

COURSE AMENDMENT

Description



Life Sciences LEVEL 2

Amendment Description

Learning Outcomes

Current Learning Outcomes

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

- have personal skills to plan, organise and complete activities, including practical tasks
- understand basic biological concepts, theories and models from subcellular processes to ecosystem dynamics
- understand how basic biological systems interact and are interrelated; the flow of matter and energy through and between these systems; and processes by which they persist and change
- understand the role and impact of life sciences in society
- apply basic scientific concepts and knowledge to biotechnical contexts
- have basic practical skills in the use of techniques and equipment relating to life sciences
- analyse basic data and interpret basic evidence to draw conclusions
- communicate biological understanding, findings, arguments and conclusions using appropriate representations, modes and genres.

Proposed Learning Outcomes (includes some reordering to align with content and criteria)

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

- undertake and complete scientific activities and tasks (including practical tasks) individually and as a group
- use practical skills and techniques, safely utilising equipment relating to life sciences
- inquire into biological systems by collecting data and finding trends and patterns to draw valid conclusions
- collect, process, organise and communicate biological data and information following accepted conventions
- describe the application and impact of life sciences in society
- describe and utilise basic biological concepts, theories and models from subcellular processes to ecosystem dynamics
- describe how basic biological systems interact and are interrelated; the flow of matter and energy through and between these systems; and processes by which they persist and change
- utilise appropriate biological concepts and knowledge to describe and interpret biotechnical contexts

Pathways

Current Pathways

This course is designed for learners who are interested in studying the science related to the living world. Life Sciences may be studied as a stand-alone course and is also useful preparation for further study in Level 3 courses such as: *Biology, Environmental Science and Society* and *Physical Sciences*. It may provide background and support for vocational programs within training packages, where some scientific knowledge and experience is useful. It may also provide links with VET programs, traineeships and apprenticeships.

Proposed Pathways

This course is designed for learners who are interested in studying the science related to the living world. *Life Sciences, Level 2* may be studied as a stand-alone course and is also useful preparation for further study in Level 3 courses such as: *Biology, Level 3, Environmental Science, Level 3* and *Physical Sciences, Level 3*. It may provide background and support for vocational programs within training packages traineeships and apprenticeships, where some scientific knowledge and experience is useful.

Course Content

Current introductory text under THEMES within the Course Content

The following themes are EXAMPLES only. They are expanded below to illustrate some relationships between themes and core topics, and possible areas of study related to biotechnology:

- Human
- Agriculture
- Environment
- Biochemistry: The Chemical Basis of Life
- Marine Studies.

This list of themes and their suggested content are not exhaustive. Other themes might include microbiology, Tasmanian flora and fauna, aquaculture, forestry, etc. At least one theme studied **must** cover current biotechnology concepts and relevant applications.

Proposed introductory text under THEMES within the Course Content

The following themes are EXAMPLES only. They are expanded below to illustrate some relationships between themes and core topics, and possible areas of study related to biotechnology (criterion 8):

- Human
- Agriculture
- Environment
- Biochemistry: The Chemical Basis of Life
- Marine Studies.

This list of themes and their suggested content are not exhaustive. Other themes might include microbiology, Tasmanian flora and fauna, aquaculture, forestry, etc. At least one theme studied must cover current biotechnology concepts and relevant contexts (criterion 8).



Criteria

Current Criteria

The assessment for *Life Sciences Level 2* 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 life sciences experiments
3. collect, process and communicate information
4. demonstrate understanding of the application and impact of life sciences in society
5. demonstrate knowledge and understanding of cells, systems and organisms
6. demonstrate knowledge and understanding of the chemical and cellular processes that support life
7. demonstrate knowledge and understanding of ecosystem diversity and dynamics
8. apply scientific concepts and knowledge to biotechnology contexts

Proposed Criteria

The assessment for *Life Sciences Level 2* will be based on the degree to which the learner can:

