Environmental Science and Society

LEVEL 3	15 TCE CREDIT POINTS
COURSE CODE	ESS315114
COURSE SPAN	2014 — 2017
READING AND WRITING STANDARD	NO
MATHEMATICS STANDARD	NO
COMPUTERS AND INTERNET STANDARD	NO

This course was delivered in 2017. Use A-Z Courses to find the current version (if available).

Environmental Science and Society is a uniquely Tasmanian Level 3 course where the interrelationship between the natural world and human society is explored

Learners further develop investigative, analytical and communication skills and use scientific understandings and evidence to make informed decisions about contemporary environmental issues and their impact in society.

Rationale

Knowledge and understanding of science, scientific literacy and scientific methods are necessary for learners to develop the skills to resolve questions about their natural and constructed world.

The purpose of science education is to develop scientific literacy, which is a high priority for all citizens, helping them: to be interested in, and understand, the world around them; to engage in discourse about science; to understand the testable and contestable nature of science, and question the claims made by others about scientific matters; to be able to identify questions and draw evidence-based conclusions; and to make informed decisions about the environment, about their own health and well-being and about the role and impact of science on society.

In studying Environmental Science and Society, learners develop their investigative, analytical and communication skills, and apply these to their understanding of environmental issues in order to engage in public debate, solve problems and make evidence-based decisions about contemporary environmental issues in society.

Aims

Environmental Science and Society aims to develop learners':

- interest in environmental science and their perspective on the interrelationship between the natural world and human society
- ability to make an informed personal response to the environmental issues of today and in the future
- understanding that environmental science knowledge is used in a variety of contexts; and its use influences, and is influenced by, ethical, political, cultural, social, economic, aesthetic, educational, and scientific considerations
- ability to conduct a variety of research, field and laboratory investigations involving collection and analysis of qualitative and quantitative data, and interpretation of evidence
- ability to critically evaluate environmental science concepts, interpretations, claims and conclusions with reference to evidence
- ability to communicate environmental understanding, findings, arguments and conclusions using appropriate representations, modes and genres.

Learning Outcomes

On successful completion of this course, learners will be able to:

1. be self-directing; be able to plan, monitor, and evaluate progress towards meeting goals and timelines
2. use scientific inquiry skills to develop, interpret and evaluate experiments
3. communicate scientific information following accepted conventions
4. understand the science of natural environments, and humans as an integral part of the biosphere, locally and globally, both now and in the future
5. think critically in examining issues by analysing, interpreting and drawing conclusions that are socially responsible, and that create economically and environmentally sustainable and optimistic futures
6. understand personal and community values that humans attach to natural resources, alternative uses for natural resources, and the implications of such choices
7. understand the concept of ecologically sustainable management
8. relate learning to their personal futures, and investigate pathways into further learning and employment
9. be able to discuss the local and global interdependence of issues concerning social equity and environmental values, and consider their personal responsibilities in these areas.

Access

This course is designed for learners who are interested in their relationship with the environment and the significance of the choices and decisions they make in their own lives.

Learners enrolled in this course are required to be able to work responsibly and safely in practical situations.

Pathways

Environmental Science and Society is designed for learners who have an interest in the natural environment, science and its applications to environmental management. Study of this course provides preparation for careers areas such as: forestry, environmental management, fisheries, teaching, tourism, national park ranging, journalism, the media, economics, and law.

The study of Environmental Science and Society may provide a pathway to the study of Biology Level 3 and Geography Level 3, and may be useful background to a career in business.

Resource Requirements

Providers offering this course will need equipment, materials and a suitable space to carry out the practical component of the course effectively and safely.

Course Size And Complexity

This course has a complexity level of 3.

At Level 3, the learner is expected to acquire a combination of theoretical and/or technical and factual knowledge and skills and use judgement when varying procedures to deal with unusual or unexpected aspects that may arise. Some skills in organising self and others are expected. Level 3 is a standard suitable to prepare learners for further study at tertiary level. VET competencies at this level are often those characteristic of an AQF Certificate III.

This course has a size value of 15.

