SGT UNIVERSITY SHREE GURU GOBIND SINGH TRICENTENARY UNIVERSITY (UGC & AICTE Approved) Gurugram, Delhi-NCR



Syllabus

For

Bachelor of Physiotherapy (Semester System - 2020)

Scheme

Code	Subject / Course Name	Credits	Teaching Hours	Hours/ week	Evalua	Evaluation schen	
		First Seme	ster				
	Theory				Internal	External	Total
PT -101	Anatomy - I	4	64	4	40	60	100
PT -102	Physiology - I	4	64	4	40	60	100
PT - 103	Biochemistry & Medical Genetics	4	64	4	40	60	100
PT -104	Basic Mechanics & Bioelectrical Modalities	4	64	4	40	60	100
PT - 105	Sociology	2	32	2	20	30	50
	Total Theory	18	288	18	180	270	450
	Practical				1	I	
PT - 101P	Anatomy – I (P)	2	64	4	40	60	100
PT - 102P	Physiology – I (P)	2	64	4	40	60	100
РТ - 103Р	Biochemistry & Medical Genetics (P)	2	64	4	40	60	100
PT -104P	Basic Mechanics & Bioelectrical Modalities (P)	2	64	4	40	60	100
	Total Practical	8	256	16	160	240	400
Tota	l both theory & Practical	26	544	34	340	510	850
	S	econd Sem	ester				
	Theory				Internal	External	Total
PT - 201	Anatomy – II	4	64	4	40	60	100
PT - 202	Physiology - II	4	64	4	40	60	100
PT - 203	Electrotherapy-I	4	64	4	40	60	100
PT - 204	Behavioral Foundation in Physiotherapy	2	32	2	20	30	50
PT - 205	Communication Skill	2	32	2	20	30	50
	Total Theory	16	256	16	160	240	400
	Practical						
PT - 201P	Anatomy – II (P)	2	64	4	40	60	100
PT - 202P	Physiology – II (P)	2	64	4	40	60	100
PT - 203P	Electrotherapy-I (P)	2	64	4	40	60	100
	Total Practical	6	192	12	120	180	300
Tota	l both theory & Practical	22	448	28	280	420	700

Code	Subject / Course Name	Credits	Teaching Hours	Hours/ week	Evalu	Evaluation scheme	
	T	hird Semes	ter				
	Theory				Internal	External	Total
PT -301	Pathology & Microbiology	4	64	4	40	60	100
PT -302	Biomechanics & Kinesiology	4	64	4	40	60	100
PT - 303	Exercise Therapy-I	4	64	4	40	60	100
PT -304	Electrotherapy-II	4	64	4	40	60	100
PT - 305	Computer Application & Information Technology	2	32	2	20	30	50
PT - 306	Environmental Studies	2	32	2	20	30	50
	Total Theory	20	320	20	200	300	500
	<u>Practical</u>						
PT - 302P	Biomechanics & Kinesiology (P)	2	64	4	40	60	100
PT - 303P	Exercise Therapy-I (P)	2	64	4	40	60	100
PT - 304P	Electrotherapy-II (P)	2	64	4	40	60	100
	Total Practical	6	192	12	120	180	300
Tot	al both theory & Practical	26	512	32	320	480	800
	Fc	orth Semes	ter				
	Theory				Internal	External	Total
PT - 401	Biomechanics & Ergonomics	4	64	4	40	60	100
PT - 402	Exercise Therapy-II	4	64	4	40	60	100
PT - 403	General Medicine	4	64	4	40	60	100
PT - 404	Pharmacology	4	64	4	40	60	100
PT - 405	Ethics, Admin & Management in Physiotherapy	4	64	4	40	60	100
PT - 406	Yoga & Naturopathy	2	32	2	20	30	50
	Total Theory	22	352	22	220	330	550
	<u>Practical</u>		11		L		
PT - 401P	Biomechanics & Ergonomics (P)	2	64	4	40	60	100
PT - 402P	Exercise Therapy-II (P)	2	64	4	40	60	100
PT - 403P	Evaluative Clinical Practices-I (General Medicine) (P)	2	64	4	40	60	100
	Total Practical	6	192	12	120	180	300
Tot	al both theory & Practical	28	544	34	340	510	850

Code	Subject / Course Name	Credits	Teaching Hours	Hours/ week	Evalua	ation sch	eme
	Fifth Ser	nester					
	Theory				Internal	External	Total
PT -501	Orthopaedic Medicine & Surgery	4	64	4	40	60	100
PT -502	Physiotherapy in Orthopaedics-I	4	64	4	40	60	100
PT - 503	General Surgery, Obstetrics & Gynaecology	4	64	4	40	60	100
PT -504	Physiotherapy in Medical & Surgical Conditions	4	64	4	40	60	100
	Total Theory	16	256	16	160	240	400
	<u>Practical</u>			r			
PT - 501P	Orthopaedic Medicine & Surgery (P)	2	64	4	40	60	100
PT - 502P	Physiotherapy in Orthopaedics-I (P)	2	64	4	40	60	100
PT - 503P	General Surgery, Obstetrics & Gynaecology (P)	2	64	4	40	60	100
PT -504P	Physiotherapy in Medical & Surgical Conditions (P)	2	64	4	40	60	100
PT -505P	Evaluative Clinical Practices-II	2	64	4	40	60	100
	Total Practical	10	320	20	200	300	500
	Total both theory & Practical	26	576	36	360	540	900
	Sixth Sei	mester	1	1	1		
	Theory				Internal	External	Total
PT - 601	Orthopaedic Medicine & Sports Injuries	4	64	4	40	60	100
PT - 602	Physiotherapy in Orthopaedics-II	4	64	4	40	60	100
PT - 603	Clinical Neurology & Psychiatry	4	64	4	40	60	100
PT - 604	Cardiopulmonary Medicine & Surgery	4	64	4	40	60	100
PT - 605	Research Methodology & Biostatistics	4	64	4	40	60	100
	Total Theory	20	320	20	200	300	500
	Practical						
PT - 601P	Orthopaedic Medicine & Sports Injuries (P)	2	64	4	40	60	100
PT - 602P	Physiotherapy in Orthopaedics-II (P)	2	64	4	40	60	100
PT - 603P	Clinical Neurology & Psychiatry (P)	2	64	4	40	60	100
	Evaluative Clinical Practices-III	2	64	4	40	60	100
	Total Practical	8	256	16	160	240	400
	Total both theory & Practical	28	576	36	360	540	900

