DAYANANDA SAGAR UNIVERSITY

ShavigeMalleshwaraHills,KumaraswamyLayout, Bengaluru-560111,Karnataka.

SCHOOL OF HEALTHSCIENCES

COLLEGE OFPHYSIOTHERAPY

SCHEME & SYLLABUS FOR

1stYear BACHELOR OF PHYSIOTHERAPY(BPT)

(ANNUALSCHEME)

(With Effect from 2022-23)

SCHEME OF TEACHING AND EVALUATION

YEAR–I BPT

SL.	COURSECODE	COURSETITLE	M/S	NO. OFTEACHINGHOURS/WEEK			SCHEMEOFEVALUATION							TOTAL
							THEORY				PRACTICAL			
				D	SPT	P	W	VV	CA	IA	P	CA	IA	
1	22PT101	HUMANANATOMY	M	04	--	--	100	30	10	10	--	--	--	150
2	22PT102	HUMAN PHYSOLOGY	M	04	--	--	100	30	10	10	--	--	--	150
3	22PT103	BIOCHEMISTRY	M	02	--	--	80	--	05	05	--	--	--	100
4	22PT104	KINESIOLOGY	M	05	--	--	100	30	10	10	--	--	--	150
5	22PT105	PSYCHOLOGY(SEC- A)	M	02	--	--	40	--	05	05	--	--	--	50
	22PT106	SOCIOLOGY(SEC–B)	M	02	--	--	40	--	05	05	--	--	--	50
6	22PT171	HUMANANATOMY	M	--	1	2	--	--	--	--	40	05	05	50
7	22PT172	HUMANPHYSIOLOGY	M	--	1	2	--	--	--	--	40	05	05	50
8	22PT173	KINESIOLOGY	M	--	2	2	--	--	--	--	40	05	05	50
TOTAL				**19**	4	**6**	**420**	**90**	**45**	**45**	**120**	**15**	**15**	**750**

Table-1

Note:

1. M- Main Course, S – Subsidiary Course , D – Didactic, CL – Clinical, P – Practical, W – Written,VV–VivaVoce,CA–ContinuousAssessment, IA–InternalAssessment SPT- Supervised Practical Training
2. The syllabus has been prescribed under the following 3 headings and the approximate percentage of questions in the university examination question paper represented under each heading from the respective course syllabiihas been indicated:

- **Must Know- 60%**
- **Desirable to know- 30%**
- **Nice to Know- 10%**

University Examination Question paper pattern for course Human Anatomy (22PT101), Human Physiology (22PT102) & Kinesiology (22PT104)

Sec A	Long Essay	Answer Any 2 out of 3	10X2=20
Sec B	Short Essay	Answer Any 12 out of 14	5X12=60
SEC C	Short Answers	Answer all 10	2X10=20
Total			100 Marks

Practical Examination Pattern for Human Anatomy (22PT 171), Human Physiology (22PT172) & Kinesiology (22PT173)

Spots	10X2=20
Long Case	10X1=10
Short Case	6X1=06
Record Keeping	4 Marks
Total	40Marks

University Examination Question paper pattern for Biochemistry (22PT103)

Sec A	Long Essay	Answer Any 2 out of 3	10X2=20
Sec B	Short Essay	Answer Any 08 out of 10	5X8=40
SEC C	Short Answers	Answer all 10	2X10=20
Total			80 Marks

University Examination Question paper pattern for Psychology (22PT105) & Sociology (22PT106)

Sec A	Long Essay	Answer Any 1 out of 2	10X1=10
Sec B	Short Essay	Answer Any 4 out of 6	5X4=20
SEC C	Short Answers	Answer all 5	2X5=10
Total			40 Marks

YEAR :I YEAR
COURSECODE :22PT101(Theory) &
22PT171 (Practical)
TITLEOFTHECOURSE:HUMANANATOMY

COURSEOBJECTIVES

Thestudyofanatomywillincludeidentificationofallgrossanatomical structures. Particular emphasis will be placed on description of bones,joints, muscles, brain, cardiopulmonary and nervous systems as these arerelatedtotheapplicationofpatientsrequiring physiotherapy.

COURSEOUTCOMES

Theexpectedoutcomesofthiscourseisthatafterthepresc ribedhoursoflectures, demonstrations and practical sessions the student will have an in-depthknowledge of human anatomy and will be able to identify bones, joints,muscles,brain, cardio - pulmonaryandnervoussystemsasneededforthestudyandpracticeinphysiotherapy.

COURSE TITLE – Human Anatomy **COURSE CODE –** 22PT101														
Hours				**Hours per week**				**Evaluation pattern**						
Th	Prac	SPT	Total	Th	Prac	SPT	Total	Theory			Th Aggregate	Practical		Th+Prac
								IA	Written exam	VV		IA	Final Exam	Final Exam
150	76	38	264	4	2	1	7	20	100	30	150	10	40	200

S.I No.	Topic		Theory hours	Practical hours
1.	**General Introduction**	**- Must Know** • Histology-Cell, tissues of the body, epithelium, connective tissue, cartilage, bone, lymph, muscle, nerve, skin, bursa, ligaments etc. • Osteology-Formation, function, growth and repair of bones, bone classification and types • Joints-definition-classification, structure of fibrous, synovial, cartilaginous joints, blood supply and nerve supply of joints. • Muscles – origin, insertion, types, nerve supply and actions	15	6

