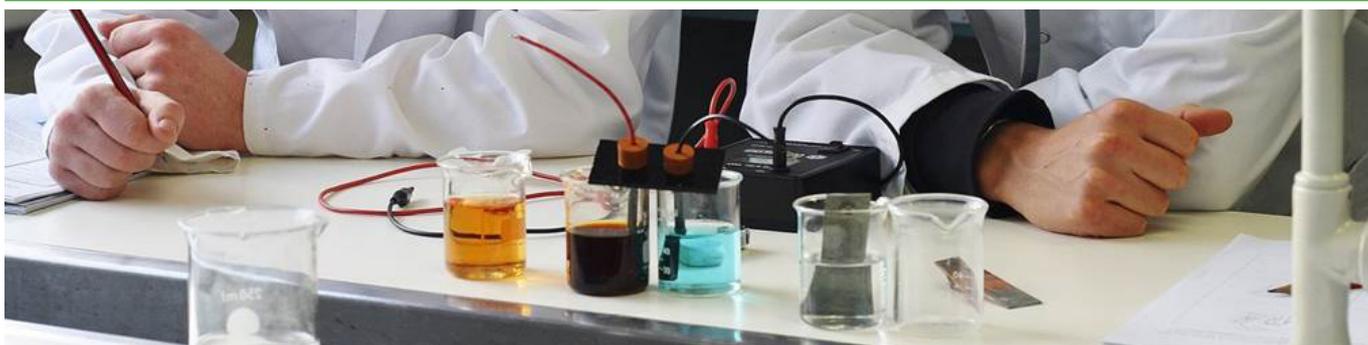


# SCIENCE AND PRIMARY INDUSTRIES



**You have:**

**TASC subjects**

**May lead to:**

|   |  |   |
|---|--|---|
| An interest in or need to develop scientific literacy skills  | <b>Life Sciences 2</b>                     | Biology 3<br>Environmental Science and Society 3  |
|   | <b>Physical Sciences - Foundation 2</b>    | Physical Sciences 3   |
| At least a 'C' in Year 10 Australian Curriculum Science and English   | <b>Environmental Science and Society 3</b> | Work where knowledge of science is beneficial   |
| At least an 'A/B' in Year 10 Australian Curriculum Science and English  | <b>Biology 3</b>                           | Further study at tertiary level or work   |
| An 'A/B' (or a 'C' in consultation with teachers) in Year 10 Australian Curriculum Science, Mathematics and English | <b>Physical Sciences 3</b>                 | Essential for Physics 4 and Chemistry 4<br>Further study at tertiary level or work<br>Careers |
| At least an 'SA' in Physical Sciences 3 and a level 3 Maths is recommended  | <b>Chemistry 4</b>                         | Further study at tertiary level or work   |
|   | <b>Physics 4</b>                           |   |

**Prerequisites:**

**VET programs**

**May lead to:**

|   |   |                              |
|---|---|------------------------------|
| No previous experience                                  | <b>Certificate I in Agrifood Operations</b>               | Further study                |
|   | <b>Certificate I in Aquaculture</b>                       |                              |
|   | <b>Certificate I in Conservation and Land Management</b>  |                              |
| An interest in the industry area                        | <b>Certificate II in Agriculture</b>                      | Further study and employment |
|   | <b>Certificate II in Animal Studies</b>                   |                              |
|   | <b>Certificate II in Aquaculture</b>                      |                              |
|   | <b>Certificate II in Horticulture</b>                     |                              |
|   | <b>Certificate II in Conservation and Land Management</b> |                              |
| Certificate II or equivalent study in the industry area | <b>Certificate III in Agriculture</b>                     | Further study                |
|   | <b>Certificate III in Animal Studies</b>                  |                              |

level 1   level 2   level 3

level 1   level 2   level 3

# TASC subjects

## Life Sciences 2

LSC215115

### YOU WILL LEARN ABOUT:

- Structure and function of living organisms
- Ecosystems
- Biotechnology
- Designing and carrying out experiments
- The role and impact of science in society.
- Other content will be dependent on the theme selected by your teacher; for example, Human Science, Marine Studies, Environmental, Biochemistry, Agricultural.

