Advanced Diploma of Horticulture

First-year subjects

202-151 Information Technology and Communication

See full subject details on page 1.

207-151 Plant Biology

Availability: Burnley

Credit points: 12.5 **HECS-band:** 2

Coordinator: Dr Cassandra McLean

Contact: Practicals/tutorials: 36 hours *(Semester 1).*

Description: This subject considers the importance of plant production and the ecological role of plants.

Topics include:

- the process of photosysnthesis, its links with respiration and growth, the effect of light conditions and plant adaptations to these; photoperiodism;
- the manipulation of light in plant production; the photosynthesis-transpiration compromise, water uptake, osmotic potential, adaptations for water conservation; irrigation;
- waterlogging and salinity; climate; temperature as a moderating and limiting factor; soil, nutrients, nutrient cycling and soil biota; other growing media; pests, diseases and their control; competition, mycorrhizas; plant growth and development, vegetative propagation, tissue culture and plant variety rights;
- sexual reproduction, its advantages, disadvantages and manipulation; Mendelian genetics; genetic engineering; and
- methods of establishing plants including site selection and preparation; dormancy and germination; natural ecosystems, disturbed ecosystems, various crops, permaculture and amenity parkland; case studies for a variety of plant production systems; and post-harvest issues.

Assessment: One mid-semester 1-hour written examination (theory) worth 20% of final marks, one mid-semester practical test worth 20% of final marks, one final 2-hour written examination worth 40% of final marks and one final practical test worth 20% of final marks.

Prescribed texts: K R Stern, *Introductory Plant Biology*, Wm C Brown, 1997.

207-152 Soil Management

Availability: Burnley campus.

Credit points: 12.5 **HECS-band:** 2

Coordinator: Dr Peter May

Contact: Twenty-four hours lectures, 24 hours laboratory sessions *(Semester 2).*

Description: The management of plants depends on a thorough knowledge and understanding of the way in which soil properties can influence plant growth. This subject aims to provide:

- background information on the chemistry basic to an understanding of soil and plant relationships including the nature of matter, atoms, molecules and bonding, stoichiometry and the chemistry of water; and
- an introduction to plant/soil relationships and the ways in which soils can be manipulated to influence and improve plant growth. It will describe the ways in which soil properties (physical, chemical and biological) can affect plant growth. It will describe the ways in which soils can be managed to maintain their productivity.

Assessment: One 2-hour written examination worth 40% of final marks, one 1-hour written test worth 20% of final marks, assignments and practical reports equivalent to 2500 words and worth 40% of final marks each.

207-153 Horticultural Plants

Availability: Burnley campus.

Credit points: 12.5 **HECS-band:** 2

Coordinator: Ms Leisa Armstrong

Contact: Twenty-four hours of lectures, 36 hours of laboratory sessions, tutorials, plant walks and field excursion *(Semester 1).*

Description: This subject covers:

- taxonomic approaches to plant description and morphology (roots, stems, leaves, flowers, fruits);
- plant habit and lifecycles, International Code of Botanical Nomenclature and Code for Cultivated Plants;
- use and application of plant recognition characters for identification; and
- study of horticultural plants in groups based on habit, life cycle and taxonomic approaches.

On completion of this subject students should be able to:

- identify a group of plants used in ornamental horticulture by scientific name, habit and life-cycle;
- write plant names in accordance with the ICBN (International Code of Botanical Nomenclature) and the ICNCP (International Code of Nomenclature for Cultivated Plants);
- identify and describe the main morphological features of stems, leaves, flowers and fruits;
- determine the floral formula for a species; and
- use these plant recognition characters to identify a plant using a taxonomic key.

Assessment: Two 90-minute written examinations (one mid-semester and one final) each worth 20% of final marks; one written assignment equivalent to 2500 words and worth 25% of the final marks; exercises and practical work submitted during the semester equivalent to 3500 words and worth 35% of the final marks. Attendance at laboratory sessions, tutorials, plant walks and field excursions is compulsory.

207-154 Horticultural Technology

Availability: Burnley campus.

Credit points: 12.5 **HECS-band:** 2

Coordinator: Mr Ken James

Prerequisites: 207-158 Horticultural Practices I.

