



Accredited Africa Training Institute for Capacity Development

Unit FO409, Hatfield Plaza · 1122 Burnett St, Hatfield 0028 · Pretoria, Gauteng · South Africa

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COURSE BROCHURE

Human Anatomy and Biophysical Functioning

Health Sciences and Social Services / Preventive Health

Unit Standard 252112 · NQF Level 5 · 20 Credits · 17 Days

COURSE OVERVIEW

This course provides foundational knowledge of human anatomy and biophysical functioning, enabling learners to understand the structure and function of the body's major systems. It equips participants with the ability to apply this knowledge in workplace contexts such as health promotion, ergonomics, and safety. The course aligns with SAQA unit standard 252112 and supports competency in health-related roles.

Category	Health Sciences and Social Services
Subfield	Preventive Health
Unit Standard	252112
Accreditation	SAQA Accredited · NQF Level 5 · 20 Credits
Duration	17 days
Training Method	Online, On-Campus, In-House
Certificate	Issued via AATICD LMS – verifiable online

LEARNING OUTCOMES

- Demonstrate knowledge of the anatomical structure and function of major body systems.
- Explain the biophysical processes underlying human movement and physiological regulation.
- Apply principles of anatomy and biophysics to workplace health and safety contexts.
- Analyze the interrelationships between body systems in maintaining homeostasis.
- Evaluate the impact of physical activity and ergonomics on biophysical functioning.
- Demonstrate understanding of common disorders affecting anatomical and biophysical function.

WHO SHOULD ATTEND

- This course is designed for individuals working in health, safety, fitness, or wellness roles, including occupational health practitioners, fitness trainers, and workplace safety officers.
- It is also suitable for anyone seeking a foundational understanding of human anatomy and physiology for professional or personal development.

COURSE OUTLINE

Day 1: Introduction to Human Anatomy and Physiology

- Overview of anatomy and physiology
- Levels of structural organisation: chemical, cellular, tissue, organ, organ system, organism
- Basic life processes: metabolism, responsiveness, movement, growth, differentiation, reproduction
- Homeostasis and feedback systems
- Anatomical position, directional terms, body planes, and regions
- Body cavities and membranes
- Medical imaging techniques

Day 2: The Chemical Basis of Life

- Atoms, elements, isotopes, and ions
- Chemical bonds: ionic, covalent, hydrogen, van der Waals
- Inorganic compounds: water, salts, acids, bases, buffers
- Organic molecules: carbohydrates, lipids, proteins, nucleic acids
- Energy, ATP, and chemical reactions
- Enzymes and factors affecting enzyme activity

Day 3: The Cellular Level of Organisation

- Cell theory and cell diversity
- Plasma membrane: structure (fluid mosaic model) and functions
- Membrane transport: passive and active transport, endocytosis, exocytosis
- Cytoplasm and organelles: nucleus, ribosomes, ER, Golgi, mitochondria, lysosomes, peroxisomes, cytoskeleton
- Cell cycle: interphase, mitosis, cytokinesis
- Meiosis and gametogenesis

Day 4: The Tissue Level of Organisation

- Epithelial tissue: covering and lining, glandular; classification by shape and layering
- Connective tissue: proper, cartilage, bone, blood; extracellular matrix and fibres
- Muscle tissue: skeletal, cardiac, smooth
- Nervous tissue: neurons, neuroglia
- Tissue repair and regeneration
- Membranes: cutaneous, mucous, serous, synovial

Day 5: The Integumentary System

- Epidermis: layers, keratinocytes, melanocytes, Langerhans cells, Merkel cells
- Dermis: papillary and reticular layers, blood supply, nerve endings
- Hypodermis (subcutaneous layer)
- Skin colour: melanin, carotene, haemoglobin
- Accessory structures: hair follicles, sebaceous glands, sweat glands, nails
- Functions of the integumentary system
- Skin disorders and burns

Day 6: The Skeletal System

- Bone tissue: compact and spongy bone, osteocytes, osteoblasts, osteoclasts
- Bone development: intramembranous and endochondral ossification
- Axial skeleton: skull, vertebral column, rib cage