Code	Subject / Course Name	Credits	Teaching Hours	Hours/ week	Evalı	Evaluation scheme		
	Seve	nth Seme	ester					
	Theory				Internal	External	Total	
PT -701	Clinical Neurology & Neurosurgery	4	64	4	40	60	100	
PT -702	Physiotherapy in Neurology-I	4	64	4	40	60	100	
PT - 703	Physiotherapy in Cardiothoracic Conditions	4	64	4	40	60	100	
PT -704	Manual Therapy	2	32	2	20	30	50	
PT - 705	Radiology & Diagnosis	2	32	2	20	30	50	
	Total Theory	14	256	16	160	240	400	
	Practical							
PT - 701P	Clinical Neurology & Neurosurgery (P)	2	64	4	40	60	100	
PT - 702P	Physiotherapy in Neurology-I (P)	2	64	4	40	60	100	
PT - 703P	Physiotherapy in Cardiothoracic Conditions (P)	2	64	4	40	60	100	
PT -704P	Manual Therapy (P)	2	64	4	40	60	100	
PT -705P	Evaluative Clinical Practices-IV	2	64	4	40	60	100	
	Total Practical	10	320	20	200 300 500			
Tot	al both theory & Practical	25	576	36	360	540	900	
	Eigh	th Seme	ster	ſ		[]		
	Theory				Internal	External	Total	
PT - 801	Physiotherapy in Neurology-II	4	64	4	40	60	100	
РГ - 802	Pediatric & Geriatric Physiotherapy	4	64	4	40	60	100	
PT - 803	Physiotherapy in Sports	4	64	4	40	60	100	
PT - 804	Disability Prevention & Rehabilitation	4	64	4	40	60	100	
PT - 805	Project Work	4	64	4	80	120	200	
	Total Theory	20	320	20	240	360	600	
	Practical							
PT - 801P	Physiotherapy in Neurology-II (P)	2	64	4	40	60	100	
PT - 802P	Pediatrics Physiotherapy (P)	2	64	4	40	60	100	
PT - 803P	Physiotherapy in Sports (P)	2	64	4	40	60	100	
PT - 804P	Evaluative Clinical Practices-V	2	64	4	40	60	100	
	Total Practical	8	256	16	160	240	400	
Tot	al both theory & Practical	28	576	36	400	600	1000	
	Compulsory Rotatory Internsh	ip - six M	Ionths (1	56 days	X 8 hou	ırs)		
	Rotatory Internship	26	1248	64		Nil		

Anatomy – I BPT-1st Semester

Code	Credits	Teaching	Hours/	Evaluation scheme		
		Hours	week	Internal	External	Total
PT -101	4	64	4	40	60	100

Course objectives:

- Understanding of gross anatomy of various body parts.
- Recognize the essential terminology necessary to properly describe the fundamental relationships and orientation of structures in the human body.
- Define the basic embryological processes associated with development of the various components and systems of the human body.
- Identify the osteology of the human skeleton in both the gross specimen and through medical imaging.
- Differentiate the muscles of the human body, including their attachments to the skeleton, innervation by the nervous system and the function of each muscle when contracted.
- Application of knowledge of anatomy to learn evaluation and application of physical therapy.

Module 1. General Anatomy:

Histology

- 1. Cell- Structure and Function
- 2. Tissues of the body
- 3. Connective Tissues- its modification, tendons, membranes, cartilage
- 4. Bone- structure, blood supply, growth, ossification, and classification
- 5. Muscle classification, structure and functional aspect
- 6. Nerve structure, classification, microscopy with examples
- 7. Joint classification, structures of joints, movements, range, limiting factors, stability, blood supply, nerve supply and applied anatomy.
- 8. Circulatory system major arteries and veins of the body, structure of blood vessels
- 9. Lymphoid system its structure, function and circulations

General Embryology

Ovum, spermatozoa, fertilization, differentiation, development of various systems and fetal circulation.

Surface anatomy

Nerve, muscle, skeleton, major blood vessels and cardiopulmonary

Module 2. Upper extremity:

- 1. Osteology-Clavicle, scapula, humerus, radius, ulna, carpals, metacarpals, phalanges
- 2. Joints structure, range of movement
- 3. Soft Tissue
- i. Pectoral Region, Axilla, Front of the arm, back of the arm, cubital fossa, front fore arm, back of fore arm, palm and dorsum of hand.

(20 Hours)

(16 Hours)

- 4. Muscles- origin, insertion, actions, nerve supply
- 5. Nerves course, branches and implications of nerve injuries
- 6. Blood vessels course and implications of pathological event
- 7. Radiographic identification of bone and joints

Module 3. Lower Extremity:

(18 Hours)

1. Osteology (Hip bone, femur, tibia, fibula, patella, tarsals, metatarsals and phalanges)

- 2. Joints structure, range of movement
- 3. Soft Tissues- Gluteal region, front & back of the thigh (femoral triangle, femoral canal, and inguinal canal), medial side of the thigh(adductor canal), lateral side of the thigh, popliteal fossa, anterior & posterior compartment of the leg, sole of the foot
- 4. Muscles origin, insertion, actions, nerve supply
- 5. Nerves course, branches and implications of nerve injuries
- 6. Major vessels course and implications of pathological event
- 7. Radiographic identification of bone and joints

Module 4. Head and Neck:

- 1. Osteology of various bones of the skull
- 2. Soft tissues: Muscles of the face and neck and their nerve and blood supply, triangles of the neck
- 3. Gross Anatomy of Special senses (Brief Description): Nerve receptors, Eye, Ear, Labyrinth, Nose, Tongue

Text & References:

- 1. Text Book of Anatomy (3 vol.), B.D. Chaurasia
- 2. Handbook of General Anatomy, Dr. B.D. Chaurasia
- 3. Textbook of Anatomy by Inderbir Singh; 4th edition; Jaypee Publications
- 4. Anatomy by Samar Mitra, Academic Publishers
- 5. Colour Atlas of Anatomy, a Photographic study of the Human Body, Roben, Johanneswetal
- 6. Clinical Anatomy for Medical students, by Snell (Richard S), Little Brown and Company Boston
- 7. Gray's Anatomy, M. Berry, Lawrence H. Bannister



(10 Hours)

Anatomy – I BPT-1st Semester Practical

Code	Credits	Teaching	Hours/	Evaluation scheme		
		Hours	week	Internal	External	Total
PT -101P	4	64	4	40	60	100

- 1. Demonstrate surface markings of important organs.
- 2. Demonstrate muscle testing and movements at joints.
- 3. Routine and special stained slides of all the tissues and organs of body
- 4. Upper Limb: Pectoral and scapular, axillary and shoulder region, arm, forearm. Joints, Palm and dorsum of hand.
- 5. Lower Limb: Gluteal region, front and back of thigh popliteal fossa, front back and lateral side of leg and dorsum of foot, Sole of the foot and joints
- 6. Head & Neck: Superficial and deep dissection of face and neck, orbit and eye ball. Submandibular region temporal and infratemporal fossa, cranial cavity, naso and oropharyngeal regions. Ear, Larynx and pharynx. Prosected specimens to demonstrate visual system, auditory and vesibular pathways and major functional areas

- 1. Cunningham manual of practical anatomy: upper and lower limb ed 15 Vol 1 Oxford Medical Publication, Oxford 1996,
- 2. Cunningham manual of practical anatomy : Thorax and abdomen ed15 Vol II Oxford Medical Publication, Oxford 1996,
- 3. Cunningham manual of practical anatomy : Head and Neck and Brain ed 15 Vol II Oxford Medical Publication, Oxford 1996,
- 4. Rohen JW, Yokochi C, Lütjen-Drecoll E. Color atlas of anatomy: a photographic study of the human body. Schattauer Verlag; 2006.
- 5. Netter FH, Colacino S. Atlas of human anatomy. Ciba-Geigy Corporation; 1989 Sep.



Physiology – I **First Semester**

Code	Credits	Teaching	Hours/	Evaluation scheme		
		Hours	week	Internal	External	Total
PT -102	4	64	4	40	60	100

Course objectives:

- i. To understand the Physiological functions of human body
- ii. To understand the application of physiological functions & physiology of exercise in relation to physical therapy
- iii. learning of Major area of cardio-respiratory, Musculo-skeletal and nervous system.
- To understand the basic function of Cell and its morphology. iv.
- To understand the basic function and composition of Blood. v.
- vi. To understand the basic physiology of Cardio Vascular System.
- vii. To understand the basic physiology of Nervous System

Module -I

General Physiology

- 1. Cell: Morphology. Organelles: their structure and functions
- 2. Transport Mechanisms across the cell membrane
- 3. Body fluids: Distribution, composition.
- 4. Homeostasis

Nerve

- 1. Nerve cell structure
- 2. Genesis of membrane potential, Action potential & propagation
- 3. Ionic basis of nerve conduction
- 4. Classification & types of nerve fiber
- 5. Mixed nerves & compound action potential
- Concept of nerve injury, degeneration and regeneration 6.

Module -II

Muscle

- 1. Types and morphology, mechanism of muscle contraction, EC coupling
- 2. Muscle properties and functions
- 3. Electrical & Mechanical responses & their basis
- 4. Concept of isometric & isotonic muscle contraction
- 5. Neuromuscular junction, structure & events occurring during excitation-contraction coupling
- 6. Myasthenia gravis, Rigor mortis,

(10 hours)

(5 hours)

(11 hours)

Text & References:

- 1. Review of Medical Physiology Ganong William F
- 2. Human Physiology C. C. Chatterjee
- 3. Textbook of Practical Physiology A.K. Jain
- 4. Text Book of Medical Physiology Guyton, Arthur C & John E. Hall
- 5. A text book for Medical students, R.L. Bijlani

formation of edema. 3. W.B.C., R.B.C., Platelets formation & functions

2. Plasma: Composition, formation, functions. Plasma proteins, Starling Forces &

- 4. Hemoglobin –structure, function and derivatives Anemia (in detail), types of Jaundice. Blood indices, PCV, ESR.
- 5. Blood Groups, Erythroblastosis foetalis, Blood Coagulation
- 6. Hemostasis, Immunity, Blood Transfusion

1. Introduction: Composition and functions of blood.

Module -IV

Module -III

Blood

Cardiovascular System

Synaptic & Junction Transmission

1. Basic synaptic anatomy

3. Inhibition & facilitation

2. Synaptic activity, Chemical transmission

4. Principal neurotransmitter system

- 1. Introduction: Physiological anatomy and nerve supply of the heart and blood vessels. Organization of CVS. Cardiac muscles: Structure. Ionic basis of action potential and pacemaker potential. Properties.
- 2. Anatomical, biophysical consideration of arterial, capillary, venous and Lymphatic circulation
- 3. Arterial Blood Pressure: Definition. Normal values and its variations. Determinants. Peripheral resistance. Regulation of BP.
- 4. Basic idea of Electrocardiogram
- 5. Mechanical events of Cardiac cycle, Cardiac output, its regulation
- 6. Local & systemic regulatory mechanisms of CVS, humeral & neural
- 7. Lymph: Composition, formation, circulation and functions
- 8. Cerebral, coronary, splanchnic, skin, Hepatic

10

(17 hours)

(5 hours)

(16 hours)

Physiology – I First Semester Practical

Code	Credit	Teaching	Hours/	Evaluation scheme		
		Hours	week	Internal	External	Total
PT -102P	2	64	4	40	60	100

- 1. Examination of pulse, Blood pressure recording, Heart Rate
- 2. Estimation of Hemoglobin,
- 3. Determination of R.B.C., W.B.C. count, Differential leucocyte count, Blood grouping, Bleeding & Clotting time
- 4. Calculation of Blood indices
- 5. Learning of muscle contractions and demonstration of muscle fatigue
- 6. Auscultation

- 1. Text book of medical physiology Guyton Arthur
- 2. Concise medical physiology Chaudhuri Sujit K.
- 3. Human Physiology Chatterjee C.C.
- 4. Text book of practical Physiology Ranade.
- 5. Text of Physiology A.K.Jain.
- 6. Basics of Medical physiology- Venkatesh D & Sudhakar H H



Biochemistry and Medical genetics First Semester

Code	Credits	Teaching	Hours/	Evaluation scheme		
		Hours	week	Internal	External	Total
PT -103	4	64	4	40	60	100

Course Objectives:

- To understand biochemical basis of life sciences i.
- To understand the metabolism, function and mechanism of action of various elements. ii.
- To understand the basics of molecular genetics. iii.
- iv. To understand the role of biochemistry in diagnostic medicine.

