Government of **Western Australia**
School Curriculum and Standards Authority

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.

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. Teachers must exercise their professional judgement as to the appropriateness of any they may wish to use.

Sample course outline

Human Biology – General Year 12

Unit 3 and Unit 4

The scientific method content aligns with the science understanding and scientific literacy content of the unit and is integrated throughout the learning experiences.

Scientific method

- identify a topic for investigation; research and construct questions for investigation
- determine the appropriate methodology for investigations
- design scientific investigations, including the formulation of investigable questions and/or hypotheses, materials required, procedure to be followed to collect valid and reliable data, and identification of safety and ethical considerations
- conduct risk assessments to identify potential hazards and prevent potential incidents and injuries
- select appropriate equipment and techniques to safely, competently and methodically collect valid and reliable data, and use equipment with precision, accuracy and consistency
- represent qualitative and quantitative data in meaningful and useful ways, including the construction of appropriately labelled tables, process quantitative data using appropriate mathematical relationships and units, and draw appropriate graphs
- analyse data to identify and describe trends, patterns and relationships, including the use of appropriate mathematical techniques, and recognise errors and limitations in data
- draw conclusions consistent with the evidence and relevant to the question being investigated, identify further evidence that may be required, and recognise the limitations of conclusions
- evaluate the investigative procedure, including the relevance, accuracy, validity and reliability of data, and suggest improvements
- communicate information and ideas in a variety of ways using scientific conventions and terminology, including the selection and presentation of data and ideas to convey meaning to selected audiences in written, oral and multimedia formats

Semester 1 – Unit 3

Week	Key teaching points
1–3	**Cell reproduction** **DNA** • chromosomes are made up of large molecules of DNA found in the cell nucleus • DNA has a double helix structure that is made up of nucleotides with complementary base pairing • genes are units of inheritance and are responsible for carrying genetic information from one generation to the next **Cell division** • mitosis produces diploid cells for the purpose of growth and repair and meiosis produces haploid cells for the purpose of gamete production (names and specific details of stages not required) **Assessment task 1 – Practical assessment**
4–6	**Reproductive systems** **Male reproductive system** • the production and delivery of gametes is facilitated by the structures of the male and female reproductive systems; females have additional structures that support the development of the unborn baby • the male reproductive hormones follicle stimulating hormone (FSH), luteinising hormone (LH) and testosterone have a role in the production and maturation of sperm **Female reproductive system** • the production and delivery of gametes is facilitated by the structures of the male and female reproductive systems; females have additional structures that support the development of the unborn baby • the female reproductive hormones follicle stimulating hormone (FSH) and luteinising hormone (LH) have a role in the production, maturation and release of ova; oestrogen and progesterone have a role in preparing the uterus for implantation after fertilisation (detailed menstrual and ovarian cycle not required) **Production of gametes** • mitosis produces diploid cells for the purpose of growth and repair and meiosis produces haploid cells for the purpose of gamete production (names and specific details of stages not required) • the production and delivery of gametes is facilitated by the structures of the male and female reproductive systems; females have additional structures that support the development of the unborn baby **Sexually transmitted infections** • sexually transmitted infections (STIs) can be prevented through safe sex methods and, if left untreated, can lead to serious health consequences • distinguish between opinion, anecdote and evidence, and scientific and non-scientific ideas • use reasoning to construct scientific arguments, and to draw and justify conclusions consistent with the evidence and relevant to the question under investigation • identify examples of where the application of scientific knowledge may have beneficial, harmful and/or unintended consequences

