



SAMPLE COURSE OUTLINE

HUMAN BIOLOGY
GENERAL YEAR 12

Acknowledgement of Country

Kaya. The School Curriculum and Standards Authority (the Authority) acknowledges that our offices are on Whadjuk Noongar boodjar and that we deliver our services on the country of many traditional custodians and language groups throughout Western Australia. The Authority acknowledges the traditional custodians throughout Western Australia and their continuing connection to land, waters and community. We offer our respect to Elders past and present.

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Sample course outline

Human Biology – General Year 12

Unit 3 and Unit 4

Semester 1 – Unit 3 – Coordination

Week	Key teaching points
1–2	<p>Skeletal system</p> <ul style="list-style-type: none"> • The skeleton <ul style="list-style-type: none"> ▪ functions of the skeleton ▪ axial skeleton <ul style="list-style-type: none"> ○ function ○ bones ▪ appendicular skeleton <ul style="list-style-type: none"> ○ function ○ bones • Bones <ul style="list-style-type: none"> ▪ microscopic structure Practical activity – Observing bone tissue ▪ types of bones and their function <ul style="list-style-type: none"> ○ long bones ○ short bones ○ flat bones ○ irregular bones ▪ long bones Practical activity – The anatomy of a long bone <ul style="list-style-type: none"> ○ structure ○ development for growth and repair
3–4	<ul style="list-style-type: none"> • Joints <ul style="list-style-type: none"> ▪ function of joints ▪ types of joints Practical activity – Observing joints <ul style="list-style-type: none"> ○ range of movement and location <ul style="list-style-type: none"> – immovable – cartilaginous – synovial joints (hinge, pivot, gliding, ball and socket) ○ structure of synovial joints • Treatment of damage to joints and bones caused by sporting injury (basic first aid, medication, surgery) <p>Task 1: Science inquiry (practical) – Basic first aid for joint and bone injuries</p>
5–6	<p>Muscular system</p> <ul style="list-style-type: none"> • Structure of skeletal muscles <ul style="list-style-type: none"> ▪ macroscopic → microscopic (muscle fibre, fibrils, myofibrils, actin and myosin) ▪ sliding filament theory (name of bands and zones not essential) • Movement at a joint Practical activity – The relationship between muscles and bones <ul style="list-style-type: none"> ▪ antagonistic muscles ▪ flexing arm at the elbow • Muscle tone • Walking <ul style="list-style-type: none"> ▪ phases of walking • Balance <ul style="list-style-type: none"> ▪ centre of gravity

Week	Key teaching points
	<ul style="list-style-type: none"> Ongoing research into the causes and treatments of muscular system dysfunctions (e.g. muscular dystrophy, sarcopenia, myalgia) <p>Commence Task 6: Extended response – Dysfunctions of the muscular, nervous and endocrine systems</p> <p>Task 2: Test – Skeletal and muscular systems</p>
7	<p>Nervous system</p> <ul style="list-style-type: none"> Function of the nervous system Division of the nervous system <ul style="list-style-type: none"> central nervous system <ul style="list-style-type: none"> structure and function – brain (cerebellum, cerebrum, brainstem) and spinal cord protection – bone, meninges, cerebrospinal fluid peripheral nervous system <ul style="list-style-type: none"> structure and function Structure and function of neurons (sensory, connector, motor) Reflexes <ul style="list-style-type: none"> reflex arc <p>Practical activity – Brain dissection</p> <p>Practical activity – Reaction times</p>
8–9	<ul style="list-style-type: none"> Sense organs – responding to changes in the external environment <ul style="list-style-type: none"> receptors <ul style="list-style-type: none"> location and function (light, sound, changes in position, chemical, touch, pressure, pain and temperature) the eye <ul style="list-style-type: none"> Practical activity – The pupil reflex structure and function <ul style="list-style-type: none"> Practical activity – Eye dissection sight <ul style="list-style-type: none"> the transmission of light to light receptors accommodation (near and distant vision) <ul style="list-style-type: none"> Practical activity – Accommodation stereoscopic vision <ul style="list-style-type: none"> Practical activity – Seeing in 3D the role of rods and cones <ul style="list-style-type: none"> Practical activity – The blind spot <p>Task 3: Science inquiry (investigation) – The effect of age on accommodation distance</p>
10–11	<ul style="list-style-type: none"> the ear <ul style="list-style-type: none"> structure and function hearing <ul style="list-style-type: none"> the transmission of sounds to sound receptors head position and movement – utricle and saccule, semicircular canals the skin <ul style="list-style-type: none"> function of skin receptors (pressure, pain and temperature) <ul style="list-style-type: none"> Practical activity – Responding to stimuli Interaction of nervous and musculoskeletal system <ul style="list-style-type: none"> balance <ul style="list-style-type: none"> inputs to the cerebellum from <ul style="list-style-type: none"> utricle and saccule semicircular canals eyes stretch receptors in muscles and joints pressure receptors in the skin outputs from the cerebellum to muscles walking

