Associate Degree in Agriculture

First-year subjects

208-126 Mathematics and Scientific Communication

See full subject details on page 1.

202-154 Introductory Biology for Land and Food

Note: The subject does not assume prior secondary study of biology at Year 11 or 12, although this would be an advantage.

Availability: Dookie campus

Credit points: 12.5

Coordinator: Dr Ken Young

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

Description: The subject introduces students to biological concepts and skills and includes:

- cell biology and metabolism: molecules of life, water, organic compounds, ions, polymers (proteins, nucleic acids, polysaccharides), organelles, membranes and walls; unicellular and multicellular organisms, cell division, mitosis;
- cell differentiation and specialisation; diversity and unity of cell structure, prokaryotes and eukaryotes; tissues and organs; major metabolic pathways, metabolism; enzymes;
- photosynthesis and photorespiration, respiration, glycolysis, fermentation; inheritance: protein synthesis and gene expression; brief description of DNA, RNA, the double helix, recombination and mutation;
- Mendelian genetics; plant structure and function: roots, stems, leaves, meristems, flowers and seeds; plant cells and tissues, anatomical diversity; transpiration and translocation;
- animal structure and function: tissues, organs and organ systems; comparative anatomy; homoeostasis;
- nutrient uptake, circulation, gas and fluid exchange; differences between animal and plant anatomy;
- structure of selected invertebrate groups, especially insects;
- mammalian structures;
- nutrient uptake; primary and secondary growth; reproduction and nutrition: heterotrophy and autotrophy; nutrients and nutrient cycling; productivity;
- gametogenesis, process and structures in plants and animals; fertilisation, seed development, germination, emergence; gestation, embryo development, parturition, hatching; life cycles; and
- introduction to biodiversity and evolution: populations, communities and ecosystems, adaptation, phylogeny.

Practicals will emphasise the handling and identification of biological material and the use of microscopes and other instruments.

Assessment: Mid-semester examination (15%), End of semester 3-hour examination (40% of final marks), two assignments equivalent to 2000 words (each worth 15% of final marks) and practical reports (15% of final marks).

Hurdle Requirement: 80% of practicals must be attended to pass this subject.

Recommended texts: R B Knox, P Y Ladiges and B K Evans, *Biology*, McGraw Hill, 1994. • N Campbell and J Reece, *Biology*, Benjamin Cummings, 2002.

207-171 Sustainable Catchment Management

Availability: Dookie campus

Credit points: 12.5

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

Description: The objectives of this unit are intended to extend the participant's ability to assess and manage issues relating to:

- systems approach to regional land management affecting soil and water;
- use and conservation;
- management of conflicting values relating to natural resource production systems within catchment areas; and
- analysis of physical and socio-economic implications for catchment management.

The topics covered in this unit include:

- a background in systems thinking;
- sustainability;
- implications for national and regional biodiversity; and
- the political, geological and ecological implications for catchment management.

Assessment: One 3-hour end-of- semester examination (50% of final marks) and two mid-semester assignments each equivalent to 3000 words (25% each of final marks).

208-125 Review of Australian Agriculture

See full subject details on page 1.

207-172 Rural Economics

Availability: Dookie campus

Credit points: 12.5

Coordinator: Ms Ros Gall

Contact: Twenty-four hours of lectures; 24 hours of tutorials. Residential workshop for flexible-delivery students *(Semester 2).*

Description: This subject is an overview of the ways that prices for agricultural commodities are determined; and Australia's competitive position in the markets for our major exported agricultural commodities.

Topics include importance of agriculture to the Australian economy; an economics perspective of the advantages and disadvantages of the major marketing alternatives for agricultural commodities; market support mechanisms; factors determining rural policy development; impact of government policies and the constraints within the Australian Constitution on marketing agricultural commodities; product marketing fundamentals, including marketing mix, segmentation and target markets, promotion, distribution and pricing strategies; and developing and implementing marketing plans.

Assessment: One 3-hour written examination worth 50% of final marks, two assignments equivalent to 2500 words and worth 25% of final marks each.

Prescribed texts: K O Campbell and B S Fisher, *Agricultural Marketing and Prices*, Longman Cheshire, 1991. • J R McColl-Kennedy, G Kiel, C H Lusch, V N Lusch, *Marketing Concepts and Strategies*, 2nd edn, Thomas Nelson, 1999.