### YOU DO THIS BY STUDYING:

- Cells, organs and systems of plants and animals
- Exchange and transport of materials through a cell
- Photosynthesis and respiration
- Food webs: the interdependence of organisms and resources
- Other topics specifically related to the theme
- The role of scientists and the application of science in decision making.

### LEARNING ACTIVITIES MUST INCLUDE:

- Practical work
- Investigative study.

### LEARNING ACTIVITIES MAY INCLUDE:

- Scientific reports
- Field trips
- Group work and presentations
- Assignments, tests and research tasks.

### TO ENROL IN THIS SUBJECT YOU NEED:

- No previous experience, however an interest and/or a need to develop scientific literacy skills is recommended.

### THIS SUBJECT:

- Allows you to better understand decisions about science issues in society and your local community
- Can be an introduction to *Biology 3* and *Environmental Science and Society 3*
- Prepares you for further study and careers in teaching, health, agriculture, aquaculture, forestry, medical/nursing, environmental management, hairdressing and other areas where a knowledge of science is beneficial
- Contributes 15 credit points for your Tasmanian Certificate of Education.

## Physical Sciences - Foundation 2

SPW215114

### YOU WILL LEARN ABOUT:

- Basic principles of chemistry to describe properties of matter
- Basic principles of physics to describe natural phenomena
- Environmental issues
- Designing and carrying out experiments
- The role and impact of science in society.

### YOU DO THIS BY STUDYING:

- Atoms, elements, compounds and chemical reactions
- Principles of motion and force, work and energy
- Practical investigations
- The use of chemical and physical data
- The role of scientists and the application of science in decision making.

### LEARNING ACTIVITIES MUST INCLUDE:

- Practical work.

### LEARNING ACTIVITIES MAY INCLUDE:

- Scientific reports
- Field trips
- Group work and presentations
- Assignments, tests and research tasks.

### TO ENROL IN THIS SUBJECT YOU NEED:

- No previous experience, however an interest and/or need to develop scientific literacy skills is recommended.

### THIS SUBJECT:

- Allows you to better understand decisions about science issues in society and your local community
- Can be an introduction to *Physical Sciences 3*
- Prepares you for further study and careers in automotive engineering (trades), electrical engineering (trades), mechanics and physical sciences, or other areas where a knowledge of science is beneficial
- Contributes 15 credit points for your Tasmanian Certificate of Education.

## Environmental Science and Society 3

ESS315114

### YOU WILL LEARN ABOUT:

- Ecological processes
- How ecosystems are changing locally and globally
- How humans depend on and impact upon ecosystems
- Ecologically sustainable management of the environment
- Scientific method and experimental design
- Current and topical environmental issues and their impact in society.

### YOU DO THIS BY STUDYING:

- Ecosystems: how they operate and function
- Factors affecting ecosystems such as climatic factors, fire, biodiversity, introduced species, greenhouse gas composition etc (local, national and international examples)
- Local environments including rivers and estuaries, forests and beaches
- Environmental data, investigations, surveys and case studies
- How natural events and humans impact upon ecosystems
- The importance of the sustainable use of resources, and strategies for their management
- The role of scientists and the application of science in decision making.

### LEARNING ACTIVITIES MUST INCLUDE:

- Practical work
- An extended case study.

### LEARNING ACTIVITIES MAY INCLUDE:

- Scientific reports
- Group work and presentations
- Assignments and research tasks
- Field trips
- Tests and a mid-year exam.

### TO ENROL IN THIS SUBJECT IN YEAR 11 IT IS RECOMMENDED THAT YOU HAVE:

- An A/B (C in consultation with teachers) in Year 10 Australian Curriculum English and Science
- An interest in environmental issues.

**THIS SUBJECT:**

- Allows you to better understand and be able to make informed decisions about environmental issues both locally and globally, and their increasing importance to our planet
- Provides a pathway to further study and careers in conservation, parks and wildlife, fisheries and oceanography, environmental biology, ecology, environmental engineering, forestry, journalism, environmental management, science, tourism, aquaculture, teaching, and life sciences
- Contributes 15 credit points for your Tasmanian Certificate of Education.

**Biology 3**

BIO315116

**YOU WILL LEARN ABOUT:**

- Cells, the chemistry of cells and processes within cells
- Structure and function of biological systems of organisms (including humans)
- Evolutionary change
- Immunology
- Scientific method and experimental design
- The role and impact of science in society.