Week	Key teaching points
7–10	**Pregnancy** **Fertilisation** • fertilisation combines the male and female gametes producing a zygote with genes from both parents and pregnancy will be established if implantation occurs **Embryonic and foetal development** • embryonic and foetal development have a known and predictable sequence of events (details of specific milestone events not required) • the placenta has an important role in the provision of nutrients to and removal of wastes from the developing baby • the unborn baby can be monitored utilising a variety of techniques, including ultrasound and blood tests • parental, embryonic and foetal testing can be done to detect a range of genetic and chromosomal abnormalities through the examination of karyotypes and DNA profiles • maternal lifestyle choices, including the use of drugs, alcohol and smoking, will affect the developing baby and ongoing health of the child • distinguish between opinion, anecdote and evidence, and scientific and non-scientific ideas • use reasoning to construct scientific arguments, and to draw and justify conclusions consistent with the evidence and relevant to the question under investigation • identify examples of where the application of scientific knowledge may have beneficial, harmful and/or unintended consequences **Birth** • the sequence of events in the birth process prepare the baby and mother for delivery • various methods of delivery of the baby are available **Assessment task 2 – Supervised written assessment**
11–12	**Reproductive technologies** **Contraception** • contraceptive methods or devices are used to prevent fertilisation or implantation • distinguish between opinion, anecdote and evidence, and scientific and non-scientific ideas • use reasoning to construct scientific arguments, and to draw and justify conclusions consistent with the evidence and relevant to the question under investigation • identify examples of where the application of scientific knowledge may have beneficial, harmful and/or unintended consequences **Infertility treatments** • there are a variety of infertility treatments which help overcome infertility problems; each has its limitations, risks and benefits • distinguish between opinion, anecdote and evidence, and scientific and non-scientific ideas • use reasoning to construct scientific arguments, and to draw and justify conclusions consistent with the evidence and relevant to the question under investigation • identify examples of where the application of scientific knowledge may have beneficial, harmful and/or unintended consequences
13–15	**Assessment task 3 – Project** **Assessment task 4 – Externally set task**

Semester 2 – Unit 4

Week	Key teaching points
1–2	**Infectious disease** **Pathogens** • infectious disease is caused by the invasion of a pathogen, including bacteria, viruses, fungi, protozoa and parasites **Transmission of pathogens** • transmission of a pathogen from one host to another occurs by various mechanisms, including direct and indirect contact • hygiene practices, including social distancing, personal protective equipment (PPE), hand hygiene and the use of antiseptics, assist in limiting the transmission of disease **Commence Assessment task 5 – Investigation**
3–6	**Immune system** **First line of defence** • the first line of defence involves external non-specific biological, chemical and physical barriers to prevent the entry of pathogens **Second line of defence** • the second line of defence involves phagocytic cells, including neutrophils and macrophages, and other non-specific responses, including inflammation and fever **Third line of defence** • the third line of defence involves specific responses to antigens, including the production of antibodies and memory cells for short-term and long-term immunity (details of B and T cells are not required) **Submit Assessment task 5 – Investigation**
7–8	**Immunity** • passive and active immunity can be acquired through natural and artificial means **Antimicrobial medications** • antivirals and antibiotics can be used to reduce the rate or severity of infection • use and misuse of antibiotics can lead to the development of multidrug-resistant bacteria **Assessment task 6 – Supervised written assessment**
9–12	**Community and global health** **Immunisation** • a vaccine prepares the immune system to recognise and fight a pathogen it has not previously been exposed to • national immunisation programs aim to develop herd immunity in communities • an individual's decision to participate in immunisation programs can be influenced by the socio-cultural context in which it is considered **Assessment task 7 – Project**

Week	Key teaching points
13–15	**Infectious disease control** • hygiene practices, including social distancing, personal protective equipment (PPE), hand hygiene and the use of antiseptics, assist in limiting the transmission of disease • contact tracing is a disease control strategy that involves identifying cases and their contacts to interrupt disease transmission • quarantine separates and restricts the movement of people who may have been exposed to an infectious disease and isolation separates and restricts the movement of people with an infectious disease • susceptibility of urban areas to epidemics and pandemics of infectious disease can be due to population density, variation in living conditions and healthcare provisions • the reporting of notifiable diseases enables public health authorities to restrict outbreaks, prevent possible epidemics and inform public health policy • the transmission and spread of infectious disease is facilitated by local, regional and global movement of individuals, and travel warnings provide information to help reduce risk of infection • international cooperation and communication are needed to evaluate the risk of the spread of disease, including the emergence of new viral diseases **Assessment task 8 – Practical assessment**