		• Development of Musculoskeletal system. -**Desirable to know** • Axial skeleton • Differentiation, development of various systems (skin, blood vessels, lymphatic system, fascia) **-Nice to know** • General Embryology- Ovum, spermatozoa, fertilization • Foetal circulation		
2.	**Systems of Human Body**	**- Must Know** • Cardiovascular System –Anatomy of heart, Arteries, Capillaries, Veins, lymphatic system • Respiratory System - Anatomy of lungs, upper and lower respiratory tract including nose, larynx, trachea, bronchi, broncho-pulmonary segments, pleura and lungs • Sensory Organs -**Desirable to know** • Urogenital System –Anatomy of Urinary system, Urogenital Diaphragm. **-Nice to know** • Genetics • Digestive System–Anatomy of the gastro-intestinal tract.	15	8
3.	**Upper Extremity**	**- Must Know** • Outline the anatomical features, attachments, ossification and side determination of the bones of U/L: Clavicle, Scapula, Humerus, Radius, Ulna, Carpals, Metacarpals, Phalanges • Joints of upper limb: shoulder girdle, Shoulder joint, Elbow, Wrist and joints of hand • Fascia and Muscles of front and back of upper arm: origin, insertion, nerve supply and action • Muscles of front and back of forearm:	24	14

		origin, insertion, nerve supply and action • Muscles of hand: origin, insertion, nerve supply and action, arches of hand • Nerves of upper Extremity and their position course, relations & distribution • Blood vessels of upper Extremity and their position course, relations, distribution and main branches. Lymphatic drainage of upper Extremity • Surface & Bony landmarks of upper extremity • Demonstration of muscles and movements of Upper extremity joints. • Palpation of peripheral arteries & nerves of upper extremity -**Desirable to know** • Radiographic appearance of Musculoskeletal system of Upper Extremity **Nice to know** • Applied anatomy of all structures of Upper Extremity		
4.	**Thorax**	**- Must Know** • Ribs: Parts & main features of typical rib & define true, false and floating ribs • Sternum: parts and anatomical features • Thoracic vertebrae: parts and anatomical features • Mediastinum – divisions and contents • Pericardium and Conduction system of heart • Joints of Thorax**-** Identify & explain in detail various joints: • Manubrio-sternal joint, Costo-Chondral joints, Chondro- sternal joints • Costo-vertebral joints, Costo-transverse joints • Intervertebral joints • Movements of vertebral column & Rib cage. • Intercostal space and its content and accessory muscles of respiration	14	6

		• Diaphragm- origin, insertion, structures passing through it. • Mention the course and branches of nerves, blood vessels and lymphatic drainage of thorax. -**Desirable to know** • Surface anatomy and radio-graphical appearance of structures of thorax **-Nice to know** • Applied anatomy of thorax		
5.	**Head, Face and Neck**	**- Must Know** • Bones of skulland mandible • Muscles & Vessels and nerve supply of neck • Facial muscles and its nerve supply and blood supply • Temporo-Mandibular (TM) joint, Cervical vertebrae & Skull. • Movement of TM joint -**Desirable to know** • Triangles of neck • Larynx, Pharynx • Grossanatomy and muscles of eyes, earsandtongue • Blood and nerve supply of eyes and ears • Salivary glands • Lateral wall of nose • Position, shape, size, function, blood supply and nerve supply of: Hypothalamus and pituitary glands, pineal glands, thyroid glands, parathyroid glands, thymus. **-Nice to know** Surface and radiographic appearance of Head, Neck and Face. • Applied anatomy of Head, Neck and Face.	14	0
06.	**Neuroanatomy**	**- Must Know** • Central Nervous System • Peripheral Nervous System	18	8

		• Cranial nerves • Peripheral Nerves • Neuromuscular Junction • Sensory End Organs • Spinal Cord Segments & Areas • Brainstem • Cerebellum • Inferior colliculi & Superior colliculi • Thalamus • Corpus striatum • Cerebral hemispheres • Basal Ganglia • Internal Capsule • Thalamo-cortical radiations • Pyramidal systems & Extra-pyramidal systems • Sympathetic & Para-sympathetic system • Ventricles system • Meninges • Pons, medulla • Blood supply of the brain -**Desirable to know** • Epithalamus • Rhinencephalon • Diencephalon • Visual radiation • Auditory radiation • Neural tube • Position, shape, size, function, blood supply and nerve supply of the following glands: Hypothalamus, pituitary gland.		
7.	**Trunk and Abdomen**	**- Must Know** • Vertebral columns: Identify parts of typical (and atypical) vertebra and state the main features, attachments and ossification. • Intervertebral disc and mention its part. Myology- • Fascia and muscles of back / para vertebral muscles. • Fascia and muscles of post Abdominal Wall: origin, insertion, nerve supply and	16	8

		action. • Peritoneum: Parietal peritoneum, visceral peritoneum, folds of peritoneum, functions of peritoneum. • Fascia and muscles connecting U/L with vertebral column: origin, insertion, nerve supply, action. -**Desirable to know** • Surface Anatomy of all vertebrae • Mention the course and branches of nerves, blood vessels and also lymphatic drainage of trunk & abdomen. • Lumbar Plexus: Position, formation and branches. • Rectus sheath: formation and contents. • Contents of vertebral canal and abdomen • Large blood vessels of the gut: Location, size, shape, features, blood supply, nerve supply and functions of the following: Stomach, liver spleen, pancreas, kidney, urinary bladder, intestines, gall bladder. • Radiographic appearance of vertebrae • Position, shape, size, function, blood supply and nerve supply of the following glands: Adrenal glands, pancreatic islets. **-Nice to know** • Applied Anatomy of structures of trunk & abdomen.		
8.	**Pelvis**	**- Must Know** • Features of pubic symphysis and sacroiliac joints. • Muscles of pelvic floor, their attachments, action • Nerve supply, Lymphatic drainage and Blood vessels of the region with course, variations, distribution and main branches -**Desirable to know** • Demonstration of movements of pelvis • Sacral Plexus • Main features of subdivision, boundaries, walls & floor of pelvis.	10	6