Module -I

Living matter and cell structure

- 1. Biochemical characteristics of living matter and ionic balance.
- 2. Biochemical importance of cell structures, review of sub-cellular organelles.

Module -II

Carbohydrate, lipid, and protein metabolism

- 1. Carbohydrates- Classification, physiologically important carbohydrates & derivates, metabolism
- 2. Lipids- Classification, physiologically important lipids, metabolism, fatty acids
- 3. Proteins-Classification, amino acids, physiologically important proteins, metabolism

Module -III

Vitamins, minerals, enzymes, muscle & nerve

- 1. Vitamins & Minerals- Water soluble vitamins, fat soluble vitamins, hypo and hyper vitaminosis, macrominerals, essential trace elements.
- 2. Enzymes- Definition and classification with examples, factors affecting enzyme action, brief study of enzyme, inhibition, clinical importance of enzymes
- 3. Bioenergetics-Biochemical changes in the cell with specific focus on muscle function.
- 4. Biochemical basis of muscle and nerve function

Module -IV

Molecular genetics

- 1. Nucleic acids- Brief overview of the structure of RNA and DNA including nucleotides.
- 2. Techniques in biochemistry-Principle and applications of gel, ion exchange, affinity thin layer and gas chromatography, HPLC, electrophoresis
- 3. Role of biochemistry and molecular genetics in diagnostics

Text & References:

- 1. Text book of Biochemistry for Medical students by DM vasudevan, 7th Edition
- 2. Text book of Biochemistry by Dr. S.K.Gupta
- 3. Textbook of Biochemistry for Paramedical Students By Dr. P. Ramamoorthy
- 4. Essentials of Biochemistry by U. Sathyanarayana
- 5. Harper's Illustrated Biochemistry 30th Edition



12

(16 hours)

(7 hours)

(20 hours)

(20 hours)

Biochemistry and Medical genetics First Semester Practical

Code	Credit	Teaching	Hours/	Evaluation scheme		
		Hours	week	Internal	External	Total
PT -103P	2	64	4	40	60	100

- 1. Carbohydrate metabolism, testing, disorders
- 2. Kidney function testing, disorders
- 3. Protein nitrogen substances, testing, disorders
- 4. Liver function, testing, disorders
- 5. Lipid metabolism, testing, disorders

Students will be assessed by viva and practical demonstration based upon learning in theory and practical classes

- 1. Mu P, Plummer DT. Introduction to practical biochemistry. Tata McGraw-Hill Education; 2001.
- 2. Varley H. Practical clinical biochemistry. Practical clinical biochemistry. 1954.
- 3. Fasman GD. Practical handbook of biochemistry and molecular biology. CRC press; 1989 Mar 31.
- 4. Wilson PD, Wilson K, Walker J, Walker JM, editors. Principles and techniques of practical biochemistry. Cambridge University Press; 2000 Mar 16.



Basic Mechanics and Bioelectric modalities First Semester

Code	Credits	Teaching	Hours/	Evaluation scheme		
		Hours	week	Internal	External	Total
PT -104	4	64	4	40	60	100

Course Objectives:

- i. The objective of this course is that after completion of the lectures and discussion the student will be able to do understand the basic concepts of physics related to physiotherapy.
- ii. Student will be able to work out proper application for the efficient application of the concepts of mechanics.
- iii. The students should be able to explain the physical rationale for the use of exercise therapy and apply the concepts on human body
- iv. Students should be able to explain the basic concepts of mechanics and how it is applied in practice
- v. Students should be able to identify and explain the different electric equipment's and their use in electrotherapy

Basic Mechanics

Module -I

1. Force	(5 hours)
Definition of Force, Newton's laws of motion; Work, energy, and power, Torque an	d angle of
pull, Force system	
2. Moments	(4 hours)
Axis, planes and movements; Joints and their classification; Degree of freedom, motion; surface anatomy of joints	, range of
3. Elasticity	(4 hours)
Stress and strain, Hooke's law, spring and their properties	
4. Friction	(3 hours)
Types of friction and strategies to overcome it	
5. Gravity	(4 hours)
Center of Gravity, Line of Gravity, Base of Support, It's Human application	
Module -II	
1. Equilibrium	(2 hours)
Types, supporting bases, stability	
2. Fluid Mechanics	(3 hours)
Archimedes' principle, buoyancy & trust, apparent loss of weight, Bernoulli's theore	em
3. Levers	(4 hours)
Types, Functions and Application	
4. Pulleys	(3 hours)
Types, Functions and Application	

Bioelectric Modalities

Module -III

1. Static Electricity	(4 hours)
Electric charge, characteristics, lines of forces, Electro Motive Force	
2. Unit of electricity	(4 hours)
Farad, volt, watt, hertz, coulomb, conductors, insulators, potential difference, reintensity	esistance and
3. Condensers	(3 hours)
Definition, types of condensers and its application 4. Magnetism Definition properties Electromagnetic induction transmission magnetic field	(5 hours)
effects of electric field Module -IV	i, magnetie
1. Ohm's law and fuse	(4 hours)
Ohm's law and its application to DC and AC currents: Fuse	(110010)
2. Rectifying Devices	(4 hours)
Thermionic valves, Semiconductors, Transistors, Amplifiers, transducers and c circuits	scillator
3. Transformers and Amplifiers	(3 hours)
Definition, Types, Eddy currents, Application	
4. Electric shock	(5 hours)
Dangers like short circuit, precautions- safety, earthing, management of electric	shock
Text & References:	
Basic Mechanics	

