describe the steps required to establish a sustainable production enterprise and justify the technology chosen from the options available, including pest control strategies;
- match crop climatic requirements with suitable production regions; and

- describe recent trends in the market for crop products and changes in production technology across the industry in response to these changes, including the impact of world markets and production regions on the Australian industry.

The content includes:

- the production regions in Australia and overseas and the importance of international trade;
- the impact of, climate, soils, processing, and market, on crop yield and value;
- the current production options within the industry including their advantages and disadvantages;
- crop variety characteristics and their production requirements;
- site characteristics and development requirements and matching these with crop requirements when choosing an appropriate production site;
- crop quality assessment and harvest requirements;
- integrated pest management strategies for the control of current and potential pest problems;
- crop management practices through planting, pruning, trellising and training, irrigation, fertilising, pest control and harvesting;
- interactions between crop yield, climatic variables and crop harvest quality; and
- post-harvest treatments and their impact on product quality including cool storage.

Assessment: Two assignments (2500 words) each 25% and one 2.5-hour exam (50%).

Fourth year (Honours)

207-301 Global Environment & Sustainable Systems

See full subject details on page 8.

207-401 Soil Management and Conservation

See full subject details on page 10.

207-404 Agricultural Policy & International Trade

See full subject details on page 10.

207-413 Community Mgt Of Land & Natural Resource

See full subject details on page 5.

207-414 Social Research Methods

See full subject details on page 4.

208-402 Advanced Plant Breeding and Improvement

See full subject details on page 10.

208-409 Animal Welfare

See full subject details on page 11.

208-407 Genetics and Animal Breeding

See full subject details on page 4.

207-410 Agroforestry

See full subject details on page 4.

208-413 Biological Systems Analysis

Availability: Dookie

Credit points: 12.5

HECS-band: 2

Coordinator: Dr Ken Young

Prerequisites: Admission to honours or postgraduate degree.

Contact: Twenty-four hrs of lectures, and 36 hrs of tutorials and presentations (*Semester 2*).

Description: This subject will examine the biophysical, biological and ecological processes in agricultural production, with an emphasis on plants and plant communities.

Case studies will be used as a framework for students to identify the major factors operating in agricultural systems, and their interrelationships. In each case study, lectures and tutorials will assist students to systematically build a conceptual model of how the system functions, identify key variables and response functions, and find data from literature to parameterise the variables and functions. Appropriate process-based models will be used to explore the behaviour of the system in response to changes in environment and management.

The subject should help students develop an understanding of the major driving factors and variables in biological systems, determine future research requirements and identify where management changes will have the greatest impact.

At the completion of this subject students should be able to:

- recognise the complexity of a biological system and how components of biological systems interact at different levels;
- display an understanding of how models can be used to analyse biological factors and variables, and their interactions;
- identify research or management priorities from an understanding of biological systems; and
- formulate simple process-based conceptual models at different hierarchical levels.

Assessment: Two mid-semester assignments totalling up to 3000 words (20% each), an end-of-semester paper of up to 3000 words (40%) and a seminar presentation (20%).

208-414 Directed Reading in Land Resources

Availability: Dookie

Credit points: 12.5

HECS-band: 2

Coordinator: Dr Dennis O'Brien

Prerequisites: Admission to honours or postgraduate degree.

Contact: Fortnightly supervision session on designated readings with supervisor (*Semester 1, repeat 2*).

Description: This subject involves a supervised study of a single area of scholarship chosen by the student in consultation with an appointed supervisor and the subject and course co-ordinators.

A reading list will be developed and agreed during the semester as the reading proceeds, and the student will prepare a thematic written review of the selected discipline area.

This subject extends knowledge of a topic studied in other coursework subjects, or allows students to research a topic not otherwise treated within the course, and may complement but not overlap with an Honours thesis topic or the Honours thesis literature review. The subject should enhance the student's powers of independent inquiry, encourage initiative in self-directed research, and strengthen the student's capacities in theoretical analysis and argument.

Upon completion of this subject, students should be able to:

- express a deeper understanding of a specific area of choice;
- show a high level of interpretation and critical analysis of written material; and
- write clearly and precisely in a scientific manner.

Assessment: One or more written papers totalling 5000 words.