**YOU DO THIS BY STUDYING:**

- Cell structure and function
- How cells maintain equilibrium (homeostasis)
- Photosynthesis and respiration
- Digestion and absorption, gas exchange, transport, excretion
- DNA and genetic variation
- Natural selection
- Organisms that cause disease and line of defence inside the body
- Investigations and analysis of biological data
- The role of scientists and the application of science in decision making.

**LEARNING ACTIVITIES MUST INCLUDE:**

- Practical work.

**LEARNING ACTIVITIES MAY INCLUDE:**

- Scientific reports
- Group work and presentations
- Assignments and research tasks
- Field trips
- Tests and a mid-year exam.

**TO ENROL IN THIS SUBJECT IN YEAR 11\* IT IS RECOMMENDED THAT YOU HAVE:**

- An A/B in Year 10 Australian Curriculum English and Science
- A strong interest in the biological sciences.

\* It is advised to enrol in this subject in Year 12, but please discuss this with a teacher or course counsellor.

**THIS SUBJECT:**

- Allows you to better understand and be able to make informed decisions about science issues in society and your local community
- Provides a pathway to further study and careers in teaching, nursing, medicine, dietetics, pharmacy, dentistry, child care, optometry, speech therapy, veterinary science, agriculture, marine science, aquaculture, botany, zoology, and developing biotechnologies
- Contributes 15 credit points for your Tasmanian Certificate of Education.

**Physical Sciences 3**

PSC315114

**YOU WILL LEARN ABOUT:**

- Underlying principles of chemistry
- Underlying principles of physics
- The role and impact of science in society.

**YOU DO THIS BY STUDYING:**

- Principles of motion and force
- Meaning of energy, work and power
- Nuclear reactions and electric circuits
- Properties and structures of atoms and elements
- Properties and structures of compounds; including carbon compounds
- Principles of chemical reactions; including reacting quantities
- Aqueous solutions and acidity
- Investigations and analysis of experimental data
- The role of scientists and the application of science in decision making.

**LEARNING ACTIVITIES MUST INCLUDE:**

- Practical work.

**LEARNING ACTIVITIES MAY INCLUDE:**

- Scientific reports
- Group work and presentations
- Assignments and research tasks
- Tests and a mid-year exam.

**TO ENROL IN THIS SUBJECT IT IS RECOMMENDED THAT YOU HAVE:**

- An A/B (or C in consultation with teachers) in Year 10 Australian Curriculum Science, Mathematics and English. Successful completion of this course relies on a strong mathematical background.

**THIS SUBJECT:**

- Allows you to better understand and be able to make informed decisions about science issues in society and your local community
- Is essential for enrolment into *Physics 4* and *Chemistry 4*
- Provides a pathway for further study and careers in many university courses including those in health sciences, environmental science and engineering, including AMC science degrees
- Contributes 15 credit points and meets the standard for everyday adult mathematical skills for your Tasmanian Certificate of Education.

**Chemistry 4**

CHM415115

**YOU WILL LEARN ABOUT:**

- Fundamental principles and theories of electrochemistry
- Principles and theories of thermochemistry, kinetics and equilibrium
- Properties and reactions of organic and inorganic matter
- Solving quantitative chemical problems
- The role and impact of science in society.

**YOU DO THIS BY STUDYING:**

- Structures and properties of organic and inorganic materials
- Properties of gases
- Periodic table
- Oxidation, reduction and electrochemical cells
- Corrosion
- Heat and energy in chemical reactions
- Reaction rates and chemical equilibrium
- Reacting quantities including calculations and analyses of data
- The role of scientists and the application of science in decision making.

**LEARNING ACTIVITIES MUST INCLUDE:**

- Practical work.

**LEARNING ACTIVITIES MAY INCLUDE:**

- Scientific reports
- Group work and presentations
- Assignments and research tasks
- Tests and a mid-year exam.

## TO ENROL IN THIS SUBJECT YOU NEED:

- A strong SA in *Physical Sciences 3* or equivalent, and
- A strong background in mathematics, e.g. level 3 mathematics, is highly recommended.