Contact: Twenty-four hours of lectures, 24 hours of practical classes and tutorials *(Semester 2).*

Description: This subject examines:

- the range of machinery used in the management of horticultural sites, together with the principles of machinery operation and maintenance;
- health and safety techniques to identify hazards associated with machinery used, the assessment of risk and the control methods used to comply with current legislation;
- basic site surveying techniques that will enable the production of site plans and levelling details, for horticultural and irrigation applications;
- irrigation equipment such as micro, trickle and sprinkler systems as used in horticulture; and
- water management principles used in the design and management of irrigation systems, including the evaluation of the performance of irrigation systems.

Assessment: One 2000 word assignment (20%) and two two-hour examinations (40% each).

207-155 Horticultural Practice II

Availability: Burnley campus

Credit points: 12.5 **HECS-band:** 2

Coordinator: Mr Brian Shields

Contact: Twenty-four hours of lectures, 36 hours of practical classes, 12 hours tutorials *(Semester 2).*

Description: This subject builds on the development of horticultural principles and practices in ornamental horticulture and nursery production. It includes methods for and systems of propagating plants by grafting and rootstock production, assessing critical environmental factors that influence the establishment and growth of plants in the planted landscapes and, turf and ornamental plant establishment and maintenance.

Assessment: One final two-hour written examination worth 30% of final marks, two 1-hour tests held during semester worth 20% of final marks and two written assessments equivalent to 2000 words each, worth 50% of final marks.

Recommended texts: Handreck, K. & Black, N. 2002, *Growing media for ornamental plants and turf, 3rd edn*, NSW University Press, Kensington. • Ingram, D. S., Vince-Prue, D. & Gregory, P. J., 2002, *Science and the Garden*, Blackwell Pub., Oxford, UK. • Burnley College, University of Melbourne, Version 2.16, *Burnley Plant Directory (Database) 2002*, Burnley College, University of Melbourne.

207-158 Horticultural Practice I

Availability: Burnley campus.

Credit points: 12.5 **HECS-band:** 2

Coordinator: Mr John Delpratt

Contact: 24 hours of lectures, 48 hours of practical classes *(Semester 1).*

Description: This subject covers introductory principles and practices in nursery production and ornamental horticulture. It includes methods of and systems for propagating plants from seeds and cuttings and techniques for planting, establishing and maintaining plants in the landscape.

Assessment: Two 90 minutes written examinations each worth 25% of final marks, and two written assignments/ practical reports equivalent to 2000 words and each worth 25% of final marks.

Recommended texts: Handreck, K. & Black, N. 2002, *Growing media for ornamental plants and turf, 3rd edn*, NSW University Press, Kensington. • Hartmann, H.T., Kester, D.E., Davies, F.T & Geneve, R. L. 2002, *Hartmann and Kester's Plant Propagation: principles and practices, 7th edn*, Prentice-Hall International, Upper Saddle River.

207-173 Plant Protection

Availability: Burnley

Credit points: 12.5 **HECS-band:** 2

Coordinator: Mr James Will

Contact: 36 hours lectures and 24 hours practical activities *(Semester 2).*

Description: This subject includes:

- impact of stress on plants and invasion by pests and other parasitic organisms; the classification of pests;
- identification of common pest, disease and weed species;
- integrated pest control concepts;
- pest control measures;
- fate of chemicals in the environment; and
- legislation pertaining to pests, noxious weeds and environmental weeds.

Assessment: One final 2-hour written examination worth 50% of final marks, two pest identification assessments worth a total of 30% of final marks and written reports (plant protection record sheets) worth 20% of final marks.

*Hurdle Requirement:*Students must obtain a 40% pass mark for the final examination to pass the subject.

Prescribed texts: Kerruish, R, *Plant Protection 1- Methods of Disease, Pest and Weed Control*, Rootrot Press, Canberra, 1990.

208-161 Financial Management for Resource Ind I

See full subject details on page 2.

Second-year subjects

202-051 Industry Placement#

See full subject details on page 2.

207-252 Horticultural Practice III

Availability: Burnley campus.

Credit points: 12.5 **HECS-band:** 2

Coordinator: Mr Clive Sorrell

Contact: 36 hours of lectures and 36 hours of practical activities *(Semester 1).*

Description: This subject covers:

- studies of horticultural plants based on garden styles and landscape themes; and
- technical issues and practical activities in a specific horticultural industry sector:
  - *arboriculture:* safely climbing and pruning trees utilising modern technologies and techniques; fundamental tree anatomy and physiology; CODIT defence strategies in trees;
  - *parks and gardens management:* planting design, plant and garden management, turf establishment and management, garden planning;
  - *landscape construction:* power tools and construction equipment, earthworks and earthmoving equipment, pavement materials and pavement construction, concrete construction (slabs and footings), retaining and free standing wall; and
  - *nursery production and management:* propagation and production management, growing media, micro-propagation, comparative irrigation systems.

