

## **HUMAN BIOLOGY (Level 3) Bioscience Entry Course**

### **Aims:**

This module is designed to enable students to gain access to Higher Education (HE) qualifications such as the postgraduate 'MSc/PG Dip/PG Cert Personalised Nutrition' programmes which CNELM offer in collaboration with Middlesex University (MU). It can also be studied to gain access to other health science courses across the UK and abroad.

The course assumes no prior knowledge of the subject and will take you from the living cell to all the human body systems.

### **Unit 1: The Cell and its Structures; Tissues and Organs**

By the end of this unit you will be able to:

- list the characteristics that define living organisms
- draw a mammalian cell including its organelles
- know the functions of each structure and organelle in the cell
- define DNA and RNA and their differences, including function
- understand mitosis and what its function is
- describe the different transport mechanisms in cells
- list and describe the different sorts of tissues and give examples of each
- understand the basics of each of the organ systems in the body.

### **Unit 2: The Digestive System**

By the end of this unit you should be able to:

- Draw a labelled diagram of the digestive tract from memory
- Name the principle digestive enzymes and state where they are produced
- List the main functions of hydrochloric acid
- Draw a villus and describe its function
- Describe the functions of the large intestines

### **Unit 3: The Liver**

By the end of this unit you should be able to:

- Outline the main functions of the liver
- Describe the importance of the liver's role in detoxification
- List factors that can influence detoxification capability
- Define what is meant by the terms 'toxin', 'endotoxin' and 'exotoxin'
- Give examples of toxins and symptoms of toxicity
- List the main detoxification mechanisms of the liver
- Describe the purpose and processes involved
- Discuss the importance of balance between each state
- Describe the relationship between the liver and the digestive system
- Describe the relationship between the liver and the gallbladder
- Describe the importance of bile
- Describe what is meant by "hepatic-portal circulation"

### **Unit 4: The Cardiovascular System and Blood**

By the end of this unit you should be able to:

- Identify the main structural parts of the heart
- describe the function of each part of the heart
- describe and explain the differences between the types of blood vessels
- describe how a heartbeat functions and how it is controlled
- describe the different circulatory patterns in the body
- list the components of normal blood
- describe the basic function of each formed component of blood
- discuss some basic disease conditions in relation to the blood component affected
- Name the 2 most important blood group classifications and list the different groups

### **Unit 5: The Lymphatic System and the Immune System**

By the end of this unit you should be able to:

- compare and contrast the lymphatic system with the blood circulation system
- describe what lymph is
- name the principal lymph system organs
- name the principal lymph nodes and locate where they are in the body
- describe the structure of a lymph node

- list the cells of the immune system
- demonstrate understanding of the differences between innate, acquired, natural, artificial, active and passive immunity.
- describe the basics of the humoral and cell- mediated immune systems
- Give the differences between T & B lymphocytes in terms of function
- Name examples of autoimmune conditions and common allergens

## **Unit 6: The Urinary System and Fluid Balance**

By the end of this unit you should be able to:

- Describe the structure and location of the kidneys and their main functions
- Draw and label a nephron
- Demonstrate understanding of the way in which kidneys 'clean' the blood
- Describe the structure, location and mechanism of the bladder

## **Unit 7: The Respiratory System**

By the end of this unit you should be able to:

- Draw a labelled diagram of the major components of the respiratory tract
- Describe how the structure of the alveolus affects the major function of the respiratory tract and how surfactant assists alveolar function
- Describe how the respiratory and digestive tracts mechanically interact
- Explain the importance of the diaphragm to breathing and how this affects the pressure within the lungs

## **Unit 8: The Integumentary System and Body Membranes**

By the end of this unit you should be able to:

- classify, compare the structure of, and give examples of each type of body membranes
- describe the structure and function of the epidermis and dermis
- list and briefly describe each accessory organ of the skin
- list and discuss the three primary functions of the integumentary system
- classify burns and describe how to estimate the extent of a burn injury
- You will find questions throughout the module –Try to answer all questions without referring back to the text or the book

## **Unit 9: The Skeletal and Muscular Systems**

By the end of this unit you should be able to:

- Name and locate the principal bones in the body
- Describe the structure of bone and how it is maintained
- Describe the structure of the limbs in terms of the bones involved
- Name and describe the different types of joints and locate examples of each

## **Unit 10: The Nervous System**

By the end of this unit you should be able to:

- identify the major divisions of the nervous system and their functions
- label a neurone
- draw a named reflex arc
- describe how the central nervous system is protected
- compare the structural and functional characteristics of the two divisions of the autonomic nervous system
- explain what occurs during a nerve impulse

## **Unit 11: The Endocrine System**

By the end of this unit you should be able to:

- List the main hormones produced by the body and briefly describe their action
- Draw a labelled diagram showing where each of the major hormones are produced
- Demonstrate your understanding of the basis of a negative feedback loop
- Demonstrate understanding of an „active“ hormone
- Describe the functions of glucocorticoids and how they are involved in the stress response
- Describe basic differences between the endocrine and nervous system

## **Unit 12: The Reproductive System**

By the end of this module you should be able to:

- Demonstrate a basic understanding of the roles of oestrogen and progesterone throughout the female lifecycle and the role of testosterone in men