Course Content

For the content areas of Environmental Science and Society, the three (3) interrelated strands, Science Inquiry Skills, Science as a Human Endeavour and Science Understanding, build on students' learning in F-10 *Australian Curriculum: Science*. In the practice of science, the three strands are closely integrated: the work of scientists reflects the nature and development of science, is built around scientific inquiry, and seeks to respond to and influence society. These three strands will be integrated into six (6) sections of study:

- Development, interpretation and evaluation of experiments and practical activities
- Application and impact of environmental science on society
- Ecological processes
- Changes in ecosystems, locally and globally
- Human dependence and impact on ecosystems
- Principles for ecologically sustainable management of the environment.

Each section of study is **compulsory**, however the order of delivery is not prescribed. These sections relate directly to Criteria 2, 4 – 8. Criteria 1 and 3 apply to all sections of study.

The primary objective of Environmental Science and Society is to help learners develop a perspective on the interrelationship between the natural world and human society, a view that will allow them to develop an informed personal response to the environmental issues of today and tomorrow. Attention will be drawn to their own relationship with the environment and the significance of the choices and decisions they make in their own lives.

Much of the course can be studied within the context of current environmental issues and topics that have been highlighted in the media.

This course has a design time of 150 hours. Approximately 20% of the design time is to be spent on field and/or laboratory work during this course of study. Practical aspects of this course should include biotic and abiotic surveys of various ecosystems.

SCIENCE INQUIRY SKILLS

- Identify, research and construct questions for investigation; propose hypotheses; and predict possible outcomes.
- Design investigations, including the procedure(s) to be followed, the materials required, and the type and amount of primary and/or secondary data to be collected; observe risk assessments; and consider research ethics, including animal ethics.
- Safely, completely and methodically collect valid and reliable data from practical investigations.
- Represent data in meaningful and useful ways; organise and analyse data to identify trends, patterns and relationships; qualitatively describe sources of measurement error, and uncertainty and limitations in data; and select, synthesise and use evidence to make and justify conclusions.
- Select, construct and use appropriate representations to communicate conceptual understanding, solve problems and make predictions.
- Interpret a range of scientific resources, for example, research and media reports, and evaluate processes, claims and conclusions by considering the quality of available evidence; and use reasoning to construct scientific arguments.
- Communicate to specific audiences for specific purposes using appropriate language, nomenclature, genres and modes, including scientific reports.

Analyse, interpret and draw conclusions from data

Learners will be given practice in analysing, interpreting and drawing conclusions from environmental data presented in a variety of forms for example, tables, graphs, models, illustrations and photographs. Familiarity with data will be integrated into the entire course. The data may be secondary, or primary, data generated from the learner's own investigations. The case study provides an excellent opportunity for the learners to present and analyse data. The ability to relate and critically evaluate data is key to the ideals of this course.

Case study

Each learner is expected to complete a case study that will represent about 15% of design time. The study can be individual or a small group investigation.

The topic will be chosen in consultation with the teacher, allowing flexibility in the choice of topic, the method of investigation and the format in which it is presented. It is expected that the study will contain at least some primary information and not be based solely on

secondary knowledge.

The case study will be assessed against a number of criteria with particular emphasis on the criteria not included in the external assessment (Criteria 1, 3 and 4).

SCIENCE AS A HUMAN ENDEAVOUR

- Scientific knowledge can enable scientists to offer valid explanations and make reliable predictions.
- ICT and other technologies have dramatically increased the size, accuracy and geographic and temporal scope of data sets with which scientists work.
- The acceptance of scientific knowledge can be influenced by the context in which they are considered.
- Science can be limited in its ability to provide definitive answers to public debate; there may be insufficient reliable data available, or interpretation of the data may be open to question.

SCIENCE UNDERSTANDING

***Development, interpretation and evaluation of experiments and practical activities* (*Criterion 2*)**

Experimental design

- Propose an hypothesis
- Design an experiment
- Analyse and interpret data
- Evaluate the method and suggest improvements to experiments.

Biotic and abiotic surveys

- Baseline studies and continuous monitoring of environmental factors
- Use of indicator (index) species as indicators of environmental health
- Techniques such as capture/recapture, line transects, quadrats, remote sensing
- Chemical analysis of water, air and soil.