Assessment: One 90 minute written examination worth 25% of final marks, two plant materials tests worth a total of 30% of final marks and horticultural industry sector practical or written assignments (equivalent to 3000 words) worth a total of 45% of total marks.

Prescribed texts: Burnley College, University of Melbourne, Version 1.05, *Burnley Plant Directory (Database) 2000*, Burnley College, University of Melbourne.

207-253 Horticultural Practice IV

Availability: Burnley campus.

Credit points: 12.5 **HECS-band:** 2

Coordinator: Mr Ian Winstone

Contact: Thirty-six hours of lectures and 36 hours of practical activities *(Semester 2).*

Description: This subject includes:

- project studies of horticultural plants based on a plant genus or group within a plant genus; and
- technical, design, planning and management issues relating to a specific horticultural industry sector:
  - *arboriculture:* establishing, maintaining and managing trees that enhance urban and other human environments;
  - *parks and gardens:* parks planning and management, garden history, horticultural therapy;
  - *landscape construction:* bricklaying, soil water movement and drainage construction, rock and water in the landscape, ornamental pond construction, step construction;
  - *nursery:* materials handling, production scheduling, production nursery design, trials organisation and management, specialist production enterprises, nursery retailing and marketing, greenhouse management issues.

Assessment: One oral presentation incorporating a written synopsis to 1500 words (plant materials) worth 15% of final marks, one final 2-hour examination worth 35% of final marks, and practical assessment or two written assessments equivalent to 2000 words each, worth 50% of final marks.

Recommended texts: Burnley College, University of Melbourne, Version 1.05, *Burnley Plant Directory (Database) 2000*, Burnley College, University of Melbourne.

207-263 Advanced Plant Biology

Note: Study commitment for this subject is five hours per week.

Availability: Burnley campus.

Credit points: 12.5 **HECS-band:** 2

Coordinator: Dr G M Moore

Contact: Twenty-four hours lectures, 24 hours practicals, 12 hours tutorials *(Semester 1).*

Description: The aims of this subject are to extend the student's ability to:

- apply the principles and units of chemical measurement and energy balances;
- describe the biochemistry of major plant physiological processes;
- identify the causes and effects of environmental stresses;
- decribe the effects of the major plant hormones on plant growth and development;
- describe the role of natural selection and competition in plant biology;
- assess the effects of herbicides on plant metabolism, the environment and health;
- determine the physiological basis of plant responses to disease and decay; and
- identify responses of native plants to aspects of the Australian environment.

Content to be studied includes:

- nutrient cycling, uptake and assays;
- photosynthesis;
- respiration;
- germination, growth, flowering and senescence;
- the biology of mycorrhizal fungi;
- competition, breeding and genetics;
- stress physiology;
- physiological plant pathology;
- hormone biology;
- mechanisms of herbicide action;
- plant pollutants; and
- the biology of native plants.

Assessment: One 1-hour mid-semester examination worth 20% of final marks, one final 2-hour examination worth 50% of final marks and three practical reports equivalent to 2000 words worth 30% of final marks.

207-265 Plant Management and the Environment

Availability: Burnley

Credit points: 12.5 **HECS-band:** 2

Coordinator: Mr Geoff Connellan

Contact: Twenty-four hours lectures and 36 hours practical work *(Semester 2).*

Description: This subject includes:

- developing and utilising diagnostic skills and equipment in the management of plant health;
- case studies of managing pest, disease and weed problems (including damage thresholds and control strategies);
- integrated pest management programs in horticultural sectors (including design, planning, implementation and evaluation);
- sustainable water management practices in urban horticulture; and
- the relationships between edaphic factors and and plant growth.

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

208-269 Managing Staff

See full subject details on page 3.

Elective subjects

202-250 Quantitative Skills for Land and Food

See full subject details on page 3.

207-251 Plant Technology

Availability: Burnley campus.

Credit points: 12.5 **HECS-band:** 2

Coordinator: Mr James Will

Contact: Thirty-six hours of lectures, 24 hours of practical classes and site visits *(Semester 1)*.