1. apply skills to organise and complete activities
2. undertake, interpret and review life sciences experiments
3. collect, process and communicate information
4. describe the application and impact of life sciences in society
5. describe and utilise concepts of cells, systems and organisms
6. describe and utilise concepts of the chemical and cellular processes that support life
7. describe and utilise ecosystem diversity and dynamics concepts
8. describe and interpret biotechnology concepts and contexts

Expectations Defined By National Standards In Content Statements Developed by ACARA

Proposed additional expectations

Science Inquiry Skills (Biology Units 1 and 2)

- Identify, research and construct questions for investigation; propose hypotheses; and predict possible outcomes (ACSBL001 and ACSBL030)
- 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; conduct risk assessments; and consider research ethics, including animal ethics (ACSBL002 and ACSBL031)
- Conduct investigations, including using ecosystem surveying techniques, safely, competently and methodically for the collection of valid and reliable data (ACSBL003 and ACSBL032)
- 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 (ACSBL004 and ACSBL033)
- Interpret a range of scientific and media texts, and evaluate processes, claims and conclusions by considering the quality of available evidence; and use reasoning to construct scientific arguments (ACSBL005 and ACSBL034)
- Select, construct and use appropriate representations, including classification keys, food webs and biomass pyramids, to communicate conceptual understanding, solve problems and make predictions (ACSBL006 and ACSBL035)



- Communicate to specific audiences and for specific purposes using appropriate language, nomenclature, genres and modes, including scientific reports (ACSBL007 and ACSBL036)

Science as a Human Endeavour (Units 1 and 2)

- Science is a global enterprise that relies on clear communication, international conventions, peer review and reproducibility (ACSBL008 and ACSBL037)
- Development of complex models and/or theories often requires a wide range of evidence from multiple individuals and across disciplines (ACSBL009 and ACSBL038)
- Advances in science understanding in one field can influence other areas of science, technology and engineering (ACSBL010 and ACSBL039)
- The use of scientific knowledge is influenced by social, economic, cultural and ethical considerations (ACSBL011 and ACSBL040)
- The use of scientific knowledge may have beneficial and/or harmful and/or unintended consequences (ACSBL012 and ACSBL041)
- Scientific knowledge can enable scientists to offer valid explanations and make reliable predictions (ACSBL013 and ACSBL042)
- Scientific knowledge can be used to develop and evaluate projected economic, social and environmental impacts and to design action for sustainability (ACSBL014 and ACSBL043)

Line of Sight

Proposed Line of Sight

Learning Outcome	Criterion	Content	Criterion and elements
undertake and complete scientific activities and tasks individually and as a group, including practical tasks	1. apply skills to organise and complete activities	All	C1 All
use practical skills and techniques, safely utilising equipment relating to life sciences	2. undertake, interpret and review life sciences experiments	All	C2 E2
inquire into biological systems by collecting data and finding trends and patterns to draw valid conclusions	2. undertake, interpret and review life sciences experiments	Science Inquiry Skills applied across all other content	C2 E1 and E3 to E5
collect, process, organise and communicate biological data and information following accepted conventions	3. collect, process and communicate information	All content	C3 All



Learning Outcome	Criterion	Content	Criterion and elements
describe the application and impact of life sciences in society	4. describe of the application and impact of life sciences in society	Science as a Human Endeavour applied across all other content	C4 All
describe and utilise basic biological concepts, theories and models from subcellular processes to ecosystem dynamics	5. describe and utilise concepts of cells, systems and organisms 6. describe and utilise ecosystem diversity and dynamics concepts	Demonstrate knowledge and understanding of cells, systems and organisms (Criterion 5) Demonstrate knowledge and understanding of the cellular processes that support life (Criterion 6)	C5 All C6 All
describe how basic biological systems interact and are interrelated; the flow of matter and energy through and between these systems; and processes by which they persist and change	7. describe and utilise ecosystem diversity and dynamics concepts	Demonstrate knowledge and understanding of ecosystem diversity and dynamics (Criterion 7)	C7 All
utilise appropriate biological concepts and knowledge to describe and interpret biotechnical contexts	8. describe and interpret biotechnology concepts and contexts	Themes	C8 All