Maulana Abul Kalam Azad University of Technology, West Bengal
(Formerly known as West Bengal University of Technology)
Syllabus of B.Sc. (Dietetics and Nutrition)
Effective from academic session 2023-2024

Semester-III

FYBDN 301 Human Physiology-I
3 credits, Total-30 hours + 15 Tutorial hours

Course Objectives

1. To impart basic knowledge about the organelles of a typical cell and to describe their functions.
2. To develop an idea on Circulatory and Excretory system, Digestive System, Respiratory System, Immune System

Sl. No.	Course Outcome (CO)
1.	Explain and recall the structure of cells and its different parts including their functions.
2.	Construct the knowledge on chromosome, Chromosomal and mitochondrial DNA, DNA packing,
3.	Illustrate the structure, function and mechanism of Circulatory and Excretory system, Digestive System, Respiratory System, Immune System.

UNIT-I 5hrs
Cell - Structure and functions, Cellular transport-active and passive, ion channels & ionophores, Intercellular communication: basic idea about tight junction, gap junctions, adherens junction, extracellular matrix, Chromosome structure: Morphology, chromosomal DNA packing, Chromatin, Human genome, Mitochondrial DNA, Epistasis, Penetrance, Expressivity, Pleiotropism, Karyotyping. Cell cycle, Cell division, Crossing- over, Linkage.

UNIT-II 5hrs
Digestive system - Anatomical consideration – structure & functions, Digestive glands and its structure and function, Enterohepatic circulation, Movement of alimentary canal, Brief study of the organization of the digestion, absorption and assimilation of food, Defecation.

UNIT-III 5hrs
Tissues Structure and functions, Blood, RBC, WBC, Platelets and Lymph. Blood coagulation, blood grouping and

Rh factor.
Circulatory system - Heart structure and functions - cardiac cycle, cardiac output, electrocardiography, cardiovascular homeostasis, blood pressure, pulse, coronary circulation, baroreceptors, chemoreceptors.

UNIT-IV 5hrs

Excretory system - Excretory organs - structure of kidney and functions, formation of urine, renal regulation-acid base balance, composition of urine. Renal function tests, Non-excretory functions of kidney, Structure and functions of skin, Sweat gland, regulation of body temperature, hypo & hyperthermia, concept on pyrogens, pyrexia.

UNIT-V 5hrs

Respiratory system - Basic anatomy of the respiratory system, mechanism of breathing, spirometry process of respiration, transport and exchange of oxygen and carbon dioxide in the body. Regulation of respiration, Disorders of breathing,

UNIT VI 5hrs

Immune system: adaptive immunity, innate immunity, role of different W.B.Cs in immunity, cell signalling

Reference Books:

1. Chaterjee, C.C., Human Physiology, Vol-I&II Medical allied agency, Calcutta 13th Edition,2020
2. Best and Taylor, Living body. Mc.Graw hill company, Newyork.
3. Sathya Narayana, Essentials of Biochemistry (2000).
4. Saratha Subramanian, Text of Human Physiology (2000).
5. Stuart Ira Fox, Human Physiology (2003)
6. Guyton & Hall Textbook of Medical Physiology_3rd SAe-E-Book: Third South Asia Edition,2020

FYBDN 391Human Physiology-I Practical
2 credits, Total-30 hours + 20 self-paced practice hours

1. Identification of tissues
2. Bleeding time, Clotting time, Blood groups –identification
3. Measurement of Hemoglobin by cyanmethemoglobin method
4. Measurement of Radial Pulse Rate
6. Measuring of Blood Pressure by Sphygmometer
7. Measurement of height, weight and calculation of BMI
8. Determination of Packed Cell Volume (PCV)
9. Measurement of Physical Fitness Index by Harvard Step Test

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FYBDN 302 Biochemistry-I
3 credits, Total-30 hours + 15 Tutorial hours
Course Objectives:

1. To acquaint the students with the basic concepts of Biochemistry and metabolism.
2. To acquaint the students with the basic concepts and functions of enzymes, coenzymes.
3. To acquaint the students with the basic structures and functions of carbohydrates, proteins & amino acids.

Sl. No.	Course Outcome (CO)
1	Demonstrate the basic concepts and functions of different enzymes and various coenzymes.
2	Apply basic knowledge about the structure, function and metabolism of carbohydrate
3	Relate basic knowledge about the structure, function and metabolism of amino acid, protein.

UNIT 1 7hrs

Introduction to Biochemistry: Definition, objectives, scope and inter-relationship between biochemistry and other biological sciences. Introduction to Enzymes; Introduction to enzymes, Coenzymes, Classification of enzymes, Enzyme Inhibition. Factors affecting the enzyme activity. Coenzymes and their functions in the metabolism of carbohydrates, lipids and proteins.

UNIT 2 8hrs

Carbohydrates; Definition, Structure and general properties of: Monosaccharides glucose, fructose, galactose, ribose. Disaccharides – maltose, lactose, sucrose. Polysaccharides – dextrin, starch, glycogen. Metabolism of Carbohydrates: Introduction, anabolism, catabolism, metabolism. Glycogenesis, Glycogenolysis, Glycolysis, Kreb's cycle, energy output, Homeostasis of blood sugar-role of hormones, Glucose Tolerance Test.

UNIT 3 7hrs

Proteins: Definition, classification, elementary knowledge of structure of proteins, biomedical importance.

UNIT 4 8**hrs**

Amino acids; Definition, classification, Essential and non- essential amino acids, structure of important amino acids. Metabolism of proteins: Dynamic equilibrium, nitrogen balance, essential Amino acids, Glycogenic, Ketogenic, and both glycol-ketogenic amino acids. Oxidation of amino acids- Transamination, Deamination-Oxidative, Non-oxidative, Decarboxylation. Metabolism of carbon skeleton, Metabolism of ammonia -Urea cycle.

Reference Books:

1. Lehninger A L, Nelson D L and Cox M M (2009). Principles of Biochemistry,
6th Ed. CBS Publishers and Distributors.
2. Murray R.K, Granner D K, Mayes P A and Rodwell V W (2009).Harper's Biochemistry, 28th Ed, Lange Medical Book.
3. Hawk PB, Oser BL and Summerson WH (1954). Practical Physiological Chemistry,
Mcgraw Hill, New York.
4. Sundararaj P and Siddhu A (2006). Qualitative Tests and Quantitative Procedures in
Biochemistry. Elite Publishing House Pvt. Ltd., New Delhi.

FYBDN 392 Biochemistry-I Practical
2 credits, Total-30 hours + 20 self-paced practice hours

Qualitative Methods

1. Qualitative tests for mono, di and polysaccharides and their identification in unknown mixtures
2. Qualitative tests for proteins

Quantitative Methods:

1. Estimation of total carbohydrates by Anthrone method.
2. Quantitative estimation of reducing sugars by Dinitro Salicylic acid (DNS) method.
3. Estimation of total protein by Lowery's method
4. Quantitative estimation of glucose by GOD/POD method
5. TLC/Paper Chromatography of protein