



Certificate in Anatomy and Physiology (ITEC accredited) Module Outline 2011 – 2012

Venue for Optional Boot Camps: Education & Research Centre, Our Lady's Hospice,
Harold's Cross, Dublin 6W

Students with no science background may choose to complete the IHS Foundation course in Basic Sciences (see separate module outline) prior to embarking on the Certificate in Anatomy and Physiology. Please contact the IHS office to discuss your requirements.

Module	Module Content
<p>ANATOMY AND PHYSIOLOGY PART 1</p> <p>NB: some topics from module 1 part 1 may be covered at in class lectures and boot camps</p>	<p>Cells: : Structure and function of the major components of the cell Tissues: Epithelial and connective tissue Basic biochemistry: Atoms, molecules and compounds, Protons and electrons, Bonds Water: Chemical structure and biological properties, Buffering How the human body works: homeostasis, control systems, transport systems Building Blocks of Life: Polymers (proteins, carbohydrates, lipids, nucleotides) Introduction to energy production: cellular respiration: Processes involved in producing and using energy in the body, The importance of metabolic reactions Enzymes: Definition and mechanism of action, Factors regulating enzyme function, Coenzymes and cofactors, Competitive and non-competitive inhibition Musculoskeletal System: Bones: Axial and Appendicular Skeleton, The major bones of the body, The anatomy and histology of compact and spongy bone, The process of ossification, Bone growth, Classification of joints, Calcium homeostasis. Muscles: Skeletal, cardiac and smooth muscle, Neuromuscular junctions and skeletal muscle contraction Digestive System: Gross anatomy, Physiological functions, The accessory organs, The digestion of carbohydrates, proteins and fats, Enzymes and their action in digestion, Hormones and their action in digestion Urinary system: The gross anatomical and histological structure of the kidney, ureters, bladder, and urethra, The blood supply to the kidney, The structure of the nephron and its related functions, The basic process of urine formation Electrolyte balance: "Fluid balance," "electrolyte balance," and "acid-base balance", The compositions of intracellular and extracellular fluids and how this balance is maintained, The hormones, compensatory and buffering systems that play important roles in regulating fluid and electrolyte balance Cardiovascular system: The anatomy and physiology of the heart, The anatomical and histological structure and function of blood vessels, Homeostasis of blood pressure, Systole, diastole, cardiac cycle, heart sounds, The conduction system of the heart, Cardiac output, stroke volume, heart rate (and factors influencing these) Blood: The key functions of the blood, The composition of blood and its components, Different blood groups and typing The skin: The structure and functions of skin The special senses: The sensory organs, Their structure and functions, Their pathways to the brain</p>
<p>ANATOMY AND PHYSIOLOGY PART 2</p> <p>NB: some topics from module 1 part 2 may be covered at in class boot camps</p>	<p>Lymphatic System: Functions and anatomical organization, The structure and function of the lymph vessels (lymph capillaries, lymphatics, lymph ducts), The structure and function of lymph nodes, thymus, tonsils, spleen and Peyers patches The Immune System: Non-specific and specific defences, The components of the immune system, The different stages of inflammation, Humoral immunity and cell-mediated immunity, Hypersensitivity reactions, The Healing Process and Scar Formation Reproductive system: The anatomy and functions of the male reproductive organs, Spermatogenesis, spermiogenesis, The anatomy and functions of the female reproductive tract, The menstrual cycle, The process of fertilization, implantation, embryonic development, birth, lactation, The menopause Genetics: Genotypes, phenotypes, genes, inheritance, mutations Endocrine System: Intercellular communication, Paracrine and autocrine systems, Hormones, Endocrine organs and glands, Receptors, Target cells</p>

	<p>The nervous system: The functions of the nervous system, The structures of the nerve cell, Classifications of the nervous system, The names and functions of the cranial nerves 1 to 12, The autonomic nervous system, Neuroglial cells and functions, The blood-brain barrier, The function of the different lobes of the brain, The structure and functions of the spinal chord and meninges, The physiology of the nerve impulse, The structure and physiology of the synapse</p> <p>Respiratory System: The anatomical components and functions of respiratory system, The mechanics of breathing, Respiratory Rate, Respiratory Volumes, Gas Exchange, The oxygen Haemoglobin Saturation Curve, The control of Respiration</p>
<p>PATHO-PHYSIOLOGY</p> <p>NB: some topics from module 1 part 2 may be covered at in class boot camps</p>	<p>Pathologies of: The immune system, digestive system, cardiovascular system, urinary system, lymphatic system, skin, respiratory system, the special sense organs, endocrine system, nervous system and musculoskeletal system.</p> <p>Relevant orthodox treatments for the above, plus supporting information on prognosis, related pathologies and prevalence/epidemiology</p> <p>Material may be studied alongside the relevant systems identified in the Anatomy and Physiology module</p>

Optional Lecture and 'Boot Camp' Weekends

IHS will be running a number of lecture weekends and 'boot camps' relevant to all anatomy and physiology students during the academic year from Sept 2011-May 2012. If you wish to attend any of the lectures or boot camps below then please contact the IHS office. We recommend that any students attending the boot camps study all material relating to the topics covered prior to the weekend to ensure they get the most from it.