		• Difference between male and female pelvis. • Anatomy, Blood and nerve supply and difference between male and female reproductive system. • Position, shape, size, function, blood supply and nerve supply of the following glands: ovaries and testes. **-Nice to know** • Applied anatomy of lumbar plexus		
9.	**Lower Extremity**	**- Must Know** • Osteology - Hip bone, femur, Tibia, Fibula, Patella, and bones of the foot • Myology- Origin, Insertion, Nerve Supply, Action of the following: • Fascia and muscles in anterior of thigh • Fascia and muscles of medial side of thigh • Fascia and muscles of posterior of thigh • Fascia and muscles of gluteal region • Fascia and muscles of lateral side of leg • Fascia and muscles of back of leg and sole of foot • Arches and skin of foot • Detailed explanation of joints of Lower extremity: Hip, joint, Knee joint, Ankle joint, joints of foot. • Surface & Bony landmarks of lower extremity • Demonstration of muscles and movements of lower extremity joints. • Identification and palpation the nerves of Lower extremity and mention their position course, relations and distribution • Indication and palpation the blood vessels of Lower extremity and mention their position, course, relation, distribution and main branches • Explain femoral triangle, femoral canal, inguinal canal and adductor canal and subsartorial canal • Poptileal fossa -**Desirable to know**	24	14

		• Radiographic appearance of musculoskeletal system of Lower extremity • Lymphatic drainage of Lower extremity **-Nice to know** • Applied Anatomy of structures of Lower extremity		
10.	**SPT**		38	

RecommendedTextbooks:

1. B.D Chaurasia's Human Anatomy – Regional And Applied; Volume I, Volume II and VolumeIII.
2. SINGH [Inderbir], Textbook of Anatomy with colour atlas: Introduction, Osteology,UpperExtremity,LowerExtremity.VolI. JPBrothers,NewDelhi1996.
3. SINGH[Inderbir],TextbookofAnatomywithcolourAtlas:ThoraxandAbdomen.VolII.JPBrothers,NewDelhi1996.
4. SINGH[Inderbir],TextbookofAnatomywithcolourAtlas:HeadandNeckCentralNervousSystem.VolIII.JPBrothers,NewDelhi1996.
5. SINGH[Inderbir],HumanOsteology.JPBrothers,NewDelhi1990.

ReferenceBooks:

1. SNELL [Richards],ClinicalAnatomyforMedicalstudents:Ed.5.LittleBrownandCompany, Boston. 1995.
2. MOORIE[KiethL],ClinicallyOrientedAnatomy.Ed.3.,WilliamsandWilkins, Baltimore,1992
3. DATTA[A.K],EssentialsofhumanAnatomy:ThoraxandAbdomenEd.2. Vol.ICurrentBookInternational,Culcutta1994
4. DATTA[A.K], EssentialsofhumanAnatomy:HeadandNeckEd2.Vol.II, Current Book International, Culcutta1995

YEAR **:I YEAR**
COURSECODE **:22PT102 (Theory)**
22PT171 (Practical)
TITLEOFTHECOURSE **:HUMAN PHYSIOLOGY**

COURSEOBJECTIVES

This course helps the student to understand the basis of normal human physiology with special emphasis on the functioning of the cardiovascular,musculoskeletal,nervoussystemandrespiratorysystem.

COURSEOUTCOMES

Theexpectedoutcomesofthiscourseisthatafterthe prescribedhoursoflectures,demonstrations,andlabandpracticalthestudentwillbeabletodemonstrateanunderstandingofelementaryhumanphysiology.

COURSE TITLE – Human Physiology **COURSE CODE –** 22PT102														
Hours				**Hours per week**				**Evaluation pattern**						
Th	Prac	SPT	Total	Th	Prac	SPT	Total	Theory			Th Aggregate	Practical		Th+Prac
								IA	Written exam	VV		IA	Final Exam	Final Exam
150	76	38	264	4	2	1	7	20	100	30	150	10	40	200

S.I No.	Topic		Theory hours	Practical hours
1.	**General Physiology**	**- Must Know** • Cells & its organelles – structure & functions • Homeostasis, biofeedback mechanisms • Transport across cell membrane • Outline of membrane potential & action potential -**Desirable to know** • Body fluids: Distribution, composition. Tissue fluid – formation.	8	-
2.	**Nerve Muscle Physiology**	**- Must Know** • Muscle- classification, structure, sarcomere &	14	6

		its properties • Myoneural junction & transmission • Molecular basis of muscle contraction • Motor unit, EMG • Nerve - Structure, Properties & Classification of nerves • Propagation of nerve impulse, Resting membrane potential. Action potential – ionic basis and properties. • Degeneration and regeneration of nerve • Neuromuscular junction – Structure • Neuromuscular transmission -**Desirable to know** • Applied aspects – Myasthenia Gravis, Rigor mortis • Length – Tension Relationship, Strength-Duration Curve • Reaction of degeneration • Muscle disorders **-Nice to know** • Fatigue • Load • Plasticity		
3.	**Haematology**	**- Must Know** • Composition and functions of blood • Red blood cell – morphology, formation, normal count, functions, physiological and pathological variation. • White blood cell- morphology, classification, properties, functions, physiological & pathological variation • Haemoglobin– basic chemistry, fate and functions. • Immunity- definition, classification, concept of antigen & antibody • Haemostasis– steps, role of platelets • Blood groups – A, B,O,AB and Rh system, Landsteiner's Law • Anaemia, ESR & PCV • Lymph: Composition, formation, circulations and functions	14	6