Application and impact of environmental science in society (*Criterion 4*)

- Environmental science knowledge can enable scientists to offer valid explanations and make reliable predictions. This knowledge, and understanding by society, is relevant to environmental issues and informs decision making.
- People's values (ethical, political, cultural, social, economic, aesthetic, educational, scientific) are important in decision making.
- Attitudes to the environment impact decision making.
- Pressure groups/stakeholders influence decision making on environmental issues.
- The use of scientific knowledge may have beneficial and/or harmful and/or unintended consequences.
- Current issues demonstrate the complexity and tensions (ethical, political, cultural, social, economic, ethical, aesthetic, social, educational, scientific) surrounding decision making on environmental issues.

***Ecological processes* (*Criterion 5*)**

This section looks at how ecosystems operate and function generally.

The systems approach

- Levels of organisation within the biosphere
- The energy laws (First & Second Laws of Thermodynamics)
- Positive and negative feedback.

Ecosystems

- Influence of abiotic factors on biotic components
    - range of tolerance
    - zone of physiological stress
    - optimal zone
- Terrestrial and aquatic ecosystems (brief outline of the major systems)
- The Australian landscape and its varying ecosystems, for example
    - Forestry and forest types
        - Influence of abiotic and biotic factors on
          Geology, soils, climate, rainfall in determining the following forest types:
          wet sclerophyll; dry sclerophyll; rainforest; grasslands alpine
    - Aquatic ecosystems (freshwater, estuarine and marine)
        - Influence of abiotic and biotic factors on:
          Freshwater – altitude, rainfall, snow and vegetation cover
          Estuarine – nutrient input, salinity changes
          Marine – upwelling and nutrient input from terrestrial ecosystems.

Inputs and outputs of ecosystems

- Role of producers in photosynthesis and factors affecting productivity
- Role of producers, consumers and decomposers in ecosystems
- Food chains and food webs
- Nutrient cycles: carbon, nitrogen (including role of legumes), phosphorus, water
    - Sources and sinks of all cycles
- Energy flow through ecosystems
- Concept of trophic levels
    - Loss of matter and energy at each trophic level (10% concept)
    - Explanation for the above in terms of the energy laws
    - Reasons for so few trophic levels in some ecosystems
- Pyramids of numbers, biomass and energy.

Relationships between species

- Niche concept
- Competition, predation, parasitism, commensalism, mutualism
- Generalists and specialists.

Populations

- Characteristics of populations
- Basic demographic change, birth, death, migration rates
- Factors that limit population size, carrying capacity, importance of competition
- Graphical representation of population growth: predator/prey relationships, S curves and J curves.

***Changes in ecosystems, locally and globally* (*Criterion 6*)**

This section looks at how ecosystems are changing due to natural events and/or due to human impacts on the systems.

Role of cycles in influencing abiotic factors

- Diurnal, seasonal
- Tidal
- Climatic.

Role of fire in the Australian landscape

- Fire cycle and regeneration of forest types.

Climate change

- Greenhouse gas (GHG) composition in the Earth's atmosphere over time
- Sources of evidence for changes (for example, ice cores).

Consequences of enhanced GHG and its influence on climate change

- Ocean acidification
- Coral bleaching
- Sea level rise, coastal erosion and flooding
- Ice melt
- Changing sea currents
- Increase in frequency and intensity of weather events
- Changes to species distribution and timing of biological events (for example, extinction).

Biodiversity and its importance

- Types of biodiversity (genetic, species, ecosystem)
- The importance of biodiversity
- Processes that threaten biodiversity – loss of habitat, etc...
- Preventing the loss of biodiversity
- How species become threatened/endangered

- Management approaches used to prevent/mitigate loss of species.

Introduced species

- Introduced species leading to ecosystem imbalances and impacts on natural populations
    - Why introduced species thrive
    - Impacts of introduced species
    - Control methods (trapping, shooting, poisoning, manual removal, biological control).

***Human dependence and impact on ecosystems* (*Criterion 7*)**

This section looks at how humans depend on the ecosystems and what impacts we have as a result of using resources.

Importance of ecosystem services

- The role of ecosystems in providing humans with
    - Food, oxygen, clean water, clean air
    - Climate regulation
    - Resources - renewable and non-renewable.

Ecological footprint

- The factors that are considered in the footprint
- Comparison of ecological footprints of different human populations.

Concept of 'Commons'

- Tragedy of the Commons.

Contaminants and Pollutants

- Distinguish between contaminants and pollutants
- Characteristics of pollutants (biodegradability, persistence in environment)
- Pollutants and sources, primary and secondary pollutants (for example, heavy metals, pesticides)
- Biomagnification and bioaccumulation
- How pests develop resistance to pesticides.

