Government of NCT of Delhi

Delhi Pharmaceutical Sciences and Research University

Sector-3, Pushp Vihar, New Delhi-17

Syllabus

For

Bachelor of Physiotherapy

(Semester System)

2018-2022

Subject Code	Subject	Teaching/ Week		Credits	Total credit hours	Examination (Marks)		
		Th	Pr			Internal	External	Total
First Semester								
BPT 101	Human Anatomy - I	5	-	5	80	20	80	100
BPT 102	Human Physiology - I	5	-	5	80	20	80	100
BPT 103	Sociology	4	-	4	64	20	80	100
BPT 104	Fundamentals of Physiotherapy-I	5	-	5	80	20	80	100
BPT 105	Yogic Sciences	2		2	32	10	40	50
BPT 106	Computer Application	2		2	32	Non-University		
BPT 101P	Human Anatomy - I	-	4	2	64	20	80	100
BPT 102P	Human Physiology - I	-	4	2	64	20	80	100
BPT 104P	Fundamentals of Physiotherapy - I	-	4	2	64	20	80	100
BPT 105P	Yogic Sciences		2	1	32	10	40	50
	Total	23	14	30	592	160	640	800
Second Semester								
BPT 201	Human Anatomy - II	5	-	5	80	20	80	100
BPT 202	Human Physiology - II	5	-	5	80	20	80	100
BPT 203	Psychology	4	-	4	64	20	80	100
BPT 204	Fundamentals of Physiotherapy - II	5	-	5	80	20	80	100
BPT 205	Biochemistry	4	-	4	64	20	80	100
BPT 206	Communication Skills	2		2	32	20	80	100
BPT 201P	Human Anatomy - II	-	4	2	64	20	80	100
BPT 202P	Human Physiology - II	-	4	2	64	20	80	100
BPT 204P	Fundamentals of Physiotherapy - II	-	4	2	64	20	80	100
	Total	25	12	31	592	180	720	900

	Subject	Teaching/ Week		Credits	Total credit hours	Examination (Marks)		
		Th	Pr			Internal	External	Total
Third Semester								
BPT 301	Pathology & Microbiology	4	-	4	64	20	80	100
BPT 302	Pharmacology	4	-	4	64	20	80	100
BPT 303	Kinesiology & Biomechanics-I	4	-	4	64	20	80	100
BPT 304	Exercise therapy-I	5	-	5	80	20	80	100
BPT 305	Electrotherapy -I	5	-	5	80	20	80	100
BPT 306	Environmental Sciences	1		1	16	10	40	50
BPT 307	First Aid & Basic Nursing	2		2	32	Non University		
BPT 303P	Kinesiology & Biomechanics-I	-	2	1	32	20	80	100
BPT 304P	Exercise therapy-I	-	4	2	64	20	80	100
BPT 305P	Electrotherapy -I	-	4	2	64	20	80	100
	Total	25	10	30	560	170	680	850
Fourth Semester								
BPT 401	Medicine	4	-	4	64	20	80	100
BPT 402	General Surgery	4	-	4	64	20	80	100
BPT 403	Obstetrics & Gynaecology	3		3	48	20	80	100
BPT 404	Kinesiology & Biomechanics-II	4	-	4	64	20	80	100
BPT 405	Exercise therapy-II	4	-	4	64	20	80	100
BPT 406	Electrotherapy -II	4		4	64	20	80	100
BPT 404P	Kinesiology & Biomechanics-II	-	2	1	32	20	80	100
BPT 405P	Exercise therapy-II	-	4	2	64	20	80	100
BPT 406P	Electrotherapy -II	-	4	2	64	20	80	100
	Total	23	10	28	528	180	720	900

Subject Code	Subject	Teaching/ Week		Credits	Total credit hours	Examination (Marks)		
		Th	Pr			Internal	External	Total
Fifth Semester								
Theory								
BPT 501	Clinical Orthopaedics-I	3	-	3	48	20	80	100
BPT 502	Physiotherapy in Orthopaedics-I	4	-	4	64	20	80	100
BPT 503	Physiotherapy in General Medical & Surgical conditions-I	4	-	4	64	20	80	100
BPT 504	Research Methodology & Biostatistics -I	3	-	3	48	20	80	100
BPT 505	Clinical Cardiothoracic Conditions	3		3	48	20	80	100
BPT 506	Radiology & Radiodiagnosis	1		1	16	Non-University		
Practical								
BPT 501P	Clinical Orthopaedics-I	-	2	1	32	10	40	50
BPT 502P	Physiotherapy in Orthopaedics-I	-	4	2	64	20	80	100
BPT 503P	Physiotherapy in General Medical & Surgical conditions-I		2	1	32	20	80	100
BPT 505P	Clinical Cardiothoracic Conditions		2	1	32	20	80	100
	Clinical Training Hours (3hrs/day X 80days)							
	Total	18	10	23	448	170	680	850
Sixth Semester								
Theory								
BPT 601	Clinical Orthopaedics-II	3	-	3	48	20	80	100
BPT 602	Physiotherapy in Orthopaedics-II	4	-	4	64	20	80	100
BPT 603	Physiotherapy in General Medical & Surgical conditions-II	4	-	4	64	20	80	100
BPT 604	Research Methodology & Biostatistics -II	3		3	48	20	80	100
BPT 605	Professional Ethics & Administration	3		3	48	10	40	50
Practical								
BPT 601P	Clinical Orthopaedics-II	-	2	1	32	10	40	50
BPT 602P	Physiotherapy in Orthopaedics-II	-	4	2	64	20	80	100
BPT 603P	Physiotherapy in General Medical & Surgical conditions-II		2	1	32	20	80	100
	Clinical Training Hours (3hrs/day X 80days)							
	Total	17	8	21	400	140	560	700

Subject Code	Subject	Teaching /Week		Credits	Total credit hours	Examination (Marks)		
		Th	Pr			Internal	External	Total
Seventh Semester								
Theory								
BPT 701	Clinical Neurology & Neurosurgery-I	3	-	3	48	20	80	100
BPT 702	Physiotherapy in Neurological Conditions -I	4	-	4	64	20	80	100
BPT 703	Physiotherapy In Cardiothoracic & Cardiopulmonary Conditions-I	4	-	4	64	20	80	100
BPT 704	Physiotherapy In Sports-I	3	-	3	48	20	80	100
BPT 705	Community based Rehabilitation & Bioengineering-I	2	-	2	32	20	80	100
Practical								
BPT 701P	Clinical Neurology & Neurosurgery -I	-	2	1	32	10	40	50
BPT 702P	Physiotherapy in Neurological Conditions-I	-	4	2	64	20	80	100
BPT 703P	Physiotherapy In Cardiothoracic & Cardiopulmonary Conditions-I	-	2	1	32	20	80	100
BPT 704P	Physiotherapy In Sports-I	-	2	1	32	20	80	100
BPT 705P	Community based Rehabilitation & Bioengineering -I		2	1	32	20	80	100
	Clinical Training Hours (3hrs/day X 80days)							
	Total	16	12	22	448	190	760	950
Eighth Semester								
Theory								
BPT 801	Clinical Neurology & Neurosurgery-II	3	-	3	48	20	80	100
BPT 802	Physiotherapy in Neurological Conditions –II	4	-	4	64	20	80	100
BPT 803	Physiotherapy In Cardiothoracic & Cardiopulmonary Conditions-II	4	-	4	64	20	80	100
BPT 804	Physiotherapy In Sports-II	3	-	3	48	20	80	100
BPT 805	Community based Rehabilitation & Bioengineering -II	2	-	2	32	20	80	100
BPT 806	Project Work	-	-	-	-	20	80	100
Practical								
BPT 801P	Clinical Neurology & Neurosurgery –II	-	2	1	32	10	40	50

BPT 802P	Physiotherapy in Neurological Conditions-II	-	4	2	64	20	80	100
BPT 803P	Physiotherapy In Cardiothoracic & Cardiopulmonary Conditions-II	-	2	1	32	20	80	100
BPT 804P	Physiotherapy In Sports-II	-	2	1	32	20	80	100
BPT 805P	Community based Rehabilitation & Bioengineering -II		2	1	32	20	80	100
	Clinical Training Hours (3hrs/day X 80days)							
	Total	16	12	22	448	210	840	1050

Subject Code	**Subject**	**Teaching/ Week**		**Credits**	**Total credit hours**	**Examination (Marks)**		
		Th	**Pr**			**Internal**	**External**	**Total**
Ninth Semester								
BPT 901	Rotatory Internship	---	928	29	928	(8hrs/day X 152Days)		
BPT 902	Internship project		288	9	288			
	Total		1216	38	1216			

First Semester
Human Anatomy – I

Subject code: BPT 101

Course objectives:
Understanding of gross anatomy of various body parts of Human body. Applications of knowledge of anatomy to learn evaluation and application of physical therapy. Major emphasis of learning is towards Musculo-skeletal, cardio-respiratory and nervous system.

Module I : General Anatomy

- Introduction to Anatomy, terms and terminology
- Regions of Body, cavities and Systems outline.
- Surface anatomy – nerve, muscle, skeleton, major blood vessels and cardiopulmonary
- Cell Structure and function of cell organelles (Brief outline only).
- Connective tissue & its modification, tendons, membranes, cartilage.
- Bone structure, blood supply, growth, ossification, and classification.
- Muscle classification, structure and functional aspect.
- Nerve – structure, classification, microscopy with examples.
- Neurons, classification with examples. Simple reflex arc.
- Parts of a typical spinal curve/Dermatome
- Skin and skin appendages
- Joints – classification, structures of joints, movements, range, limiting factors, stability, blood supply, nerve supply, dislocations and applied anatomy.
- Circulatory system – major arteries and veins of the body, structure of blood vessels
- Lymphoid system – circulation + function, lymphoid organs- and their structure & functions.

Module II : Upper extremity

- Osteology (Clavicle, scapula, humerus, radius, ulna, carpals, metacarpals, phalanges)
- Joints – structure, range of movement
- Soft Parts- Brest, 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.
- Muscles – origin, insertion, actions, nerve supply of all muscles.
- Major nerves – course, branches and implications of nerve injuries
- Major vessels – course and implications of pathological event
- Development of limb bones, muscles and anomalies
- Arches of the Hand, skin of palm, and dorsum of the hand
- Radiographic identification of bone and joints

Module III : Lower Extremity

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

- Joints – structure, range of movement
- Soft parts- 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
- Muscles – origin, insertion, actions, nerve supply
- Major nerves – course, branches and implications of nerve injuries
- Major vessels – course and implications of pathological event
- Development of limb bones, muscles and anomalies
- Arches of foot, skin of the foot
- Radiographic identification of bone and joints

Practical:

Surface anatomy

- Identification and Description of surface landmarks on Human Specimen/ human model
- The emphasis to be laid on surface marking for - -bones, muscles and ligaments
- Surface anatomy of major nerves, arteries of the limbs.