		-**Desirable to know** • Plasma proteins • Blood coagulation factors, Anticoagulants • Blood transfusion **-Nice to know** • Haemophilia • Thrombocytopenia • Edema		
4.	**Cardiovascular System**	**- Must Know** • Physiological anatomy and nerve supply of the heart and blood vessels. Organization of CVS. • General organization and properties of cardiac muscle • Origin and conduction of cardiac impulse • Cardiac cycle and heart sounds • Normal heart rate, bradycardia, tachycardia, normal ECG • Cardiac output- normal values, physiological variations, factors affecting cardiac output and regulation • Blood pressure- normal values, measurement, determinants, short term and long term regulation • Pressure and volume changes during cardiac cycle • Regional circulation- Coronary, Muscular, Cerebral • Shock – Defination, Classification – causes and features. **-Desirable to know** • Pathophysiology of circulatory shock and oedema • Hypertension, hypotension **-Nice to know** • Cardiovascular changes during exercise.	14	6
5.	**Respiratory System**	**- Must Know** • General organization of respiratory system • Nerve supply and Functions of respiratory system • Mechanics of respiration- inspiratory &	14	6

		expiratory muscles, intrapleural pressure, lung & thoracic compliance, surfactant, lung volumes & capacities • Diffusion of gases • Transport of respiratory gases • Regulation of respiration • Outline of hypoxia- types & physiological changes • Acclimatization to high altitude. • Dead space, Ventilation/ perfusion ratio • Maximum breathing capacity & breathing reserve • Pulmonary function tests. -**Desirable to know** • Artificial respiration • Chest Expansion **-Nice to know** • Asphyxia, cyanosis (types and physiological changes) • Respiratory changes during exercise.		
6.	**Digestive System**	**- Must Know** • Physiological anatomy and nerve supply of alimentary canal. Enteric nervous system • General organization • Mastication and deglutition • Saliva – composition, functions & regulation of salivary secretion • Gastric secretion – composition, mechanism, phases of secretion, • Regulation and functions. • Outline of gastric emptying and peristalsis • Pancreatic secretion - composition, regulation & functions • Liver and Gallbladder – composition and functions of bile • Movements and functions of small and large intestine • Defecation reflex **-Desirable to know** • Jaundice • Peptic ulcer	12	6

		• Constipation, diarrhoea		
7.	**Renal Physiology**	**- Must Know** • General introduction, structure and functions of kidney • Formation of urine- filtration, re-absorption and secretion, GFR – normal value and factors affecting • Physiology of micturition • Neurogenic bladder -**Desirable to know** • Renal circulation • Creatinine Clearance • Plasma clearance test • Acid-Base Balance **-Nice to know** • Artificial kidney – Principle of haemodialysis	10	6
8.	**Body Temperature Regulation**	**- Must Know** • Normal body temperature & its regulation • Skin-structure and functions -**Desirable to know** • Hypothermia, hyperthermia	6	6
9.	**Endocrine System**	**- Must Know** • Introduction - General organization of endocrine glands • Mechanism of hormone action • Releasing hormones from hypothalamus • Physiological actions, regulation & disorders of: ➢ Anterior & Posterior pituitary hormones ➢ Thyroid & Parathyroid Hormones ➢ Adrenal cortex & medulla ➢ Pancreatic hormones -**Desirable to know** Local Hormones. **-Nice to know** • Disorders: Gigantism, Acromegaly, Dwarfism, Diabetes insipidus. • Disorders: Myxedema, Cretinism, Grave's	12	6

		disease • Disorder: Diabetes mellitus. • Calcitriol, Thymus and Pineal gland**.** • Disorders: Addison's disease, Cushing's syndrome, Conn's syndrome, Adreno-genital syndrome.		
10.	**Reproductive System**	**- Must Know** • Functional anatomy of reproductive system • Puberty, changes in males and females, menarche, menopause • Spermatogenesis - stages and regulation, Physiological actions of testosterone, Semen • Menstrual cycle & Ovarian cycles – phases & hormonal regulation, ovulation • Physiology of pregnancy • Lactation – initiation, maintenance and control, • Functions of placenta -**Desirable to know** • Sex determination, Sex differentiation • Pregnancy tests • Contraception methods **-Nice to know** • Sex chromosomes • precocious and delayed puberty	12	-
11.	**Central Nervous System**	**- Must Know** • General organization of nervous system • Receptors – definition, classification and functions • Synapse-definition, physiological anatomy & synaptic transmission • Reflexes – classification, properties and functions • Spinal cord- ascending & descending tract and functions • Ascending tracts-sensations carried, pathways & functions • Descending tract - Origin, course & termination & functions • Pain sensation – types of pain, pathways for pain, referred pain, central analgesia system	18	6

