

course information

Biology

The main aim of this course is to assist you in obtaining the skills and knowledge to confidently approach tertiary studies in any of the biology disciplines.

On successful completion of this course you will be able to:

- write short notes on or give definitions of the technical terms used in general biology
- write short notes to explain the meaning or significance of key concepts in biology
- write brief essays to outline the structure or functioning of biological systems or to explain the unifying concepts.

You will be able to demonstrate an understanding of the following key concepts:

- cell theory
- role of nucleic acids (DNA/RNA)
- genetics and inheritance
- homeostasis
- evolution.

You will be able to apply these skills across a range of organisms:

- microbes
- animals
- plants.

You will also be able to apply these skills (as appropriate) across a range of levels of biological organisation:

- cells, tissues
- organs, organ systems
- individuals and ecological aggregates.

Assumed prior knowledge

This course does not assume that you have any prior knowledge beyond general reading and writing skills. It does presume you will be self-motivated and capable of self-directed learning (within the guidelines provided by the course materials). If you have little background in the sciences may find that your progress through the earlier modules will be slower to begin with but much of the material is quite descriptive and familiarity with the concepts should develop quickly.

How long will this course take to complete?

You have 12 months to complete this course, however it may be completed sooner.

We recommend 180-220 hours as a reasonable timeframe to complete this course.

course information (continued)

Assessment

There are two methods of assessment. You can elect to sit a final, supervised, closed book examination at a time and place negotiated with Learning Network Queensland (LNQ); or arrange an invigilator.

The examination will be 2 hours in duration. You will be given a Certificate of Achievement that includes a grade and percentage mark for your performance in the examination. If a fail grade is awarded on the first attempt, you can negotiate with LNQ to re-sit the examination. All examinations will be on a fee-for-service basis negotiated through LNQ.

To be eligible to sit the final exam, you must complete at least 10 of the 16 progress tests for this subject. Completing all tests will improve your chances of successfully passing the final exam.

Content

Campbell Essential Biology with Physiology

Chapter 1 Introduction: Biology Today

- The Scope of Life
- Evolution: Biology's Unifying Theme
- The Process of Science

Chapter 2 Essential Chemistry for Biology

- Some Basic Chemistry
- Water and Life

Chapter 3 The Molecules of Life

- Organic Compounds
- Large Biological Molecules

Chapter 4 A Tour of the Cell

- The Microscopic World of Cells
- Membrane Structure
- The Nucleus and Ribosomes
- The Endomembrane System
- Chloroplasts and Mitochondria
- The Cytoskeleton

course information (continued)

Chapter 5 The Working Cell

- Some Basic Energy Concepts
- ATP and Cellular Work
- Enzymes
- Membrane Function

Chapter 6 Cellular Respiration: Obtaining Energy from Food

- Energy Flow and Chemical Cycling in the Biosphere
- Cellular Respiration: Aerobic Harvest of Food Energy
- Fermentation: Anaerobic Harvest of Food Energy

Chapter 7 Photosynthesis: Using Light to Make Food

- The Basics of Photosynthesis
- The Light Reactions
- The Calvin Cycle

Chapter 8 Cellular Reproduction: Cells from Cells

- What Cell Reproduction Accomplishes
- The Cell Cycle and Mitosis
- Meiosis, the Basis of Sexual Reproduction

Chapter 9 Patterns of Inheritance

- Heritable Variations and Patterns of Inheritance
- Variations on Mendel's Laws
- The Chromosomal Basis of Inheritance
- Sex Chromosomes and Sex-Linked Genes

Chapter 10 The Structure and Function of DNA

- DNA: Structure and Replication
- The Flow of Genetic information from DNA to RNA to Protein
- Viruses and Other Noncellular Infectious Agents

course information (continued)

Chapter 11 How Genes are Controlled

- How and Why Genes are Regulated
- Cloning Plants and Animals
- The Genetic Basis of Cancer

Chapter 12 DNA Technology

- Recombinant DNA Technology
- DNA Profiling and Forensic Science
- Genomics and Proteomics
- Human Gene Therapy
- Safety and Ethical Issues

Chapter 13 How Populations Evolve

- Charles Darwin and the Origin of Species
- Evidence of Evolution
- Natural Selection
- The Modern Synthesis: Darwinism Meets Genetics
- Mechanisms of Evolution

Chapter 14 How Biological Diversity Evolves

- Macroevolution and the Diversity of Life
- The Origin of Species
- The Evolution of Biological Novelty
- Earth History and Macroevolution
- Classifying the Diversity of Life

Chapter 15 The Evolution of Microbial Life

- Major Episodes in the History of Life
- The Origin of Life
- Prokaryotes
- Protists

course information (continued)

Chapter 16 Plants, Fungi, and the Move onto Land

- Colonizing Land
- Plant Diversity
- Fungi

Chapter 17 The Evolution of Animals

- The Origins of Animal Diversity
- Major Invertebrates Phyla
- Vertebrate Evolution and Diversity
- The Human Ancestry

Chapter 18 An Introduction of Ecology and the Biosphere

- An Overview of Ecology
- Living in Earth's Diverse Environments
- Biomes
- Global Climate Change

Chapter 19 Population Ecology

- An Overview of Population Ecology
- Population Growth Models
- Applications of Population Ecology
- Human Population Growth

Chapter 20 Communities and Ecosystems

- The Loss of Biodiversity
- Community Ecology
- Conservation and Restoration Biology

Chapter 21 Unifying Concepts of Animal Structure and Function

- The Structural Organization of Animals
- Exchanges with the External Environment
- Regulating the Internal Environment

course information (continued)

Chapter 22 Nutrition and Digestion

- Overview of Animal Nutrition
- A Tour of the Human Digestive System
- Human Nutritional Requirements
- Nutritional Disorders

Chapter 23 Circulation and Respiration

- Unifying Concepts of Animal Circulation
- The Human Cardiovascular System
- Unifying Concepts of Animal Respiration
- The Human Respiratory System

Chapter 24 The Body's Defenses

- Innate Defenses
- Adaptive Defenses
- Immune Disorders

Chapter 25 Hormones

- Hormones: An Overview
- The Human Endocrine System

Chapter 26 Reproduction and Development

- Unifying Concepts of Animal Reproduction
- Human Reproduction
- Reproductive Health
- Human Development
- Reproductive technologies

Chapter 27 Nervous, Sensory, and Motor Systems

- An Overview of Animal Nervous Systems
- The Human Nervous System: A Closer Look
- The Sense
- Motor Systems

course information (continued)

Chapter 28 The life of a Flowering Plant

- The Structure and Function of a Flowering Plant
- Plant Growth
- The Life Cycle of a Flowering Plant

Chapter 29 The Working Plant

- How Plants Acquire and Transport Nutrients
- Plant Hormones
- Response to Stimuli