

South Australia

A course guide for candidates taking the SA Stage 2 Biology Course is provided below. Material (including preparatory material) for this course is covered in both this and the Year 12 Workbook. Candidates must complete all themes and the practical component. Please consult the SSABSA syllabus statement for

details on strand structure within each theme. 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.

Stage 2 Biology		Topic in Workbook (Year 11 unless indicated otherwise)	Topic in Workbook (Year 11 unless indicated otherwise)
Theme M: Macromolecules			
M1-4	Structure and role of DNA. The structure and function of chromosomes. The gene as the functional unit of information. DNA transcription, translation, protein synthesis.	Cell Structure Cellular Processes Yr 12 workbook	
M5	Protein structure and function.	Cell Structure	
M6	The structure and roles of lipids and polysaccharides.	Cell Structure	
M7	The mechanism of DNA replication.	Yr 12 workbook	
M8	Enzyme function: the induced-fit model and factors affecting enzyme activity.	Cell Structure Yr 12 workbook	
M9	Plasma membrane receptors and molecular recognition.	Cellular Processes Yr 12 workbook	
M10	Enzyme reaction rates and the role of enzymes as catalysts.	Cell Structure Yr 12 workbook	
M11	Macromolecules as energy reserves.	Cell Structure Yr 12 workbook	
M12	How DNA carries genetic information. Perpetuation of DNA through replication.	Yr 12 workbook	
M13	Universal presence of DNA as evidence for the common ancestry of living things.	Yr 12 workbook	
M14	Uses of DNA and protein sequences for determining relatedness.	Yr 12 workbook	
M15	Changes within genes: mutagens, mutations and their consequences.	Yr 12 workbook	
M16-17	Techniques and applications of DNA manipulation and DNA technology.	Yr 12 workbook	
Theme C: Cells			
C1	The cell as the unit of life. The significance of cell surface area to volume ratio.	Cell Structure Cellular Processes	
C2	Structure and size of prokaryotic and eukaryotic cells. Eukaryotic cell organelles. Size, structure, and role of genomes.	Cell Structure Yr 12 workbook	
C3	Structure and function of the plasma membrane and the cytoskeleton. Endocytosis and exocytosis	Cell Structure Cellular Processes Yr 12 workbook (review)	
C4	Regulation of the intracellular environment. Selective exchanges at the cell membrane.	Cellular Processes	
C5	Passive and active transport mechanisms.	Cellular Processes ● Osmosis & Water Potential ● Cellular Processes Overview	
C6-7	Energy requirements of cells. Role of ATP. Photosynthesis and its regulation. Enzyme control of metabolic pathways.	Nutrition Yr 12 workbook	
C8	Cell division. Comparing binary fission in prokaryotes and mitosis in eukaryotes.	Cellular Processes Reproduction & Development	
C9	The role of genes and hormones in regulating cell division. Carcinogens: their disruption of cell division.	Yr 12 workbook	
C10	Evolution of cells: early existence of prokaryotic cells.	The Origin & Evolution of Life	
C11	The techniques involved in cell culture and applications of cultured cells.	Yr 12 workbook	
C12	The effects of chemicals on the metabolism of cells.	Not yet covered	
Theme O: Organisms			
O1	Differentiation of cells for a specialised function. Hierarchical structure of organisation within multicellular organisms.	Cellular Processes	
O2	The role of the nervous and hormonal systems in coordination and control. The gene as the functional unit of information.	Yr 12 workbook	
O3	Response to stimuli: sensory receptors and reflex responses.	Yr 12 workbook	
O4	Properties of exchange surfaces: structure and function of the kidney nephron, lung alveoli, villi. The role of blood and lymph capillaries in the exchange of materials.	Gas Exchange Nutrition Transport & Excretion	
O5	Maintenance involved in control of body temperature.	Environment & Adaptation Yr 12 workbook	
O6-7	Energy requirements: photosynthesis, cellular respiration (aerobic & anaerobic). Autotrophic & heterotrophic nutrition.	Nutrition Gas Exchange ● Chemiosmosis Yr 12 workbook	
O8-9	Comparison of asexual and sexual reproduction in eukaryotes. Significance of meiosis: crossing over, and independent assortment.	Reproduction & Development Yr 12 workbook	
O10	Meiosis and its contribution to genetic variation in offspring.	Yr 12 workbook	
O11	Natural selection: some characteristics increase survival and reproduction.	Yr 12 workbook	
O12	Techniques and ethics of genetic manipulation of organisms.	Yr 12 workbook	
O13	The role of diet, exercise, and drugs on human health. (Aspects covered).	Transport & Excretion Yr 12 workbook	
Theme E: Ecosystems			
E1	Population and community structure, the species concept, reproductive isolating mechanisms.	Population Dynamics Communities Yr 12 workbook	
E2	The role of producers, consumers, and decomposers in a community.	Communities	
E3	Communities influenced by environmental factors.	Environment & Adaptation	
E4	Productivity and nutrient cycling.	Communities	
E5	Energy flow in communities, input and output of energy.	Communities	
E6	Ecological succession and biodiversity.	Changes in Ecosystems Evolution of Australia's Biota	
E7	Reproductive strategies of <i>r</i> and <i>K</i> selected species.	Population Dynamics	
E8	Natural selection, the gene pool, and genetic variability in a population.	Yr 12 workbook	
E9	Geographical isolation and speciation.	Yr 12 workbook	
E10	Human impact on communities, species extinction by human activity, habitat conservation.	Changes in Ecosystems ● Human Impact on Ecosystems	
E11	Human population growth and resources.	● Human Impact on Ecosystems	
Skills			
	Skills include hypothesis formation, experimental design. Observation, replication, repetition, precision, accuracy of experiments. Data analysis and interpretation. Communication and presentation of results.	Skills in Biology Practical Ecology ● Reliability of the Mean, Regression, ANOVA & Statistical Spreadsheets	