		• Posture & equilibrium, Vestibular apparatus • Thalamus & Hypothalamus – its functions • Cerebellum – functions, effects of lesion • Basal ganglia – functions, effects of lesion, Parkinsonism • Muscle tone • Cerebral cortex – Gross anatomy, division & functions of each lobe • Autonomic nervous system – Organization & functions of parasympathetic & sympathetic system and functions • CSF – Composition, formation, circulation, functions & Blood brain barrier, Applied aspects • Differences between Upper Motor Neuron and Lower Motor Neuron lesions -**Desirable to know** • Synthesis of neurotransmitters • Limbic system and its functions **-Nice to know** • Effects of spinal transection • Decerebrate and decorticate rigidity • Thalamic syndrome • Ascending and descending reticular activating system • Speech, memory and learning		
12.	**Special Senses**	*Vision* **Must Know** • Vision – Structure of Eye ball, retina, refractory errors • Accommodation, visual pathway, Pupillary reflexes **Desirable to know** • Light and dark adaptation • Photochemistry of vision *Ear* **Must Know** • Functional anatomy of Ear, Cochlea • Functions of middle & inner ear **Desirable to know** • Auditory pathway	16	6

		• Audiometry **Nice to know** • Physics of sound • Theories of hearing		
		Taste & smell **Must Know** • Functional anatomy • Factors affecting taste and smell		
13.	**Practical & Lecture demonstrations (L.Ds)**	a) Clinical examination of arterial pulse. b) Determination of arterial blood pressure. c) Clinical examination of the cardiovascular system. d) Clinical examination of the respiratory system. e) Clinical examination of higher mental functions. f) Clinical examination of the sensory system. g) Clinical examination of motor system –I. h) Clinical examination of motor system –II i) Clinical examination of all cranial nerves.	-	22
14.	**SPT**		38	

Recommended Textbooks:

1. Textbook of medical physiology – Guyton Arthur
2. Concise medical physiology – Chaudhuri Sujit K.
3. Human Physiology – Chatterjee C.C.
4. Textbook of practical Physiology – Ranade.
5. Text of Physiology – A.K.Jain.
6. Basics of Medical physiology- Venkatesh D &Sudhakar H H
7. Manipal Manual of Physiology – Prof. C N Chandrashekar

Reference Books:

1. Review of Medical Physiology – Ganong William F.
2. Physiological basis of Medical practice – Best &Taylo

YEAR :I YEAR
COURSECODE :22PT103
TITLEOFTHECOURSE :BIOCHEMISTRY

COURSEOBJECTIVES

This course provides the knowledge and skills in fundamental organicchemistryandintroductorybiochemistrythatareessentialforfurtherstudies. Itcoversbasicbiochemical,cellular,biologicalandmicrobiological processes, basic chemical reactions in the prokaryotic andeukaryotic cells, the structure of biological molecules, introduction tothe nutrients i.e. carbohydrates, fats, enzymes, nucleic acids and aminoacids.

COURSEOUTCOMES

Thestudentwouldknow:

1. Variousbio-moleculeswhicharepresentinthebodyandfunctions
2. Theformationandfateofthesebio-molecules
3. Theirnormallevelsinbodyfluidsrequiredforfunctioningandtheirabnormallevelstoundersta ndthediseaseprocess.

Hours		Evaluation pattern	
Tot	Lec	Written	Total

		IA	Final Exam	Final Exam
60	60	20	80	100

Unit I

S.I No.	Topic		Theory hours
1.	**Nutrition**	**- Must Know** • 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 • Physical activities - Energy expenditure for various activities. Calculation of energy requirement of a person **-Desirable to know** • Balanced diet Recommended dietary allowances • Role of carbohydrates in diet: Digestible carbohydrates and dietary fibers Role of lipids in diet **-Nice to know** • 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 Nutritional disorders	7
2.	**Carbohydrate Chemistry**	**- Must Know** • Definition, general classification with examples, Glycosidic bond • Structures, composition, sources, properties and functions of Monosaccharides, Disaccharides, Oligosaccharides and Polysaccharides.	3
3.	**Lipid Chemistry**	**- Must Know** • Definition, general classification Definition, classification, properties and functions of Fatty acids, Triacylglycerol, Phospholipids, Cholesterol -**Nice to know** • Essential fatty acids and their importance	3

		Lipoproteins: Definition, classification, properties, Sources and function Ketone bodies	
4.	**Amino-acid Chemistry**	-**Desirable to know** • Amino acid chemistry: Definition, Classification, Peptide bonds Peptides: Definition, Biologically important peptides Protein chemistry: Definition, Classification, Functions of proteins.	3
5.	**Enzymes**	**- Must Know** • Definition, Active site, Cofactor (Coenzyme, Activator), Proenzyme. -**Nice to know** • Classification with examples, Factors affecting enzyme activity, Enzyme inhibition and significance, Isoenzymes, Diagnostic enzymology (clinical significance of enzymes)	3

Unit II

S.I No.	Topic		Theory hours
1.	**Nucleotide and Nucleic acid Chemistry**	**- Must Know** • Nucleotide chemistry: Nucleotide composition, functions of free nucleotides in body. -**Desirable to know** • Nucleic acid (DNA and RNA) chemistry: Difference between DNA and RNA, Structure of DNA (Watson and Crick model), Functions of DNA**.** **-Nice to know** • Structure and functions of tRNA, rRNA, mRNA.	2
2.	**Digestion and Absorption**	**- Must Know** • General characteristics of digestion and absorption, Digestion and absorption of carbohydrates, proteins and lipids. -**Desirable to know**	3

