

LSB231 Physiology

Introduction to physiology and the Brain

- Neurones, axon terminal and synapses
- The Brain - Glial cells
- The cerebrum, cerebral cortex and language
- White matter and the limbic system
- The brain stem, reticular activating system, sleep and the cerebellum

- ▶ Action Potential | Neuron
- ▶ Resting Membrane Potential | Nervous System
- ▶ Graded Potential | Neuron
- ▶ Overview of the Brain
- ▶ Cells of the Nervous System (Neurons and Glia)
- ▶ Brain stem
- ▶ Language Processing
- ▶ Language (Speech) Production
- ▶ The Cerebellum

The Nervous system - Autonomic Nervous System

- Introduction to the Autonomic nervous system
- The plasma membrane and hydrophobic and hydrophilic molecules
- The sympathetic nervous system - the fight or flight response
- The parasympathetic nervous system - resting and digesting

- ▶ Autonomic Nervous System
- ▶ Autonomic Nervous System (Sympathetic & Parasympathetic) - Overview
- ▶ Sympathetic Nervous System

Endocrine physiology

- Introduction, hypothalamus and pituitary
- The Growth Hormone axis and Thyroid hormones
- Steroid hormones and other hormones
- Insulin

- ▶ Overview of the Endocrine System
- ▶ Principles of Endocrine Physiology

- ▶ Insulin - How insulin works, in 2mins!
- ▶ Insulin Secretion
- ▶ Diabetes Mellitus in under 2 mins!
- ▶ Types of Diabetes | type 1, type 2 & gestational

Muscle physiology 1

- Muscle fibers and sarcomere structure
- The neuromuscular junction and excitation contraction coupling
- Muscle contraction - sliding filaments and crossbridge cycling
- Motor units and electromyography (EMG)
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- ▶ Sliding Filament Theory | Muscle Contraction
- ▶ Neuromuscular Junction

Muscle physiology 2

- Muscle fiber types
- The muscle twitch - the basis of muscle contraction
- Isotonic and isometric contractions and the length-tension relationship
- ▶ Type 1 and type 2 muscle fibers | Muscular-skeletal system physiology | NCLEX-RN | ...
- ▶ Muscle Fiber Types Explained: Type 1, Type 2a, Type 2x | Muscle Physiology and Trai...
- ▶ Rate Coding Explained (Neuromuscular Adaptation to Resistance Training)
- ▶ Size Principle of Motor Unit Recruitment Explained
- ▶ Isotonic, Isometric, Eccentric and Concentric Muscle Contractions

Cardiovascular physiology 1

- The cardiovascular system and cardiac cycle
- Heart sounds
- Electrical activity of the heart - the conduction system
- Electrical activity of the heart - cardiomyocyte action potential
- The electrocardiogram (ECG)
- ▶ Heart Sounds & Surface Anatomy | Cardiology
- ▶ Lub Dub | Circulatory system physiology | NCLEX-RN | Khan Academy
- ▶ Cardiac Conduction System | Cardiology
- ▶ Heart Muscle (myocardium) Action Potential | Cardiology
- ▶ Heart Conduction & ECG (EKG) Interpretation

Cardiovascular physiology 2

- The Pacemaker action potential and regulation of heart rate.
- Excitation contraction coupling in cardiac muscle
- Cardiac output
- Mean arterial Blood pressure and measuring blood pressure

▶ Pacemaker Cells of the Heart | Cardiology

▶ Heart Muscle (myocardium) Action Potential | Cardiology

▶ Neural Control of the Heart | Cardiology

▶ Cardiac Output | Preload and Afterload EXPLAINED!

▶ Blood Pressure

Cardiovascular physiology 3

- Factors affecting blood pressure - Cardiac output
- Factors affecting blood pressure (2)
- Regulation of blood flow and blood pressure
- The cardiovascular system and exercise
- Osmosis and capillary exchange

▶ Cardiac Output | Preload and Afterload EXPLAINED!

▶ Systemic Vascular Resistance (Total Peripheral Resistance) | Cardiology

▶ Exercise & Blood Pressure

▶ Baroreceptor Reflex

▶ Capillary Exchange

▶ Diffusion | Membrane Transport

▶ Osmosis | Membrane Transport

▶ Adrenergic Receptors - CHEAT SHEET!

Respiratory Physiology

- Introduction to respiration and pressure in the respiratory system
- The respiratory cycle - ventilation of the lungs
- Respiratory volumes and spirometry
- Oxygen transport and control of respiration

▶ Respiratory Physiology | The Respiratory System

▶ Lung Volumes and Capacities

▶ Neural Control of Breathing | Respiratory System

▶ Pulmonary Ventilation/Total vs. Alveolar Ventilation

▶ Daltons Law | Partial Pressures ▶ Boyle's Law | Respiratory System

▶ Henrys Law | Gas Exchange

BONUS:

▶ Parts of the Respiratory System - Overview

▶ Muscles of Breathing | Inspiration/Inhalation

▶ Muscles of respiration (expiration)

REVISION: ▶ Diving Physiology | Respiratory System

Renal Physiology

- Function of the renal system and the nephron
- The formation of urine - processes in the nephron
- Concentrating urine
- Urinalysis and the renal system and blood pressure

▶ Renal System - Overview

▶ Nephron Components | Renal System

▶ Urine formation

▶ Urinalysis Explained

▶ Dehydration (ADH release)

▶ Renin Angiotensin Aldosterone system

Digestive System Physiology

- The gastrointestinal tract (GIT) and digestive processes
- Overview of the digestive tract
- Digestion and absorption of carbohydrates, proteins and fats
- Regulation of digestion

- Glucose and insulin balance and type 2 diabetes mellitus

https://www.youtube.com/watch?v=QYlqS_fc8Mc

- ▶ Overview of the Digestive System
- ▶ Lecture 6 - Structure and Function of the Digestive System
- ▶ Carbohydrate, Protein, and Fat Metabolism | Metabolism
- ▶ Chemical digestion
- ▶ Fart vs Poop in under 2 mins!
- ▶ Liver Functions
- ▶ Pancreas Structure and Function | Digestive System
- ▶ Fat Digestion - Lipolysis & Lipid Transport
- ▶ Diabetes Mellitus: Type 1 vs Type 2
- ▶ Types of Diabetes | type 1, type 2 & gestational

Reproductive System Physiology

- Introduction and the male reproductive system
- The female reproductive system
- Fertilisation and pregnancy

- ▶ Male Reproductive System
- ▶ Testes and sperm production
- ▶ Female Reproductive Cycle (Menstrual Cycle)
- ▶ Fertilisation and implantation
- ▶ Gonadotropins | Follicle Stimulating Hormone (FSH) and Luteinizing Hormone (LH)