Impacts on the commons

- Water
    - Urban runoff
    - Runoff and waste from farms (sewage, eutrophication, biological oxygen demand (B.O.D.), and pathogens)
- Land
    - Dry land and irrigation salinity

    - Erosion
- Air
    - Enhanced greenhouse effect/global warming (GHGs, impacts and consequences of global warming)
    - Ozone (formation of ozone, UV radiation, effects of ozone depletion)
    - Acid rain
    - Urban air pollution – photochemical smog.

Impact of use of resources

- Food
    - Challenges of feeding a growing population
    - Impacts of climate change on food production
    - Agriculture
        - Nutrient management
        - Water allocation
        - Chemical use
    - Fisheries
        - Impacts of fishing techniques
        - Impacts of aquaculture
- Water
    - Impact of increasing human demand for water, for domestic, agricultural and industrial use
    - Maintaining environmental flows
- Energy
    - Energy production and use, renewable and non-renewable resources (dis/advantages).

***Principles for ecologically sustainable management of the environment* (*Criterion 8*)**

This section provides a framework for the sustainable use of resources.

Ecologically sustainable development

- Definition of ecological sustainability
- Important principles
    - Intergenerational equity
    - Intragenerational (social) equity
    - Conservation of biodiversity and ecological integrity
    - Precautionary and anticipatory principle
    - Pricing environmental values and natural resources (user pays principle)
    - Efficiency of resource use.

Strategies for management

- Education
- Science and technology
- Economics
    - Green economics compared to traditional economics
    - Examples: real cost pricing principle – externalities/environmental cost (user pays principle), taxes (polluter pays principle); incentives; rebates
- Law
    - General principles behind key legislation protecting biodiversity and the environment
    - Federal example: EPBC Act
    - International conventions and instruments, for example, CITES, the Montreal Protocol, IWC, Law of the Sea, World Heritage List, Ramsar Convention, CCAMLR.

Management tools

- EIA/EIS

    - Outline of process involved
- Environmental management plans (EMP)
    - What is an EMP?
    - The development of management plans:
        - Stakeholder identification
        - Vision statement
        - Description and mapping of resources
        - Valuing of resources
        - Identification of legal restrictions
        - Selection of appropriate technology
        - Ongoing monitoring
        - Evaluating the EMP
        - Learners should be able to make appropriate, specific and relevant suggestions in relation to EMP scenarios.

Conservation of ecosystems and biodiversity

- CAR system of reserves for Australia's bioregions, including Marine Protected Areas (MPAs)
- World Heritage Areas (WHAs)
- *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act) and *Threatened Species Act 1995*.

Challenges to sustainability

Learners should apply the above strategies using the framework above to overcome the following challenges:

- Population growth (Differences in LEDC's vs MEDC's)
- Food
    - Agriculture
    - Fisheries/aquaculture
    - Overuse of species
- Water
    - Limited supply
- Energy
    - Reliance on use of fossil fuels.

Assessment

Criterion-based assessment is a form of outcomes assessment that identifies the extent of learner achievement at an appropriate end-point of study. Although assessment – as part of the learning program – is continuous, much of it is formative, and is done to help learners identify what they need to do to attain the maximum benefit from their study of the course. Therefore, assessment for summative reporting to TASC will focus on what both teacher and learner understand to reflect end-point achievement.

The standard of achievement each learner attains on each criterion is recorded as a rating 'A', 'B', or 'C', according to the outcomes specified in the standards section of the course.

A 't' notation must be used where a learner demonstrates any achievement against a criterion less than the standard specified for the 'C' rating.

A 'z' notation is to be used where a learner provides no evidence of achievement at all.

Providers offering this course must participate in quality assurance processes specified by TASC to ensure provider validity and comparability of standards across all awards. To learn more, see TASC's quality assurance processes and assessment information.

Internal assessment of all criteria will be made by the provider. Providers will report the learner's rating for each criterion to TASC.

TASC will supervise the external assessment of designated criteria which will be indicated by an asterisk (*). The ratings obtained from the external assessments will be used in addition to internal ratings from the provider to determine the final award.

Quality Assurance Process

The following processes will be facilitated by TASC to ensure there is:

- a match between the standards of achievement specified in the course and the skills and knowledge demonstrated by learners community
- confidence in the integrity and meaning of the qualification.