Bones: Identification of Bones of

- Upper limb: Clavicle, Scapula, Humerus, Radius, Ulna, Carpals, Meta Carpals and Phalanges in articulated hand.
- Lower limb: Hip bone, Femur, Tibia, Fibula, Patella, Tarsal's, Meta Tarsal's and Phalanges.

Muscles

- Name and locate musculoskeletal structures on a skeleton
- Origin and Insertion of different muscles
- Main functions of muscles

Applied Anatomy

- Applied aspect of ossification, bones, joints and muscles
- Points of palpation of nerves and arteries

Reference Books:

1. Handbook of General Anatomy, Dr. B.D. Chaurasia
2. Colour Atlas of Anatomy, a Photographic study of the Human Body, Roben, Johanneswetal
3. Gray's Anatomy, M. Berry, Lawrence H. Bannister
4. Text Book of Anatomy (3 vol.), B.D. Chaurasia
5. Textbook of Anatomy by Inderbir Singh; 4th edition; Jaypee Publications
6. Cunningham Manual of Practical Anatomy-Vol-1, 2, 3 by G J Romanes Churchill Livingstone
7. McMinn's- A colour atlas of human anatomy, Mosby

First Semester
Human Physiology – I

Subject code: BPT 102

Course objectives:

- To understand the Physiological functions of human body
- To understand the application of physiological functions & physiology of exercise in relation to physical therapy
- Major area of learning is cardio-respiratory, Musculo-skeletal and nervous system.

Module I : Organization of Human Body

- General Physiology: Introduction to Human Body
- Cell: Morphology. Organelles: their structure and functions, Transport Mechanisms across the cell membrane
- Tissue level of organization
- Body fluids: Distribution, composition.
- Homeostasis

Module II : Principles of Support & Movement

- Function of Bone & Skeletal System
- Structure of a bone and bone tissue
- Formation, function, Blood and nerve supply of a bone tissue
- Ossification of a bone
- Classification of Joints: fibrous, cartilaginous and fibrous
- Structure of synovial joint and ranges of different synovial joints
- Muscle tissue & its types, morphology, mechanism of muscle contraction, EC coupling
- Muscle properties and functions
- Electrical & Mechanical responses & their basis
- Concept of isometric & isotonic muscle contraction and relaxation of skeletal muscle fibres, muscle metabolism and production of ATP in muscle fibres
- Control of muscle tension: motor units and their recruitment
- Types of skeletal muscle fibres
- Neuromuscular junction, structure & events occurring during excitation-contraction coupling
- Myasthenia gravis, rigor mortis,

Module III : Nervous tissue

- Nerve cell – structure
- Genesis of membrane potential, Action potential & propagation
- Ionic basis of nerve conduction
- Classification & types of nerve fiber
- Mixed nerves & compound action potential
- Concept of nerve injury, degeneration and regeneration
- Synaptic & Junction Transmission
- Basic synaptic anatomy

- Synaptic activity, Chemical transmission
- Inhibition & facilitation
- Principal neurotransmitter system
- Regeneration and repair of nervous tissue

Module IV : Blood

- Introduction: Composition and functions of blood.
- Formation of blood cells
- Plasma: Composition, formation, functions. Plasma proteins, Starling Forces & formation of oedema
- W.B.C., R.B.C., Platelets formation & functions
- Haemoglobin –structure, function and derivatives anemia (in detail), types of Jaundice. Blood indices, PCV, ESR.
- Blood Groups, Erythroblastosis foetalis, Haemostasis, Immunity

Module V : Cardiovascular System

Introduction: Physiological anatomy and blood and nerve supply of the heart

- Organisation of CVS. Cardiac muscles: Structure. Ionic basis of action potential and pacemaker potential. Properties.
- Anatomical, biophysical consideration of arterial, capillary, venous and Lymphatic circulation
- Arterial Blood Pressure: Definition. Normal values and its variations. Determinants. Peripheral resistance. Regulation of BP.
- Basic idea of Electrocardiogram
- Mechanical events of Cardiac cycle, Cardiac output, its regulation
- Local & systemic regulatory mechanisms of CVS, humeral & neural
- Lymph: Composition, formation, circulation and functions
- Specific resistance: Immunity
- Cerebral, coronary, splanchnic, skin, Hepatic circulation

Practical

Haematology

Study of microscope, Hb, RBC, WBC, Blood groups, BT & CT

Clinical examination of cardiovascular system:

Heart sounds, Pulse rate, Blood Pressure etc.

Reference Books:

1. Manual of Practical Physiology, A.K. Jain
2. Review of Medical Physiology, Ganong
3. Text Book of Medical Physiology, Guyton, Arthur C & John E. Hall
4. A text book for Medical students, R.L. Bijlani

First Semester
Sociology

Subject code: BPT 103

Course Objectives:
To understand sociological aspects in health and disease
To understand sociological impact of disability and measures to address adverse situations

Module I
Definition and scope of Sociology

- Its relation with Anthropology, Psychology, Social Psychology and ethics
- Methods of Sociology-case study, Social Survey, Questionnaire, interview and opinion poll methods
- Importance of its study with special reference to health care professionals
- Social Factors in Health and Disease
- Socialization - Meaning and nature, Primary, Secondary, and Anticipatory Socialization and Agencies of Socialization
- Social Groups – Concept, influence of formal and informal groups on health and sickness and role of groups in the hospital and rehabilitation settings

Module II

- Family - Meaning and definition, Functions, family Patterns, influence of family on the individual health, family, and nutrition, effects of sickness on family and psychosomatic disease and their importance to Physiotherapy
- Community – (Rural community & Urban community – Meaning and features and health hazards)

Module III

- Culture and Health – Concept, cultures and behavior, cultural meaning of sickness and culture and health disorders
- Social change - Meaning & Factors of social change
- Human adaptation and social change, Social change and stress, deviance, and health Program,
- The role of social planning in the improvement of health and in rehabilitation

Module IV

- Social problems of disabled - Consequences of the social problems in relation to sickness and disability, remedies to prevent these problems
- Population explosion, Poverty and unemployment, Beggary, Juvenile delinquency, Prostitution, Alcoholism,
- Problems of women in employment

Module V

- Social Stratification- caste, class, gender
- Social security - Social security and social legislation in relation to the disabled
- Social worker - Meaning of social work; the role of a medical social worker

Reference Books:

- Sociology for Physiotherapists by Dibyendunarayana Bid, 1st edition, Jaypee Publication.
- Introduction to Sociology, Vidya Bhusan & DP Sachdeva
- An introduction to sociology by - Sachdeva and Bhushan, 32nd Edition, Kitab Mahal Publication.
- Textbook of Sociology for Physiotherapy Students by KP Neeraja, 1st Edition, Jaypee Publication

First Semester
Fundamentals of Physiotherapy- I

Subject Code: BPT104

Course Objectives:

- This course will enable the student to understand the basic principles of biomechanics
- To understand basic principles of exercise therapy and its effects
- This course will enable the student to understand the basic electricity & electronics
- To understand functioning and application of electrical and electronic equipment used in physiotherapy

Module I

- Mechanics - Definition of mechanics and Biomechanics
- Force - Definition, diagrammatic representation, classification of forces, concurrent, coplanar and co-linear forces, composition and resolution of forces, angle of pulls of muscle
- Momentum - principles, and practical application
- Friction
- Gravity - Definition, line of gravity, Centre of gravity

Module II

- Equilibrium - Supporting base, types, and equilibrium in static and dynamic state
  Levers - Definition, function, classification and application of levers in physiotherapy & order of levers with example of lever in human body
- Pulleys - system of pulleys, types and application
- Elasticity - Definition, stress, strain, HOOKE'S Law
- Springs - properties of springs, springs in series and parallel, elastic materials in use

Module III

- Normal Posture - definition & description, static and dynamic, alignments of various joints, centre of gravity, planes & muscular moments, and Analysis of posture
  Movements - Anatomical definition and description, Movements and exercise as therapeutic modality and their effects, Physiological reaction of exercise
- Starting positions - Description and muscle work, Importance of fundamental and derived types, Effects and uses of individual positions

Module IV

- Massage- History, definition, types and their rationale, general
- effects, local effects on individual (physiological effects) and uses,
- contra-indications and techniques of application

Module V

- DC Currents -Modern concept of electricity: fundamental electric charges (proton and electron), bound and free electrons, free electrons and current, static electric charge, charging of an object potential and capacitance, potential difference and EMF
- A.C. currents: Sinusoidal wave from, frequency, wavelength, Amplitude and phase of a sine wave, Average & RMS value of a sine wave

Module VI

- Quantity of electricity, magnitude of current, conductors and insulators, resistance of conductor and Ohm's law, resistances in series and parallel
- Capacitors: Electric field around a capacitor, charging and discharging a capacitor, types of capacitor with application of each in Physiotherapy department
- Rheostat: series and shunt Rheostat with application of each in the Physiotherapy department
- Effects of electric Current: Thermal effect, chemical effect (ionization) and magnetic effect. Electric shock, Earth shock, causes and its prevention

Practical

- Demonstration of Bioelectrical principles
- Demonstration of electrotherapy instruments, principles of their functioning, usage, and safety
- implications for human beings
- Demonstration and practice of , posture, starting and derived positions
- Demonstration and practice of Massage techniques

Reference Books

1. Therapeutic Massage, Holey, E. and Cook, E.
2. Practical Exercise Therapy, Hollis, M. and Cook, P.F.
3. Principles of Exercise Therapy, Gardiner, Dena M.
4. Clinical Kinesiology for Physical Therapy, Lippert, Lynn
5. Introduction to Physical Therapy, Paliarulo, M. A.
6. Human Movement Explained, Jones and Barker
7. Measurement of Joint Motion, Norkin
8. Clayton's Electrotherapy:Theory and Practice, Froster, A. and Palastanga, N.
9. Electrotherapy Explained: Principles, Jhon, Low and Ann, Reed
10. Clinical Electrotherapy Nelson, R.M. and Currier, D.P.
11. Physical Agents in Rehabilitation, Chemeron, M.H.
12. Thermal Agents in Rehabilitation , Michlovitz, S L

First Semester
Yogic Sciences

Subject code: BPT 105

Course Objectives:
The students will be able to appreciate the role of yoga in their day to day life. The course has fo cus on basic concept of yoga, ashtanga yoga and its effect, various kinds of asanas and pranayam a and different aspects of mudra.