208-152 Agricultural Technology

Availability: Dookie campus

Credit points: 12.5

Coordinator: Dr Dennis O'Brien

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

Description: On completion of this subject students should be able to:

- understand the role of engineering in current agricultural and related practices;
- apply to these practices the relevant basic laws and principles of engineering;
- identify and know the use of a range of agricultural and related equipment;
- understand and measure machinery performance, capacity and efficiency of a number of machines;
- make necessary machinery adjustments to improve performance and efficiency;
- determine the size and select an appropriate machine to perform a specific task; and
- understand environmental control techniques and their associated structures.

This subject covers the role of engineering in agriculture, develops the principles and explains the laws that are necessary to determine agricultural machinery performance specifications, fluid behaviour for both hydraulic power transmission and rural water supply specifications, and agricultural structures requirements. Topics covered will include:

- performance: mechanical performance, hydraulic performance, pressure, flow rate, torque, power, velocity and speed, efficiency, stress, strain, voltage and current, measurement, accuracy, power transmission, engine cycles, engine components, engine performance, maintenance;
- fluid behaviour: pressure, flow rate, head, head loss, pump and motor performance, pipe flow, pipe and pump specifications;
- structural requirements: functional design, loads, materials, controlled environments.

Assessment: One 2.5-hour written examination worth 40% of final marks, two assignments equivalent to 3000 words and worth 30% of final marks each.

208-154 Production Systems and Skills II

Availability: Dookie campus

Credit points: 12.5

Coordinator: Mr Neil McLeod

Contact: Twenty-four hours of lectures and 48 hours of practicals/tutorials. Each student will spend four hours per week on the various farm units and in a group learning activities relating to farm practices *(Semester 2)*.

Description: Skills topics include farm safety (OH&S), lifting procedures, farm chemical safety, safe operation of farm machinery, routine machine maintenance, machinery calibration, livestock feeding, livestock handling, basic livestock requirements, farm physical recording, integrating activity planning around a number of farm enterprises, types of fencing, costing of farm projects, chainsaw use and safety, basic concreting, introduction to welding systems and safety.

On completion of this subject students should be able to:

- develop an understanding of the production and performance objectives of agricultural and horticultural enterprises;
- apply tactical planning and decision making in farm management;
- apply quality assurance programs;
- apply enterprise and whole farm analysis, use of benchmarks and historical records in performance analysis; and
- recognise and demonstrate appreciation of farm safety practices and procedures.

Assessment: One 2.5-hour written examination (40%), two 3000-word assignments (30% each).

208-167 Introduction to Agricultural Systems

Credit points: 12.5

Coordinator: Mr Chris Laird

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

Description: Encompassing both natural and social sciences, the subject provides a foundation to consider sustainable approaches to agricultural production, and the impact of agricultural systems on people and the environment. Students will be introduced to the nature of agricultural production systems as managed ecosystems, how they function, how they interact with the natural environment and how they are intimately connected with human society and social changes.

Through the introduction of sciences as they apply to agriculture, students will be further prepared for the theoretical concepts encountered in specific discipline areas in latter parts of the course.

Students will be introduced to the concepts of decision making and the evaluation of changes in terms of outcomes and consequences.

Topics include:

- Agriculture in the environment - air, land and water; natural and social;
- Natural cycles within food and fibre production - e.g. nutrients, reproduction, growth and development;
- Perpetuation of food and fibre production - sustainability, genetics;
- Productivity and Landscapes - use of technology, chemicals and fertilizers;
- Ecology of crops and pastures;
- Catchment ecology - factors impacting on water quality;
- Global Issues - issues associated with climate change and deforestation.

Assessment: One two-hour examination 50%, students teams will also participate in, and submit a report on 3 practical field trials/experiments; each will contribute 10% to their final grade (total 30%). One individual literature-based assignment of 2000 words, 20%.

Second-year subjects

Semester 1

208-165 Financial Management I

Availability: Dookie campus

Credit points: 12.5

Coordinator: Mr Peter McSweeney

Contact: Twenty-four hours of lectures (2 hours per week) and 36 hours of tutorials (3 hours per week). Residential workshop for flexible-delivery students *(Semester 1, repeat 2)*.