Process – TASC gives course providers feedback about any systematic differences in the relationship of their internal and external assessments and, where appropriate, seeks further evidence through audit and requires corrective action in the future.

Criteria

The assessment for Environmental Science and Society Level 3 will be based on the degree to which the learner can:

1. demonstrate personal skills to plan, organise and complete activities
2. develop, interpret and evaluate experiments and investigations*
3. collect, process and communicate information
4. demonstrate understanding of the application and impact of environmental science in society
5. demonstrate knowledge and understanding of ecological processes*
6. demonstrate knowledge and understanding of changes to ecosystems, locally and globally*
7. demonstrate knowledge and understanding of how humans depend and impact on ecosystems*
8. demonstrate knowledge and understanding of principles for the ecologically sustainable management of the environment*

* = denotes criteria that are both internally and externally assessed

Standards

Criterion 1: demonstrate personal skills to plan, organise and complete activities

The learner:

Rating A	Rating B	Rating C
selects and uses techniques and equipment safely, competently and methodically, applying them to unfamiliar contexts	selects and uses techniques and equipment safely, competently and methodically	uses familiar techniques and equipment safely, competently
follows instructions accurately, adapting to new circumstances	follows instructions accurately	follows instructions accurately
monitors and critically evaluates progress towards meeting goals and timelines, and plans future actions	monitors and evaluates progress towards meeting goals and timelines, and plans future actions	monitors progress towards meeting goals and timelines
performs and monitors own tasks and guides others in their contribution to successful completion of group activities.	performs tasks and monitors their contribution to successful completion of group activities.	performs tasks to contribute to completion of group activities.

Criterion 2: develop, interpret and evaluate experiments and investigations

This criterion is both internally and externally assessed.

The learner:

Rating A	Rating B	Rating C
expresses an hypothesis to explain observations as a precise and testable statement that can be supported or refuted by an experiment	expresses an hypothesis to explain observations as a precise and testable statement	expresses an hypothesis to explain observations, meeting most of the criteria of a testable hypothesis
designs a controlled, safe and ethical experiment, identifying all variables and including all accepted elements of experimental design, to efficiently collect valid, reliable data	designs a controlled, safe and ethical experiment, identifying the main variables, to collect valid and reliable data	designs a controlled experiment, identifying the main variables and considering safety and ethics, to collect valid data
critically analyses and interprets data to draw a valid conclusion that relates to an hypothesis	analyses and interprets data to draw a valid conclusion that relates to an hypothesis	based on data, draws a conclusion that relates to an hypothesis, and has some validity
discusses significant limitations and sources of error in experimental design, with reference to evidence	identifies significant limitations and sources of error in experimental design	identifies some limitations and sources of error in experimental design
critically analyses an experimental design and provides an evidence-based critique and discussion on valid improvements and alternatives.	evaluates an experimental design and describes a number of possible valid improvements.	identifies a valid improvement in an experimental design.

Criterion 3: collect, process and communicate information

The learner:

Rating A	Rating B	Rating C

uses a variety of relevant resources and critically evaluates their reliability	uses a variety of relevant resources to collect information, and evaluates their reliability	uses a variety of relevant resources to collect information
collects a wide range of appropriate experimental data, and records it methodically for analysis	collects adequate, relevant experimental data, and records it suitably	collects and records experimental data
clearly identifies the information, images, ideas and words of others used in the student's work	clearly identifies the information, images, ideas and words of others used in the student's work	differentiates the information, images, ideas and words of others from the student's own
clearly identifies sources of the information, images, ideas and words that are not the student's own. Referencing conventions and methodologies are followed with a high degree of accuracy.	clearly identifies sources of the information, images, ideas and words that are not the student's own. Referencing conventions and methodologies are followed correctly.	identifies the sources of information, images, ideas and words that are not the student's own. Referencing conventions and methodologies are generally followed correctly.
creates appropriate, well structured reference lists/bibliographies	creates appropriate, structured reference lists/bibliographies	creates appropriate reference lists/bibliographies
selects and uses appropriate scientific formats for effective and accurate communication of information for specific audiences and purposes.	uses an appropriate scientific format for clear and accurate communication of information for specific audiences and purposes.	uses an appropriate scientific format for communication of information.

