



Shape of ACT Senior Secondary Curriculum

Horticulture A/M/V

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1. PURPOSE

- 1.1 The *Shape of ACT Senior Secondary Curriculum: Horticulture A/M/V* will guide the writing of the revised *Horticulture* course.
- 1.2 This paper has been prepared following the deliberations of the *Horticulture* writing team and also in consultation with Peter Hay, Horticulture Project Officer at the National Capital Authority.
- 1.3 The paper should be read in conjunction with *The Shape of the ACT Senior Secondary Curriculum* located at: http://www.bsss.act.edu.au/curriculum/bsss_course_development_consultation

2. INTRODUCTION

- 2.1 The *Horticulture A/M/V* course will be the basis of planning, teaching, learning and assessment in ACT senior secondary schools.
- 2.2 The course makes provision for qualifications or a Statement of Attainment from the Agriculture, Horticulture and Conservation and Land Management Training Package.

Refer to <https://training.gov.au/Training/Details/AHC>

3. BACKGROUND

- 3.1 The ACT Board of Senior Secondary Studies is reviewing the *Horticulture* curriculum as part of the Final Recommendations of the *BSSS Review of C and E Course Classifications Final Report*.
- 3.2 *Horticulture A/M/V* is a discreet subject that develops significant skills, knowledge, and understandings for working in the horticulture industry, as well as a range of general capabilities to pursue a range of future occupations and life aspirations. In its developed form, this course will be contemporary and highly relevant to senior secondary students in the twenty-first century.
- 3.3 All courses under development are required to meet Board design specifications and to align with Board requirements for the senior secondary curriculum. These specifications align with ACARA course design specifications and provide teachers with flexibility to plan, teach and assess according to the needs and interests of their students.
- 3.4 The *Horticulture* course is a highly practical course, and to facilitate delivery, it is to be developed under the *Industry and Services Framework*, which prioritises practical applications. The Framework is located at:

http://www.bsss.act.edu.au/data/assets/pdf_file/0010/411022/Industry_and_Services_Framework_k.pdf

The rationale for this framework describes Industry and Services courses as:

Courses written under this framework provide students with knowledge, understanding and skills relating to areas of work inside the industry & services domains. In broad terms, students learn about industry practices, processes, procedures, and concepts such as technical information, materials, sustainability, equipment, and work health & safety (WHS). Students learn to analyse, problem solve, make decisions, and develop interpersonal and intrapersonal skills suitable for employment and further training.

- 3.5 All courses based on this framework should enable students to:
 - analyse industry practices, processes, and procedures
 - analyse technical information and specifications
 - understand materials and equipment
 - demonstrate industry specific literacy and numeracy skills
 - solve problems and use industry specific terminology
 - organise resources and material to create quality products and services

- work independently and collaboratively in accordance with WHS principles and industry standards
- communicate in a range of modes and mediums.

Courses developed under this Framework provide details of course content through the component units of the course. While this content will differ according to the particular course, all content will be chosen to enable students to work towards the achievement of the common and agreed goals of the Framework.

3.6 Concepts, knowledge and skills from the Industry and Services Framework:

Concepts and knowledge

- industry practices, processes, concepts, and procedures
- technical information and terminology
- materials and equipment
- Workplace Health and Safety.

Skills

- analysing and evaluating
- problem solving
- decision making
- reflecting on own learning
- industry specific literacy and numeracy
- interpersonal and intrapersonal strategies communication.

3.7 All courses of study for the ACT Senior Secondary Certificate should enable students to develop essential capabilities for twenty-first century learners. The Australian Curriculum General Capabilities comprise an integrated and interconnected set of knowledge, skills, behaviours, and dispositions that students develop and use in their learning across the curriculum.

Students in *Horticulture A/M/V* engage with the General Capability of Literacy as they engage with a variety of texts for purpose and communicate information for understanding.

In the Australian Curriculum, students become literate as they develop the knowledge, skills, and dispositions to interpret and use language confidently for learning and communicating in and out of school and for participating effectively in society. Literacy involves students listening to, reading, viewing, speaking, writing, and creating oral, print, visual and digital texts, and using and modifying language for different purposes in a range of contexts.

<https://www.australiancurriculum.edu.au/f-10-curriculum/general-capabilities/literacy/>

Students in *Horticulture A/M/V* engage with the General Capability of Critical and Creative Thinking through examination of information and data and through problem solving.

