

# HORTICULTURE AND VITICULTURE (HORT)

## HORT 1001 Crop Production (10 Credit Points)

Subject Details (<https://hbook.westernsydney.edu.au/subject-details/hort1001/>) **Legacy Code:** 300815

This subject aims to provide students with an understanding of the scientific basis of sustainable crop and food production and security. These include broad-acre cropping, fruits/orchards and vegetables. In this subject students will gain an understanding of the physiological controls on crop yield in the variable Australian environment in which crops are grown. Students will become familiar with the science and practice of sustainable crop production and develop crop management skills through the production of nursery crops, vegetables and fruits. Students will also gain an understanding of processing these crops after harvest, to develop an appreciation of factors impacting upon produce quality and safety.

**Level:** Undergraduate Level 1 subject

**Equivalent Subjects:** HORT 1003 - Horticultural Production 2 BIOS 2023 - Fruit Production LGYA 5943 - Floriculture HORT 1002 - Crop Production

**Restrictions:** Please see the Subject Details page for any restrictions for this subject

## HORT 1004 Horticultural Production Systems (10 Credit Points)

Subject Details (<https://hbook.westernsydney.edu.au/subject-details/hort1004/>) **Legacy Code:** 301096

Food represents the single largest part of your environmental footprint. This means our modern, urban-oriented society must begin to reconnect with the sources of our food to create more sustainable future. This subject explores the scientific basis of sustainable crop production by examining fruit, vegetable and grain enterprises. Management of produce from harvest to consumption will also be explored to examine factors that impact upon food quality and safety. Students will compare and contrast growing conditions of the highly variable Australian environment to consider the global context for horticultural industry development. By delving into the world of crop management, students will identify the impacts (opportunities and constraints) of plant physiology on the sustainability of food. Students will also consider how novel food products can prompt consumers to appreciate the environmental, economic and social benefits that can arise from sustainable horticultural production.

**Level:** Undergraduate Level 1 subject

**Equivalent Subjects:** HORT 1003 - Horticultural Production 2 LGYA 5944 - Fruit Production HORT 1002 - Crop Production HORT 1001 - Crop Production

**Restrictions:** Please see the Subject Details page for any restrictions for this subject

## HORT 1006 Protected Cropping Biosecurity and Pollination (10 Credit Points)

Subject Details (<https://hbook.westernsydney.edu.au/subject-details/hort1006/>) **Legacy Code:** 301214

The protected cropping industry in Australia is a rapidly expanding sector. There is an identified need for trained professionals who have an understanding of the management of plant pests and diseases. Students studying this course will learn industry best practice related to biosecurity, pest and disease management and emergency response procedures. In addition to pest and disease management the challenges of pollination in the context of Australian protected cropping will be explored. Western Sydney University is home to the state of the art National Vegetable and Protected Cropping Centre (NVPCC), this facility will be utilized in the on campus components of this course.

**Level:** Undergraduate Level 1 subject

**Restrictions:** Please see the Subject Details page for any restrictions for this subject

## HORT 1007 Protected Cropping Plant Nutrition (10 Credit Points)

Subject Details (<https://hbook.westernsydney.edu.au/subject-details/hort1007/>) **Legacy Code:** 301277

Plant nutrition is essential to plant health and defence, productivity and crop quality; this is especially so in the soilless environment employed by the protected cropping industry. This subject will focus on crop nutrient requirements, nutrient deficiencies and their symptoms, practical nutrient monitoring using hand-held technologies and the PRIVA system and correction techniques. This subject also explores soilless substrates and their influence on nutrient loads, nutrient-rich waste water recovery, reuse and environmentally sustainable disposal options. Western Sydney University is home to the state of the art National Vegetable and Protected Cropping Centre (NVPCC), this facility will be utilized in the on campus components of this course.