## THIS SUBJECT:

- Allows you to better understand and be able to make informed decisions about science issues in society and your local community
- Is a pre-requisite for many university courses in health and science, which may include medicine, biotechnology, biochemistry, medical research, pharmacy and agricultural and environmental science
- Provides a pathway to further study or careers in agriculture, pharmacy, environmental science, engineering, health and medical science
- Contributes 15 credit points and meets the standard for everyday adult mathematical skills for your Tasmanian Certificate of Education.

## Physics 4

PHY415115

## YOU WILL LEARN ABOUT:

- Physical principles and applications of:
  - » Newtonian mechanics
  - » Electricity and magnetism
  - » Wave motion
  - » Light
  - » Atomic and nuclear physics.
- The role and impact of science in society.

## YOU DO THIS BY STUDYING:

- Motion, momentum and force
- Work, energy and power
- Gravity and gravitational fields
- Static electricity and electric fields
- Magnetic fields and their applications
- Waves (light and sound)
- Particle nature of light and quantum theory
- Atomic and nuclear physics
- The theory of relativity
- The role of scientists and the application of science in decision making.

## LEARNING ACTIVITIES MUST INCLUDE:

- Practical work.

## LEARNING ACTIVITIES MAY INCLUDE:

- Scientific reports
- Group work and presentations
- Assignments and research tasks
- Tests and a mid-year exam.

## TO ENROL IN THIS SUBJECT YOU NEED:

- A strong SA in *Physical Sciences 3* or equivalent, and
- A strong background in mathematics, e.g. level 3 mathematics, is highly recommended.

## THIS SUBJECT:

- Allows you to better understand and be able to make informed decisions about science issues in society and your local community
- Is a pre-requisite for some university courses in medical science and engineering
- Provides a pathway to further study or careers in medical/health sciences and engineering technology
- Contributes 15 credit points and meets the standard for everyday adult mathematical skills for your Tasmanian Certificate of Education.



### University College Program: A Practical Introduction to Temperate Marine Biology

This predominantly field-based, 2017 University College Program offers and extension to *Life Sciences, Biology or Environmental Science and Society*. It is designed to engage, challenge, excite and inspire you through an experiential, and hands-on marine science program.

This program will introduce you to concepts of ecological theory and practice, allowing you to apply marine biology theories, techniques and sampling methods during a practical field investigation of species diversity within temperate

marine habitats. Emphasis will be placed on developing an ability to design, collect and interpret biological data. It will encourage you to explore issues threatening marine biodiversity plus important local fisheries, including climate change, overharvesting, invasive species, pollution and habitat destruction. The program provides a HECS-free pathway into study at the University of Tasmania. To find out more, ask your teacher.



# VET programs

All certificate programs contribute credit points for the Tasmanian Certificate of Education. The number of credit points is dependent on the units of competence. For details go to the TASC course planner at: [www.tasc.tas.gov.au/3666](http://www.tasc.tas.gov.au/3666)

## Certificate I in Agrifood Operations

AHC10210

### YOU WILL LEARN ABOUT:

- The basic skills and knowledge for a career start in horticulture through a combination of classroom lessons, practice and assessments.

### YOU DO THIS BY STUDYING:

- A range of horticultural situations
- Techniques in the horticulture industry
- The expectations of employers.

### LEARNING ACTIVITIES INCLUDE:

- Demonstrations
- Hands-on work in gardens and orchards
- Classroom learning.

### TO ENROL IN THIS PROGRAM YOU NEED:

- Basic literacy, numeracy and communication skills
- An interest in horticulture.

### THIS PROGRAM:

- Provides a pathway to Certificate II programs in this sector.

## Certificate I in Conservation and Land Management

AHC10110

### YOU WILL LEARN ABOUT:

- The conservation and land management industry in Australia

### YOU DO THIS BY STUDYING:

- Working safely
- Natural area conservation
- Maintenance of associated machinery and equipment.

### LEARNING ACTIVITIES MAY INCLUDE:

- Practical environmental activities
- Written assignments.

### TO ENROL IN THIS PROGRAM YOU NEED:

- An interest in conservation and land care
- To enjoy working outdoors.

### THIS PROGRAM:

- Provides a pathway into further study at certificate II level.

## Certificate I in Aquaculture

SFI10111

### YOU WILL LEARN ABOUT:

- The aquaculture industry in Australia and the basic requirements and operations in farming aquatic species.