Description: Topics include:

- clonal and non-clonal methods for producing plants for nursery and revegetation programs through tissue culture;
- the biological basis for plant tissue culture;
- the tissue culture and micropropagation process;
- in-vitro media and environments;
- seed processing technologies;
- laboratory testing for seed quality; and
- seed sowing techniques for nursery, field and revegetation.

Assessment: One 2-hour written examination (50%), two written assignments each equivalent to 2000 words (25%).

207-254 Horticultural Project Management

Availability: Burnley campus.

Credit points: 12.5 **HECS-band:** 2

Coordinator: Mr Mike Green

Prerequisites: 207-152 Soil Management; 207-252 Horticultural Management I; 208-161 Financial Management for Resource Industries I.

Contact: Twelve hours lectures, 12 hours tutorials, 48 hours practical and project classes *(Semester 2)*.

Description: This subject includes:

- project design;
- planning and management;
- contract administration and management;
- presentation skills;
- report styles and writing;
- access, analysis and presentation of horticultural information; and
- project studies relating to a specific horticultural activity.

Assessment: One written assignment (project report) equivalent to 5000 words (75%) and one oral presentation (25%).

207-258 Sports Turf Management

Availability: Burnley campus

Credit points: 12.5 **HECS-band:** 2

Coordinator: Dr David Aldous

Semester: Semester 1

Description: Areas for this subject have been designed to extend the student's ability to:

- describe the benefits, values, location, and distribution of the national and international turfgrass industry;
- describe basic turfgrass function, physiology, inflorescence, and seed development;
- describe the major cool, transitional, and warm-season turfgrasses, and alternatives;
- describe specialist sowing/planting/instant lawn and after-care practices;
- describe important turf fertilisers and conditioners for turf performance;
- describe the components of surface playing quality;
- describe the agronomic factors influencing surface playing quality;
- describe the performance requirements for different grassed surfaces;
- measure and assess the playing quality of a range of grass surfaces;
- describe the practices associated with efficient and effective irrigation and drainage application;
- describe the practices associated in the use and care of turfgrass machinery and equipment for maintenance and renovation;
- recommend control methods and strategies for weeds, insects, nematodes, and diseases of turfgrass; and
- develop a works program and schedule for fine and coarse turf maintenance.

Assessment: One 3-hour common examination (50%) (short-answer, or essay), one web assignment of 2500 words (25%) (analysis of an industry topic), and two workshop reference exercises of 1000 words (25%).

Prescribed texts: D E Aldous (ed.), *International Turf Management Handbook.*, Butterworth-Heinemann, 1999.

207-261 Landscape Design and Graphics

Availability: Burnley campus

Credit points: 12.5 **HECS-band:** 2

Coordinator: Mr Mike Green

Contact: Twenty-four hours lectures and 36 hours practicals *(Semester 1)*.

Description: Upon completing this subject the student should be able to:

- demonstrate basic graphic design and technical drafting skills;
- describe the principle components of the design process;
- demonstrate an ability to interpret client requirements; and
- draw basic landscape plans for small projects in park, garden or turf facilities.

The content includes:

- the theory of design both contemporary and historic, site analysis techniques;
- developing and interpreting a brief;
- use of graphic symbols to communicate;
- use of scale perspective;
- planting plans; and
- colour media.

Assessment: One oral presentation worth 15% of final marks, one written assignment equivalent to 2500 words worth 25% of final marks, and four design studio assignments worth a total of 60% of final marks.

207-269 Vegetation Management

Availability: Burnley campus.

Credit points: 12.5 **HECS-band:** 2

Coordinator: Mr John Rayner

Contact: Thirty-six hours lectures, 24 hours practical classes and site visits *(Semester 2)*.

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

- identify important characteristics of different vegetation types;
- define a range of ecological terms and functions;
- discuss issues of importance in the management of different vegetation types; and
- describe the activities of organisations and agencies in vegetation management

Topics in this subject include:

- vegetation classification schemes;
- Australian vegetation communities;
- ecological terms and definitions;
- global issues in vegetation management;
- different urban vegetation types and their management (planning, design, establishment, maintenance, monitoring and evaluation);
- management issues in amenity and street trees; and
- agencies and organisations involved in vegetation management.

Assessment: One 2-hour written examination worth 50% of final marks, one assignment equivalent to 4000 words worth 50% of final marks.

207-333 Amenity Tree Assessment and Management

See full subject details on page 6.