		• Disorders of digestion and absorption – Lactose intolerance.	
3.	**Carbohydrate Metabolism**	**- Must Know** • Introduction, Glycolysis – Aerobic, Anaerobic Citric acid cycle, Substrate level phosphorylation -**Desirable to know** • Glycogen metabolism – Glycogenesis, Glycogenolysis, Metabolic disorders glycogen, Gluconeogenesis, Cori cycle **-Nice to know** • Hormonal regulation of glucose, Glycosuria, Diabetes mellitus.	5
4.	**Lipid Metabolism**	**- Must Know** • Introduction to lipid metabolism, Lipolysis, Oxidation of fatty acids -oxidation of fatty acids, Lipogenesis - Denovo synthesis of fatty acids, chain elongation, desaturation, triacylglycerol synthesis, fat metabolism in adipose tissues Ketone body metabolism: Ketone body formation (ketogenesis), utilization (ketolysis), ketosis, Rothera's test -**Desirable to know** • Cholesterol metabolism: synthesis, degradation, cholesterol transport Hypercholesterolemia and its effects (atherosclerosis and coronary heart diseases) •	5
5.	**Amino acid and Protein Metabolism**	**- Must Know** • Catabolism of amino acids - Introduction, transamination, deamination, Fate of ammonia, transport of ammonia, Urea cycle -**Desirable to know** • Specialized products formed from amino acids - from glycine, arginine, methionine, phenylalanine and tyrosine.	3
6	**Vitamins**	**-Must Know** • Definition, classification according to solubility. -**Desirable to know**	7

		• Individual vitamins - Sources, Coenzyme forms, functions, RDA, digestion, absorption andtransport, deficiency and toxicity	

Unit III

S.I No.	Topic		Theory hours
1.	**Mineral Metabolism**	-**Desirable to know** • 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	2
2.	**Cell Biology**	**- Must Know** • Introduction, Cell structure, Cell membrane structure and function, various types of absorption. • Intracellular organelles and their functions, briefly on cytoskeleton	2
3.	**Muscle Contraction**	**- Must Know** • Contractile elements in muscle, briefly on the process of muscle contraction, Energy for muscle contraction	2
4.	**Biochemistry of Connective tissue**	**- Must Know** • Introduction, various connective tissue proteins: Collagen, elastin - Structure and associated disorders. Glycoproteins, Proteoglycans	2
5.	**Hormone Action**	**- Desirable to know** • Definition, classification, Mechanism of hormone action. Receptors, signal transduction, second messengers and cell function	2
6.	**Acid-Base balance**	**- Must Know** • 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	2

7.	**Water balance**	**Nice to know** • Water distribution in the body, Body water, water turnover, Regulation of water balance: role of ADH and thirst centre.	1
8.	**Electrolyte balance**	**Nice to know** • Osmolarity. Distribution of electrolytes Electrolyte balance: Role of aldosterone, rennin angiotensin system and ANF	1
9.	**Clinical Biochemistry**	**Must Know** • Normal levels of blood and urine constituents, Relevance of blood and urine levels of Glucose, Urea, Uric acid, Creatinine, Calcium, Phosphates, pH and Bicarbonate. **Desirable to know** • Liver function tests, Renal function tests	2
			60

Recommended Textbooks:

1. MURRAY [ROBERT KK], Harper's Bio Chemistry Ed 24, Prentice Hall. 1996, p925 RAMAKRISHNA [S], PRASANNA [KG], RAJAN [R], Text Book of Medical Biochemistry, Ed1, orient Langman, Bombay 1980.
2. VASUDEVAN [DM] and SREE KUMARI [S], Text Book of Bio Chemistry for Medical students, Ed 1, Jaypee Brothers, New Delhi, 1995
3. DAS [Debajyothi], Biochemistry, Ed. 7, Academic Publishers Calcutta, 1992
4. PRASAD RM, RM's Physiotherapy Textbook Series, Textbook of Biochemistry for Bachelor ofPhysiotherapy First Edition, RM Publications, Mangalore.

Reference Books:

1. LEHININGER [Albert] et.al., Principles of Biochemistry, Ed. 3, LBS Publishers, Delhi, 1993
2. ORTEN [James M] and NEUHAUS [OHO.W]. Human Biochemistry, Ed. 9, Mosby, St.Louis,1975
3. Strayer [LUBERT], Biochemistry, Ed. 4, WH, Freeman & Co., Ny.1995
4. DEVLIN [Thomas M], Biochemistry with Clinical Correalation, Ed. 4, Willey Libs, NY 1997

YEAR **:I YEAR**
COURSECODE **: 22PT104 (Theory)**
22PT173 (Practical)
TITLEOFTHECOURSE **: KINESIOLOGY**

COURSEOBJECTIVES

This course supplements the knowledge of anatomy and enables thestudentstohaveabetterunderstandingoftheprinciplesofbiomechanicsandtheirapplicationsinmusculoskeletalfunctionanddysfunction.

COURSEOUTCOMES

Theexpectedoutcomesofthiscourseisthatafterthe prescribedhoursoflectures and demonstrations in addition to clinical the student will beabletodemonstrateanunderstandingoftheprinciplesofbio-mechanicsandkinesiologyandtheirapplicationinhealthanddisease.