- Appendicular skeleton: pectoral girdle, upper limbs, pelvic girdle, lower limbs
- Joints: fibrous, cartilaginous, synovial; types of movement
- Common skeletal disorders: fractures, osteoporosis, arthritis

Day 7: The Muscular System

- Skeletal muscle tissue: structure from whole muscle to myofilaments
- Neuromuscular junction and excitation-contraction coupling
- Sliding filament theory
- Muscle metabolism: aerobic vs anaerobic, fatigue
- Types of muscle contraction: isotonic, isometric
- Major skeletal muscles: head, neck, trunk, upper limb, lower limb
- Cardiac and smooth muscle structure and function

Day 8: The Nervous System

- Neurons: structure, classification, neuroglia
- Membrane potentials: resting, graded, action potentials
- Synaptic transmission: chemical and electrical synapses, neurotransmitters
- Central nervous system: brain (cerebrum, cerebellum, brainstem), spinal cord
- Peripheral nervous system: cranial nerves, spinal nerves, plexuses
- Autonomic nervous system: sympathetic and parasympathetic divisions
- Sensory and motor pathways

Day 9: The Endocrine System

- Endocrine vs exocrine glands; hormone chemistry
- Hypothalamus and pituitary gland: posterior and anterior pituitary hormones
- Thyroid and parathyroid glands: thyroid hormones, calcitonin, PTH
- Adrenal glands: adrenal cortex (cortisol, aldosterone) and medulla (epinephrine, norepinephrine)
- Pancreas: insulin, glucagon, diabetes mellitus
- Gonads: sex hormones
- Pineal gland, thymus, and other endocrine tissues

Day 10: The Cardiovascular System: Blood and Heart

- Blood: plasma, erythrocytes, leukocytes, platelets
- Haemostasis: vascular spasm, platelet plug, coagulation cascade
- Blood types and transfusion compatibility
- Heart anatomy: chambers, valves, great vessels
- Coronary circulation
- Cardiac cycle: systole, diastole, heart sounds
- Cardiac conduction system: SA node, AV node, Purkinje fibres
- Electrocardiogram (ECG) basics

Day 11: The Cardiovascular System: Blood Vessels and Circulation

- Blood vessel structure: tunics, types
- Systemic circulation: major arteries and veins
- Pulmonary circulation
- Hepatic portal circulation and fetal circulation
- Blood pressure: systolic, diastolic, pulse pressure, mean arterial pressure
- Regulation of blood pressure: neural, hormonal, renal mechanisms

- Capillary exchange: diffusion, filtration, reabsorption
- Circulatory shock and homeostasis

Day 12: The Lymphatic System and Immunity

- Lymphatic vessels, lymph nodes, spleen, thymus, tonsils
- Lymphatic circulation and oedema
- Innate immunity: physical barriers, phagocytes, natural killer cells, inflammation, fever
- Adaptive immunity: antigens, antibodies, lymphocytes
- Humoral immunity: B cells, plasma cells, antibodies
- Cell-mediated immunity: T cells, cytotoxic and helper T cells
- Immunological memory, vaccination, and immune disorders

Day 13: The Respiratory System

- Upper respiratory tract: nose, pharynx, larynx
- Lower respiratory tract: trachea, bronchi, bronchioles, alveoli
- Pulmonary ventilation: inspiration, expiration, pressures
- Lung volumes and capacities: spirometry
- Gas exchange: partial pressures, diffusion across respiratory membrane
- Oxygen transport: haemoglobin, oxyhaemoglobin dissociation curve
- Carbon dioxide transport: bicarbonate, carbamino compounds
- Control of respiration: medullary centres, chemoreceptors

Day 14: The Digestive System

- Oral cavity: teeth, tongue, salivary glands, mastication, deglutition
- Oesophagus and stomach: anatomy, gastric juice, regulation
- Small intestine: duodenum, jejunum, ileum; digestion and absorption
- Large intestine: structure, functions, defecation reflex
- Accessory organs: liver (bile, functions), gallbladder, pancreas (pancreatic juice)
- Enzymes and hormones of digestion
- Nutrient absorption pathways
- Disorders of the digestive system