Description: Topics include:

- financial management (principles and responsibilities);
- financial recording/reporting of information systems;
- analysis and interpretation of accounting/financial information;
- business structure;
- financial statements (profit, cashflow, balance sheets);
- budgets and planning;
- costing methods;
- computer business applications;
- debt finance;
- leasing decisions;
- direct taxes;
- indirect taxes; and
- taxation planning issues.

Assessment: One 2.5-hour written examination worth 40% of final marks, two assignments equivalent to 3000 words and worth 30% of final marks each.

Prescribed texts: Makeham and Malcolm, *The Farming Game Now*, Cambridge Press, 1993.

208-273 Managing Staff

Availability: Dookie campus

Credit points: 12.5

Coordinator: Mr Peter McSweeney

Contact: As for 208-269 Managing Staff *(Semester 1, repeat Summer)*.

Description: As for 208-269 Managing Staff.

Assessment: As for 208-269 Managing Staff.

Prescribed texts: K Cole, *Supervision: the Theory and Practice of First Line Management*, Prentice-Hall, Sydney, 2001.

Semester 2

208-248 Water, Soil and Nutrient Management

See full subject details on page 1.

Year-long subject

202-052 Industry Placement#

Note: This subject is a hurdle requirement for the completion of the Advanced Diploma of Agriculture and Horticulture.

Availability: Dookie campus

Coordinator: Mr Rowan Reid

Contact: At least eight weeks practical experience in an industry workplace, arranged by the student in consultation with the campus coordinator. The eight-week requirement must include one placement of at least four weeks duration, unless a variation is negotiated. Placements are normally completed during vacation breaks. Students may also be required to complete formal training in workplace occupational health and safety, risk assessment, and practical skills acquisition, delivered in block courses *(Year long)*.

Description: Work experience is a feature of all LFR degree and advanced diploma courses. On completion of Industry Placement, students should have:

- direct experience of employment and of employer-employee relationships in a range of workplaces in the relevant land and food industries;
- improved inter-personal and vocational skills;
- broader understanding of the diversity of workplaces and professional roles in the relevant land and food industries;
- greater appreciation of the practical application of the content taught during their course; and
- improved practical skills relevant to the management and operation of businesses in the land and food industries.

Industry placements may be undertaken in a range of businesses in the relevant land and food industries. These include commercial farm, equine, horticulture or forest operations, service industries including financial institutions, government departments and agencies, processing and marketing companies. Formal training in workplace occupational health and safety, risk assessment, and practical skills may be provided in block courses to give students an appreciation of safe working practices.

Assessment: A written report (1000 words) is submitted on one period of industry placement and is marked as pass/fail only. A journal must be kept for all placements and be made available for review by campus coordinator. Host employers will complete evaluation forms assessing the standards of performance and participation achieved by students while on placement.

Elective subjects

Second-year (Semester 1)

208-265 Integrated Pest and Weed Management

Availability: Dookie campus

Credit points: 12.5

Coordinator: Ms Helen Waite

Contact: Thirty-six hours of lectures and 36 hours of tutorials and practicals *(Semester 1).*

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

- identify the principles of integrated pest and weed management;
- identify the common range of pests and diseases that impact on crops and pastures;
- recall how population change occurs under different climatic and other factors; and
- document physical loss from pests and disease, and identify suitable time for control for economic control.

The content includes:

- causes of crop and pasture loss including arthropods and animal pests, weeds and plant pathogens;
- crop health assessment;
- principles and methodology of crop protection including pest exclusion, crop management practices, chemical control, biological control, and genetic resistance;
- economic assessment of control strategies;
- monitoring pest and weed populations and determining optimum control strategies; and
- case studies of current and proposed integrated pest and weed control programs.

Assessment: One 2.5-hour written examination (50% of final marks); one 2000-word essay (20% of final marks); one 3000-word essay (30% of final marks).

Hurdle Requirement: In order to pass the subject students must attend 4 of the 5 practical sessions, 4 of the 5 tours/excursions and both the practical workshops in week 1 and week 12.

208-253 Pasture Management

Availability: Dookie campus

Credit points: 12.5

Prerequisites: 202-154 Introductory Biology for Land and Food

Contact: Thirty-six hours of lectures and 36 hours of practicals/tutorials *(Semester 1, repeat Summer).*

Description: On completion of the subject, students should:

- understand the growth phases of pastures and how to monitor and measure these growth stages;
- understand the determinants that drive plant growth and yield of pastures;
- have a working knowledge of plant nutrient requirements for the major pastures of southern Australia and how to determine plant nutrient requirements;
- be able to develop a pre-season plan for pasture including forecasting potential yields;
- understand the major constraints to plant growth including soil limitations, plant disease, insect and weed management; and
- understand the different grazing methods of pastures and why they are used.