Module I : Introduction of Yoga
- Etymology of Yoga
- Concept of Chitta and Chitta Bhumis
- General introduction to four paths of Yoga
- Importance of Nadi & Chakra in Yoga

Module II : Ashtanga Yoga: Purpose, Significance and Effects
Eight limbs of Yoga as per Yogasutra of Patanjali – Discipline/self restraint (Yama), Observance (Niyama), Posture (Asana), Restraint of breath/exercises of life force (Pranayama), Abstraction of senses/Introversion-of attention (Pratyahara), Concentration (Dharna), Meditation(Dhyana) and Super conscious state/illumination (Samadhi)

Module III : Asana and Pranayama
- Introduction of Asanas
- Benefits and Contra-indication of Asanas
- Define and understand the concept of Prana & Pranayama
- Benefits and Contra-indication of Pranayama
- Physiological effect of Pranayama

Module IV : Shatkarma, Mudra and Bandh
- Introduction of Mudra
- Benefits and Contra-indication of Mudra
- Introduction of Bandh
- Benefits and Contra-indication of Bandh
- Introduction of Shatkarma
- Benefits and Contra-indications of Shatkarma

Module V :
- Yoga Nidra (The Conscious Dynamic Sleep),
- Meditation Technique
- Cause of Pain (Dukha) according to Yog Sutra of Patanjali
- Yogic lifestyle (Ahara, Vihar, Achar, Vichar),
- Yogic attitudes (Maitri, Karuna, Mudita and Upeksha) and practices for Mental Wellbeing.

Practical

Asana - Sukshma Vyayam (Joints Movement)

Backward Bending Asanas

- Sarpasana (snake pose)
- Bhujangasana (cobra pose)
- Ardha Shalabhasana (half locust pose)
- Shalabhasana (locust pose)
- Dhanurasana (bow pose)
- Kandharasana (shoulder pose)

Forward Bending Asanas

- Paschimottanasana (back stretching pose)
- Janu Sirshasana (head to knee pose)
- Pada Hastasana (forward bending pose)

Meditation Asanas

- Sukhasana (easy pose)
- Padmasana (lotus pose)

Vajrasana Group of Asanas

- Vajrasana (thunderbolt pose)
- Padadhirasana (breath balancing pose)
- Shashank Bhujangasana (striking cobra pose)
- Ustrasana (camel pose)

Digestive/Abdominal Asanas

- Pawanmuktasana
- Uttanpadasana (raised legs pose)
- Nukasana (boat pose)

Standing Asanas

- Akarna Dhanurasana (bow and arrow pose)
- Tadasana (palm tree pose)
- Tiryaka Tadasana (swaying palm tree pose)
- Kati Chakrasana (waist rotating pose)
- Dwikonasana (double angle pose)
- Trikonasana (triangle pose)

Spinal Twisting Asanas

- Bhu Namanasana (spinal twist prostration pose)
- Shava Udarakarshanasana (universal spinal twist)
- Ardha Matsyendrasana (half spinal twist)

Balancing Asanas

- Ek Pada Pranamasana (one-legged prayer pose)
- Natarajasana (Lord Shiva's pose)

Relaxation Asanas

- Shavasana (corpse pose)

Advanced Asanas

- Chakrasana (wheel pose)
- Brahmacharyasana (celibate's pose)

Pranayama

- Narishodhan (psychic network purification)
- Ujjayi (psychic breath)
- Kapalbhati (frontal brain cleansing breath)
- Bhastrika (bellows breath)
- Bharamri (humming bee breath)
- Surya Bhedi (vitality stimulating breath)
- Chandra Bhedi
- Sheetali (cooling breath)

Bandh

- Jalandhara Bandh(throat lock)
- Uddiyan Bandh (abdominal contraction)
- Moola Bandh (perineum contraction)
- Maha Bandh (great lock)

Mudra

- Giyan Mudra (chin mudra)
- Hridaya Mudra (heart gesture)
- Bhoochri Mudra (gazing into nothing)
- Yoga Mudra (Attitude of psychic union)
- Shambhavi Mudra (eyebrow centre gazing)

Shat-karma

- Kapalbhati
- Neti, Jala (nasal cleaning with water)
- Agnisara (activating the digestive fire)

Reference Books

1. Asana Pranayama Mudra Bandha by Swami Satyananda Saraswati. Publisher: Yoga Publication Trust, Munger, Bihar, India
2. Karma Yoga, Bhakti Yoga, Raja Yoga, JnanaYoga by Swami Vivekananda
3. Yoga Nidra by Swami Satyananda Saraswati. Publisher: Yoga Publication Trust, Munger, Bihar, India
4. Yoga Sutras of Patanjali by Swami Venkateshananda Publisher: Motilal Banarsidass Publishers Private Limited, New Delhi, India
5. Hatha Yoga by Swami Sivananda. Publisher: The Divine Life Society, Uttarakhand, India
6. Gheranda Samhita by Swami Niranjanananda Saraswati. Publisher: Yoga Publication Trust, Munger, Bihar, India

First Semester
COMPUTER APPLICATIONS
(Non -University)

Subject code: BPT 106

Course Objectives:
The students will be able to appreciate the role of Computer technology. The course has focus on computer organization, computer operating system and software, and MS Windows, word processing, excel data worksheet and PowerPoint presentation.

Module I
Introduction to computer: Introduction, characteristics of computer, block diagram of computer, computer languages.

Module II
Input output devices: Input devices (keyboard, point and draw devices, data scanning devices, digitizer, electronic card reader, voice recognition devices, vision input devices), output devices (monitors, pointers, plotters, screen image projector, voice response systems).

Module III
Processor and memory: The central Processing Unit CPU, Main memory.

Module IV
Introduction of Operating System: introduction, operating system concepts, types of operating system. History of Windows, features, desktop, taskbar, icons on the desktop, operation with folder, creating shortcuts, operation with windows opening, closing, moving, resizing, minimizing and maximizing etc. and install different software.

Module V
Introduction to MS Word: Complete menu of the MS-word, Basic shortcut keys for MS- Word

Module VI
Introduction to excel: Introduction, about worksheet, entering information, saving workbooks and formatting, printing the worksheet, creating graphs, macron, tables, basic formulas/ Functions (Sum, count, average, logical operators), forting and filteration, Gridlines, Merge, basic short cut keys for MS- Excel.

Module VII
Introduction to PowerPoint: Introduction, creating and manipulating presentation, views, formatting and enhancing text slide with graphs.

Module VIII
Internet and its applications: Definition, brief history, basic services email, File transfer protocol, telnet, the World Wide Web (WWW), www browsers, use of the internet. Computer networks: introduction, types of network (LAN, MAN, WAN, Internet, Intranet), network topologies (star, ring, bus, mesh, tree, hybrid), components of network.

Reference Books:

1. Fundamentals of computer by V. Rajaraman, Neeharika Adabala
2. Computer Fundamentals by Anita Goel
3. Introduction to computer Science: a textbook for beginners in informatics by Gilbert Brands

Second Semester
Human Anatomy – II

Subject code: BPT 201

Course objectives:

- Understanding of gross anatomy of various body parts.
- Application of knowledge of anatomy to learn evaluation and application of physical therapy.
- Major emphasis of learning is towards Musculo-skeletal, cardio-respiratory and nervous system.

Module I : Spine

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

Module II : Thorax

- Thoracic cage, Pleural cavities & pleura
- Lungs and respiratory tree
- Heart and great vessels
- Diaphragm

Module III : Neural anatomy

- Mandible and bones of the skull.
- Muscles of the face and neck and their nerve and blood supply-extra ocular muscles, triangles of the neck Central nervous system – disposition, parts and functions of
- Cerebrum, Cerebellum, Midbrain & brain stem
- Blood supply & anatomy of strokes (Circle of Willis)
- Spinal cord- anatomy, blood supply, nerve pathways
- Pyramidal, extra pyramidal system
- Development of nervous system & defects (Brief Description)
- Cranial nerves – special emphasis on V, VII, X, XI, XII (course, distribution and palsies)
- Peripheral nerves
- Sympathetic nervous system, its parts and components
- Parasympathetic nervous system.

Module IV : Miscellaneous

- Embryology in brief covering neuromuscular developmental aspect, Foetal & placental circulations
- Endocrine - system – Pituitary, Thyroid, parathyroid (Brief Description)
- Special senses (Brief Description): Nerve receptors, Eye, Ear, Labyrinth, Nose, Tongue
- Abdomen and pelvis (Brief descriptions only):
- Abdominal cavity – divisions

- Muscles of abdominal wall, pelvic floor, innervations
- Bony Pelvis
- Digestive system (Liver & pancreas, Alimentary canal)
- Urinary system – Kidney, Ureter, bladder, urethra
- Genital system – male and female

Practical:

Surface anatomy

- Identification and Description of surface landmarks of spine, ribs, skull on Human Specimen/ human model
- The emphasis to be laid on surface marking for - -bones, muscles and ligaments

Bones: Identification of Bones of

- Spine: Cervical spine, thoracic spine, lumber spine & Sacrum.
- Ribs, Skull and mandible

Muscles

- Name and locate musculoskeletal structures on a skeleton
- Origin and Insertion of different muscles of back, abdomen, pelvic floor

Neuroanatomy

- Demonstration and identification of Different parts of brain, spinal cord

Visceral Anatomy

- Demonstration and identification of parts of Different Viscera

Reference Books:

1. Handbook of General Anatomy, Dr. B.D. Chaurasia
2. Colour Atlas of Anatomy, a Photographic study of the Human Body, Roben, Johanneswetal
3. Gray's Anatomy, M. Berry, Lawrence H. Bannister
4. Text Book of Anatomy (3 vol.), B.D. Chaurasia
5. Textbook of Anatomy by Inderbir Singh; 4th edition; Jaypee Publications
6. Cunningham Manual of Practical Anatomy-Vol-1, 2, 3 by G J Romanes Churchill Livingstone
7. McMinn's- A colour atlas of human anatomy, Mosby

Second Semester
Human Physiology – II

Subject code: BPT 202

Course Objective:
This course aims at imparting an understanding of the physiological functions of the systems of human body with special emphasis on Respiratory, nervous, Renal and Digestive system. The physiological principles in the practice of physical therapy.