Criterion 4: demonstrate understanding of the application and impact of environmental science in society

The learner:

Rating A	Rating B	Rating C
explains relevance of identified science background to an issue	describes relevant science background to an issue	identifies relevant science background to an issue
explains significant components of an issue, and presents a detailed and balanced discussion	describes components of an issue, and presents a balanced discussion	identifies key components of an issue, and presents a discussion
clearly describes and critically evaluates the tensions and connections between an issue and all significant relevant influences (ethical, political, cultural, social, economic, aesthetic, educational, scientific)	clearly describes the tensions and connections between an issue and most of the relevant influences (ethical, political, cultural, social, economic, aesthetic, educational, scientific)	identifies connections between an issue and some of the relevant influences (ethical, political, cultural, social, economic, aesthetic, educational, scientific)
analyses and evaluates to present a complex argument related to the benefits of the use of scientific knowledge, and any harmful or unintended consequences	describes the benefits of the use of scientific knowledge, and any harmful or unintended consequences	identifies the benefits of the use of scientific knowledge, and any harmful or unintended consequences
argues a reasoned conclusion, linking it to relevant evidence, and assessing the relative impact of influences on their decision making.	argues a reasoned conclusion, linking it to relevant evidence.	presents a reasoned conclusion, using some relevant evidence.

Criterion 5: demonstrate knowledge and understanding of ecological processes

This criterion is both internally and externally assessed.

Related to the study of ecological processes, the learner:

Rating A	Rating B	Rating C
explains concepts	describes concepts	identifies basic concepts
applies concepts to explain ecological processes, analyse and interpret complex problems, and make plausible predictions in familiar and unfamiliar contexts	applies concepts to explain ecological processes, analyse problems, and make plausible predictions in familiar and some unfamiliar contexts	applies basic concepts to explain ecological processes, discuss problems, and make plausible predictions in familiar contexts
justifies the selection of data as evidence, critically analyses evidence with reference to concepts, and draws evidence-based conclusions that identify any limitations.	selects appropriate data as evidence, interprets evidence with reference to concepts, and draws conclusions based on data.	uses data to demonstrate links to basic concepts, and presents simple conclusions based on data.

Criterion 6: demonstrate knowledge and understanding of changes to ecosystems, locally and globally

This criterion is both internally and externally assessed.

Related to the study of local and global changes to ecosystems, the learner:

Rating A	Rating B	Rating C
explains concepts	describes concepts	identifies basic concepts
explains changes	describes changes	identifies changes
applies concepts to explain local and global changes, analyse and interpret complex problems, and make plausible predictions in familiar and unfamiliar contexts	applies concepts to explain local and global changes, analyse problems, and make plausible predictions in familiar and some unfamiliar contexts	applies basic concepts to explain local and global changes, discuss problems, and make plausible predictions in familiar contexts
justifies the selection of data as evidence, critically analyses evidence with reference to concepts, and draws evidence-based conclusions that identify any limitations.	selects appropriate data as evidence, interprets evidence with reference to concepts, and draws conclusions based on data.	uses data to demonstrate links to basic concepts, and presents simple conclusions based on data.

Criterion 7: demonstrate knowledge and understanding of how humans depend and impact on ecosystems

This criterion is both internally and externally assessed.

Related to the study of how humans depend and impact on ecosystems, the learner:

Rating A	Rating B	Rating C
explains concepts	describes concepts	identifies basic concepts
explains impacts	describes impacts	identifies impacts
applies concepts to explain dependence and impacts, analyse and interpret complex problems, and make plausible predictions in familiar and unfamiliar contexts	applies concepts to explain dependence and impacts, analyse problems, and make plausible predictions in familiar and some unfamiliar contexts	applies basic concepts to explain dependence and impacts, discuss problems, and make plausible predictions in familiar contexts
justifies the selection of data as evidence, critically analyses evidence with reference to concepts, and draws evidence-based conclusions that identify any limitations.	selects appropriate data as evidence, interprets evidence with reference to concepts, and draws conclusions based on data.	uses data to demonstrate links to basic concepts, and presents simple conclusions based on data.

Criterion 8: demonstrate knowledge and understanding of principles for the ecologically sustainable management of the environment

This criterion is both internally and externally assessed.