COURSE TITLE – Kinesiology **COURSE CODE –** 22PT104		
Hours	**Hours per week**	**Evaluation pattern**

Th	Prac	SPT	Total	Th	Prac	SPT	Total	Theory			Th Aggregate	Practical		Th+Prac
								IA	Written exam	VV		IA	Final Exam	Final Exam
152	38	38	228	4	1	1	6	20	100	30	150	10	40	200

COURSE CONTENTS			
Topic	Kinesiology	Hours of teaching learning	
		Theory	Practical
UNIT - I			
1	Section 1- Basic concepts of Biomechanics	12	1
	Must Know • Review of mechanics, including motion, forces, force systems, composition of forces, Force of Gravity ,Reaction forces,Equilibrium,Objects in Motion ,Force of friction, Concurrent force systems, Parallel force systems • Introduction to Biomechanics and terminology • Axis & planes with movements occurring at each joint • Levers, Pulleys,Moment Arm and Force • Newton's law of motion • Center of Gravity, Line of gravity, Stability and Equilibrium		
2	Section – II - Muscle Structure and function	8	2
	Must Know • Composition, unit, structure, architecture of muscle Classification of Muscles • Functions of muscles & factors affecting it • Group action of muscle		
	Nice to know- • Effect of immobilization, injury & aging on muscle		
3	Section – III - Joint structure and function	10	2
	Must Know • Basic principles of Joint design and a human joint • Tissues present in human joint including fibrous tissue, bone, cartilage and connective tissue • Bio-physical properties of connective tissue [contractile &non-contractile], Elasticity /Plasticity- response to sudden/slow/ sustained loading- Stress		

	strain Curve, Creep, Hysteresis • Classification of joints		
	Desirable to Know • Effect of immobilization, injury & aging on joint		
4	Section – IV Anatomy and Biomechanics of the joints	70	15
	Must Know • Upper limb: Shoulder girdle, elbow, wrist and hand • Lower Limb: Hip complex, knee, ankle and foot • Vertebral Column: Cervical, Thoracic, thoracic cage, Lumbar andSacroiliac spine		
	Nice to know • Pathomechanics of the joints		
UNIT - II			
5	Section- V Goniometry	6	3
	Must Know • Parts, types, principles and uses of a goniometry.		
	Desirable to know • Techniques for measurement of ROM of all peripheral joints		
	Nice to know • Techniques for measurement of spine ROM		
6	Section- VI Biomechanics of Thorax and Chest Wall	4	1
	Must Know • General structure and function Rib cage movements -Kinetics and Kinematics • The muscles associated with the rib cage		
7	Section-VII – Biomechanics of Vertebral Column	15	2
	Must Know • General structure and function • Regional structure and function – Cervical region, thoracic region, lumbar region, sacral region • Muscles of the vertebral column • Ligaments of Vertebral Column		
	Nice to know • Pathomechanics of the vertebral column		
8	Section VIII- Temperomandible Joint	3	1

	Must Know • General features • structure and function		
UNIT - III			
9	Section IX- Analysis of Posture	8	3
	Must Know • Static and dynamic posture, • postural control, • kinetics and kinematics of posture • Ideal posture analysis of posture		
10	Section X- Analysis of Gait	8	4
	Must Know • General features of gait, • Gait initiation, kinematics and kinetics of gait, energy requirements. • kinematics and kinetics of gait		
	Desirable to know • Energy requirements • Kinematics and kinetics of the trunk and upper extremities in relation to gait, stair case climbing and running		
	Nice to know • Pathomechanics of abnormal gait patterns		
11	Section XI -Movement Analysis	3	2
	Must Know • Kinetics & Kinematics of various activities of daily living like supine to sitting, sitting to standing, walking and climbing up & down		
	Nice to know • Kinetics &Kinematics of running, jogging, pulling, pushing • Kinetics &Kinematics of lifting, overhead activities, squatting		
12	Section XII- Walking aids	5	2
	Must Know • Parallel bars, crutches, canes, walkers, etc. – types, parts and uses.		

13	SPT	38

Recommended Textbooks :

1. Joint Structure and Function – A comprehensive Analysis, JP Bros Medical Publishers, NewDelhi.
2. Brunnstrom, Clinical Kinesiology, JP Bros Medical Publishers, Bangalore, 5th Ed 1996,1stIndian Ed 1998
3. Clinical Kinesiology for Physical Therapist Assistants, JP Bros Medical Publishers, Bangalore, 1st Indian Ed 1997

YEAR :I YEAR
COURSECODE : 22PT105
TITLEOFTHECOURSE :PSYCHOLOGY

COURSEOBJECTIVES

Thiscourse will enable the student to understand specific psychologicalfactors and effects in physical illness and thus help them to have aholistic approach in their dealings with patients during admission,rehabilitationanddischarge.

COURSEOUTCOMES

Theexpectedoutcomesofthiscourseisthataftercompletionoflecturesanddemonstrationsthestudentswillbeabletorecognizeandhelpwith the psychological factors involved in disability, pain, disfigurement,unconsciouspatients,chronicillness, death,bereavementandmedical–surgicalpatient/condition.