Module I: Autonomic nervous system

Module II: Higher functions of nervous system
Learning & memory, neocortex, limbic functions, sexual behaviors, fear & rage, motivation– brief idea.
Special senses,

- Vision: Functional anatomy of eye ball. Functions of cornea, iris, pupil, aqueous humor – glaucoma, lens – cataract, vitreous humor, rods and cones. Visual Pathway and the effects of lesions. Refractive Errors: myopia, hypermetropia, presbyopia and astigmatism, Visual Reflexes, Visual acuity and Visual field.
- Audition: Physiological anatomy of the ear. Functions of external ear, middle ear and inner ear. Structure of Cochlea and organ of corti. Auditory pathway. Types of Deafness. Tests for hearing.
- Taste: Taste buds. Primary tastes. Gustatory pathway.
- Smell: Olfactory membrane. Olfactory pathway.
- Vestibular Apparatus: Crista ampullaris and macula. Functions, Disorders

Arousal mechanisms & sleep

Module III: Male & female reproductive system
Anatomy of male reproductive organs, Sex determination, functions of testes. Pubertal changes in males. Spermatogenesis, Testosterone: action, Regulation of secretion.
Female Reproductive System: Functions of ovaries and uterus. Pubertal changes in females, Oogenesis. oestrogen and progesterone-action, regulation of secretion. Menstrual Cycle

Module IV: Respiratory System
Physiological anatomy of lungs, mechanics of respiration
Pulmonary circulation, Gas exchange in lungs, Oxygen & Carbon dioxide transport
Other function of respiratory system
Neural & chemical control of breathing
Regulation of respiratory activity, non-chemical influences on respiratory activity.
Cardio respiratory adjustments in health & disease:
Exercise, high altitude, deep sea diving
Hypoxia, hypercapnia, hypocapnia, oxygen treatment
Asthma, emphysema, artificial respiration

Module V: Renal System
Renal circulation
Glomerular filtration rate, clearance, Tubular function
Water excretion, concentration of urine-regulation of Na+, Cl-, K+ excretion
Diuretics
Physiology of urinary bladder
Difference of tonicity, volume & pH of body fluids

Module VI: Digestive System & Endocrinology
Digestion & absorption of lipids, carbohydrates, proteins, nucleic acids, water, electrolytes, vitamins & minerals
Gastrointestinal secretions & their regulation
Liver & Exocrine Pancreas

Practical

1. Clinical examination of respiratory system, respiratory rate, respiratory sounds by using stethoscope etc
2. Clinical examination of higher functions.
3. Clinical examination of sensory system.
4. Clinical examination of motor system

Reference Books:

1. Manual of Practical Physiology, A.K. Jain
2. Review of Medical Physiology, Ganong
3. Text Book of Medical Physiology, Guyton, Arthur C & John E. Hall
4. A text book for Medical students, R.L. Bijlani

Second Semester
Psychology

Subject code: BPT 203

Course Objectives:

- This course will enable the student to understand specific psychological factors and effects in physical illness and this will help them to have a holistic approach in their dealings with patients during admission, treatment, rehabilitation and discharge.

Module I

Introduction to Psychology

- Definition and nature of Psychology, Fields & subfields of psychology.
- Schools of thoughts – Structuralism, functionalism, Behaviorism, Gestalt, Psycho-analytic Theory
- Developmental Psychology : Definition & its Theories - Physiological and psychological changes during Infancy, Early & Late childhood, adolescent stage, Puberty, adulthood & old age

Module II

- Learning – Definition and theories, conditioning, Role of learning in human life
- Memory- theories of memory and forgetting, thinking & methods to improve memory
- Attention & perception- Nature of attention, Nature of perception, Principle of grouping
- Thinking – process, problem solving, decision making and creative thinking

Module III

- Motivation - theories and types of Motivation
- Emotions - theories of Emotions and stress
- Attitudes – theories, attitudes and behavior, factors in attitude change
- Intelligence - theories of intelligence

Module IV

- Personality, theories of personality, factors influencing personality
- Development and growth of behavior in infancy and childhood, adolescence, adulthood and old age
- Behavior - normal and abnormal

Module V

- Counseling - Definition, Aims and principles
- Psychotherapy – brief introduction to paradigms in psychopathology and therapy
- Psychological need of children and geriatric patients
- Communication – effective and faulty

Module VI

- Psychological disorders
- Anxiety Disorders
- Eating disorders
- Somatoform and Dissociate Disorders
- Personality Disorder
- Stress and health
- Severe psychological disorders – Mood disorders, psychosis
- Mental deficiency - Mental retardation, Learning disabilities & Autistic behavior

Reference Books:

1. Introduction to Psychology, Morgan, C. T. et al
2. Hilgard's Introduction to Psychology, Atkinson, Rital et al
3. Feldman, R.S. Understanding Psychology, Tata McGraw Hill Publication
4. Health Psychology, Howard S.Friedman & M. Robin Diamatteo
5. Social Psychology, Baron, Robertj A. & Donn Byrine

Second Semester
Fundamentals of Physiotherapy- II

Subject Code: BPT 204

Course Objectives:

- This course will enable the student to understand the basic principles of hydrodynamics, Gaits, along with the functioning & application of the biomechanical instruments.
- To understand basic electronics system and magnetism used in physiotherapy

Module I

Hydrostatics and Hydrodynamics:

- History, Properties of water, Specific gravity,
- Hydrostatic pressure
- Archimedes principle, Buoyancy-law of floatation
- Effect of buoyancy on movements performed in water
- Equilibrium of a floating body, Bernoulli's theorem
- Physiological effects of exercise in water

Hydrotherapy:

- Indication, contraindication, benefits, dangers and precautions
- Hydrotherapy regimes of exercises,
- Hydrotherapy exercise for all age groups
- Types of pools and baths

Module II

Suspension Therapy:

• Principles of suspension & types
• Components
• Effects and uses & therapeutic application

Module III

Normal Gait - definition & description, alignments, centre of gravity during gait cycle, planes & muscle acting mechanisms, pattern, characteristics Normal gait cycle, temporal & spatial variables, & determinants of Gait

Module IV

Aims and scope of various biomechanical modalities – shoulder wheel, shoulder ladder, shoulder pulleys, pronator-supinator instrument, static cycle, rowing machine, ankle exerciser, balancing board, springs, weights

Module V

Magnetism: Magnetic - non-magnetic substances and their properties, properties of magnet, molecular theory, poles of magnet and its properties, magnetic lines of force and their properties, Electromagnetism, magnetic effects of electric current, Electromagnetic induction, Lenz's law, Inductor and Inductance types of inductor, reactance and impedance.

Module VI

- Thermionic Valves: Thermionic emission, Diode and Triode valves and their characteristics, Construction and application of Cathode Ray Oscilloscope
- Semiconductor Devices: Intrinsic and extrinsic semiconductors, advantages of diode and transistors devices. Basing of Diode and their characteristics, Light Emitting Diodes, integrated circuits
- Electronic Circuits: Rectifiers & smoothing circuits, Oscillators - Sinusoidal and non-sinusoidal types
- A.C. AND D.C. meters: Functions and applications of Ammeter and volt meters, Ohmmeters, Wheat stone bridge
- Introduction to Therapeutic Energies – Thermal, Mechanical, Electrical, Electromagnetic and magnetic - Definition, description, physiological effects, pathological effects and dangers

Practical

- Demonstration of Bioelectrical principles
- Demonstration of electrotherapy instruments, principles of their functioning, usage, and safety
- implications for human beings
- Demonstration of suspension principles of their functioning, usage, and safety
- implications for human beings
- Demonstration of hydrotherapy principles of their functioning, usage, and safety
- implications for human beings
- Demonstration of physiotherapy equipments, principles of their functioning, usage, and safety
- implications for human beings

Reference Books

1. Aquatic Exercise Therapy, Bates, Andrea and Hanson, Norm
2. Practical Exercise Therapy, Hollis, M. and Cook, P.F.
3. Principles of Exercise Therapy, Gardiner, Dena M.
4. Clinical Kinesiology for Physical Therapy, Lippert, Lynn
5. Introduction to Physical Therapy, Paliarulo, M. A.
6. Human Movement Explained, Jones and Barker
7. Tidy's Physiotherapy, Thomson, Ann
8. Measurement of Joint Motion, Norkin
9. Clayton's Electrotherapy:Theory and Practice, Froster, A. and Palastanga, N.
10. Electrotherapy Explained: Principles, Jhon, Low and Ann, Reed
11. Clinical Electrotherapy Nelson, R.M. and Currier, D.P.
12. Physical Agents in Rehabilitation, Chemeron, M.H.
13. Thermal Agents in Rehabilitation , Michlovitz, S L

Second Semester
Biochemistry

Subject code: BPT 205

Course Objectives:
To have firm foundations in the fundamentals and applications of current chemical theories for the physical world. A general understanding of the major types of biochemical molecules, including small, large and super-molecular components found in cells. To understand basic energy metabolism of cells.

Module I

a) Cell Biology - Brief description of cell structure and its various components
b) Carbohydrates
   1. Chemistry-Definition, Classification With Examples & Functions of Carbohydrates.
   2. Reducing Properties Of Sugars Of Clinical & Diagnostic Importance (Eg.Benedict's Test, Banfood`s Test Etc)
   3. Metabolism-Digestion & Absorption of Carbohydrates, glycolysis, Aerobic, Anaerobic, Energetics & Regulation
   4. Kreb`s Cycle-Its Energetics & Regulation- Role of T.C.A. Cycle, Glycogenesis, Glycogenolysis & Their Regulation, Glyconeogenesis-Significance Of H.M.P. Shunt
   5. Hormonal Regulation of Blood Sugar Levels-Important Metabolic Disorders of Glycogen, Lactose Intolerance, Diabetes Mellitus.

