**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.

**Copyright**

© School Curriculum and Standards Authority, 2020

This document – apart from any third party copyright material contained in it – may be freely copied, or communicated on an intranet, for non-commercial purposes in educational institutions, provided that the School Curriculum and Standards Authority (the Authority) is acknowledged as the copyright owner, and that the Authority’s moral rights are not infringed.

Copying or communication for any other purpose can be done only within the terms of the *Copyright Act 1968* or with prior written permission of the Authority. Copying or communication of any third party copyright material can be done only within the terms of the *Copyright Act 1968* or with permission of the copyright owners.

Any content in this document that has been derived from the Australian Curriculum may be used under the terms of the [Creative Commons Attribution 4.0 International licence](http://creativecommons.org/licenses/by/4.0/).

**Disclaimer**

Any resources such as texts, websites and so on that may be referred to in this document are provided as examples of resources that teachers can use to support their learning programs. Their inclusion does not imply that they are mandatory or that they are the only resources relevant to the course.

# Sample course outline

# Human Biology – General Year 12

## Unit 3 and Unit 4

## Semester 1 – Unit 3 – Coordination

| **Week** | **Key teaching points** |
| --- | --- |
| 1–2 | **Skeletal system*** The skeleton
* functions of the skeleton
* axial skeleton
* function
* bones
* appendicular skeleton
* function
* bones
* Bones
* microscopic structure

Practical activity – Observing bone tissue* types of bones and their function
* long bones
* short bones
* flat bones
* irregular bones
* long bones

Practical activity – The anatomy of a long bone* structure
* development for growth and repair
 |
| 3–4 | * Joints
* function of joints
* types of joints

Practical activity – Observing joints* range of movement and location
* 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)

**Task 1: Science inquiry (practical) – Basic first aid for joint and bone injuries** |
| 5–6 | **Muscular system*** Structure of skeletal muscles
* 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* antagonistic muscles
* flexing arm at the elbow
* Muscle tone
* Walking
* phases of walking
* Balance
* centre of gravity
* Ongoing research into the causes and treatments of muscular system dysfunctions (e.g. muscular dystrophy, sarcopenia, myalgia)

**Commence Task 6: Extended response – Dysfunctions of the muscular, nervous and endocrine systems** **Task 2: Test – Skeletal and muscular systems** |
| 7 | **Nervous system*** Function of the nervous system
* Division of the nervous system
* central nervous system
* structure and function – brain (cerebellum, cerebrum, brainstem) and spinal cord
* protection – bone, meninges, cerebrospinal fluid

Practical activity – Brain dissection* peripheral nervous system
* structure and function
* Structure and function of neurons (sensory, connector, motor)
* Reflexes
* reflex arc

Practical activity – Reaction times |
| 8–9 | * Sense organs – responding to changes in the external environment
* receptors
* location and function (light, sound, changes in position, chemical, touch, pressure, pain and temperature)
* the eye

Practical activity – The pupil reflex* structure and function

Practical activity – Eye dissection* sight
* the transmission of light to light receptors
* accommodation (near and distant vision)

Practical activity – Accommodation* stereoscopic vision

Practical activity – Seeing in 3D* the role of rods and cones

Practical activity – The blind spot**Task 3: Science inquiry (investigation) – The effect of age on accommodation distance** |
| 10–11 | * the ear
* structure and function
* hearing
* the transmission of sounds to sound receptors
* head position and movement – utricle and saccule, semicircular canals
* the skin
* function of skin receptors (pressure, pain and temperature)

Practical activity – Responding to stimuli* Interaction of nervous and musculoskeletal system
* balance
* inputs to the cerebellum from
* utricle and saccule
* semicircular canals
* eyes
* stretch receptors in muscles and joints
* pressure receptors in the skin
* outputs from the cerebellum to muscles
* walking
* 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 | **Endocrine system*** Role of hormones
* Endocrine glands
* location of endocrine glands (hypothalamus, pituitary, adrenal, pancreas, thyroid, pineal, parathyroid, testes, ovaries, placenta)
* Homeostasis
* negative feedback
* components of feedback loop (stimulus, receptor, modulator, effector, response and feedback)

Practical activity – Negative feedback* negative feedback loops relating to the hormonal regulation of metabolism
* maintenance of body temperature (thyroxine)
* role of thyroxine, cortisol, growth hormone and adrenaline in the regulation of metabolism
* Ongoing research into the causes and treatments of endocrine system dysfunctions (e.g. diabetes, hypothyroidism, hyperthyroidism, menopause)

**Task 4: Externally set task****Task 5: Test – Nervous and endocrine systems** |
| 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 | **Disease*** Infectious disease – definition
* Pathogens
* types of pathogens and examples of diseases
* bacteria (e.g. salmonella)
* viruses (e.g. influenza, Ross River disease)
* fungi (e.g. tinea)
* parasites (e.g. malaria)
* transmission of pathogens

Practical activity – Modelling the spread of disease* modes of transmission
* 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
* local, regional and global movement of individuals
* hygiene practices in the workplace

**Task 7: Science inquiry (practical) – The effect of hand washing on the spread of infection** |
| 4–5 | * changing ideas about disease and disease transmission over time
* preventing transmission of disease
* quarantine
* immunisation
* disruption of pathogen lifecycle

**Task 8: Test – Disease** |
| 6–8 | **Vaccines and immunology*** Inflammatory response (non-specific response)
* histamine
* phagocytes
* lymphatic system
* Specific responses
* antigens
* antibodies
* memory cells

Practical activity – Modelling specific responses* Immunity
* natural exposure to pathogens
* vaccination against pathogens

Practical activity – Modelling the effect of vaccinationsCommence Task 9: Extended response – Vaccinations |
| 9–10 | * Medical intervention to reduce the rate and severity of infection
* antiseptics
* antibiotics
* risks associated with misuse of antibiotics
* antibiotic resistance
* superbugs
* antivirals

**Task 9: Extended response – Vaccinations** |
| 11–13 | **Community and global health*** Hygiene
* reducing the risk of infection
* Australia’s hygiene practices and standards
* global variations in hygiene standards
* travel warnings
* ‘hygiene hypothesis’
* Influences on disease transmission
* population density
* movement patterns
* contact with isolated communities
* international collaboration in response to global issues (e.g. SARS, bird flu)

**Task 10: Test – Vaccines, immunology, community and global health** |
| 14–15 | * Sexually transmitted infections
* common STIs (e.g. chlamydia, genital warts, gonorrhoea, syphilis, HIV)
* transmission
* prevention
* treatment
* impact of social behaviour on the transmission, spread and persistence of sexually transmitted infections

**Task 11: Science inquiry (investigation) – The effect of behaviour on the spread of STIs** |