**Level:** Undergraduate Level 1 subject

**Restrictions:** Please see the Subject Details page for any restrictions for this subject

## HORT 2001 Greenhouse Technology for Food Sustainability (10 Credit Points)

Subject Details (<https://hbook.westernsydney.edu.au/subject-details/hort2001/>) **Legacy Code:** 301097

Greenhouses are enclosed structures that optimise temperature, light, water and carbon dioxide to maximise plant production. Also called 'greenhouse horticulture', these advanced systems integrate technologies across disciplines (e.g. horticultural, environmental and material sciences; mechanical engineering and design; robotics and computing programming) to create futuristic indoor environments that increase the quantity and quality of plant-derived foods. Controlled environments can significantly reduce reliance on inputs (fertiliser, pesticide, energy and water) and reduce environmental impacts (including 'food miles'). This subject explores a range of greenhouse technologies in Australia and overseas-from simple low-cost options, through to cutting-edge technology in energy and water-efficient production. Students will observe current status and future trends in the industry to examine how advanced technologies can improve sustainability measures along with the reliability of horticultural output. Students will consider how innovative horticultural enterprises can provide consumers with greater capacity to adopt more sustainable diets.

**Level:** Undergraduate Level 2 subject

**Restrictions:** Please see the Subject Details page for any restrictions for this subject

**HORT 2003 Plant Production (10 Credit Points)**

Subject Details (<https://hbook.westernsydney.edu.au/subject-details/hort2003/>) **Legacy Code:** 301447

This subject will provide you with an understanding of the scientific basis of sustainable plant production in natural and built environments. These include cropping of plants for food production in extensive and intensive systems. In this subject you will gain an understanding of the physiological controls on plant yield in the Australian environment. You will become familiar with the science and practice of sustainable plant production and develop crop management skills through the production of nursery crops, vegetables and fruits.

**Level:** Undergraduate Level 2 subject

**Restrictions:** Please see the Subject Details page for any restrictions for this subject

**HORT 3001 Postharvest (10 Credit Points)**

Subject Details (<https://hbook.westernsydney.edu.au/subject-details/hort3001/>) **Legacy Code:** 300869

This subject explores the factors affecting the retention of quality of fresh fruit, vegetables and cut flowers from grower to consumer. Topics include: the role of fresh produce for the health and happiness of people; the growth and maturation and physiology of fresh produce; the importance of managing temperature and relative humidity of the storage environment; the responses of fresh produce to changes in temperature and water loss; the role of ethylene in fruit ripening and senescence; the practical issues of assessing harvest maturity; packaging; distribution and the control of postharvest diseases and pest and the concepts of market access.

**Level:** Undergraduate Level 3 subject

**Restrictions:** Please see the Subject Details page for any restrictions for this subject

**HORT 3002 Protected Cropping Technology (10 Credit Points)**

Subject Details (<https://hbook.westernsydney.edu.au/subject-details/hort3002/>) **Legacy Code:** 301448

This subject will develop your understanding of the role technology plays in underpinning plant production, in built environments, as well as the impact on processing and consumption of established and emerging opportunities. This subject explores the factors affecting growth, maturation and physiology of plant products in the protected cropping environment. Industry issues of controlling pests and disease, assessing harvest maturity, post-harvest management are underpinned by systems modelling and sustainable practices.

**Level:** Undergraduate Level 3 subject

**Restrictions:** Please see the Subject Details page for any restrictions for this subject

**HORT 7001 Advanced Greenhouse Technology (10 Credit Points)**

Subject Details (<https://hbook.westernsydney.edu.au/subject-details/hort7001/>) **Legacy Code:** 301358

This subject explores a range of advanced greenhouse technologies in Australia and overseas-from simple low-cost options, through to cutting-edge technology in energy and water-efficient production. Students will observe current status and future trends in the industry to examine how advanced technologies can improve sustainability measures along with the reliability of horticultural output. This subject focuses on engineering aspects of greenhouse horticulture systems as well as crop growth and development. The basics of crop growth and development and the physical principles of greenhouse systems at different levels will be taught. The main in depth topics of the subject are: the selection of suitable greenhouse technology, physics of greenhouse climate, greenhouse systems (passive greenhouse, climate controlled, closed or semi-closed greenhouse), cropping systems, cover materials and smart glass technologies, energy saving technologies, water and nutrient recycling, and robotics for de-leafing and picking.

**Level:** Postgraduate Coursework Level 7 subject

**Restrictions:** Please see the Subject Details page for any restrictions for this subject

**HORT 7002 Greenhouse Control Systems (10 Credit Points)**

Subject Details (<https://hbook.westernsydney.edu.au/subject-details/hort7002/>) **Legacy Code:** 301359

This subject develops an understanding of the leading controlling systems for protected cropping in low, medium and high-tech greenhouses. The main topics are: the integration of hardware and software in a range of different protected cropping systems, management of the aerial environment (e.g. manageable parameters and greenhouse climate engineering, radiation management, energy sources and distribution systems, ventilation, air conditioning and cooling systems, screens, carbon dioxide-sources and distribution), and management of the hydroponic environment (factors, tools, control of water and nutrient balance, water quality, salinity effects). The subject emphasises computing skills, calculation, and analysis that are applicable to a range of different greenhouse control systems.