Module II

1. Proteins - Chemistry-Definition-Function-Classification of Amino Acids-Protein Structure-Effect of Temperature on Proteins-Denaturation-Coagulation Isoelectric Ph & Its Importance.
2. Lipids - Chemistry-Definition-Classification-[Including Fatty Acids with Examples]-Function.
3. Nucleic Acids - D.N.A.,R.N.A.-Definition-structure & function-types-Genetic Code-Catabolism of purine –Gout

Module III

a) Enzymes - Definition- Enzymes, Co-Enzymes, Isozymes -Classification-Factors Affecting the activity. General Mechanism of Enzymes, Inhibition & Types Of Inhibitors, Iso-Enzymes, Clinical & Therapeutic Use Of Enzymes
b) Vitamins- Water & Fat Soluble-Definition-Classification, -Sources of Individual Vitamins , Co-Enzyme Forms & Function, Reaction Related To Metabolism, RDA-Deficiency & Toxicity

Module IV

a) Minerals : Phosphate, Calcium, & Iron [In Details]; Magnesium, Flouride, Zinc, Copper, selenium molybdenum, Iodine-sources, RDA. Functions & disorders of minerals
b) Acid- Base Balance, Water & Electrolyte : Body Water, Ph-osmolarity extra & intra cellular fluid, Buffers-Ph, buffer system In blood, Role of kidneys & lungs in acid-base balance, Water- electrolyte balance imbalance-dehydration

Module V

Nutrition : Importance of Nutrition-Calorimetry-Energy Value-Calorimeter-Respiratory Quotient & Its Significance, Nitrogen Balance & Its Significance-Protein Energy Malnutrition-Kwashiorkor & Marasmus.

Reference Books:

1. Vasudevan And Sree Kumar, Text Book of Bio Chemistry for Medical students, Jaypee Brothers,
2. Murray Robert KK, Harper's Bio Chemistry, Prentice Hall.
3. Debajyothi Das, Biochemistry, Academic Publishers Calcutta
4. Review of Biochemistry by Harper

Second Semester
Communication Skills

Subject code: BPT 206

Course Objectives:

This course will prepare the young Physiotherapy student to interact effectively with doctors, nurses, dentists, and other health workers. At the end of this course the student will get the soft skills set to work cohesively with the team as a team player and will add value to the physiotherapy profession.

Module-I

- Communication Skills: Introduction, Definition, The Importance of Communication, The Communication Process – Source, Message, Encoding, Channel, Decoding, Receiver, Feedback, Context
- Barriers to communication: Physiological Barriers, Physical Barriers, Cultural Barriers, Language Barriers, Gender Barriers, Interpersonal Barriers, Psychological Barriers, Emotional barriers
- Perspectives in Communication: Introduction, Visual Perception, Language, Other

Module -II

- Elements of Communication: Introduction, Face to Face Communication - Tone of Voice, Body Language (Non-verbal communication), Verbal Communication, Physical Communication
- Communication Styles: Introduction, The Communication Styles Matrix with example for each -Direct Communication Style, Spirited Communication Style, Systematic Communication Style, Considerate Communication Style.

Module -III

- **Basic Listening Skills:** Introduction, Self-Awareness, Active Listening, Becoming an Active Listener, Listening in Difficult Situations
- **Effective Written Communication:** Introduction, When and When Not to Use Written Communication - Complexity of the Topic, Amount of Discussion' Required, Shades of Meaning, Formal Communication
- **Writing Effectively:** Subject Lines, Put the Main Point First, Know Your Audience, Organization of the Message

Module -IV

Interview Skills: Purpose of an interview, Do's and Dont's of an interview • Giving Presentations: Dealing with Fears, Planning your Presentation, Structuring Your Presentation, Delivering Your Presentation, Techniques of Delivery

Module -V

Group Discussion: Introduction, Communication skills in group discussion, Do's and Dont's of group discussion

Reference Books:

1. Basic communication skills for Technology, Andreja. J. Ruther Ford, 2nd Edition, Pearson Education, 2011
2. Communication skills, Sanjay Kumar, Pushpalata, 1st Edition, Oxford Press, 2011
3. Organizational Behaviour, Stephen .P. Robbins, 1st Edition, Pearson, 2013
4. Brilliant- Communication skills, Gill Hasson, 1st Edition, Pearson Life, 2011 Page 15 of 21
5. The Ace of Soft Skills: Attitude, Communication and Etiquette for success, Gopala Swamy Ramesh, 5th Edition, Pearson, 2013
6. Developing your influencing skills, Deborah Dalley, Lois Burton, Margaret, Green hall, 1st Edition Universe of Learning LTD, 2010
7. Communication skills for professionals, Konar nira, 2nd Edition, New arrivals – PHI, 2011
8. Personality development and soft skills, Barun K Mitra, 1st Edition, Oxford Press, 2011
9. Soft skill for everyone, Butter Field, 1st Edition, Cengage Learning india pvt.ltd, 2011
10. Soft skills and professional communication, Francis Peters SJ, 1st Edition, Mc Graw Hill Education, 2011
11. Effective communication, John Adair, 4th Edition, Pan Mac Millan,2009
12. Bringing out the best in people, Aubrey Daniels, 2nd Edition, Mc Graw Hill, 1999

Third Semester
Pathology & Microbiology

Subject Code: BPT 301

Course Objectives:

- This course will enable the students to acquire the knowledge of concepts of cell injury, healing process, Etio-pathogenesis, the pathological effects & the clinico --pathological correlation of common infections &non-infectious diseases.
- Correlate normal & altered morphology of different organ systems in different diseases needed for understanding disease process & their clinical significance
- At the end of the Microbiology course, the candidate will have sound knowledge of the agents responsible for causing human infections

Section-A Pathology

Module I : Cell injuries

Aetiology and Pathogenesis with a brief recall of important aspects of normal cell structure. Reversible cell injury-Types, Sequential changes, Cellular swellings, vacuolation, Hyaline changes, Mucoid changes. Irreversible cell injury-Types of Necrosis & Gangrene, Autolysis. Pathologic calcification- Dystrophic and Metastatic. Intracellular Accumulations - Fatty changes, Protein accumulations, Glycogen accumulations, Pigments - Melanin / Hemosiderin. Extra cellular accumulations: Amyloidosis - Classification, Pathogenesis, Pathology including special stains.

Module II : Inflammation and Repair

Acute inflammation: features, causes, vascular and cellular events. Inflammatory cells and Mediators. Chronic inflammation: Causes, Types, Classification nonspecific and granulomatous with examples. Repair, Wound healing by primary and secondary union, factors promoting and delaying the process.

Module III : Immunopathology

Immune system, Hypersensitivity: type and examples, antibody and cell mediated tissue injury, Secondary immunodeficiency including HIV infection. Auto-immune disorders: Basic concepts and classification.

Module IV : Infectious diseases

- Mycobacterial diseases: Tuberculosis, Leprosy and Syphilis.
- Bacterial disease: Pyogenic, Diphtheria, Gram negative infection, Bacillary dysentery.
- Viral diseases: Poliomyelitis, Rabies, Measles, HIV infection.
- Fungal disease and opportunistic infections.
- Parasitic diseases: Malaria, Filaria, Amoebiasis, Kala-azar.

Module V: Cardio-respiratory system & Circulatory Diseases

Atherosclerosis -Ischemic heart diseases– myocardial infarction – Pathogenesis / Pathology Hypertension, Congestive Cardiac Failure, Pericarditis, Cardiomyopathy, Rheumatic Heart Disease, Infective endocarditis, Peripheral vascular diseases

Respiratory system : COPD, Pneumonia (lobar, broncho, viral), T.B. Primary, secondary – morphologic types, complications, Lung collapse – atelectasis Hyperemia/Ischemia and Haemorrhage,

Module VI : Musculoskeletal System

Osteomyelitis, tuberculosis, mycetoma, Metabolic diseases: rickets/Osteomalacia, osteoporosis, Hyperparathyroidism, Paget's disease,

Tumours Classification: Benign, Malignant, Metastatic and synovial sarcoma.
Arthritis: Suppurative, Rheumatoid, Osteoarthritis, Gout.

Module VII : Neuropathology

TB Meningitis, Pyogenic Meningitis, viral meningitis and Brain Abscess, CNS Tumors, Neuroblastoma, Meningioma, Medulloblastoma, Multiple Sclerosis, stroke,
Neuropathies (Carcoat Marie Tooth's disease, Compression and entrapments, diabetic, G.B syndrome), Myasthenia Gravis

Section-B Microbiology

Module I : General Microbiology

Definitions: infections, parasite, host, vector, fomite, contagious disease, infectious disease, epidemic, endemic, pandemic, Zoonosis, Epizootic, Attack rate. Normal flora of the human body.

Routes of infection and spread- endogenous and exogenous infections; source at reservoir of infections. Essentials of bacterial growth requirements.

Sterilization, disinfection and universal precautions in relation to patient care and disease Prevention, Definition of asepsis, sterilization, disinfection.

Antimicrobials: Mode of action, interpretation of susceptibility tests, resistance spectrum of activity.

Module II : Immunology

Basic principles of immunity immunobiology: lymphoid organs and tissues. Antigen, antibodies, antigen and antibody reactions with relevance to pathogenesis and serological diagnosis. Humoral immunity and its role in immunity, Cell mediated immunity, Immunology of hypersensitivity, Measuring immune functions.

Module III : Bacteriology & Virulogy

Morphology, pathogenicity & lab diagnosis of Staphylococci, Streptococci & Neisseria. Morphology, pathogenicity & lab diagnosis of Coryne bacterium diphtheria, clostridium tetani, E. coli, Klebsiella, Pseudomonas, Shigella, Salmonella, V. Cholera. M. tuberculosis., M. leprae, Spirochaetes.

Classification, cultivation of Viruses& methods for diagnosis of viral infections, Morphology transmission clinical syndromes, Laboratory diagnosis & Prevention of HIV, Hepatitis, polio, measles.

Module IV :Mycology & Parasitology

Morphological classification & general lab Diagnosis, Definition, causative Agents & lab Diagnosis of mycetoma, Aspergillosis & Candidiasis. List of parasites affecting CNS, on short about lab diagnosis of malaria, Filarial.

Reference Books

1. Text book of pathology: Harshmohan
2. General systemic pathology: Churchill Livingstone
3. Text book of Pathology: Robbins
4. Textbooks of Microbiology – by R. Ananth Narayan& C. K. Jayram Panikar
5. Text book of microbiology by Chakraborthy

Third Semester
Pharmacology

Subject Code: BPT 302

Course Objectives:

This course introduces the student to basic pharmacology of common drugs used, their importance in the overall treatment including Physiotherapy. The student after completing the course will be able to understand the general principles of drug action and the handling of drugs by the body. The student will be aware of the contribution of both drug and physiotherapy factors in the outcome of treatment.

Module I : General Pharmacology

Introduction, Definitions, Classification of drugs, Sources of drugs, Routes of drug administration, Distribution of drugs, Metabolism and Excretion of drugs Pharmacokinetics, Pharmacodynamics, Factors modifying drug response, Adverse effects.