Related to the study of principles for ecologically sustainable management of the environment, the learner:

Rating A	Rating B	Rating C
explains concepts	describes concepts	identifies basic concepts
explains concepts of management tools for management of the environment	describes concepts of management tools for management of the environment	identifies basic concepts of management tools for management of the environment
explains challenges to sustainability	describes challenges to sustainability	identifies challenges to sustainability
applies concepts to explain principles and solutions, analyse and interpret complex problems, and make plausible predictions in familiar and unfamiliar contexts	applies concepts to explain principles and solutions, analyse problems, and make plausible predictions in familiar and some unfamiliar contexts	applies basic concepts to explain principles and solutions, discuss problems, and make plausible predictions in familiar contexts
justifies the selection of data as evidence, critically analyses evidence with reference to concepts, and draws evidence-based conclusions that identify any limitations.	selects appropriate data as evidence, interprets evidence with reference to concepts, and draws conclusions based on data.	uses data to demonstrate links to basic concepts, and presents simple conclusions based on data.

Qualifications Available

Environmental Science and Society Level 3 (with the award of):

EXCEPTIONAL ACHIEVEMENT

HIGH ACHIEVEMENT

COMMENDABLE ACHIEVEMENT

SATISFACTORY ACHIEVEMENT

PRELIMINARY ACHIEVEMENT

Award Requirements

The final award will be determined by the Office of Tasmanian Assessment, Standards and Certification from the 13 ratings (8 from the internal assessment, 5 from the external assessment).

The minimum requirements for an award in Environmental Science and Society Level 3 are as follows:

EXCEPTIONAL ACHIEVEMENT (EA)
11 'A' ratings, 2 'B' ratings (4 'A' ratings, 1 'B' rating from external assessment)

HIGH ACHIEVEMENT (HA)
5 'A' ratings, 5 'B' ratings, 3 'C' ratings (2 'A' ratings, 2 'B' ratings, 1 'C' rating from external assessment)

COMMENDABLE ACHIEVEMENT (CA)
7 'B' ratings, 5 'C' ratings (2 'B' ratings, 2 'C' ratings from external assessment)

SATISFACTORY ACHIEVEMENT (SA)
11 'C' ratings (3 'C' ratings from external assessment)

PRELIMINARY ACHIEVEMENT (PA)
6 'C' ratings

A learner who otherwise achieves the ratings for a CA (Commendable Achievement) or SA (Satisfactory Achievement) award but who fails to show any evidence of achievement in one or more criteria ('z' notation) will be issued with a PA (Preliminary Achievement) award.

Course Evaluation

The Department of Education's Curriculum Services will develop and regularly revise the curriculum. This evaluation will be informed by the experience of the course's implementation, delivery and assessment.

In addition, stakeholders may request Curriculum Services to review a particular aspect of an accredited course.

Requests for amendments to an accredited course will be forwarded by Curriculum Services to the Office of TASC for formal consideration.

Such requests for amendment will be considered in terms of the likely improvements to the outcomes for learners, possible consequences for delivery and assessment of the course, and alignment with Australian Curriculum materials.

A course is formally analysed prior to the expiry of its accreditation as part of the process to develop specifications to guide the development of any replacement course.

Expectations Defined By National Standards

There are no content statements developed by ACARA relevant to this course.

Accreditation

The accreditation period for this course is from 1 January 2014 to 31 December 2017.

Version History

Version 1 – Accredited on 9 September 2013 for use in 2014 to 2017. This course replaces Environmental Science (EVS315109) that expired on 31 December 2013.

Appendix 1

GLOSSARY

Accuracy
The extent to which a measurement result represents the quantity it purports to measure; an accurate measurement result includes an estimate of the true value and an estimate of the uncertainty.

Analyse
To examine, scrutinise, explore, review, consider in detail for the purpose of finding meaning or relationships, and identifying patterns, similarities and differences.

Assess
Determine the value, significance or extent of (something).

Communicates
Conveys knowledge and/or understandings to others.

Complex
Consisting of multiple interconnected parts or factors.

Critically analyse
Examine the component parts of an issue or information, for example identifying the premise of an argument and its plausibility, illogical reasoning or faulty conclusions.

Critically evaluate
Evaluation of an issue or information that includes considering important factors and available evidence in making critical judgement that can be justified.