### YOU DO THIS BY STUDYING:

- The farmed life-cycle of species including Atlantic Salmon and/or Pacific Oysters
- Environmental sustainability
- Basic food handling
- Communication
- Workplace health and safety.

### LEARNING ACTIVITIES INCLUDE:

- Operating a fresh-water recirculating aquaculture system or salt-water shellfish culture equipment
- Regular visits to marine farms.

### TO ENROL IN THIS PROGRAM YOU NEED:

- To enjoy working outdoors
- Basic level mathematics and English.

### THIS SUBJECT:

- Provides a pathway to further study at Certificate II level.

## Certificate II in Agriculture

AHC20110

### YOU WILL LEARN ABOUT:

- The basic skills and knowledge for your chosen farming stream such as dairy, beef, wool, sheep, cropping and general agriculture
- Safe and efficient work habits.

### YOU DO THIS BY STUDYING:

- Basic farm operations
- How to train, prepare and exhibit animals at local and state agricultural shows
- Workplace health and safety
- Chainsaw operation.

### LEARNING ACTIVITIES MAY INCLUDE:

- Written assessments
- Projects (group or individual) - may be practical or research based
- Visits to farms
- Involvement in shows and special events
- Assignments
- Practical assessments.

### TO ENROL IN THIS PROGRAM YOU NEED:

- Basic literacy, numeracy and communication skills
- An interest in agriculture
- To participate in a suitability process.

## Certificate II in Conservation and Land Management

AHC21010

### YOU WILL LEARN ABOUT:

- The conservation and land management industry in Australia.

### YOU DO THIS BY STUDYING:

- Workplace health and safety
- Environmentally sustainable work practices
- Use and maintenance of associated machinery and equipment
- A variety of plants and their requirements for growth.

### LEARNING ACTIVITIES MAY INCLUDE:

- Practical work in land care environments
- Assignments
- Activity booklets.

### TO ENROL IN THIS PROGRAM YOU NEED:

- An interest in conservation and land care
- To enjoy working outdoors.

### THIS PROGRAM:

- Provides a pathway into further study at Certificate III level.

## Certificate II in Animal Studies

ACM20110

### YOU WILL LEARN ABOUT:

- General animal care including the provision of food, water and shelter for a range of animals
- Animal first aid and rescue
- Providing information on companion animals products and services
- The support of animals in native animal parks, zoos, veterinary clinics, and animal care facilities.

**YOU DO THIS BY STUDYING:**

- Core units which include:
  - » Working in the animal care industry
  - » Feeding and watering animals
  - » Hygiene and health
  - » Workplace communication
  - » Environmentally sustainable work practices
  - » Occupational health and safety practices.
- Elective units which include first aid for animals and care of domestic animals.

**LEARNING ACTIVITIES MAY INCLUDE:**

- General animal care including the provision of food, water and shelter for a range of animals
- Animal rescue
- Assisting with surgery preparations
- Providing information on companion animals products and services
- The support of native animal parks, veterinary clinics and RSPCA centres and zoos.

**TO ENROL IN THIS PROGRAM YOU NEED:**

- Basic literacy, numeracy and communication skills
- An interest in animals and to enjoy working outdoors
- To participate in a suitability process.

**THIS PROGRAM:**

- Provides a pathway to *Certificate III in Animal Studies*
- May be an entry point in the areas of veterinary nursing, zoo or native animal parks, the companion animal industry and animal rescue.

**Certificate II in Aquaculture**

SFI20111

**YOU WILL LEARN ABOUT:**

- The aquaculture industry in Australia and develop entry-level skills required for employment in Tasmania's aquaculture industry.

**YOU DO THIS BY STUDYING:**

- The farmed life-cycle of species including Atlantic Salmon and/or Pacific Oysters
- Environmental sustainability
- Basic food handling
- Communication
- Workplace health and safety
- Feeding and caring for farmed aquatic species
- Monitoring and manipulation of water quality
- Maintenance of aquaculture farm equipment.

**LEARNING ACTIVITIES MAY INCLUDE:**

- Operating a fresh-water recirculating aquaculture system or salt-water shellfish culture equipment
- Regular visits to marine farms including work placement
- Basic vessel operations
- Structured work placement in the aquaculture industry.