Module I : Autonomic Nervous system

- General considerations – The Sympathetic and Parasympathetic Systems, Receptors, Somatic Nervous System
- Cholinergic and Anti-Cholinergic drugs, Adrenergic and Adrenergic blocking drugs, Peripheral muscle relaxants.

Module II : Cardiovascular Pharmacology

- Drugs used in the treatment of heart failure: Digitalis, Diuretics, Vasodilators, ACE inhibitors Antihypertensive Drugs: Diuretics, Beta Blockers, Calcium Channel Blockers, ACE Inhibitors, Central Acting Alpha Agonists, Peripheral Alpha Antagonists, Direct acting Vasodilators
- Antiarrhythmic Drugs
- Drugs used in the treatment of vascular disease and tissue ischemia : Vascular Disease, Hemostasis Lipid-Lowering agents, Antithrombotics, Anticoagulants and Thrombolytics Ischemic Heart Disease – Nitrates, Beta-Blockers, Calcium Channel Blockers, Cerebral Ischemia Peripheral Vascular Disease.

Module III : Neuropharmacology

- Sedative-Hypnotic Drugs: Barbiturates, Benzodiazepines
- Antianxiety Drugs: Benzodiazepines, Other Anxiolytics
- Drugs Used in Treatment of Mood Disorders: Monoamine Oxidase Inhibitors, Tricyclic Antidepressants, Atypical Antidepressants
- Antipsychotic drugs

Module IV : Disorders of Movement

- Drugs used in Treatment of Parkinson ‘s disease
- Antiepileptic Drugs
- Spasticity and Skeletal Muscle Relaxants

Module V: Inflammatory/Immune Diseases

- Non-narcotic Analgesics and Nonsteroidal Anti-Inflammatory Drugs: Acetaminophen, NSAIDs, Aspirin, Nonaspirin NSAIDs, drug Interactins with NSAIDs
- Glucocorticoids: Pharmacological Uses of Glucocorticoids, adverse effects, Physiologic Use of Glucocorticoids
- Drugs Used in Treatment of Arthritic Diseases: Rheumatoid Arthritis, Osteoarthritis, Gout
- Drugs Used in the Treatment of Neuromuscular Immune/Inflammatory Diseases: Myasthenia gravis, Idiopathic Inflammatory Myopathies, systemic lupus Erythematous, Scleroderma, Demyelinating Disease
- Respiratory Pharmacology: Obstructive Airway Diseases, Drugs used in Treatment of Obstructive airway Diseases, Allergic Rhinitis

Module VI : Digestion and Metabolism

Gastrointestinal Pharmacology: Peptic Ulcer Disease, Constipation, Diarrhea Drugs Used in Treatment of Diabetes Mellitus: Insulin, Oral Hypoglycemic

Reference Books:

1. Essential of Medical Phramacology by Tripathi
2. Text book of Medical Pharmacology by Padmaja udaykumar
3. Lippincott's Pharmacology.

Third Semester
Kinesiology & Biomechanics -I

Subject code: BPT 303

Course objectives:

- To describe movement precisely, using well-defined terms (kinematics)
- To consider the role of force in movement (kinetics).
- To develop knowledge about joint structure, muscle and their functions.

Module I: Basic Concepts in Biomechanics:
Kinematics and Kinetics

- Motion- Types of Motion, Location of Motion, Direction of Motion, Magnitude of Motion, Objects in Motion
- Force- Definition of Forces, Force of Gravity, Reaction forces Concurrent force systems, Parallel force system ,Force components
- Equilibrium- Types of Equilibrium, factors affecting equilibrium
- Force of friction
- Work
- Moment arm of force
- Axis Planes
- Levers

Module II: Joint structure and Function

- Basic principles of joint design and Materials used in human joints.
- General properties of connective tissues
- Human joint design
- Joint function
- Joint motion
- General effects of disease, injury and immobilization.

Module III: Muscle structure and function

- Mobility and stability functions of muscles
- Elements of muscle structure
- Muscle function
  - Types of muscle contraction and muscles work.
  - Classification of muscles and their functions.
  - Group action of muscles, co-ordinated movement.

Module IV: Biomechanics of the Shoulder Complex –
Describe the structural components of the shoulder complex including the articulating surfaces, capsular attachments and ligaments and movements of the following joints:

- Sternoclavicular
- Acromioclavicular
- Scapulothoracic
- Glenohumeral

Module V: Biomechanics of the Elbow Joint
The elbow complex: Structure and function of the elbow joint – humeroulnar and humeroradial articulations, superior and inferior radioulnar joints; mobility and stability of the elbow complex.

Module VI: Biomechanics of the wrist and hand complex
The wrist and hand complex: Structural components and functions

Module VII : Ergonomic
Ergonomics in home activity
Ergonomic modification and rehabilitation of work related issues.
Office Ergonomics

Practical
Various assessment and evaluation techniques for above mentioned should be demonstrated and practiced by the students

Reference Books:

1. Joint Structure & Function by Cynthia C Norkin
2. Brunnstrom's clinical kinesiology-Smith-F.A Davis
3. Basic biomechanics explained-Low & reed- Butterworth Heinmann
4. Kinesiology-Applied to pathological motion-SoderbergLippit

Third Semester
Exercise Therapy I

Subject code: BPT 304

Course Objectives:
At the end of the course, the candidate will be able to describe the physiological & Therapeutic uses, merits /demerits of various exercise modes, demonstrate various therapeutic exercises on self & acquire the application skill on models, Acquire the skill of assessment of isolated & group muscle strength, & Range of motion of the joints subjectively & objectively.

Module I : Passive movements
• Definition
• Relaxed, forced and stretching type.
• Indications, contraindications, advantages and Techniques of passive movements of different joints.

Module II : Active movements
• Free, assisted and resisted Movements
• Indication, contraindications, advantages and techniques of active exercises of different joints.
• Special emphasis on: Shoulder flexion, extension, abduction & adduction, elbow flexion, extension, wrist dorsiflexion, planter flexion, radial deviation, ulnar deviation, hip flexion, extension, abduction, adduction, knee flexion, knee extension, ankle planter flexion, dorsi flexion.
• Clinical methods of strengthening of various muscle groups.

Module III : Goniometry
• Measurement of joints range of motion in normal and disease condition of all upper extremity and lower extremity.
• Different techniques of goniometry.
• Limb length measurements

Module IV : Manual Muscle Testing
• Concept, introduction, significance and limitations.
• Grade systems
• Techniques of Muscle testing.
• Emphasis on skills to grade individual muscles of upper extremity, lower extremity, neck and trunk muscles including trick movements.

Module V: Muscle Stretching
• Stretching – definition, effects and uses of stretching, indications, contra indications, general techniques & group stretching techniques
• Special emphasis on stretching of: Sternocleidomstoid, trapezius, Pectoral major, biceps brachii, triceps brachii, long flexors of fingers, extensors of finger, ilio-psoas, quadriceps, hamstrings, ilio-tibial band, hip abductors, hip adductors, gastrocnemius-soleus, evertors.

Practical

1. Demonstration and learning of active & passive movements of Limbs and spine
2. Demonstration and practice of Manual Muscle testing, Goniometry
3. Demonstration and practice of muscle stretching techniques
4. Demonstration and practice of muscle strengthening techniques

Reference Books:

1. Therapeutic Massage, Holey, E. and Cook, E.
2. Practical Exercise Therapy, Hollis, M. and Cook, P.F.
3. Principles of Exercise Therapy, Gardiner, Dena M.
4. Clinical Kinesiology for Physical Therapy, Lippert, Lynn
5. Introduction to Physical Therapy, Paliarulo, M. A.
6. Human Movement Explained, Jones and Barker
7. Tidy's Physiotherapy, Thomson, Ann
8. Measurement of Joint Motion, Norkin
9. Physical Agents in Rehabilitation, Chemeron, M.H.
10. Thermal Agents in Rehabilitation , Michlovitz, S L

Third Semester
Electrotherapy I

Subject code: BPT 305

Course Objectives:
At the end of the course, the candidate will be able to describe the Production &Physiological effects, Therapeutic uses, merits, demerits indication &contraindications of various low/medium Frequency Currents modes. Acquire the skill of Application of the Electro therapy modes on electrotherapy equipment for the purpose of Assessment &Treatment.

Module I
Medical Instrumentation For Physical Therapy: Brief description of generation, circuit diagrams and testing

Module II
Low frequency currents:
Nerve Muscle Physiology: brief outline
Faradic current:
Indications, contraindications, Techniques, parameters, Group muscle stimulation.
Faradic footbath, Faradism under pressure and muscle re-education.
Dosimetry

Galvanic current:
• Indications, contraindications, precautions and therapeutic effects of stimulation.
• Techniques, parameters, Dosimetry

Electro-Diagnosis:
• S. D. Curve, Reaction of degeneration, Chronaxie & Rheobase
• Outline of EMG & Nerve conduction velocity

Iontophoresis:
• Definition and principles & factors
• Indications, effects, techniques, contraindications, precautions and Potential harmful effects.

TENS therapy:
• Principle of therapy, Parameters and therapeutic uses.
• Theories of pain and pain control.
• Indications and contra-indications, Dosimetry

Module III
Medium frequency currents:
Definitions, effects, indications, techniques of application, contraindications
Interferential therapy:
• Physiological, therapeutic effects & dangers, Indications & contra indications
• Technique and method of applications, Dosimetry

Module IV
Infrared Therapy:
• Therapeutic effects and uses, Techniques of application.
• Indications, contraindications precautions and Potential harmful effects.

Heating Modalities:
• Therapeutic effects and uses, Techniques and applications
• Indications, contraindications, precautions and Potential harmful effects of various heat modalities:
Paraffin wax bath therapy, Hydro collator packs, Whirlpool and moist heat Heating pads, Hot air chambers.

Cold-therapy:
• Indications, contraindications and therapeutic effects.
• Technique, precautions and Potential harmful effects of treatment, Dosimetry

Module V
Traction instruments:
Rationale, technique, indications, contraindications, precautions of electric traction equipment.

Practical

- Demonstration of Electrical Modalities functioning & Usage.
- Demonstration and practice of various motor point stimulations.
- Demonstration and practice of therapeutic application of different low frequency currents.
- Demonstration and practice of Reaction of degeneration, SD curves plotting.
- Demonstration and practice of therapeutic application of the following modalities
- Wax bath, Hydro collator, Electric muscle stimulator, Interferential currents, TENS, and Electrical Traction.

