

HSC

Students must complete the Preliminary course before undertaking the HSC course. HSC candidates must complete all three core topics and one option, as well as an assessment of practical work. Course material is covered in the workbook

as indicated below. Additional material to complete a unit requirement is available on the Teacher Resource CD-ROM and identified below. Weblinks supporting each topic are identified throughout each chapter, but are not specifically indicated.

HSC Year 12 course		Topic in Year 12 Workbook	Topic in Year 12 Workbook
Maintaining a Balance			
1	<i>Activity occurs in a limited temperature range:</i> Enzymes and metabolism. Homeostasis and temperature regulation in animals. Plant responses to temperature.	The Chemistry of Life Principles of Homeostasis Homeostasis & Adaptation Control & Coordination	
2	<i>Transport of dissolved nutrients and gases:</i> Composition and role of blood. Adaptations to altitude. Gas transport and regulation of blood gases. Arteries and veins. Transport in plants.	Homeostasis & Adaptation	
3	<i>Gases, water, and waste products are regulated.</i> Excretion in fish and mammals. Role and function of the mammalian kidney (including the role of hormones in regulation of function). Excretion in plants. Adaptations of plants that assist in minimising water loss.	Homeostasis & Adaptation <i>also see</i> Maintaining a Balance Supplement on the TRC	
Blueprint of Life			
1	<i>Evidence of evolution & mechanisms for change:</i> Environmental change and evolution. Evidence in support of evolutionary theory. The consequences of evolution by natural selection and isolation: adaptive radiation, divergent evolution, and convergent evolution.	Evolution Evidence for Evolution Population Genetics Evolution	
2	<i>The significance of Mendel's experiments:</i> Mendelian genetics. Dominance of alleles, phenotype, inherited patterns and pedigrees.	Inheritance	
3	<i>Chromosome structure as the key to inheritance:</i> Nature of chromosomes and genes. Meiosis and genetic variation. Sex linkage and codominance. Genes and environment.	The Genetic Code Inheritance	
4	<i>The structure of DNA can be changed:</i> DNA structure and replication. Protein synthesis. Origins, causes and effects of mutations. Variation as the raw material for natural selection. Punctuated equilibrium and gradualism.	The Genetic Code Mutations Population Genetics Evolution	
5	<i>Reproductive technology & genetic engineering:</i> Reproductive technologies and consequences. Transformation: techniques and applications. Ethics of using transgenic organisms.	Cell Division and Cloning Gene Technology	
The Search for Better Health			
1	<i>What is a healthy organism?:</i> Health vs Disease. The genetic and cellular basis of health and disease.	Non-infectious Disease Mutations	
2	<i>Food safety and hygiene:</i> Infectious v non-infectious disease. The role of hygiene in controlling disease. Conditions under which organisms become pathogens.	Pathogens & Disease	
3	<i>The significance of Pasteur and Koch's work:</i> The work of Pasteur and Koch in identifying the cause of disease. Pathogens and examples of diseases they cause. Role of antibiotics in managing disease.	Pathogens & Disease	
4	<i>The body's responses to infection:</i> First and second lines of defence. Antigens as molecular triggers for an immune response. Microflora in humans. Self recognition and the reasons behind transplant rejection.	Defence & the Immune System	
5	<i>MacFarlane Burnet's work and immunisation:</i> Third line of defence. Structure and role of the immune system: cell and antibody mediated immunity. Role of vaccinations. Organ transplants.	Defence & the Immune System	
6	<i>Epidemiology of disease:</i> Features of epidemiology. Examples of non-infectious diseases and their classes.	Pathogens & Disease Non-infectious Disease	
7	<i>Controlling and preventing disease:</i> Role of quarantine in preventing spread of disease in Australia. Strategies for the control and/or prevention of disease.	Pathogens & Disease Gene Technology	
Option: Communication			
1-4	<i>Detecting stimuli and visual communication:</i> Receptors and sensory reception. Structure and function of the human eye, including accommodation. Correcting visual problems. Photoreceptor cells: colour vision and its role in animal communication		Control & Coordination
5-7	<i>Sound stimuli and signal transmission:</i> Sound production and reception. Structure and function of the human ear. Nerve transmission. Interpreting sensory information.		Control & Coordination
Option: Biotechnology			
1-3	<i>The history and applications of biotechnology:</i> Origins of biotechnology. Industrial applications of microbial fermentation. Strain isolation		<i>also see</i> Biotechnology Supplement on the TRC
4-7	<i>Techniques & ethics of biotechnology</i> Enzymes, protein synthesis, and recombinant DNA technology. Applications of these to biotechnology, ethical issues, and areas of research in biotechnology.	The Chemistry of Life The Genetic Code Gene Technology Defence & the Immune System	
Option: Genetics: The Code Broken?			
1	<i>Genes code for polypeptides:</i> Gene structure and the genetic code. Gene expression through polypeptide production.		The Genetic Code
2	<i>Multiple alleles & polygenes produce variability:</i> Multiple alleles: ABO/Rh blood groups, polygene inheritance. DNA profiling.		Defence & the Immune System Inheritance Gene Technology
3	<i>The inheritance of genes:</i> Meiosis. Inheritance: dihybrid crosses. Chromosome mapping.		Inheritance
4	<i>The Human Genome Project:</i> Human Genome Project. Recombinant DNA and its use in gene mapping.		Gene Technology
5	<i>Gene therapy for specific conditions:</i> Gene therapy and its current uses.		Gene Technology
6	<i>Mechanisms of genetic change:</i> Mutations, mutagens, and DNA self-repair.		Mutations
7	<i>Selective breeding and gene cloning:</i> Selective breeding, Gene cloning and whole organism cloning: applications and effects.		Population Genetics Cell Division & Cloning
8	<i>The role of gene expression in development:</i> The role of genes in embryonic and later development. Gene homologues.		The Evidence for Evolution Year 11 workbook
Option: The Human Story			
1	<i>Classification of humans and primates:</i> Hierarchical classification. Species definition. Distinguishing features of humans & primates.		Evolution Human Evolution
2-4	<i>Hominid evolution; evidence & relationships:</i> Evidence for human evolution. Fossil dating and interpretation. Alternative views on human evolution. Features of hominids. Evidence for human migration. Polymorphism examples.		Evidence for Evolution Human Evolution Population Genetics
5-6	<i>Cultural development; trends and impact:</i> Cultural evolution of humans and possible impacts. Current and future trends.		Human Evolution <i>also see</i> The Human Story on the TRC
Option: Biochemistry			
1-8	<i>Photosynthesis:</i> The history and biochemistry of photosynthesis.		Cellular Energetics
Practical Work			
	Practical work, including statistics & chi-squared in genetics.		Year 11 workbook <i>also see</i> Spreadsheets & Statistics on the TRC