Week	Key teaching points
	<ul style="list-style-type: none"> ○ inputs to the cerebellum from cerebrum ○ outputs from the cerebellum to muscles ● Ongoing research into the causes and treatments of nervous system dysfunctions (e.g. cataracts, glaucoma, deafness, Parkinson’s disease, Alzheimer’s disease, Multiple Sclerosis)
12–14	<p>Endocrine system</p> <ul style="list-style-type: none"> ● Role of hormones ● Endocrine glands <ul style="list-style-type: none"> ▪ location of endocrine glands (hypothalamus, pituitary, adrenal, pancreas, thyroid, pineal, parathyroid, testes, ovaries, placenta) ● Homeostasis <ul style="list-style-type: none"> ▪ negative feedback <ul style="list-style-type: none"> ○ components of feedback loop (stimulus, receptor, modulator, effector, response and feedback) <p>Practical activity – Negative feedback</p> <ul style="list-style-type: none"> ▪ negative feedback loops relating to the hormonal regulation of metabolism <ul style="list-style-type: none"> ○ maintenance of body temperature (thyroxine) ▪ role of thyroxine, cortisol, growth hormone and adrenaline in the regulation of metabolism <ul style="list-style-type: none"> ● Ongoing research into the causes and treatments of endocrine system dysfunctions (e.g. diabetes, hypothyroidism, hyperthyroidism, menopause) <p>Task 4: Externally set task</p> <p>Task 5: Test – Nervous and endocrine systems</p>
15	Task 6: Extended response – Dysfunctions of the muscular, nervous and endocrine systems

Semester 2 – Unit 4 – Infectious disease

Week	Key teaching points
1–3	<p>Disease</p> <ul style="list-style-type: none"> • Infectious disease – definition • Pathogens <ul style="list-style-type: none"> ▪ types of pathogens and examples of diseases <ul style="list-style-type: none"> ○ bacteria (e.g. salmonella) ○ viruses (e.g. influenza, Ross River disease) ○ fungi (e.g. tinea) ○ parasites (e.g. malaria) ▪ transmission of pathogens <p>Practical activity – Modelling the spread of disease</p> <ul style="list-style-type: none"> ○ modes of transmission <ul style="list-style-type: none"> – direct and indirect contact (e.g. influenza, tinea, STIs, measles) – contaminated food and water (e.g. salmonella, gastroenteritis) – vectors (e.g. malaria, Ross River disease) ○ factors affecting transmission and spread <ul style="list-style-type: none"> – local, regional and global movement of individuals – hygiene practices in the workplace <p>Task 7: Science inquiry (practical) – The effect of hand washing on the spread of infection</p>
4–5	<ul style="list-style-type: none"> ○ changing ideas about disease and disease transmission over time ○ preventing transmission of disease <ul style="list-style-type: none"> – quarantine – immunisation – disruption of pathogen lifecycle <p>Task 8: Test – Disease</p>
6–8	<p>Vaccines and immunology</p> <ul style="list-style-type: none"> • Inflammatory response (non-specific response) <ul style="list-style-type: none"> ▪ histamine ▪ phagocytes ▪ lymphatic system • Specific responses <ul style="list-style-type: none"> ▪ antigens ▪ antibodies ▪ memory cells <p>Practical activity – Modelling specific responses</p> <ul style="list-style-type: none"> • Immunity <ul style="list-style-type: none"> ▪ natural exposure to pathogens ▪ vaccination against pathogens <p>Practical activity – Modelling the effect of vaccinations</p> <p>Commence Task 9: Extended response – Vaccinations</p>
9–10	<ul style="list-style-type: none"> • Medical intervention to reduce the rate and severity of infection <ul style="list-style-type: none"> ▪ antiseptics ▪ antibiotics <ul style="list-style-type: none"> ○ risks associated with misuse of antibiotics <ul style="list-style-type: none"> – antibiotic resistance – superbugs ▪ antivirals <p>Task 9: Extended response – Vaccinations</p>

Week	Key teaching points
11–13	<p>Community and global health</p> <ul style="list-style-type: none"> • Hygiene <ul style="list-style-type: none"> ▪ reducing the risk of infection <ul style="list-style-type: none"> ○ Australia’s hygiene practices and standards ○ global variations in hygiene standards ○ travel warnings ▪ ‘hygiene hypothesis’ • Influences on disease transmission <ul style="list-style-type: none"> ▪ population density ▪ movement patterns ▪ contact with isolated communities ▪ international collaboration in response to global issues (e.g. SARS, bird flu) <p>Task 10: Test – Vaccines, immunology, community and global health</p>
14–15	<ul style="list-style-type: none"> • Sexually transmitted infections <ul style="list-style-type: none"> ▪ common STIs (e.g. chlamydia, genital warts, gonorrhoea, syphilis, HIV) <ul style="list-style-type: none"> ○ transmission ○ prevention ○ treatment ▪ impact of social behaviour on the transmission, spread and persistence of sexually transmitted infections <p>Task 11: Science inquiry (investigation) – The effect of behaviour on the spread of STIs</p>