Reference Books:

1. Clayton's Electrotherapy:Theory and Practice, Froster, A. and Palastanga, N.
2. Electrotherapy Explained: Principles, Jhon, Low and Ann, Reed
3. Clinical Electrotherapy Nelson, R.M. and Currier, D.P.
4. Thermal Agents in Rehabilitation, Michlovitz, S L
5. Physical Agents in Rehabilitation, Chemeron, M.H.

Third Semester
Environmental Sciences

Subject code: BPT 306

Course Objectives:
Upon completion of the course the student shall be able to Create the awareness about environmental problems among learners, Impart basic knowledge about the environment and its allied problems, Develop an attitude of concern for the environment, Motivate learner to participate in environment protection and environment improvement, Acquire skills to help the concerned individuals in identifying and solving environmental problems and Strive to attain harmony with Nature.

Module-I
The Multidisciplinary nature of environmental studies
Natural Resources
Renewable and non-renewable resources:
Natural resources and associated problems

a) Forest resources; b) Water resources; c) Mineral resources; d) Food resources; e) Energy resources; f) Land resources: Role of an individual in conservation of natural resources.

Module-II
Ecosystems: Concept of an ecosystem, Structure and function of an ecosystem. Introduction, types, characteristic features, structure and function of the ecosystems: Forest ecosystem; Grassland ecosystem; Desert ecosystem; Aquatic ecosystems (ponds, streams, lakes, rivers, oceans, estuaries).

Module -III
Environmental Pollution: Air pollution; Water pollution; Soil pollution

Reference Books:

1. Y.K. Sing, Environmental Science, New Age International Pvt, Publishers, Bangalore Page 19 of 19
2. Agarwal, K.C. 2001 Environmental Biology, Nidi Publ. Ltd. Bikaner.
3. Bharucha Erach, The Biodiversity of India, Mapin Pu blishing Pvt. Ltd., Ahmedabad – 380 013, India,
4. Brunner R.C., 1989, Hazardous Waste Incineration, McGraw Hill Inc. 480p
5. Clark R.S., Marine Pollution, Clanderson Press Oxford
6. Cunningham, W.P. Cooper, T.H. Gorhani, E & Hepworth, M.T. 2001, Environmental Encyclopedia, Jaico Publ. House, Mumbai, 1196p
7. De A.K., Environmental Chemistry, Wiley Eastern Ltd.
8. Down of Earth, Centre for Science and Environment

Third Semester
First Aid & Basic Nursing
(Non-University)

Subject code: BPT 307

Course Objectives:

1. To Know The importance of First aid in Physiotherapy and utilize the nursing process to provide individualized care to clients and significant support persons throughout the lifespan.
2. To Know the principles of client care management in the delegation of basic nursing procedures to qualified assistive personnel.

Module I

- Instrumentation used in First Aid (First Aid kit) & Examination of Vital Signs, First aid of Emergencies (Snake & animal bites, Poisoning, Electric shock, Hypovolemic Shock, Traumatic accidents, Cardiac arrest, Burns, spinal cord injuries & fractures)
- Indications, assessment and Technique of Cardio-pulmonary resuscitation
- Artificial ventilation & Basic life support

Module II

- Introduction and nursing principles of Nursing, Bandaging extremities: triangular bandages & their application Environment safety
- Bed Rest & Mobility - Bed making (Prone, lateral dorsal, dorsal recumbent, fowler's position , Comfort measures, Aid to rest & sleeps, Transfers, Basic turns , Lifting patients up in the bed : transferring from bed to wheelchair, Transferring from bed to stretcher)

Module III

- Observation & Nourishment - Providing for patients elimination , Giving & taking bed pan, urinal: observation of stools, urine
- Observation of sputum - Understand use & case of catheters
- Methods of giving nourishment - Feeding tube, feeding drips, transfusions
- Care of rubber goods , Observation, reporting & recording temperature, respiration & pulse simple aseptic techniques, sterilisation & disinfection, Surgical dressing, Parential administer of medicine

Reference Books:

- Wellness and Physical Therapy, Fair, S.E. 1st Edition
- Primary Care for the PT: Exam & Triage Boissonnault, W. 2nd Edition , Guidelines for Exercise Testing & Prescription, ACSM, 9th Edition
- Resource Manual for Guidelines for Exercise Testing and Prescription, ACSM, 7th Edition
- Ewles, L. & Simnett, I. (2003) , Promoting Health. A practical guide. (5^{th} ed). Ediburgh Ballière Tindall.
- First aid in emergency – St. John. Ambulance Association.
- Surgical & Medical Procedures for Nurses & Paramedical staff – Nathan.
- First aid & management of general injuries & common ailments-Gupta & Gupta.

Fourth Semester
Medicine

Subject code: BPT 401

Course Objectives:
This subject follows the basic science subjects to provide the knowledge about relevant aspects of general medicine. The student will have a general understanding of the diseases the therapist would encounter in their practice. The objective of this course is that discussion the student will be able to list the etiology, pathology, clinical features and treatment methods for various medical conditions.

Module I : Infection
Effects of Infection on the body, Pathology, source and spread of infection, vaccinations, generalized infections, rashes and infection, food poisoning and gastroenteritis, sexually transmitted diseases, HIV infections and Aids.
Poisoning: Clinical features, general management, common agents in poisoning, pharmaceutical agents, drugs of misuse, chemical pesticides, Envenomation.

Module II : Food and Nutrition
Assessment of Nutritional and Energy requirements; clinical features and treatment of Deficiency diseases, Protein Energy Malnutrition, Obesity and its related disorders: Causes, Complications, benefits of weight loss, management of Obesity, diet, exercise and medications.

Module III : Endocrine diseases
Etiology and pathogenesis, Common presenting symptoms, Diagnosis and management of the disease; Diabetes Mellitus, hypo and hyperthyroid, hypo-parathyroid

Module IV : Diseases of the blood
Etiology and pathogenesis, Common presenting symptoms, Diagnosis and management of the disease anemia, Hemophilia, Leukaemia, complications due to repeated hemorrhages, complications due to therapy.

Module V : Diseases of the digestive system
Etiology, clinical features, diagnosis, complications and treatment of the following conditions : Reflux Oesophagitis, Achlasia Cardia, Carcinoma of Oesophagus, GI bleeding, Peptic Ulcer disease, Carcinoma of Stomach, Pancreatitis, Malabsorption Syndrome, Ulcerative Colitis, Peritonitis, Infections of Alimentary Tract
Etiology, clinical features, diagnosis, complications and treatment of the following conditions: Viral Hepatitis, Wilson‘s Disease, Alpha1-antitrypsin deficiency, Tumors of the Liver, Gall stones, Cholycystitis.

Module VI : Diseases of the Skin
Causes, clinical features and management of the following skin conditions: Leprosy, Psoriasis, Pigmentary Anomalies, Vasomotor disorders, Dermatitis, Coccal and Fungal Parasitic and Viral infections.

Module VII : Pediatrics

Problems and management of LBW infants, Perinatal problems and management, Congenital abnormalities and management, Respiratory conditions of childhood,

Cerebral Palsy – causes, complications, clinical manifestations, treatment ; Spina Bifida – management and treatment, Epilepsies – types, diagnosis and treatment; Recognizing developmental delay, common causes of delay ;

Orthopedic and Neuromuscular disorders in childhood, clinical features and management ; Sensory disorders – problems resulting from loss of vision and hearing ; Learning and behavioural problems – Hyperactivity, Autism, Challenging behaviours, Educational delay, The Clumsy Child.

Reference Books:

Davidson's Principles & Practice of Medicine, Haslett Et al

Harrison's Principles of Internal Medicine, Edited by Dennia L. Kasper Et al

Fourth Semester

General Surgery

Subject code: BPT 402

Course Objectives:

The candidate will able to learn the basic science subjects to provide the knowledge about relevant aspects of general surgery, general understanding of the surgical conditions the therapist would encounter in their practice and will be able to list the indications for surgery, etiology, clinical features and surgical methods for various conditions.

Module I

Definition, Causes, Classifications, clinical evaluation, complications & management(in brief) in Wounds, Gangrene , Scars, Ulcers, Boils and Carbuncles

Module II

Reasons for Surgery; Types of anaesthesia and its effects on the patient ; Types of Incisons; Clips Ligatures and Sutures ; General Thoracic Procedures, Endoscopy – types, Biopsy – uses and types. Overview and Drainage systems and tubes used in Surgery. Blood Transfusion

Module III

Causes, Clinical Presentation, Diagnosis and treatment of the following Thoracic Trauma situations – Airway obstruction, Pnuemothorax, Hemothorax, Cardiac Tamponade, Tracheobronchial disruption, Aortic disruption, Diaphragmatic disruption, Esophageal disruption, Cardiac and Pulmonary Contusions.

Thoracic surgeries – Thoracotomy – Definition, Types of Incisions with emphasis to the site of insision, muscles cut and complications. Lung surgeries : Pnumonectomy, Lobectomy, segmentectomy; Thoracoplasty, Pleurectomy, Pleurodesis and Decortication of the Lung.

Cardiac surgeries – An overview of the Cardio-Pulmonary Bypass Machine – Extracardiac Operations, Closed Heart surgery, Open Heart surgery. Transplant Surgery – Heart, Lung

Module IV

Diseases of the Arteries and Veins : Definition, Etiology, Clinical features, signs and symptoms, complications, management and treatment of following diseases : Arteriosclerosis, Atherosclerosis, Aneurysm, Buerger's disease, Raynaud's Disease, Thrombophlebitis, Deep Vein Thrombosis, Pulmonary Embolism, Varicose Veins.

Module V

Definition, Indication, Incision, Physiological changes and Complications following Common operations like Cholecystectomy, Colostomy, Ileostomy, Gastrectomy, Hernias,Appendicectomy Mastectomy, Neprectomy, Prostectomy.

Module VI

Surgical Oncology – Cancer – definition, types, clinical manifestations of cancer, Staging of Cancer, surgical procedures involved in the management of cancer.
Burn: Definition, Classification, Causes, Prevention, Pathological changes, Complications, Clinical Features and Management. Skin Grafts – Types, Grafting Procedures, Survival of Skin Graft ; Flaps – Types and uses of Flaps.
Plastic Surgery : Principles of plastic surgery Post-operative management, and Complications

Module VII

ENT: Common problems of ear, otitis media, Otosclerosis, functional achonia and deafness, management facial palsy classification, medical and surgical management of lower motor neuron type of facial palsy.

