Branch Name:	**Physiotherapy**
Program Code:	**PT101**
Course Title:	**Biochemistry (BC)**
Course Code:	**3PT1010103**
Pre-requisite Course:	**Basic science**

Teaching and Examination Scheme:

Teaching Scheme			Evaluation Scheme (Marks)				
			Theory (Marks)		Practical (Marks)		
Lecture (L)	Practical (P)	Credit	University Assessment	Continuous Assessment	University Assessment	Continuous Assessment	Total (Marks)
90	-	6	40	10	-	-	50

Course Outcomes:

After completion of this course the student shall be able to

1. Describe the structure, composition and functions of cell. (K)
2. Describe the structure and functions of cell membrane. (K)
3. Explain the metabolism of carbohydrates, Lipids, proteins and amino acids. (K)
4. Describe the types, composition and utilization of vitamins (K)
5. Explain the effect of exercise related biochemical changes and its application to exercise prescription (KH)

Course Contents: B.P.T. BC 103 (L)

Unit 1

BC 1.1. Acid-Base balance - Acids, bases and buffers, pH. Buffer systems of the body, bicarbonate buffer system Role of lungs and kidneys in acid base balance, Acid base imbalance.

BC 1.2. Carbohydrate Chemistry –

1. Definition, general classification with examples, Glycosides bond
2. Structures, composition, sources, properties and functions of Monosaccharides, Disaccharides, Oligosaccharides and Poly- saccharides.
3. Glycosaminoglycan (mucopoly saccharides)
4. Carbohydrate Metabolism - Introduction, Glycolysis – Aerobic, Anaerobic Citric acid cycle, Substrate level phosphorylation.
5. Glycogen metabolism – Glycogenesis, Glyco Geno lysis, Metabolic disorders glycogen, Gluconeogenesis, Cori cycle Hormonal regulation of glucose, Glycosuria, Diabetes mellitus
6. Role of carbohydrates in diet: Digestible carbohydrates and dietary fibers.

BC 1.3. Lipid Chemistry –

1. Definition, general classification
2. Definition, classification, properties and functions of Fatty acids, Triacylglycerol, Phospholipids, Cholesterol
3. Essential fatty acids and their importance
4. Lipoproteins: Definition, classification, properties, Sources and function Ketone bodies
5. Role of lipids in diet

BC 1.4. Amino-acid Chemistry –

1. Amino acid chemistry: Definition, Classification, Peptide bonds
2. Peptides: Definition, Biologically important peptides
3. Protein chemistry: Definition, Classification, Functions of proteins,
4. Role of proteins in diet: Quality of proteins - Biological value, net protein utilization, Nutritional aspects of proteins-essential and non- essential amino acids. Nitrogen balance

BC 1.5. Nutrition –
1. Introduction, Importance of nutrition Calorific values, Respiratory quotient – Definition, and its significance Energy requirement of a person - Basal metabolic rate: Definition, Normal values, factor affecting BMR Special dynamic action of food.
2. Physical activities - Energy expenditure for various activities. Calculation of energy requirement of a person
3. Balanced diet
i. Recommended dietary allowances
ii. Nutritional disorders.

Unit 2:

BC 2.1. Enzymes – Definition, Active site, Cofactor (Coenzyme, Activator), Proenzyme. Classification with examples, Factors affecting enzyme activity, Enzyme inhibition and significance, Isoenzymes, Diagnostic enzymology (clinical significance of enzymes)

BC 2.2. Nucleotide and Nucleic acid Chemistry -
1. Nucleotide chemistry: Nucleotide composition, functions of free nucleotides in body.
2. Nucleic acid (DNA and RNA) chemistry: Difference between DNA and RNA, Structure of DNA (Watson and Crick model), Functions of DNA. Structure and functions of tRNA, rRNA, mRNA.

BC 2.4. Mineral Metabolism- Definition, Sources, RDA, Digestion, absorption, transport, excretion, functions, disorder of Individual minerals - Calcium, phosphate, iron, Magnesium, fluoride, selenium, molybdenum, copper. Phosphate, calcium and iron in detail.

BC 2.5. Clinical Biochemistry - Normal levels of blood and urine constituents, Relevance of blood
and urine levels of Glucose, Urea, Uric acid, Creatinine, Calcium, Phosphates, pH and Bicarbonate. Liver function tests, Renal function tests.

Text Books

1. Textbook of Biochemistry- Chatterjee M.N.-Jaypee Brothers.
2. Clinical Biochemistry- metabolic & Clinical aspects- Marshall &Bangert- Churchill Livingstone.

Reference Books

1. Drugs in Sports: David R. Mottram and Sally Gunnel E. &F.N.Span.
2. Normal and Therapeutic Nutrition Robison H. Cortinne et al;, Mac Millian Publish Company, New York.

List of Open-Source Software/learning website:

- k-hub.in e library|A single platform for all e resources (K-hub, E Resource)
  - User Name- KB4605VNG
  - Password- BL@69BX!
- knowledgegainer.delnet.in (Delnet, E Resource)
  - User Name-gjspum
  - Password- spu10924

Mapping of CO with PO:

Course Outcomes	Program Outcomes (POs)										
	PO1	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**
CO1	M									L	
CO2		M						L			
CO3			L		L				H		
CO4				M			L				L
CO5						H					

H: High, M: Medium, L: Low