

# PARUL UNIVERSITY - FACULTY OF APPLIED SCIENCE

Department of Biochemistry

SYLLABUS FOR 4th Sem PROGRAMME

Clinical Biochemistry (11203251)

**Type of Course:**

**Prerequisite:**

**Rationale:**

**Teaching and Examination Scheme:**

Teaching Scheme			Credit	Examination Scheme					Total
Lect Hrs/ Week	Tut Hrs/	Lab Hrs/		External		Internal			
				T	P	T	CE	P	
4	-	-	4	60	-	20	20	-	100

Lect - Lecture, Tut - Tutorial, Lab - Lab, T - Theory, P - Practical, CE - CE, T - Theory, P - Practical

**Contents:**

Sr.	Topic	Weightage	Teaching Hrs.
1	<p><b>UNIT-I:</b></p> <p>Gastrointestinal hormones - Gastrin, secretin and cholecystokinin. Disorders of gastric function, methods of evaluation. Pancreatic exocrine secretions, pancreatic diseases, steatorrhea. Malabsorption syndrome – tests for their evaluation and significance.</p> <p>Plasma proteins – Properties, functions and their variations in diseases, Plasma lipids and lipoproteins, Interrelationship of lipids, lipoproteins and apolipoproteins. Erythropoiesis, abnormalities in blood formation. Anemias. Hemoglobinopathies. Cerebrospinal fluid – composition in health and diseases.</p>	25%	15
2	<p><b>UNIT-II:</b></p> <p>Liver function tests, their significance, Liver diseases – Jaundice, hepatitis, gall stones, cirrhosis and fatty liver. Free radical mechanism and role of reactive oxygen species in diseases. Role of liver in metabolic regulation and drug metabolism. Clinical chemistry of newborn.</p> <p>Clinical enzymology - Plasma enzymes in diagnosis and prognosis, Isoenzymes in health and diseases (Liver, cardiac and skeletal muscle enzymes)</p> <p>Kidney – Renal hormones –Renin, erythropoietin and angiotensin. Investigations of renal functions, biochemical investigation of renal disorders. Nephritis, nephrotic syndrome and urolithiasis. Compensatory mechanism for acidosis and alkalosis.</p>	25%	15

3	<p><b>UNIT-III:</b></p> <p>Pancreatic hormones – Biosynthesis of insulin, regulation of secretion of insulin and glucagon, their role in carbohydrate, lipid and protein metabolism. Endocrine disorders of pancreas – Diabetes mellitus, melliturias, hypoglycemia. Glucose tolerance test.</p> <p>Thyroidal hormones – Chemistry, function and metabolism. Hypo and hyper thyroidism, tests for thyroid function. Parathyroid hormones – Parathormone and calcitonin, their role in calcium and phosphate metabolism, abnormalities of parathyroid functions and methods of evaluation.</p> <p>Adrenals - Chemistry and biosynthesis of adrenal medullary and adrenal cortical hormones. Disorders of adrenal cortex and adrenal medulla, tests for the evaluation of adrenal functions. Biochemical effects of tumours.</p>	25%	15
4	<p><b>UNIT-IV:</b></p> <p>Synthesis, secretion, transport and biological actions of hypothalamic, adenohipophysial and neurohypophysial hormones. Hypothalamic disorders. Pituitary - Clinical syndromes and their evaluation. Penial hormones – Melatonin and serotonin.</p> <p>Chemistry, biosynthesis and role of androgens, estrogens and progesterone. Hormonal regulation of menstrual cycle, Hormonal contraception. Placental hormones. Biochemistry of reproductive disorders, pregnancy toxemia, pregnancy tests.</p>	25%	15

**\*Continuous Evaluation:**

It consists of Assignments/Seminars/Presentations/Quizzes/Surprise Tests (Summative/MCQ) etc.

# PARUL UNIVERSITY - FACULTY OF APPLIED SCIENCE

Department of Biochemistry

SYLLABUS FOR 4th Sem PROGRAMME

Physiology and Bioenergetics (11203252)

**Type of Course:**

**Prerequisite:**

**Rationale:**

**Teaching and Examination Scheme:**

Teaching Scheme			Credit	Examination Scheme					Total
Lect Hrs/ Week	Tut Hrs/	Lab Hrs/		External		Internal			
				T	P	T	CE	P	
4	-	-	4	60	-	20	20	-	100

Lect - Lecture, Tut - Tutorial, Lab - Lab, T - Theory, P - Practical, CE - CE, T - Theory, P - Practical

**Contents:**

Sr.	Topic	Weightage	Teaching Hrs.
1	<b>UNIT-I:</b> Composition of blood, erythrocytes, leucocytes, thrombocytes, Coagulation of blood and fibrinolysis. Respiratory organs and mechanism of respiration. Hemoglobin and transport of gases, Physiology of heart, Digestion and absorption of foods. Structure of kidney and nephron. Physiology of kidney. Regulation of electrolyte, water and acid base balance in the body.	25%	15
2	<b>UNIT-II:</b> Structure and organization of muscle cell, types of muscles. Molecular organization of contractile systems and molecular mechanisms of contraction and relaxation of muscle. Biochemical changes associated with muscle contraction and relaxation. Structure of nerve cell, origin of membrane potential, mechanism of propagation of nerve impulse in unmyelinated and myelinated nerve fibers. Synapse – types of synapses, transmission at adrenergic and cholinergic nerve endings. Blood brain barrier, Neurotransmitters. Physiology of vision.	25%	15
3	<b>UNIT-III:</b> Composition and structure of cell membranes, Molecular constituents of membranes, asymmetric organization of lipids and proteins, fluidity of membranes, different membrane models, Membrane channels and pumps, ligand gated ion channels, Ionic channels. Molecular models of transport mechanism, Membrane biogenesis, cell- cell interactions, ionophores, gap junctions, artificial membranes and liposomes.	25%	15

4	<b>UNIT-IV:</b> Principles of thermodynamics, free energy, enthalpy and entropy, Free energy changes in biological transformations in living systems. Redox potential, phosphate group transfer potential and ATP, High-energy compounds, oxidation and reduction reactions. Oxidation and reduction enzymes, utilization of oxygen by oxygenases, superoxide dismutase and catalase. Mitochondrial electron transport system – organization of components and importance. Substrate level phosphorylation, oxidative phosphorylation, respiratory control, Mechanism and theories of oxidative phosphorylation. Respiratory chain inhibitors and uncouplers of oxidative phosphorylation. Mitochondrial electron transport system. Bioluminescence.	25%	15
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**\*Continuous Evaluation:**

It consists of Assignments/Seminars/Presentations/Quizzes/Surprise Tests (Summative/MCQ) etc.

# PARUL UNIVERSITY - FACULTY OF APPLIED SCIENCE

Department of Applied Science & Humanities

SYLLABUS FOR 4th Sem PROGRAMME

Dissertation (11200251)

Type of Course:

Prerequisite:

Rationale:

Teaching and Examination Scheme:

Teaching Scheme			Credit	Examination Scheme					Total
Lect Hrs/	Tut Hrs/	Lab Hrs/ Week		External		Internal			
				T	P	T	CE	P	
-	-	28	28	-	200	-	100	-	300

Lect - Lecture, Tut - Tutorial, Lab - Lab, T - Theory, P - Practical, CE - CE, T - Theory, P - Practical

Contents:

Sr.	Topic	Weightage	Teaching Hrs.
1	<b>Dissertation:</b> Dissertation	30%	18

**\*Continuous Evaluation:**

It consists of Assignments/Seminars/Presentations/Quizzes/Surprise Tests (Summative/MCQ) etc.