Day 15: The Urinary System

- Kidney anatomy: cortex, medulla, renal pelvis
- Nephron: glomerulus, Bowman's capsule, proximal convoluted tubule, loop of Henle, distal convoluted tubule, collecting duct
- Glomerular filtration: filtration membrane, pressures, GFR regulation
- Tubular reabsorption: glucose, water, ions; transport mechanisms
- Tubular secretion: hydrogen, potassium, drugs
- Urine concentration and dilution: countercurrent multiplier
- Fluid balance: ADH, aldosterone, ANP
- Acid-base balance: bicarbonate buffer system, renal compensation

Day 16: The Reproductive Systems

- Male reproductive system: testes, ducts, accessory glands, penis
- Spermatogenesis, androgens, male sex hormones
- Female reproductive system: ovaries, uterine tubes, uterus, vagina, external genitalia
- Oogenesis, ovarian cycle, menstrual cycle
- Hormonal control: GnRH, FSH, LH, oestrogen, progesterone, testosterone

- Fertilisation, implantation, embryonic and fetal development
- Parturition, lactation
- Contraception and sexually transmitted infections

Day 17: Integration of Body Systems and Homeostasis

- Interrelationships among systems: examples of integration
- Homeostatic imbalances: diabetes, hypertension, respiratory acidosis, renal failure
- Stress response: nervous and endocrine coordination
- Age-related changes in body systems
- Review of major concepts: feedback loops, transport, communication, protection
- Case study analysis: clinical scenarios
- Preparation for assessment

ASSESSMENT & CERTIFICATION

Delegates are assessed through exercises and a final test. A mark of **50% or above** earns an **AATICD Certificate of Completion**, issued digitally with a unique verification code. This course carries **20 NQF credits** at **NQF Level 5**.

PRICING (PER DELEGATE, EX-VAT)

Delegates	Training Method	Price per Delegate	Total
1	Online	R 56,500.00	R 56,500.00
1	In-House	R 73,400.00	R 73,400.00
1	On-Campus (Pretoria)	R 84,700.00	R 84,700.00

UPCOMING SESSIONS

Start	End	Method	Venue
07 Aug 2026	31 Aug 2026	On-Campus	Dubai, UAE
10 Aug 2026	01 Sep 2026	On-Campus	Abu Dhabi, UAE
11 Aug 2026	02 Sep 2026	On-Campus	Durban, South Africa
11 Aug 2026	02 Sep 2026	On-Campus	Mauritius
12 Aug 2026	03 Sep 2026	On-Campus	Cape Town, South Africa
13 Aug 2026	04 Sep 2026	On-Campus	Dubai, UAE
14 Aug 2026	07 Sep 2026	On-Campus	Pretoria, South Africa
17 Aug 2026	08 Sep 2026	On-Campus	Durban, South Africa

Contact us if no suitable date is listed – on-demand sessions can be arranged for groups.

HOW TO GET A QUOTE OR APPLY

1. **Get an instant quotation online:** visit www.aaticd.co.za, open the page for this course (Unit Standard 252112) and click **Get A Quote / Apply**. Select your training method and number of delegates – your quotation is generated immediately and emailed to you with the course brochure attached.
2. **Apply by email:** send the course title, your preferred training method (Online, In-House or On-Campus Pretoria), the number of delegates and your preferred dates to apply@aaticd.co.za – our team will reply with a formal quotation.
3. **Apply by phone or WhatsApp:** call **+27 12 004 8389** or WhatsApp **+27 65 077 6310** and we will prepare your quotation and reserve your seats.
4. **Confirm your booking:** accept the quotation and settle the invoice. As soon as payment is confirmed your delegates are enrolled and receive their AATICD LMS login details by email, along with joining instructions for their chosen training method.

Group discounts apply automatically – the more delegates you enrol, the lower the price per delegate. No payment is required to request a quotation.

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