**Level:** Postgraduate Coursework Level 7 subject

**Restrictions:** Please see the Subject Details page for any restrictions for this subject

**HORT 7003 Greenhouse Crop Production (10 Credit Points)**

Subject Details (<https://hbook.westernsydney.edu.au/subject-details/hort7003/>) **Legacy Code:** 301360

This subject focuses on key concepts relating to the functioning of a range of greenhouse horticultural crops in their environment, biological mechanisms, crop growth and development, integrated pest management, crop production, quality and postharvest technology. Students will learn concepts and knowledge relevant to plant physiology, environmental sciences, horticultural production, food technology, and postharvest physiology. Students will be able to measure and interpret plant physiological, biochemical, genetic, and produce quality traits in greenhouse experiments in the context of the functional diversity in crops. The students will also integrate knowledge using plant growth modelling techniques, interpret model output, and address questions on functional diversity in crops by combining model output and experimental data.

**Level:** Postgraduate Coursework Level 7 subject

**Restrictions:** Please see the Subject Details page for any restrictions for this subject

**HORT 7004 Industry Project (10 Credit Points)**

Subject Details (<https://hbook.westernsydney.edu.au/subject-details/hort7004/>) **Legacy Code:** 301361

In this unit, students will complete an industry based project under the guidance of an industry partner and a member of the University's academic staff. Using a project based methodology, students will be required to solve a real world problem on behalf of a protected cropping industry partner. Students will develop skills in scoping, planning, implementing, reporting on the industry project; reflecting on what has been learned in the context of their personal and professional development and how this can be used in their future career.

**Level:** Postgraduate Coursework Level 7 subject

**Restrictions:** Please see the Subject Details page for any restrictions for this subject

**HORT 7005 Industry Project (Extended) (10 Credit Points)**

Subject Details (<https://hbook.westernsydney.edu.au/subject-details/hort7005/>) **Legacy Code:** 301362

In this subject, students will undertake a more in depth investigation of the project undertaken in 301361 Industry Project. Students will extend their use of project based methodologies to solve the problem identified in the pre-requisite subject 301361 Industry Project for a protected cropping industry partner. Students will extend their skills in planning, implementing, collecting and analysing data, reporting on the industry project and reflecting on what has been learned in the context of their personal and professional development and how this can be used in future career.

**Level:** Postgraduate Coursework Level 7 subject

**Pre-requisite(s):** HORT 7004

**Restrictions:** Please see the Subject Details page for any restrictions for this subject

**HORT 7006 Plant-Climate Interactions in Controlled Environments (10 Credit Points)**

Subject Details (<https://hbook.westernsydney.edu.au/subject-details/hort7006/>) **Legacy Code:** 301357

This subject aims to provide knowledge of relationships between plant growth, controlled environment and crop physiological aspects relevant to protected crop production. The subject will provide students with relevant knowledge to explain and develop concepts that are key to understanding various areas of environmental plant physiology. The subject will also stimulate students to conceptualise interactions between the physical environment and plant functioning. The subject will compare the important parameters and concepts (e.g. plant growth, plant and fruit development, light interception, light use efficiency, biomass partitioning, and water use efficiency) in horticultural crop growth in the controlled systems.

**Level:** Postgraduate Coursework Level 7 subject

**Restrictions:** Please see the Subject Details page for any restrictions for this subject

**HORT 9001 Higher Degree Research Thesis - Horticulture (10,20 Credit Points)**

Subject Details (<https://hbook.westernsydney.edu.au/subject-details/hort9001/>) **Legacy Code:** 800071

**Level:** PhD and Research Masters Level 9 subject

**Restrictions:** Please see the Subject Details page for any restrictions for this subject

**HORT 9002 Higher Degree Research Thesis - Viticulture (10,20 Credit Points)**

Subject Details (<https://hbook.westernsydney.edu.au/subject-details/hort9002/>) **Legacy Code:** 800073

**Level:** PhD and Research Masters Level 9 subject

**Restrictions:** Please see the Subject Details page for any restrictions for this subject