- 1. Principles of Exercise Therapy- Dena Gardiner,
- 2. Exercise Therapy- Carolyn Kisner, Biomechanics- Cynthia Norkins,
- 3. Practical Exercise therapy- Hollis and cook

Bioelectric Modalities

- 1. Clayton's Electrotherapy,
- 2. Electrotherapy Basanta Nanda,
- 3. Physical principles explained by Low and reed,
- 4. Bhargava- basic electronics



Basic Mechanics and Bioelectric modalities First Semester Practical

Code	Credits	Teaching	Hours/	Eval	Evaluation scheme		
		Hours	week	Internal	External	Total	
PT -104P	2	64	4	40	60	100	

Basic Mechanics

Demonstration of Gravity concepts with use of plumb line and application in human body, Demonstration of levers and pulleys used in practice and in human body

Demonstration of Aquatic therapy - Archimedes principle, Buoyancy, Whirlpool, Bernoulli's principle

Demonstration of Axis, planes, movements and Surface anatomy.

Bioelectric Modalities

Diode and Triode valves, Transistors, Ammeter, Voltmeter, Galvanometer, Rheostat, Transformer

Demonstration of different currents- Faradic, Galvanic, Direct Currents, Alternating Currents

Text & References:

Basic Mechanics

- 1. Principles of Exercise Therapy- Dena Gardiner,
- 2. Exercise Therapy- Carolyn Kisner, Biomechanics- Cynthia Norkins,
- 3. Practical Exercise therapy- Hollis and cook

Bioelectric Modalities

- 5. Clayton's Electrotherapy,
- 6. Electrotherapy Basanta Nanda,
- 7. Physical principles explained by Low and reed,
- 8. Bhargava- basic electronics



Sociology First Semester

Code	Credits	Teaching	Hours/ Evaluation		uation sch	eme
		Hours	week	Internal	External	Total
PT -105	2	32	2	20	30	50

Course Objectives:

- i. The objective of this course is that after completion of the lectures and discussion the student will be able to -
- ii. develop the basic knowledge of Sociology with respect to different society and its relation towards health and Physiotherapy treatment.

Module I

1. Introduction to Sociology

Definition, Sociology as a science of society, Uses of the study, Application of knowledge of sociology in physiotherapy and occupational therapy

2. Sociology & health

Social factors affecting health status, Social consciousness and perception of illness., Social consciousness and meaning of illness., Decision making in taking treatment. Institution of health of the people

3. Socialization

Meaning of socialization influences of social factor on personality, socialization in hospitals. Socialization in rehabilitation of patients.

4. Social Group

Concept of social group, Influence of formal and informal groups on health and sickness,

The role of primary groups and secondary groups in the hospitals and rehabilitation setting

5. Social problems of the disabled

Consequences of the following social problems in relation to sickness and disability remedies to prevent these problems:

- *i.* Population explosion
- *ii.* Poverty and unemployment
- *iii.* Beggary
- *iv.* Juvenile delinquency
- *v*. Prostitution
- vi. Alcoholism

6. Family

Influence of family on human personality, Discussion of changes in the function of a family, Influence of family on the individual's health family and nutrition, The effect of sickness on family, and psychosomatic disease

(3 hours)

(2 hours)

(3 hours)

(3 hours)

(2 hours)

17

(3 hours)

18

1. Community

Module II

Concept of community, Role of rural and urban communities in public health, Role of community in determining beliefs, practices and home remedies in treatment.

2. Culture

Components of culture, Impact of culture on human behavior, Culture meaning of sickness, response & choice of treatment, Culture induced symptoms and disease, sub-culture of medical workers

3. Social change

Definition, Factors, Human adoption and social change, Social change and stress, Social change and deviance, Social change and health programmers, The role of social planning in the improvement of health and in rehabilitation.

4. Social Control

Meaning of social control, Role of norms, folkways, customs, morals, religion, law and other means of social control in the regulation of human behavior, social deviance and disease.

5. Caste System

Feature of modern caste system and its trends.

6. Social Security

Social security and social legislation in relation to the disabled.

7. Social Worker

The role of medical social worker.

Text & References:

- 1. Megee- sociology'-Drydon press illinois.
- 2. Kupuswamy- Social Changes in India -Vikas, Delhi
- 3. Ahuja- Social problems-Bookhive, Delhi
- 4. Gihnsberg- Principles of sociology-sterling publications.
- 5. Parter & Alder': Psychology & sociology applied to medicine- W.B.Sunders.
- 6. Julian- Social Problem- Prentice hall.
- 7. Introduction to social psychology- Akolkar- Oxford publishing house.
- 8. Psychology and sociology Applied to Medicine Porter & Alder W. B.Saunders.



(2hours)

(**3hours**)

(3 hours)

(2 hours)

(2hours)

(2hours)

(2hours)

Anatomy – II Second Semester

Code	Credits	Teaching	Hours/	Eval	Evaluation scheme		
		Hours	week	Internal	External	Total	
PT -201	4	64	4	40	60	100	

Course objectives:

- i. Distinguish between the various components of the cardiovascular system, including the heart, major arteries and veins, and the lymphatic system
- ii. List the components of the respiratory system, including the lungs, trachea, bronchi, and upper respiratory system components.
- iii. Define the major components of the human nervous system, including the cortex, brainstem, cerebellum, deep brain structures, spinal cord, peripheral nerves, sensory systems, motor systems, and the autonomic nervous system.
- iv. Recognize the components of the gastrointestinal system, beginning at the oral cavity and ending at the rectum, including the major organs associated with digestion, and their innervation by the autonomic nervous system.
- v. Recall the components of the urogenital systems, classify their control by the autonomic nervous system, and differentiate the similarities and differences of the male and female pelvis and perineum.

