

VCE

The Victorian Certificate of Education (VCE) course consists of four units to be completed over two years. Units 1 and 2 must be completed before undertaking units 3 and 4. All Candidates taking the VCE course at the Year 11 stage must complete units 1 and 2, and an assessment of practical work. The details of units

3 and 4 are given in the Year 12 Workbook. Course material is covered in the workbook in the topics indicated. The CD-ROM symbol indicates that additional material is available on the Teacher Resource CD-ROM. Weblinks supporting each topic are present throughout, but are not specifically indicated.

VCE Y11 course		Topic in Year 11 Workbook	Topic in Year 11 Workbook
Unit 1: Unity and Diversity			
1	Cells in Action: <ul style="list-style-type: none"> Cell structure: prokaryote and eukaryotic cells seen with light and electron microscopy. Cellular organisation. Cell function: cell organelles. Biochemical processes including photosynthesis and respiration in terms of inputs and outputs. General role of enzymes. Cell composition: major groups of organic and inorganic substances (including carbohydrates, lipids, proteins, nucleic acids, water, minerals, and vitamins) and their role in cell structure and function. Internal and external environment of cells: plasma membranes and membrane transport (diffusion, osmosis, and active transport). Surface area to volume ratio. Cell replication (mitosis and cytokinesis): the purpose of cell replication. Cell growth, cell size and cell division. Experimental methods to investigate cellular structure, organisation and processes. 	Cell Structure Cellular Processes Cell Structure Nutrition Gas Exchange ● Chemosmosis Cell Structure ● Biochemical Tests Cellular Processes ● Osmosis & Water Potential ● Cellular Processes Overview Cellular Processes Cell Structure Cellular Processes ● Biochemical Tests ● Cell Fractionation	
2	Functioning Organisms: <ul style="list-style-type: none"> Common requirements of living things: <ul style="list-style-type: none"> Obtaining nutrients. Organic and inorganic requirements of autotrophs and heterotrophs. Obtaining energy. Photosynthesis and structural features of photosynthetic organisms. Processing nutrients. Features of effective systems in heterotrophs. Examples of digestive systems in different animals. Distributing materials. Features of effective transport systems. Examples of transport systems in different animals. Removing wastes. Nature of waste products and toxic substances. Excretory mechanisms and systems. Exchanging gases. Features of effective surfaces for gas exchange. Mechanisms and systems in multicellular organisms. Diffusion. Asexual and sexual reproduction. Mechanisms and systems of reproduction in unicellular and multicellular organisms. Classifying organisms: purposes, principles and hierarchy of biological classification. Features used in constructing major taxonomic groups. 	Nutrition Cell Structure Nutrition Nutrition Transport & Excretion Transport & Excretion Gas Exchange Cellular Processes Reproduction & Development The Principles of Classification ● Classification Practical	
Practical Work			
	<ul style="list-style-type: none"> Work requirements involve the collection, analysis, and presentation of data, making an investigation, and preparing a scientific report. 	Skills in Biology ● Reliability of the Mean ● Non-linear Regression ● Linear Regression ● Analysis of Variance	
Unit 2: Organisms and their Environment			
1	Adaptations of Organisms: <ul style="list-style-type: none"> Environmental factors: biotic and abiotic factors. Availability of resources. Structural adaptations: relating major features of organisms to survival value. Physiological adaptations: <ul style="list-style-type: none"> Tolerance range of organisms. Maintaining equilibrium by detecting and responding to changes in environmental conditions. Nerve control in complex multicellular organisms. Major sense organs and pathways of transmission of nerve impulses. Hormonal control in complex multicellular organisms. Regulating water balance. Controlling temperature. Plant tropisms: growth responses and rhythmic activities. Behavioural adaptations: individual and group behaviours of animals including rhythmic activities, feeding behaviours. Communication. Social and territorial behaviours. Reproductive adaptations: systems and strategies. Development and life cycles. Techniques used to monitor environmental changes and species distribution. 		Environment & Adaptation Environment & Adaptation Environment & Adaptation ● Detecting Changing States ● Special Senses Environment & Adaptation ● Hormones & Responses Environment & Adaptation Environment & Adaptation Environment & Adaptation ● Animal Migration ● Social Behaviour Environment & Adaptation Skills in Biology Practical Ecology
2	Dynamic Ecosystems: <ul style="list-style-type: none"> Components of ecosystems: communities and ecological groupings. Ecological niche. Relationships between organisms: feeding including parasite/host, predator/prey, of mutual benefit including mutualism and symbiosis. Flow of energy: inputs and outputs of the system. Productivity. Trophic levels and trophic efficiency. Cycling of matter: principles of exchange between abiotic and biotic components of the ecosystem, including inputs and outputs. Biogeochemical systems including water, carbon, oxygen and nitrogen. Bioaccumulation. Population dynamics: carrying capacity of ecosystems. Factors affecting distribution and abundance of organisms including birth and death rates. Migration. Changes to ecosystems over time: <ul style="list-style-type: none"> Scope and intensity of regular and irregular natural changes. Succession. Human activity and the sustainability of ecosystems. Historical practices of indigenous peoples and settlers. Techniques for monitoring and maintaining ecosystems. 		Environment & Adaptation Communities Communities ● Predators & Prey Communities ● Cave Food Webs Communities Population Dynamics Environment & Adaptation ● Animal Migration Changes in Ecosystems Evolution of Australia's Biota Changes in Ecosystems ● Human Impact on Ecosystems Evolution of Australia's Biota Skills in Biology Practical Ecology