In the Australian Curriculum, students develop capability in critical and creative thinking as they learn to generate and evaluate knowledge, clarify concepts and ideas, seek possibilities, consider alternatives, and solve problems. Critical and creative thinking involves students thinking broadly and deeply using skills, behaviours, and dispositions such as reason, logic, resourcefulness, imagination, and innovation in all learning areas at school and in their lives beyond school.

<https://www.australiancurriculum.edu.au/f-10-curriculum/general-capabilities/critical-and-creative-thinking/>

Students in *Horticulture A/M/V* engage with the General Capability of Personal and Social Capability through working and interacting with a variety of people and stakeholders for work and industry related practices and process.

Students develop Personal and Social Capability as they learn to understand themselves and others, and manage their relationships, lives, work and learning more effectively. Personal and Social Capability involves students in a range of practices including recognising and regulating emotions, developing empathy for others, and understanding relationships, establishing, and building positive relationships, making responsible decisions, working effectively in teams, handling challenging situations constructively and developing leadership skills.

<https://www.australiancurriculum.edu.au/f-10-curriculum/general-capabilities/personal-and-social-capability/>

- 3.8** The importance of the senior years of schooling as a critical transition point for young people is highlighted in two extracts from the *Alice Springs (Mparntwe) Education Declaration*:

All Australian Governments and the education community need to support students in their senior years by helping them acquire the cognitive and social skills necessary for life after school and equip students to remain engaged in learning throughout life.

Australian Governments commit to working with the education community to provide a senior secondary education that equips young people with the skills, knowledge, values, and capabilities to succeed in employment, personal and civic life.

<https://docs.education.gov.au/documents/alice-springs-mparntwe-education-declaration>

4. THE CONTEXT OF THE ACT

- 4.1** Courses of study for the ACT Senior Secondary Certificate:

- provide a variety of pathways, to meet different learning needs and encourage students to complete their secondary education
- enable students to develop the essential capabilities for twenty-first century learners
- empower students as active participants in their own learning
- engage students in contemporary issues relevant to their lives
- foster students' intellectual, social, and ethical development
- nurture students' wellbeing, and physical and spiritual development
- enable effective and respectful participation in a diverse society.

- 4.2** Each course of study:

- comprises an integrated and interconnected set of knowledge, skills, behaviours, and dispositions that students develop and use in their learning across the curriculum
- is based on a model of learning that integrates intended student outcomes, pedagogy, and assessment
- outlines teaching strategies which are grounded in learning principles and encompass quality teaching
- promotes intellectual quality, establishes a rich learning environment, and generates relevant connections between learning and life experiences
- provides formal assessment and certification of students' achievements.

- 4.3** In consideration of the ACT context, and in response to contemporary research and literature, the *Horticulture* curriculum should include:

- a student-centred pedagogical approach
- the educational needs of young people with respect to horticulture skills, knowledge, processes, and industry practices
- procedures to safely undertake work in the horticultural industry

- industry specific literacy and numeracy skills
- working collaboratively and independently
- communicating with others from diverse backgrounds and for a range of purposes
- the Industry and Services Framework and Achievement Standards
- the needs of different schools and sectors (government and non-government)
- awareness of local, national, and global issues
- aesthetic, ethical, environmental and sustainability factors.

5. AIMS OF THE HORTICULTURE CURRICULUM

5.1 The *Horticulture A/M/V* course develops knowledge, skills and understandings required to undertake work and further study within the horticultural, landscape and conservation industries. It has connections to disciplines including the sciences, agriculture, and business. *Horticulture A/M/V* explores the relationship between complex scientific understandings such as plant physiology, soil and climatic sciences and ecology whilst integrating design and art principles associated with developing environmental spaces.

According to Sharma and Alam (2013) 'Horticulture is a boon of nature which is refined by human skill as a science to obtain more and more benefits. It involves rigorous cropping expertise, including the improvement, production, distribution and use of vegetables, fruits, woody landscape and greenhouse plants. Horticulture is now one of the fastest growing industries with striking professional opportunities.' Furthermore 'The horticulture industry provides significant contributions to society, including the provision of healthy foods, economic development, the provision of essential vitamins and minerals, and contributions to recreation and leisure activities.' Such breadth of contexts provides significant opportunities for students to develop knowledge, understandings, and skills in a variety of interesting and beneficial areas they can utilise for future employment, education, and leisure.