**TO ENROL IN THIS PROGRAM YOU NEED:**

- To enjoy working outdoors
- Basic level mathematics and English
- To participate in a suitability process.

**THIS SUBJECT:**

- May lead to entry-level employment in the aquaculture industry and further training at Certificate III level either full-time or under an Australian School-based Apprenticeship.

**Certificate II in Horticulture**

AHC20410

**YOU WILL LEARN ABOUT:**

- Basic skills and knowledge required for your chosen horticulture stream such as retail or production nursery, landscaping, arboriculture, parks and gardens and general horticulture
- Safe and efficient work habits.

**YOU DO THIS BY STUDYING:**

- Propagation
- Plant recognition
- Garden maintenance
- Plants, pests and diseases
- Basic chemical safety
- The expectations of employers.

**LEARNING ACTIVITIES MAY INCLUDE:**

- Learning about plants
- Knowledge about plants, their culture and uses, nutrition, pests and diseases, weeds, propagation, their beauty and economic uses
- Using plants to create a healthy lifestyle and sustainable environments from a small garden to large landscapes
- Creating living environments to enhance a healthy and quality lifestyle.

**TO ENROL IN THIS PROGRAM YOU NEED:**

- Basic literacy, numeracy and communication skills
- An interest in horticulture and working outdoors
- To participate in a suitability process.

**THIS PROGRAM:**

- Provides a pathway to *Certificate III/IV in Horticulture*
- May lead to employment opportunities in the areas of grounds maintenance, nursery assistant, landscaper's assistant.

**Certificate III in Agriculture**

AHC30110

**YOU WILL LEARN ABOUT:**

- The skills and knowledge required for a lead farm hand.

**YOU DO THIS BY STUDYING:**

- The implementation and monitoring of environmentally sustainable work practices
- Occupational health and safety practices.

**A CHOICE FROM A RANGE OF ELECTIVE UNITS INCLUDING:**

- Operation of machinery and equipment
- Control of weeds, plant pests, diseases and disorders
- Establishing pastures and crops for livestock production
- Implementation of animal health control programs
- Rearing newborn and young livestock, implementing feeding plans
- Maintaining agricultural crops
- Operating pressurised irrigation systems
- Soil sampling and analysis.

**LEARNING ACTIVITIES MAY INCLUDE:**

- Classroom lessons
- Farm-based field work
- Working with animals
- Driving tractors and use of other equipment
- Lab work
- Computers.

**TO ENROL IN THIS PROGRAM YOU NEED:**

- Basic literacy, numeracy and communication skills
- An interest in agriculture
- To participate in a suitability process.

**THIS PROGRAM:**

- Provides a pathway to *Certificate IV in Agriculture*.

## Certificate III in Animal Studies

ACM30110

### YOU WILL LEARN ABOUT:

- The skills and knowledge required to work in the animal care and management industry.

### YOU DO THIS BY STUDYING:

- Monitor animal reproduction
- Care for young animals
- Participate in workplace communications
- Complete animal care hygiene routines
- Maintain and monitor animal health and wellbeing
- Provide enrichment for animals
- Plan for and provide nutritional requirements for animals
- Comply with infection control policies and procedures in animal work
- Contribute to occupational health and safety procedures
- Provide basic care of birds
- Provide basic care of mammals
- Participate in environmentally sustainable work practices.

### LEARNING ACTIVITIES MAY INCLUDE:

- Researching and providing information on animal products and services such as enclosure design, health issues and nutrition
- Researching and developing their own animal enrichment project and recording observations
- Observing the life cycles and reproductive management of Tasmanian devils on site at Bonorong
- Undertake training in how to care for orphaned native wildlife including tube feeding native birds and correct bottle feeding techniques for marsupials
- Participating in case-study animals by administering medication and managing treatments under supervision
- Work placement at a variety of animal industry locations including native animal parks, animal welfare centres and veterinary clinics
- Guest speakers and excursions covering specialist aspects of the animal care industry.

### TO ENROL IN THIS PROGRAM YOU NEED:

- Successful completion of *Certificate II in Animal Studies*
- An interest in animals and working outdoors
- Reasonable level of fitness and good people skills.

### THIS PROGRAM:

- Is conducted at the Bonorong Wildlife Sanctuary, Brighton
- Includes work placements that may be negotiated at various animal care locations.