Module 1. Spine:

- 1. Back muscles Superficial layer, Deep muscles of back, their origin, insertion, action and nerve supply.
- 2. Vertebral column Structure & Development, Structure & Joints of vertebra
- 3. Radiographic identification of bone and joints

Module 2. Thorax:

- 1. Thoracic cage, Pleural cavities & pleura
- 2. Lungs and respiratory tree
- 3. Diaphragm and Intercostal Muscles
- 4. Mediastinum
- 5. Heart and great vessels

Module 3. Neural anatomy:

- 1. Central nervous system disposition, parts and functions of
- 2. Cerebrum, Cerebellum, Midbrain & brain stem
- 3. Blood supply & anatomy of strokes (Circle of Willis)
- 4. Spinal cord- anatomy, blood supply, nerve pathways
- 5. Pyramidal, extra pyramidal system
- 6. Development of nervous system & defects (Brief Description)
- 7. Cranial nerves course, distribution and palsies of cranial nerves and Peripheral nerves
- 8. Sympathetic nervous system, its parts and components
- 9. Parasympathetic nervous system.

(20 hours)

(10 hours)

(14 hours)

(20 hours)

Module 4. Miscellaneous:

- 1. Embryology in brief covering neuromuscular developmental aspect, Fetal & placental circulations
- 2. Endocrine system Pituitary, Thyroid, parathyroid (Brief Description)
- 3. Abdomen and pelvis (Brief descriptions only):
 - a. Peritoneum
 - b. Abdominal cavity divisions
 - c. Muscles of abdominal wall, pelvic floor, innervations
 - d. Bony Pelvis
- 4. Digestive system (Liver & pancreas, Alimentary canal)
- 5. Urinary system Kidney, Ureter, bladder, urethra
- 6. Genital system male and female

- 1. Handbook of General Anatomy, Dr. B.D. Chaurasia
- 2. Colour Atlas of Anatomy, a Photographic study of the Human Body, Roben, Johanneswetal
- 3. Text Book of Neuroanatomy by Inderbir Singh Jaypee Publications
- 4. Essentials of Human Anatomy: Neuroanatomy by A.K. Dutta, Current Book, Calcutta



Anatomy – II Second Semester Practical

Code	Credits	Teaching	Hours/	Eval	uation sch	eme
		Hours	week	Internal	External	Total
PT -201P	4	64	4	40	60	100

1. Demonstration of Bones of skull and vertebral column.

2. Stained sections of brain and spinal cord at various levels to demonstrate cranial nerve nuclei, ascending and descending tracts, thalamic nuclei and important functional areas.

3. Thorax: Chest wall, mediastinum, pleura, lungs, heart.

4. Abdomen: Anterior abdominal wall and inguinal region, external genitalia. Viscera and Posterior Abdominal wall and nerve plexus.

5. Pelvis: Pelvic viscera, blood vessels and nerves. Perineum including ischio-rectal fossa.

6. Models to demonstrate various stages of early foetus and different organ development.

- 1. Cunningham manual of practical anatomy: upper and lower limb ed 15 Vol 1 Oxford Medical Publication, Oxford 1996,
- 2. Cunningham manual of practical anatomy : Thorax and abdomen ed15 Vol II Oxford Medical Publication, Oxford 1996,
- 3. Cunningham manual of practical anatomy : Head and Neck and Brain ed 15 Vol II Oxford Medical Publication, Oxford 1996,
- 4. Rohen JW, Yokochi C, Lütjen-Drecoll E. Color atlas of anatomy: a photographic study of the human body. Schattauer Verlag; 2006.
- 5. Netter FH, Colacino S. Atlas of human anatomy. Ciba-Geigy Corporation; 1989 Sep.



Physiology – II Second Semester

Code	Credits	Teaching	Hours/	Evaluation scheme		eme
		Hours	week	Internal	External	Total
PT -202	4	64	4	40	60	100

Course objectives:

- i. To understand the Physiological functions of human body
- ii. To understand the application of physiological functions & physiology of exercise in relation to physical therapy
- iii. Major area of learning is cardio-respiratory, Musculoskeletal and nervous system.
- iv. To understand the basic physiology of Respiratory system.
- v. To understand the basic physiology of digestive system.
- vi. To understand the basic physiology of Muscular system and its contraction mechanism

Module- I

A) Respiratory System

- 1. Physiological anatomy of lungs, mechanics of respiration
- 2. Pulmonary circulation, Gas exchange in lungs
- 3. Oxygen & Carbon dioxide transport
- 4. Neural & chemical control of breathing
- 5. Regulation of respiratory activity

B) Cardio respiratory adjustments in health & disease

- 1. Exercise, high altitude
- 2. Hypoxia, Dyspnea, Apnea, hypercapnia, periodic breathing, oxygen treatment
- 3. Asthma, emphysema, artificial respiration

Module -II

Functions of Nervous system (descriptive)

- 1. Reflexes, monosynaptic, polysynaptic, withdrawal reflex & Properties
- 2. Sense organ, receptors, electrical & chemical events in receptors
- 3. Sensory pathways for touch, temperature, pain, proprioception, others
- 4. Control of tone & posture: Integration at spinal, brain stem, cerebellar, basal ganglion levels, along with their functions & clinical aspects
- 5. Autonomic nervous system & Hypothalamus
- 6. Higher functions of nervous system
- 7. Learning & memory, neocortex,
- 8. Limbic functions, sexual behavior, fear & range, motivation
- 9. Special senses (vision, audition, smell, taste)

Module -III

Digestive System

- 1. Digestion & absorption of nutrients
- 22

(16 hours)

(8 hours)

(10 hours)

(6 hours)

- 2. Gastrointestinal secretions & their regulation
- 3. Liver & Exocrine Pancreas

Endocrine System

- 1. Major Endocrine glands (pituitary, thyroid, parathyroid, adrenal, pancreas)
- 2. Secretion, Regulation, Mechanism & Function of all hormones.
- 3. Pituitary-Hypothalamic relationship

Module -IV

Renal System

- 1. Nephrons cortical and juxtamedullary. Juxta-glomerular apparatus. Glomerular membrane. Renal blood flow and its regulation. Functions of kidneys.
- 2. Mechanism of glomerular filtration. GFR normal value and factors affecting.
- 3. Clearance (renal, insulin, creatinine), Tubular reabsorption & secretion
- 4. Water excretion, concentration of urine-regulation of Na, Cl, K excretion
- 5. Physiology of urinary bladder

