## Learning Outcomes

<table>
<thead>
<tr>
<th>The student should be able to</th>
<th>Assessment Criteria</th>
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| 1 Understand the structure and function of the cardiovascular system | 1.1 Describe the structure of the cardiovascular system, including heart, arteries, veins, capillaries and blood  
1.2 Describe the functions of the main components of the cardiovascular system |
| 2 Understand the structure and function of the respiratory system | 2.1 Describe the structure of the respiratory system  
2.2 Describe the functions of the main components of the respiratory system |
| 3 Understand the processes involved in energy release, aerobic and anaerobic | 3.1 Describe the role of the cardio-respiratory system within the energy-release process  
3.2 Explain the role of beta oxidation in the breakdown of fats to supply energy  
3.3 Explain the role of fuel (glucose) within the energy-release process  
3.4 Explain the process of aerobic respiration, including: glucose, ATP and waste products  
3.5 Explain the process of anaerobic respiration, including: glucose, lactic acid and oxygen debt  
3.6 Distinguish between sporting activities that would use aerobic and those that would use anaerobic respiration |

## Assessment Methodology

A formal unseen two-hour written examination.

## Grading of this Unit

The following grade descriptors will be applied to the assessment of this unit:

1. Understanding of the Subject  
2. Application of Knowledge  
3. Application of Skills  
4. Communication and Presentation  
5. Autonomy and/or Independence  
6. Quality

Please refer to the QAA Grade Descriptors for detail of the components of each descriptor.

## Indicative Content

Please note that the indicative content supplied below is intended as a suggested guide only. It is not meant to be a prescriptive, exhaustive or fully delivered content list.
Learning Outcome 1

Structure: heart (endocardium, myocardium, epicardium, atria, ventricles, bicuspid valve, tricuspid valve, aortic valve, pulmonary valve, aorta, superior and inferior vena cava, pulmonary vein, pulmonary artery); blood vessels (arteries, arterioles, capillaries, veins, venules), vasodilation, vasoconstriction; blood (composition – plasma)

Function of the cardiovascular system: delivery of oxygen and nutrients; removal of waste products; thermoregulation; function of blood (oxygen transport, clotting, fighting infection); cardiac cycle (sino-atrial node (SAN), atrio-ventricular node (AVN), atrio-ventricular bundle – Bundle of His, Purkinje fibres; effect of the nervous system (sympathetic and parasympathetic)

Learning Outcome 2

Structure: nasal cavity; epiglottis; pharynx; larynx; trachea; bronchus; bronchioles; lungs (lobes, pleural membrane, pleural cavity, parietal pleura, thoracic cavity, visceral pleura, pleural fluid, alveoli); diaphragm; intercostal muscles (external and internal)

Function: transport, e.g. oxygen, carbon dioxide, haemoglobin, oxy-haemoglobin; mechanisms of breathing (inspiration and expiration, respiratory volumes – tidal volume, inspiratory reserve volume, expiratory reserve volume, vital capacity, residual volume, total lung capacity); control of breathing (neural control, chemical control)

Learning Outcome 3

Exercise: aerobic; anaerobic

Energy system responses: adenosine triphosphate production; creatine phosphate and lactic acid system; anaerobic glycolysis, mitochondria; Krebs cycle; electron transport chain

Fatigue: aerobic and anaerobic: depletion of energy sources, e.g. creatine phosphate, muscle and liver glycogen; effects of waste products, e.g. blood lactate accumulation, carbon dioxide, increased acidity

Anaerobic activities: explosive activities – athletics track and field – sprint, throwing, jumping events, golf swing, tennis serve, cycle sprint track, BMX and road

Aerobic activities: long-distance swimming, running, cycling, walking; importance of aerobic base for all sports