Horticulture A/M/V examines the historical and future nature and purpose of the horticulture industry. *The Modern Horticulture Employee* identifies a changing landscape for horticulture where 'time pressures on staff, a greater appetite for native plantings and increased strain on local government spending are driving change in the horticulture industry. No longer are amenity gardens and unqualified employees good enough – people want increased yield and productivity, more native species planted... and more value for money from their rates spend on parks and open spaces'. (Australasian parks and Leisure, 2016). Understanding such requirements sets clear goals for *Horticulture A/M/V* to address these expectations.

In conducting horticultural operations, those of today operate at levels of complexity that did not exist 20 years ago. Businesses are faced with a range of compliance responsibilities in the areas of workplace health and safety, pesticide management, food safety, customer relationships and environmental sustainability.' (*Skills issues in the horticulture industry of the Riverina-Final Report*). As such an innovative *Horticulture A/M/V* course aims to address the demands for well-trained experts to meet industry demands now and into the future.

Horticulture prepares students for further study and work in a rapidly changing industry which according to *Horticulture in the USA* 'boomed during the pandemic, which brings several opportunities with it.' Trends such as "Urban horticulture" are viable concepts to provide sufficient fresh and safe food to cities, to achieve a sustainable food supply and food security.' In conjunction, urban-based consumers have become increasingly verbal about various issues such as the use of pesticides, labour conditions for farm workers, carbon taxes, buy-local campaigns, and the sustainability of production methods... Those in metropolitan environments are more and more aware of and dependent on green spaces for their livelihoods and wellbeing. The future for horticulture and its foundation sciences within such an environment is, therefore, exhilarating, tricky, motivating and surely worthwhile.'

Restoration and conservation legislation at both national and state levels provide necessity for the implementation of horticultural knowledge, understandings and skills for improved urban green

spaces and industrial sites impacted by human activity. As such the *Horticulture A/M/V* course investigates such occurrences and provides opportunities to pose solutions for improvement.

According to the *Agriculture, Horticulture, Conservation and Land Management IRC's Skills Forecast and Proposed Schedule of Work 2019 -2021* the skills required for employment in this industry include, learning agility, information literacy, intellectual autonomy, self-management, leadership, financial literacy and the use and application of technology. The *Horticulture A/M/V* course has much to offer students in the development of many of these skills in preparation for further work and study in the industry.

5.2 The *Horticulture* course enables students to:

- demonstrate horticultural skills
- develop horticultural knowledge and understandings
- implement and undertake sustainable practices
- plan, adapt and implement horticultural processes
- appraise plant and environmental conditions to make considered improvements
- develop skills in the selection of plants and materials for horticultural purposes
- develop skills in the selection and use of horticulture technology and resources
- demonstrate critical thinking and problem-solving abilities
- evaluate industry practices, and processes
- explain and apply Workplace Health and Safety legislation, rules, and procedures in horticultural contexts
- demonstrate personal and interpersonal skills, including teamwork and communication skills

6. STRUCTURE OF THE HORTICULTURE CURRICULUM

RATIONALE

Horticulture A/M/V focuses on the processes and industry practices required to design, create, and maintain plant specific environments and business in an increasingly technological and complex world. Students develop knowledge and understanding of scientific concepts in plant biology and physiology, soil nutrients and climate in conjunction with the skills to use traditional and contemporary tools, and materials of the horticulture industry for a range of purposes and in an array of contexts. They examine the challenges that exist in the horticulture industry in adapting to new technology, client demands, urbanisation and changing climatic conditions, and explore future options.

Students investigate the purpose of horticulture business, occupations, future directions, and trends. Industry practices and processes for a variety of contexts are explored and applied across a range of subsets within the industry. Through both individual and collaborative learning experiences, students learn to meet employer expectations and establish productive and appropriate work habits. Participating in industry specific tasks promotes the development of adaptable, competent, self-motivated individuals who consider safety and work collaboratively with colleagues.

Students develop skills for communicating orally, in written, and graphical modes. They plan, select, and organize materials to achieve desired horticultural outcomes, to meet design and client briefs. Students apply sustainable practices and environmental considerations. Students interpret results and data from their own investigations to draw justified conclusions about sustainability.

Students develop relevant technical, vocational, and interpersonal competencies suitable for employment and further training in the horticulture industry. It also provides for the development of employability skills such as communication and teamwork which are transferable to other industry areas. Through the study of this subject, students will gain experiences that can be applied in a range of contexts, including work, study and recreation that will assist them to make informed choices.

This course provides opportunities to complete VET qualifications or a Statement of Attainment from the Agriculture, Horticulture and Conservation and Land Management Training Package (AHC).