Assessment: Three-hour end-of-semester examination (50%), two 2000-word assignments (20% each) and one oral presentation (10%).

208-263 Animal Science and Nutrition

Availability: Dookie campus

Credit points: 12.5

Coordinator: Mr Chris Laird

Prerequisites: 202-154 Introductory Biology for Land and Food

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

Description: The subject provides students with a sound knowledge base for decision making in relation to the management of health, nutrition and breeding programs and covers the production of high quality animal products through the use of specialised intensive and semi-intensive systems. The subject will focus on ruminant species but students will be given the opportunity to develop knowledge of other farmed species.

The subject is divided into five main areas:

- animal products: factors influencing quality of meat, wool, dairy products;
- reproduction: enhancement of fertility and challenges to fertility in modern production systems;
- nutrition: systems for matching feeds to animal requirements, ration formulation, intensive feeding systems;
- health and welfare: prevention and control programs at farm and national levels; cost of disease; and
- animal improvement: economically important traits and their inheritance; breeding programs; genetic modification in animal production.

Assessment: One or more mid-semester assignments totalling 2000 words (totalling 40% of final marks); 3-hour end-of-semester examination (60% of final marks).

Second-year (Semester 2)

208-162 Agribusiness Marketing

Availability: Dookie campus

Credit points: 12.5

Coordinator: Ms Ros Gall

Prerequisites: 207-165 Rural Economics

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

Description: This subject introduces students to the economic importance of marketing activities. The subject takes a 'real world' approach to agribusiness marketing, ensuring students are familiar with the relationship of the Australian agribusiness sector with the global environment, and the importance of this relationship and international trade to the sector and the economy.

On completion of the subject students should be able to:

- characterise marketing decisions for an individual firm;
- develop marketing plans for specific agribusiness firms;
- develop strategic plans for a specific agribusiness firm;
- apply market research techniques; and
- apply effective communication tools in agribusiness problem solving.

Assessment: A three-hour end-of-semester examination (60% of final marks), and two 1500-word assignments (20% each of final marks).

208-249 Landscape Information Systems

See full subject details on page 2.

208-255 Crop Management

Availability: Dookie campus

Credit points: 12.5

Coordinator: Dr Ken Young

Prerequisites: 202-154 Introductory Biology for Land and Food

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

Description: On completion of the subject, students should:

- understand the growth phases of crops and how to monitor and measure these growth stages;
- understand the determinants that drive plant growth and yield of crops;
- have a working knowledge of plant nutrient requirements for the major crops of southern Australia and how to determine plant nutrient requirements;
- be able to develop a pre-season plan for crops including forecasting potential yields;
- understand the major constraints to plant growth including soil limitations, plant disease, insect and weed management; and
- understand the different harvesting/grazing methods of crops and why they are used.

Assessment: Three-hour end-of-semester examination (50% of final marks), two 1500-word assignments (20% each of final marks) and one oral presentation (10% of final marks).

208-271 Animal Management

Availability: Dookie campus

Credit points: 12.5

Coordinator: Dr Sarah Chaplin

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

Description: Topics include:

- the nutritional requirements of farm animals for maintenance and production, stages of livestock growth and development from conception to maturity;
- livestock appraisal, assessment of age, basic carcass and condition score evaluation, conformation and breed identification;
- general livestock marketing, reproductive management of farm animals for optimum fertility, new technology in animal breeding; the nature of animal diseases, immunity and its development;
- common causes of disease in farm animals, planned health programs for farm animals;

- animal behaviour, genetic and environmental influences, welfare issues affecting the production and management of farm animals; and
- industries in South-East Australia will be emphasised.

On completion of this subject students should be able to:

- describe cycles of production and factors influencing profitability of enterprises;
- demonstrate awareness of animal welfare and relevant codes of practice;
- describe industry trends and factors influencing these trends;
- evaluate management strategies and potential of new technologies; and
- demonstrate an awareness of the impact of animal industries on the environments in which they operate.

Assessment: Two 3000-word mid-semester assignments (30% each of total marks), and 2-hour end-of-semester exam (40% of final marks).