WEEKEND	Lecture & Home Study Content	
	Saturday (9.00am-6.00pm) * 9.00am-10.00am - tutorial	Sunday (9.30am-4.30pm)
<p>LECTURE W/E 1 PATHO-PHYSIOLOGY PART 1 24th & 25th September</p>	<p>Diseases and disorders of the immune and lymphatic systems Diseases and disorders of the digestive system Diseases and disorders of the cardiovascular system The skin. Diseases and disorders of the skin Revision of each associated system</p>	
<p>LECTURE W/E 2 ANATOMY & PHYSIOLOGY PART 1 22nd & 23rd October</p>	<p>An introduction to A and P Cells: Structure and function of the major components of the cell Tissues: Epithelial and connective tissue Basic biochemistry: Atoms, molecules and compounds, Protons and electrons, Bonds Water: Chemical structure and biological properties, Buffering How the human body works: homeostasis, control systems, transport systems Building Blocks of Life: Polymers (proteins, carbohydrates, lipids, nucleotides) Introduction to energy production: cellular respiration: Processes involved in producing and using energy in the body, The importance of metabolic reactions Enzymes: Definition and mechanism of action, Factors regulating enzyme function, Coenzymes and cofactors, Competitive and non-competitive inhibition</p>	
<p>LECTURE W/E 3 PATHO-PHYSIOLOGY PART 2 10th & 11th December</p>	<p>Endocrine System: Intercellular communication, Paracrine and autocrine systems, Hormones, Endocrine organs and glands, Receptors, Target cells The nervous system: The functions of the nervous system, The structures of the nerve cell, Classifications of the nervous system, The names and functions of the cranial nerves 1 to 12, The autonomic nervous system, Neuroglial cells and functions, The blood-brain barrier, The function of the different lobes of the brain, The structure and functions of the spinal chord and meninges, The physiology of the nerve impulse, The structure and physiology of the synapse Diseases and disorders associated with the endocrine system, nervous system and musculoskeletal system</p>	

<p>LECTURE W/E 4 ANATOMY & PHYSIOLOGY PART 2 7th & 8th January</p>	<p>Endocrine System: Intercellular communication, Paracrine and autocrine systems, Hormones, Endocrine organs and glands, Receptors, Target cells The nervous system: The functions of the nervous system, The structures of the nerve cell, Classifications of the nervous system, The names and functions of the cranial nerves 1 to 12, The autonomic nervous system, Neuroglial cells and functions, The blood-brain barrier, The function of the different lobes of the brain, The structure and functions of the spinal chord and meninges, The physiology of the nerve impulse, The structure and physiology of the synapse Reproductive system: The anatomy and functions of the male reproductive organs, Spermatogenesis, spermiogenesis, The anatomy and functions of the female reproductive tract, The menstrual cycle, The process of fertilization, implantation, embryonic development, birth, lactation, The menopause The special senses: The sensory organs, Their structure and functions, Their pathways to the brain</p>
<p>LECTURE W/E 5 ANATOMY & PHYSIOLOGY PART 3 4th & 5th February</p>	<p>Urinary system: The gross anatomical and histological structure of the kidney, ureters, bladder, and urethra, The blood supply to the kidney, The structure of the nephron and its related functions, The basic process of urine formation Electrolyte balance: "Fluid balance," "electrolyte balance," and "acid-base balance", The compositions of intracellular and extracellular fluids and how this balance is maintained, The hormones, compensatory and buffering systems that play important roles in regulating fluid and electrolyte balance Cardiovascular system: The anatomy and physiology of the heart, The anatomical and histological structure and function of blood vessels, Homeostasis of blood pressure, Systole, diastole, cardiac cycle, heart sounds, The conduction system of the heart, Cardiac output, stroke volume, heart rate (and factors influencing these) Blood: The key functions of the blood, The composition of blood and its components, Different blood groups and typing</p>
<p>LECTURE W/E 6 ANATOMY & PHYSIOLOGY PART 4 31st March & 1st April</p>	<p>Lymphatic System: Functions and anatomical organization, The structure and function of the lymph vessels (lymph capillaries, lymphatics, lymph ducts), The structure and function of lymph nodes, thymus, tonsils, spleen and Peyer's patches The Immune System: Non-specific and specific defences, The components of the immune system, The different stages of inflammation, Humoral immunity and cell-mediated immunity, Hypersensitivity reactions, The Healing Process and Scar Formation The skin: The structure and functions of skin Respiratory System: The anatomical components and functions of respiratory system, The mechanics of breathing, Respiratory Rate, Respiratory Volumes, Gas Exchange, The oxygen Haemoglobin Saturation Curve, The control of Respiration</p>
<p>LECTURE W/E 6 PATHO- PHYSIOLOGY PART 3 31st March & 1st April</p>	<p>Diseases and disorders of the urinary system The respiratory system. Diseases and disorders of the respiratory system The sensory organs. Diseases and disorders of the sensory organs Revision for exam</p>
<p>A AND P EXAM 2nd June Venue: OLH</p>	<p>Anatomy, Physiology and Pathology exam (Saturday morning)</p>