UNITS

(May be studied in any order)

Nursery Systems

Students explore foundational botany and plant physiology concepts for nursery productions. Students apply knowledge of plant functions to horticultural nursery techniques and practices. They develop an understanding of how planting mediums, nutrients, seasons, climatic conditions, and environments, both natural and artificial, influence growth and development. Students investigate technology used in plant propagation, care, and maintenance, and apply these in line with WHS requirements.

Horticulture in Context

In this unit, students investigate how context influences principles, process, and procedures in Horticulture. They examine biological and seasonal considerations for optimal output in horticultural enterprises. Students apply industry standards for production. They develop work and maintenance practices in line with WHS requirements appropriate context.

Horticulture Restoration and Conservation

Students explore the concepts of horticultural restoration and conservation. They apply policies, practices and processes used for the improvement and sustainability of natural and built environments. Students explore the physiological properties and characteristics of various plants, and their benefits, to determine suitability for use in public spaces. They investigate case studies of the conservation of native plant species, pest management, soil health, biodiversity, water access and variable climatic events. Students examine local ecosystems and green spaces and investigate their health to pose and implement, where possible, solutions for improvement.

Horticulture Industries

Students explore and research current trends and expectations within horticultural enterprises, such as consumer demands, marketing, and delivery of service. They investigate existing horticultural enterprises to identify industry opportunities. Students apply a range of cognitive, communication, collaboration, technical and practical industry skills, including WHS, to solve problems and find solutions.

Independent Study

An Independent Study unit has an important place in senior secondary courses. It is a valuable pedagogical approach that empowers students to make decisions about their own learning. An Independent Study unit can be proposed by an individual student for their own independent study and negotiated with their teacher. The program of learning for an Independent Study unit must meet the unit goals and content descriptions as they appear in the course.

Independent study units are only available to individual students in Year 12 who have completed at least three standard 1.0 units from the course. A student can only study a maximum of one Independent Study unit in each course.

An Independent Study unit requires the principal's written approval.

Please note: Training Package requirements for students seeking VET qualifications through the Agriculture, Horticulture and Conservation and Land Management Training Package (AHC) must still be met.

7. CONSIDERATIONS

7.1 Incorporating a futures orientation

The Future of Education and Skills Education 2030 stresses the importance of being future focused in the development of curriculum for schools. The *Horticulture* course has a futures orientation in addressing the growing need for young people to be innovative, responsible, and aware:

To prepare for 2030, people should be able to think creatively, develop new products and services, new jobs, new processes and methods, new ways of thinking and living, new enterprises, new sectors, new business models and new social models. Increasingly, innovation springs not from individuals thinking and working alone, but through cooperation and collaboration with others to draw on existing knowledge to create new knowledge. The constructs that underpin the competency include adaptability, creativity, curiosity, and open-mindedness.

[http://www.oecd.org/education/2030-project/contact/E2030 Position Paper \(05.04.2018\).pdf](http://www.oecd.org/education/2030-project/contact/E2030%20Position%20Paper%20(05.04.2018).pdf)

The course does more than prepare students for the world of work. It enables students to develop the essential capabilities for twenty-first century learners:

Education has a vital role to play in developing the knowledge, skills, attitudes, and values that enable people to contribute to and benefit from an inclusive and sustainable future. Learning to form clear and purposeful goals, work with others with different perspectives, find untapped opportunities and identify multiple solutions to big problems will be essential in the coming years. Education needs to aim to do more than prepare young people for the world of work; it needs to equip students with the skills they need to become active, responsible, and engaged citizens.

[http://www.oecd.org/education/2030-project/contact/E2030 Position Paper \(05.04.2018\).pdf](http://www.oecd.org/education/2030-project/contact/E2030%20Position%20Paper%20(05.04.2018).pdf)

7.2 Horticulture curriculum

Horticulture has an important place in the ACT senior secondary curriculum. The curriculum promotes problem-solving and decision-making, and in studying *Horticulture* students are active participants in their own learning. Students are challenged to think about and respond to their environment and work practices. Their personal and social development is fostered through working independently and collaboratively, and in the development of communication skills and intercultural awareness.

7.3 Equity and opportunity

The *Horticulture* curriculum is inclusive of students' needs and interests. It provides flexibility and choice for teachers and students. The factors that influence this choice include school and community contexts, local community learning opportunities, contemporary and local issues, and available learning resources.

7.4 Role of digital technologies

Students and teachers integrate a growing range of online information, tools, and applications. These include digitised online materials such as historical documents, books, newspapers, images, and items from museum collections, as well as other online resources including databases, reference works and indexes to library holdings.