Reproductive System

- 1. Male Reproductive System: Functions of testes. Pubertal changes in males. Spermatogenesis. Testosterone: action. Regulation of secretion.
- 2. Female Reproductive System: Functions of ovaries and uterus. Pubertal changes in females. Oogenesis. Oestrogen and progesterone-action. regulation of secretion. Menstrual Cycle Phases, Ovarian cycle, Uterine cycle, Hormonal basis, Menarche, & Menopause.
- 3. Physiological changes during pregnancy, Functions of placenta, Lactation, Contraception methods

Text & References:

- 1. Review of Medical Physiology Ganong William F
- 2. Human Physiology C. C. Chatterjee
- 3. Textbook of Practical Physiology A.K. Jain
- 4. Text Book of Medical Physiology Guyton, Arthur C & John E. Hall



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(8 hours)

(8 hours)

(8 hours)

Physiology – II Second Semester Practical

Code	Credits	Teaching	Hours/	Eval	Evaluation scheme		
		Hours	week	Internal	External	Total	
PT -202P	2	64	4	40	60	100	

- 1. Examination of respiratory rate, pulse rate, blood pressure
- 2. Learning of lung volumes and capacities.
- 3. Spirometry to measure various lung capacities & volumes, tidal volume, VC, timed VC, IRV, IC, ERV, EC on Spirometry.
- 4. Examination of motor system, sensory system and reflex testing.
- 5. Examination of cranial nerves
- 6. Test for function of cerebrum & Cerebellum

- 1. Text book of medical physiology Guyton Arthur
- 2. Concise medical physiology Chaudhuri Sujit K.
- 3. Human Physiology Chatterjee C.C.
- 4. Text book of practical Physiology Ranade.
- 5. Text of Physiology A.K.Jain.
- 6. Basics of Medical physiology- Venkatesh D & Sudhakar H H



Electrotherapy-I Second Semester

Code	Credits	Teaching	Hours/	Eval	Evaluation scheme		
		Hours	week	Internal	External	Total	
PT -203	4	64	4	40	60	100	

Course objectives:

- i. Able to demonstrate the techniques of application of various heating electrotherapy modalities.
- ii. Able to select the appropriate heating modalities in different conditions
- iii. Able to select the appropriate dosages of different heating Electrotherapy modalities to achieve the different goals
- iv. Able to demonstrate the techniques of application of Cold & pressure for the therapeutic purposes
- v. Able to demonstrate the techniques of application of different types of radiations for the therapeutic purposes
- vi. Able to select the appropriate dosages of different electromagnetic radiations to achieve the desired goals.

Module -I

Superficial Heat

Describe the various superficial heating agents. Explain the physiological and therapeutic effects of different superficial heating agents. Identify the indication and contraindication of heat therapy. Demonstration of Application of different heating modalities- Paraffin wax bath, hydro collateral packs, contrast bath, whirlpool, fluidotherapy, electrical heating pads.

Module -II

High Frequency currents

Describe the heat production by High frequency current- SWD & MWD, Explain the Physiological and therapeutic effects of different high frequencies current, Explain the selection of different high frequencies current in different musculoskeletal conditions. Identify the indications and contraindications of different high frequencies current, Demonstrate the techniques of application of high frequencies currents, Develop the operational skills, Calculation of doses of different high frequencies current

Module -III

Cryotherapy & Mechanical Pressure

Explain Cryotherapy, Explain the physiological and therapeutic effects of Cold, Identify the indication and contraindication of Cryotherapy and Describe different methods of application of Cryotherapy.

Explain the mechanism of action of Mechanical pressure in prevention and reduction of Oedema. Explain the physiological and therapeutic effects of Mechanical pressure, Identify the indication and contraindication of Pressure application and Demonstration of different method of application of compression therapy

(16 Hours)

(16 Hours)

(16 Hours)

Module -IV Actinotherapy

(16 Hours)

Identify different types of electromagnetic rays to be used for therapeutic purposes –UVR, IRR & LASER. Describes the Wavelength, frequency, types & sources of generation, Demonstrate the techniques of irradiation, Explain the physiological and therapeutic effects, indications, contraindications, Describe the depth of penetration, Calculate the dosimetry, Illustrate the precautions, Achieve the operational skills of equipment's and patient preparation in the following

- 1. Clayton's electrotherapy theory and practice IX Edition by Angela Forester Nigel Palastanga.
- 2. Electrotherapy Simplified- Basant Kumar Nanda-2nd Edition
- 3. <u>https://www.sigvaris.com/global/en/knowledge/principles-compression-therapy?language=it</u>
- 4. Electrotherapy explained Principles and practice IV Edition by John Low& and Reed.
- 5. Principle and practice of Electrotherapy by Joseph Kahn- 2nd Edition.



Electrotherapy-I Second Semester Practical

Code	Credits	Teaching	Hours/	Eval	Evaluation scheme		
		Hours	week	Internal	External	Total	
PT -203P	2	64	4	40	60	100	

The student of Electrotherapy must be able to demonstrate the use of electrotherapy modalities applying the principles of electrotherapy with proper techniques, choice of dosage parameters and safety precautions.

- 1. Technique of treatment and application of Paraffin wax bath, Hydrocollator packs, cryotherapy, contrast bath, whirlpool bath, electrical heating pads
- 2. Technique of treatment and application of Shortwave diathermy & Microwave diathermy
- 3. Technique of treatment and application of cryotherapy & compression therapy
- 4. Demonstrate treatment techniques of IRR.
- 5. Demonstrate the technique of UVR exposure for various conditions calculation of test dose
- 6. Calculation of dosage and technique of application of LASER

- 1. Clinical Electro Therapy-by Nelson & Currier
- 2. Electrotherapy Evidence Based Practice Sheila Kitchen
- 3. Principles and Practice of Electro Therapy –by Joseph Kahn



Behavioral Foundation in Physiotherapy Second Semester

Code	Credits	Teaching	Hours/	Eval	Evaluation scheme		
		Hours	week	Internal	External	Total	
PT -204	2	32	2	20	30	50	

Course Objectives:

- i. Psychology has traditionally focused on dysfunction—people with mental illness or other issues—and how to treat it.
- ii. Positive psychology, in contrast, is a field that examines how ordinary people can become happier and more fulfilled. In this course psychology is looked from a positive perspective.
- iii. Motivation, learning, personality development etc.
- iv. A discussion of mindfulness, flow, and spirituality is framed as search for optimal experiences.