Data
The plural of datum; the measurement of an attribute, for example, the volume of gas or the type of rubber. This does not necessarily mean a single measurement: it may be the result of averaging several repeated measurements. Data may be quantitative or qualitative and be from primary or secondary sources.

Demonstrate
Give a practical exhibition as an explanation.

Describe
Give an account of characteristics or features.

Design (verb)
Plan and evaluate the construction of a product or process.

Evaluate
Provide a detailed examination and substantiated judgement concerning the merit, significance or value of something.

Evidence
In science, evidence is data that is considered reliable and valid and which can be used to support a particular idea, conclusion or decision. Evidence gives weight or value to data by considering its credibility, acceptance, bias, status, appropriateness and reasonableness.

Explain
Provide additional information that demonstrates understanding of reasoning and/or application.

Familiar
Previously encountered in prior learning activities.

Genre
The categories into which texts are grouped; genre distinguishes texts on the basis of their subject matter, form and structure (for example, scientific reports, field guides, explanations, procedures, biographies, media articles, persuasive texts, narratives).

Hypothesis
A tentative explanation for an observed phenomenon, expressed as a precise and unambiguous statement that can be supported or refuted by experiment.

Identify
Establish or indicate who or what someone or something is.

Investigation
A scientific process of answering a question, exploring an idea or solving a problem that requires activities such as planning a course of action, collecting data, interpreting data, reaching a conclusion and communicating these activities. Investigations can include observation, research, field work, laboratory experimentation and manipulation of simulations.

Justify
Show how an argument or conclusion is right or reasonable.

Law
A statement describing invariable relationships between phenomena in specified conditions, frequently expressed mathematically.

Mode
The various processes of communication – listening, speaking, reading/viewing and writing/creating.

Model
A representation that describes, simplifies, clarifies or provides an explanation of the workings, structure or relationships within an object, system or idea.

Primary data
Data collected directly by a person or group.

Reasoned
Reasoned argument/conclusion: one that is sound, well-grounded, considered and thought out.

Research
To locate, gather, record, attribute and analyse information in order to develop understanding.

Secondary data
Data collected by a person or group other than the person or group using the data.

Select
Choose in preference to another or others.

Solve
Work out a correct solution to a problem.

Synthesise
Combine elements (information/ideas/components) into a coherent whole.

System
A group of interacting objects, materials or processes that form an integrated whole. Systems can be open or closed.

Theory
A set of concepts, claims and/or laws that can be used to explain and predict a wide range of related observed or observable phenomena. Theories are typically founded on clearly identified assumptions, are testable, produce reproducible results and have explanatory power.

Understand
Perceive what is meant, grasp an idea, and to be thoroughly familiar with.

Unfamiliar
Not previously encountered in prior learning activities.

Validity
The extent to which tests measure what was intended; the extent to which data, inferences and actions produced from tests and other processes are accurate.

Supporting documents including external assessment material

- ESS315114 Exam Paper 2014.pdf (2017-07-21 01:05pm AEST)
- ESS315114 Exam Paper 2015.pdf (2017-07-21 01:05pm AEST)
- ESS315114 Exam Paper 2016.pdf (2017-07-21 01:05pm AEST)
- ESS315114 Assessment Report 2016.pdf (2017-07-25 04:25pm AEST)
- EVS315109 Exam Paper 2012.pdf (2017-07-26 03:03pm AEST)
- EVS315109 Assessment Report 2012.pdf (2017-07-26 03:03pm AEST)
- EVS315109 Assessment Report 2013.pdf (2018-02-06 04:26pm AEDT)
- ESS315114 Assessment Report 2014.pdf (2017-07-26 03:04pm AEST)
- ESS315114 Assessment Report 2015.pdf (2017-07-26 03:04pm AEST)
- EVS315109 Exam Paper 2013.pdf (2017-07-26 03:04pm AEST)
- 2017 ESS315114 Info Sheet.pdf (2017-07-26 03:05pm AEST)
- ESS315114 External Assessment Specifications 2014 - 2017.pdf (2017-08-17 12:43pm AEST)
- ESS315114 Exam Paper 2017.pdf (2017-11-21 03:47pm AEDT)
- ESS315114 Information Sheet 2017.pdf (2017-11-21 04:19pm AEDT)
- ESS315114 Assessment Report 2017.pdf (2018-02-28 03:50pm AEDT)

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