Semester 1

Module 1 - Introduction to the Study of Man

1.1. The Mammalian Cell

- Origin of life (primordial Soup)
- Biology of the gene
- Polypeptides, polynucleotides & encapsulation as life
- Prokaryotes and eukaryotes
- Light & electron microscopic appearance of the cell
- Cell organelles & functions
- Cell cycle & cancer cells
- Cell signaling
- How does the gene express itself?
  - DNA synthesis
  - RNA & Protein synthesis
  - Mutation & genetic engineering
- The need for enzymes: structure, properties and function
- Biomolecules (The molecules of life)
  - Proteins
  - Lipids
  - Carbohydrates
  - Water
- Energy for life
  - Uptake of fuel molecules
  - Glycolysis
  - TCA cycle
  - Respiratory chain
  - HMP pathway
  - Oxidation of fats, Ketone bodies & amino acids
- Where is energy stored?
  - Glycogen
  - Fat
- Control of metabolic activity within the cells

1.2. The Human Body

- pH & buffers
- Regulation of ECF volume & tonicity
- Body composition: BMI, IBW, Waist/hip ratio
- Energy metabolism in muscle

Module 02 - Body Fluids

- Biochemical features of water as an entity for supporting life
- Function of normal haemoglobins relate how functional impairment are brought about by molecular and genetic alterations
- Function of protein and non-protein components of plasma and their changes in common clinical disorders
- Biochemical basis of common serological and haematological tests and interpretation of their results in disease

Module 03 - Cardiovascular System

- Blood vessels
- Ischemia

Module 04 - Respiratory System

- The process of O_2 & CO_2 transfer to and from lungs with special reference to the haemoglobins
- The variation in the structure and function of the abnormal haemoglobins and clinical situations with abnormal haemoglobins
- Tissue respiration and energy generation under aerobic and hypoxic conditions

Semester 2

Module 05 - Musculoskeletal System

- Muscle
- Bone
- Laboratory diagnosis

Module 06 - Gastrointestinal System

- Role of liver, and other relevant tissues in carbohydrates, lipid and protein metabolism
- Function of the liver and other relevant organs in detoxication and excretion of products of metabolism and foreign compounds
- Biochemistry of the effects of structural/functional derangements of mastication, swallowing, motility, secretion, defecation, digestion, absorption and carbohydrate, lipid, protein metabolism
- Basis of tests of gastrointestinal function and the interpretation of their results in relation to gastrointestinal disorders

Module X- Nutrition

- Process of digestion, absorption, and utilization
- Function of vitamins, foods rich in the different vitamins and the signs and symptoms of vitamin deficiency diseases
- Distribution of mineral in the body, the functions of the different body minerals and the normal mineral requirements
- Sources of energy, energy requirements, methods of estimating energy requirements and energy requirement of a given subject
- Sources of protein, protein requirements, methods of estimating protein requirement
- Protein – energy deficiency
- Types of dietary fibre and their contribution to good health
- Food rich in the different nutrients, effect of processing of food on nutrient availability and advice on the correct methods of preparation of food to minimize nutrient losses
- Balanced diet
- Use of food composition tables
- Diets suitable for different ages, different physiological conditions and for patients with nutritional and metabolic disorders
- Anthropometry & their applications

Module 07 - Urinary System

- Basis and the relevance of urine examination for abnormal constituents
- Examine urine for physical appearance, specific gravity and the presence of glucose, protein bile, urobilinogen, blood, ketone bodies and deposits

Module 08 - Endocrine System

- Hormones released by the endocrine organs and cells (hypothalamus,pineal,pituitary,thyroid,parathyroid,adrenal cortex & adrenal medulla)
- Hormones synthesis,secretion,transport,interaction with receptor,action at the target cell and degradation
- Diabetes, types, signs and symptoms, aetiology, metabolic derangements and prevention
- Hypo and hyperthyroidism, aetiology, signs and symptoms, metabolic derangements and their control

Module 09 - Reproductive System

- Sex hormones
- Eicosanoids
- Screening for and monitoring malignancy
- Pregnancy & lactation
- Foetal development
- Inborn errors

Semester 3

Module 10 - Nervous system

- Biochemical basis of vision, taste and smell(signalling pathways)
- Biochemical basis of the common defects related to the nervous system
- Biochemical basis of action of endogenous neurotransmitters and selected xenobiotics acting on the nervous system with a view to appreciate the basis of neuropharmacology