Module I

Introduction:

Structuralism, functionalism, behaviorism, Psychoanalysis, methods: Introspection, observation, inventory and experimental method, branches: pure psychology and applied psychology and physiotherapy

Growth and Development:

Life span, different stages of development (Infancy, childhood, adolescence, adulthood, middle age, old age), heredity and environment: role of heredity and environment in physical and psychological development, "Nature v/s Nurture controversy.

Motivation:

Motivation cycle (need, drive, incentive, reward), classification of motives, abraham Maslow's theory of need hierarchy, frustration and conflict, sources of frustration, management of frustration and conflict, emotions: levels of analysis of emotion (physiological level, subjective state, and overt behavior), theories of emotion, stress and management of stress, intelligence, distribution of intelligence, assessment of intelligence, Thinking: deductive and inductive reasoning, Problem solving: rules in problem solving (algorithm and heuristic), creative thinking: steps in creative thinking, traits of creative people

Module II

Learning

Factors effecting learning, theories of learning: trial and error learning, classical conditioning, Operant conditioning, insight learning, social learning theory, the effective ways to learn: Massed/Spaced, Whole/Part, Recitation/Reading, Serial/Free recall, Incidental/Intentional learning, Knowledge of results, association, organization, and mnemonic methods. **Personality:** (5 Hours)

(4 Hours)

(4 Hours)

(8 Hours)

(7 Hours)

Approaches to personality: type & trait, behavioristic, psychoanalytic and humanistic approach, personality assessment: observation, situational test, questionnaire, rating scale, interview, and projective techniques, defense Mechanisms: denial of reality, rationalization, projection, reaction formation, identification, repression, regression, intellectualization, undoing, introjection, acting out.

Mindfulness, Flow and Spirituality

(4 Hours)

Understand the importance of Mindfulness as a state of mind Living with mindfulness, Explain Flow: In search of absorption, Explain Spirituality: In search of the sacred

- 1. Morgan et al(2003). Introduction to Psychology. New Delhi: Tata McGraw hill.
- 2. Lefton(). Psychology. Boston: Alwin & Bacot Company.
- 3. Mangal, S.K (2002). Advanced Educational Psychology. New Delhi: prentice hall.
- 4. Atkinson(1996). Dictionary of Psychology
- 5. Synder, C.R., Lopez, S.J. & Pedrotti, J.T. (2011). Positive Psychology The Scientific and Practical explorations of human strengths (Second editon) Sage publications India Pvt. Ltd.
- Seligman, M.E.P. & Csikszentmihalyi, M. (2000). Positive Psychology: An Introduction. Special Issue of American Psychologist, APA, USA. DOI: 10.1037/0003-066X.56.1.89



Communications Skills Second Semester

Code	Credits	Teaching	Hours/	Evaluation scheme		
		Hours	week	Internal	External	Total
PT -205	2	32	2	20	30	50

Course Objectives:

- i. The objectives of this course are to write grammatically correct English, to develop writing skills, to understand and express meaningfully the prescribed tent.
- ii. Student able to comprehend spoken and written English for effective communication
- iii. Develop writing skills
- iv. Achieve entrepreneurship and leadership skills
- v. Describe the importance of critical thinking and teamwork, Entrepreneurship, Leadership skills.

Module -I

A. Grammar and Vocabulary

- 1. Reading Comprehension
- 2. Verb Forms, Tenses
- 3. Right Words (Synonyms, Antonyms, Homonyms and One-Word Substitutes)
- 4. Detection of Errors, Reported Speech
- 5. Precise writing, Essay, Phrases and Idioms, Transformation, Punctuation

B. Develop Communication Skills in terms of the following:

- 1. Ability to present ideas clearly, effectively and confidently, in both oral and written form.
- 2. Ability to practice active listening skills & provide feedback.
- 3. Ability to present clearly with confidence and appropriate to the level of the listener.
- 4. Ability to use technology in presentation
- 5. Ability to negotiate and reach an agreement
- 6. Ability to communicate with others from different cultures
- 7. Ability to develop interpersonal communication skills
- 8. Ability to use non-verbal skills.
- 9. Clinical application, Role Play

C. Critical Thinking and problem-solving skills

- 1. Ability to identify and analyze problems in complex and vague situations as well as to make justified evaluations.
- 2. Ability to develop and improve thinking skills such as to explain, analyze and evaluate discussions.
- 3. Ability to find ideas and alternative solutions.
- 4. Ability to think out of the box.

(4 hours)

(6 hours)

(3 hours)

- 5. Ability to make decisions based on concrete evidence.
- 6. Clinical application, Role Play
- 7. Ability to build to good relation interacts with others and work effectively with them to achieve the same objectives.
- 8. Ability to understand and interchange roles between that of a team leader and a team member.
- 9. Ability to contribute towards the planning and coordination of the team's efforts is responsible for the group's decisions.

Module -II

A. Develop Conversation and composition Skills in terms of the following: (6 hours)

- 1. Greetings and Introducing oneself
- 2. Role play
- 3. Interviews
- 4. Note Making
- 5. Resume Writing
- 6. Report Writing
- 7. Letter writing and e-Correspondence
- 8. Description of Pictures.

B. Develop the Entrepreneurial skills in terms of following: (5 hours)

- 1. The ability to identify business opportunities
- 2. The ability to outline business frameworks,
- 3. The ability to build explores and seizes business and work.
- 4. The ability to work independently.
- 5. Clinical application, Role Play

C. Develop the Leadership skills in terms of following: (5 hours)

- 1. Ability to lead a project.
- 2. Ability to understand and interchange roles between that of a team leader and a team member.
- 3. Clinical application. Role Play
- 4. Ability to supervise team members

- 1. Sherfield, R., Montgomery, R.J. & Moody, P.G. (2011). Developing Soft Skills. 3rd Edi. Pearson Education, New Delhi.
- 2. Kumar,S.S. (2010). Communication Skills and Soft Skills. Pearson Education, New Delhi
- 3. JagdishChander, 'Creative English', OxfordUniversity Press, New Delhi.