7.5 Clarity of curriculum

The curriculum is substantial and flexible. It is sufficiently rich and descriptive to guide teachers with limited experience but avoids excessive prescription that would hamper experienced teachers from exercising their skills. The curriculum document is expressed clearly in terms that are accessible to a new teacher, while allowing all teachers to enhance it with their interests and expertise.

7.6 Breadth and depth of study

Content descriptions specify the knowledge, understanding and skills that students are expected to learn and that teachers are expected to teach. Teachers are required to develop a program of learning that allows students to demonstrate all the content descriptions.

A program of learning is what a college provides to implement the course for a subject meeting students' needs and interests. It is at the discretion of the teacher to emphasis some content descriptions over others. The teacher may teach additional (not listed) content if it meets the specific unit goals providing that it does not duplicate content in other units.

7.7 The nature of the learner

The course addresses the needs of diverse learners and caters for Accredited (A) and Modified (M) levels of study.

7.8 General capabilities

Skills and understanding related to numeracy, literacy and ICT are further developed and used in *Horticulture*, as are problem solving and creativity. Critical and creative thinking are developed when students explore problems, develop innovative ideas, generate solutions, and evaluate and refine their ideas. They develop personal and social capability while working collaboratively and independently and build on self-management skills.

7.9 Cross curriculum perspectives

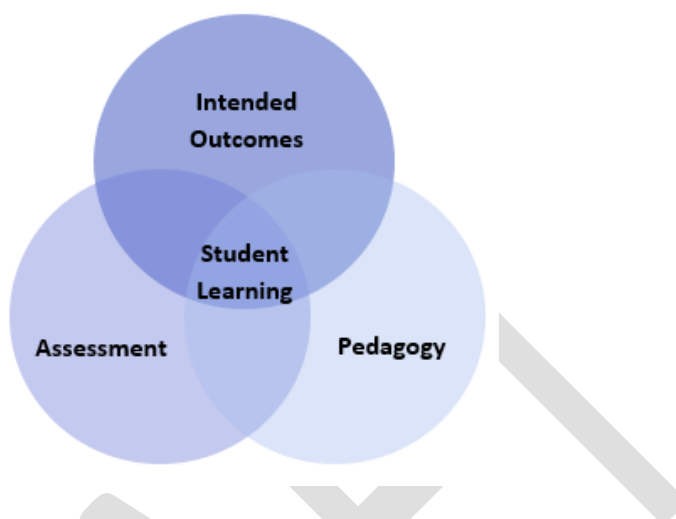
Each of the perspectives, Aboriginal and Torres Strait Islander histories and cultures, Asia and Australia's engagement with Asia, and Sustainability are represented in ways that are appropriate to in the course.

8. PEDAGOGY AND ASSESSMENT

The underpinning beliefs and learning principles for the development of the ACT Board of Senior Secondary School curriculum are as follows:

8.1 Underpinning beliefs

- All students are able to learn
- Learning is a partnership between students and teachers
- Teachers are responsible for advancing student learning.



8.2 Learning Principles

1. Learning builds on existing knowledge, understandings, and skills.
(Prior knowledge)
2. When learning is organised around major concepts, principles, and significant real-world issues, within and across disciplines, it helps students make connections and build knowledge structures.
(Deep knowledge and connectedness)
3. Learning is facilitated when students actively monitor their own learning and consciously develop ways of organising and applying knowledge within and across contexts.
(Metacognition)
4. Learners' sense of self and motivation to learn affects learning.
(Self-concept)
5. Learning needs to take place in a context of high expectations.
(High expectations)
6. Learners learn in different ways and at different rates.
(Individual differences)
7. Different cultural environments, including the use of language, shape learners' understandings and the way they learn.
(Socio-cultural effects)
8. Learning is a social and collaborative function as well as an individual one.
(Collaborative learning)
9. Learning is strengthened when learning outcomes and criteria for judging learning are made explicit and when students receive frequent feedback on their progress.
(Explicit expectations and feedback).

9. CONCLUSION

The *Horticulture A/M/V* course is to be developed under the *Industry and Services Framework*. Students develop an understanding of the horticulture industry. They learn to analyse, problem solve, and create solutions. The course equips students to engage confidently with appropriate technologies and to communicate appropriately to different audiences in a range of mediums. Students work both independently and collaboratively and develop interpersonal and intrapersonal skills suitable for employment and further training.

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