Hours		Evaluation pattern		
Tot	Lec	Written		Total
		IA	Final Exam	Final Exam

60	60	10	40	50

Topic SlNo	Course content	Hours of teaching/ learning
		Theory
	Unit I	
	Must Know :	
1	**Introduction to Psychology** • Definition and nature of Psychology, Fields &subfieldsof psychology • Schools of thoughts- Structuralism, functionalism, Behaviorism, Gestalt, Psycho-analytic Theory	**5**
2	**Developmental Psychology** • Definition & its Theories • Physiological & Psychological changes during Infancy, Early & Late childhood, adolescent stage, Puberty, Adulthood & old age	**5**
3	**Emotions**- nature & relationship with autonomic nervous system •Theories of emotions - James Lange theory, Schachter Singer theory, Cannan Bard theory	**6**
	Desireable to know	
4	**Attention & perception:** Nature of attention & perception, Principle of grouping	**2**
5	**Stress:** Physiological and Psychological relation to health and sickness, Psychosomatic, Professional stress burnout	**2**
6	Psychological Reactions of a Patient: during admission and treatment anxiety, shock, denial, suspicion, questioning, loneliness, regression, shame, guilt, rejection, fear, withdrawal, depression, egocentricity, concern about small matters, narrowed interests, emotional overreactions, perpetual changes, confusion, disorientation, hallucinations, delusions, illusions, anger, hostility, loss of hope	**2**
	Unit II	
	Must Know :	
7	**Motivation**- Maslow's hierarchy of motives, Theories of motivation, Motivation cycle **Conflict & Frustration** – Types of conflicts, Common Defense mechanism, stress	**6**
8	**Intelligence** : Theories, Distribution and Assessment	**6**
9	**Thinking:** Reasoning, Problem Solving, Creative Thinking	**4**
	Desirable to know	
10	**Reactions to Loss:** death and bereavement shock and disbelief, development of awareness, restitution, resolution, stages of acceptance as proposed by Kubler – Ross	**2**
	Unit III	

	Must Know	
11	**Learning** - Definition and theories, conditioning, Role of learning in human life **Memory**- Definition and nature, types of memory and forgetting cause Learning	**8**
12	**Personality:** Approaches to personality, Personality assessment and Defense Mechanisms. Abnormal Psychology - Difference between normal & Abnormal, Causes of abnormality	**4**
13	**Social psychology:** **Leadership**: Different types of leaders. Different theoretical approaches to leadership.	**4**
	Desirable to know	
14	**Behavior Modifications**: Application of various conditioning and learning principles to modify patient behaviours	**2**
	Nice to know	
15	**Compliance:** Nature, factors contributing to non-compliance, improving compliance	**2**

RecommendedTextbooks:

1. Feldman.R.H(1996).UnderstandingPsychology.NewDelhi:TataMcGrawhill.
2. Morganetal. (2003).Introductionto Psychology.NewDelhi:TataMcGrawhill.
3. Leftn. Psychology.Boston:Alwin&BacotCompany.
4. Mangal,S.K(2002).AdvancedEducationalPsychology.NewDelhi
5. Atkinson(1996).Dictionary of Psychology.

YEAR :I YEAR
COURSECODE : 22PT106
TITLEOFTHECOURSE: **SOCIOLOGY**

COURSE OBJECTIVES:

This course introduces students to sociological perspectives on health, illness, and medicine. It explores the social, political, cultural, and economic forces that shape contemporary medicine and experiences of health. Using a range of theoretical approaches, the course will examine topics related to the illness experience, health inequalities, biomedical knowledge and practices, and the impact of medical technologies.

COURSE OUTCOME:

- Students will develop and demonstrate a critical understanding of different sociological perspectives.
- Students will apply a critical sociological perspective to examine key concepts and approaches in public health, showing their awareness of issues regarding the production and distribution of power and knowledge.
- They will learn to link individual experiences of health and illness with social figurations and the social construction of normality.

Hours		Evaluation pattern		
Tot	Lec	Written		Total
		IA	Final Exam	Final Exam
60	60	10	40	50

Topic Sr No	Course content	Hours of teaching/ learning
		Theory
	Unit I	
	Must Know :	
1	Introduction – Definition & Relevance with Physiotherapy.	**8**
2	Sociology & Health –Social factors affecting Health Status, Social Consciousness& Perception of Illness, Decision Making in taking Treatment	**4**
3	Socialization – Definition, Influence, of Social Factors, on Personality, Socialization in the Hospital &Rehabilitation of the patients.	**6**
4	Social groups-Concepts, Influence of formal & informal groups of Health & Diseases.	**4**
	Unit II	
	Must Know :	
5	Family-Influence on human personality, Individual Health, Family & Nutrition, Effects of Sickness on Family Psychosomatic Diseases &Family	**4**
6	Community Role- in Rural & Urban communities in Public Health, in determining Beliefs, Practices & Home Remedies in Treatment.	**6**
7	Social problems of the Disabled-Consequences of the following social problems in relation to sickness disability, remedies to prevent these problems • Population Explosion • Poverty & Unemployment	**6**
8	Social Security & Social Legislation in relation to the Disabled	**4**
	Desireable to know	
9	Role of Primary & Secondary Groups in the Hospital & Rehabilitation Setting	**3**
	Unit III	
10	Culture-Components Impact on Human Behaviour Cultural Meaning of	**3**

	Sickness, Response to Sickness & Choice of Treatment	
11	Caste Systems-Features of Modern Cast Systems & its Trends, Social change factors–Human Adaptation, Stress, Deviance, Health Program, Role of Social Planning in the improvement of Health & in Rehabilitation	**4**
12	Social Control – Definition, Role of norms, Folkways, Customs, Morals, Religion, Law & other means of social controls in the regulation of Human Behavior, Social Deviance & Disease	**3**
13	Prostitution, Alcoholism, Beggary, Problems of Women in Employment, Role of a Social Worker.	**3**
	Nice to Know	
14	Role of Culture as Social consciousness in moulding the Perception of Reality, Culture induced Symptoms & Diseases, Sub-Culture of Medical Workers	**2**

Recommended Textbooks:

1. Sachdeva and Vidyabushan, Introduction to the study of sociology.
2. INDRANI T K, Text Books of Sociology for Graduates Nurses and Physiotherapy Students, JP Brothers, New Delhi,10edition. and Health Disorders