Reference books:

1. General Surgical Operations – by Kirk / Williamson
2. Surgery by Nan
3. Bailey and Love's – Short Practice of Surgery
4. Chest Disease by Crofton and Douglas.
5. Patrica A Downie, Text book of Heart, Chest Vascular Disease for physiotherapists, JP Bros.
6. Standard surgrical techniques- Shriram Bhatt

Fourth Semester
Obstetrics & Gynaecology

Subject code: BPT 403

Course objectives:

- To understand common gynecological conditions and procedures (in brief)
- To understand implications of gynecological conditions and procedures on physical therapy

Module I

Gynaecology and Obstetrics

History taking, Basic principles of clinical examination, investigation, diagnosis, prognosis of female reproductive system disorders, Birth control, Reproduction, Menstruation and its disorders

Module II

Physiological changes during pregnancy, Complications in pregnancy, Labour and its stages & delivery, Prenatal and post-natal care, Antenatal care, Antenatal assessment of foetal well - being , Abortion and birth control

Module III

- Pelvic inflammatory diseases and management, Prolapse uterus, urinary incontinence, causes & management, Surgical considerations in obstetrics and gynecology, Special considerations (previous history of C- section,
  Rh –, elderly primigravida , Grand multipara) , Bad obstetric history

- Term (newborn infant, low birth weight baby) , Diseases of the fetus and newborn , Musculo-skeletal problems in an obstetric patient and its management, Genital malignancies
- Aids to diagnosis in obstetrics.

Reference Books:

1. Gynaecology and Obstetrics in Health care of a woman by Seymoul L, Romney Mary Jane Gray. J.A Merrill
2. Shaw's Text Book Gynaecology
3. Jeffcoat's Principles of Gynaecology

Fourth Semester
Kinesiology & Biomechanics -II

Subject code: BPT 404

Course objectives:

- To understand the mechanics of the human body
- To understand various forces acting on body and the body response to them
- Implementation of the concept of biomechanics to the various disorders

Module I : Biomechanics of the Thorax and Chest wall -

- General structure and function
- Rib cage and the muscles associated with the rib cage
- Ventilatory motions: its coordination and integration

Module II : Biomechanics of the Hip Complex

Describe the general features of the hip joint including the articulating surfaces on the pelvis and the femur, angulations, angle of inclination, angle of torsion, internal architecture of femur and pelvis, joint capsule, ligaments and muscles (Flexors, Extensors-One joint extensors, two extensors, Adductors, medial rotators and lateral rotators).

Module III : Biomechanics of the Knee complex

Describe the structure of the Knee complex biomechanics, articulating surfaces on femur and tibia, the menisci, joint capsule and bursa, ligaments and other supporting structures, anterior-posterior and ligaments and mediolateral stability, muscle structure, knee flexors and extensors, axes of knee complex: Mechanical axes, anatomic axis and axis of motion.

Module IV: Biomechanics of the Ankle and foot complex

Describe the structure, ligaments, axis and function of the following: ankle joint, tibiofibular joints, subtalar joints, talocalcaneonavicular joints, transverse tarsal joint, tarsometatarsal joint, plantar arches, metatarsophalangeal joints, interphalangeal joints.

Define the terminology unique to the ankle foot complex, including inversion-eversion, pronation-supination, dorsiflexion, plantar flexion and adduction and abduction.

Module V: The Vertebral Column

- Articulations, ligaments & muscles, typical & atypical vertebrae & intervertebral disc
- Regional structure & curves of vertebral column & function of cervical, dorsal, lumbar & sacral vertebrae.
- Describe the muscles of the vertebral column. Flexors & extensors, rotators & lateral flexors
- Mechanics of intervertebral disc
- Motions of vertebral column
- Lumbar- pelvic rhythm

Module VI: Posture

- Posture: Definition, factors responsible for posture.
- Static and dynamic posture.
- Postural control
- Kinetics and kinematics of posture
- Ideal posture analysis of posture

Module VII : Gait

- Description of normal gait, determinants of gait, spatio temporal features, and analysis.
- Gait deviation: Types, causative factors and analysis.

Practical :

Various assessment and evaluation techniques for above mentioned should be demonstrated and practiced by the students

Reference Books:

1. Joint Structure & Function by Cynthia C Norkin
2. Brunnstrom's clinical kinesiology-Smith-F.A Davis
3. Basic biomechanics explained-Low & reed- Butterworth Heinmann
4. Kinesiology-Applied to pathological motion-Soderberg Lippit

Fourth Semester
Exercise Therapy II

Subject code: BPT 405

Course Objectives:
At the end of the course, the candidate will be able to describe the physiological & Therapeutic uses, merits /demerits of various exercise modes, demonstrate various therapeutic exercises on self & acquire the application skill on models, Acquire the skill of assessment of isolated &group muscle strength, & Range of motion of the joints subjectively & objectively.

Module I
Relaxation:
• Description of fatigue and spasm & factors.
• General causes, signs and symptoms of fatigue
• Techniques of Relaxation- local and General with indication
• Rationale of relaxation Techniques.

Module II
Joint Mobility:
• Joint range, stiffness, range and limitations
• Accessory movements- glides, traction and approximation
• Mobilization of peripheral joint, techniques and grading in detail.

Module III
Re-education of muscles:
• Concept, technique, spatial and temporal summation.
• Various reduction techniques and facilitating methods.
• Progressive strengthening of various muscle groups in Grade-I-Grade IV.
• Muscle strengthening techniques
• PNF - Principles of PNF, indications, contra indications, techniques, limb patterns

Module IV
Co-ordination:
• Balance – static and Dynamic
• Discoordination: LMNL & UMNL, cerebellar lesion, loss of kinesthetic sense (Tabes dorsalis, leprosy, syringomyelia)
• Re -education of balance and coordination: PNF and Frenkel's exercises.

Module V
Crutch Walking:
• Description of crutch - components, classification
• Good crutch, measurements
• Crutch use- Preparation, Training, counseling.
• Crutch gaits- types, & significance.
• Crutch complications- Palsy, dependency etc.

Practical

- Demonstration and practice of muscle re-education techniques
- Demonstration and practice of coordination exercises (Frankel's)
- Demonstration and practice of relaxation techniques
- Demonstration and practice of mobilization of peripheral joints
- Demonstration and practice of crutch gaits

Reference Books:

1. Therapeutic Massage, Holey, E. and Cook, E.
2. Practical Exercise Therapy, Hollis, M. and Cook, P.F.
3. Principles of Exercise Therapy, Gardiner, Dena M.
4. Therapeutic Exercise by Carolyn Kisner
5. Clinical Kinesiology for Physical Therapy, Lippert, Lynn
6. Introduction to Physical Therapy, Paliarulo, M. A.
7. Human Movement Explained, Jones and Barker
8. Measurement of Joint Motion, Norkin

Fourth Semester
Electrotherapy II

Subject code: BPT 406

Course Objectives:

At the end of the course, the candidate will be able to describe the Production &Physiological effects, Therapeutic uses, merits, demerits indication &contraindications of various low/medium Frequency Currents modes. Acquire the skill of Application of the Electro therapy modes on electrotherapy equipment for the purpose of Assessment &Treatment.

Module I

High frequency currents:

Short wave Diathermy: Continuous & Pulsed

• Indications, contraindications and therapeutic effects.

• Methods of application-capacitor and induction electrode, precautions and Potential harmful effects of treatment, Dosimetry.

Module II

Microwave Diathermy:

• Characteristics and therapeutic effects.

• Application techniques, indications, contraindications, precautions and potential harmful effects, Dosimetry.

Module III

Ultrasonic therapy:

• Physiological and therapeutic effects & potential harmful effects.
• Indications, contraindications, methods of application and precautions, Dosimetry

Module IV

Actinotherapy:

Laser:

• Introduction, effects and potential harmful effects.
• Indication, contraindications, precautions, method of application, dosimetry

Ultraviolet therapy:

• Physiological and therapeutic effects- photosensitization
• Indications and contraindications and Potential harmful effects.
• Methods of application, Sensitizes, Filters, Dosage, wavelength, penetration, tolerance, treatment / Application condition wise
• Comparison between UVR & IR Therapy

Module V

Advanced electrotherapy:

• Computerization of modalities
• Programming of parameter.
• Selection and combination of parameters.
• Combined therapy-U.S.+TENS-Principles, uses, indications etc.
• Principles of Bio-feed back, indications & uses.

Practical

- Demonstration of Electrical Modalities functioning & Usage.
- Demonstration and practice of therapeutic application of different high frequency currents.
- Demonstration and practice of therapeutic application of the following modalities:
- Laser, Ultraviolet therapy, Ultrasonic therapy, Microwave Diathermy, Short wave Diathermy

Reference Books:

1. Clayton's Electrotherapy:Theory and Practice, Froster, A. and Palastanga, N.
2. Electrotherapy Explained: Principles, Jhon, Low and Ann, Reed
3. Clinical Electrotherapy Nelson, R.M. and Currier, D.P.
4. Thermal Agents in Rehabilitation, Michlovitz, S L
5. Physical Agents in Rehabilitation, Chemeron, M.H.

Fifth Semester
Clinical Orthopaedics- I

Subject code: BPT 501

Course Objectives:
This subject follows the basic science subjects to provide the knowledge about orthopaedic conditions the therapist would encounter in their practice. The objective of this course is that after completion of the lectures and discussion the student will be able to demonstrate an understanding of orthopaedic conditions causing disability, list the etiology, clinical features and methods of investigations and management.

Module I: Introduction to orthopaedics
Introduction, Clinical examination, Common investigative procedures, Radiological and Imaging techniques, Inflammation and repair, Soft tissue healing.

Module II : Traumatology
Fracture: definition, types, signs and symptoms, Fracture healing, Complications of fractures, Conservative and surgical approaches, Principles of management
Subluxation/dislocations – definition, signs and symptoms, management (conservative and operative).

Module III: Fractures of Upper Limb
Causes, clinical features, mechanism of injury, complications, conservative and surgical management of the following fractures:
Fractures of clavicle and scapula, Fractures of greater tuberosity and neck of humerus, Fracture shaft of humerus, Supracondylar fracture of humerus, radial head, olecranon, and epicondyles, Side swipe injury of elbow. Fracture of forearm – monteggia, galeazzi fracture, Colle's fracture, Smith's fracture, Scaphoid fracture, Fracture of the metacarpals, Bennett's fracture, Fracture of the phalanges,
Dislocations of Upper Limb –Mechanism of injury, clinical feature, complications, conservative management, surgical management of dislocation of shoulders and elbow.

Module IV : Regional Conditions
Mechanism of injury of each, clinical features, managements- conservative and surgical of the following soft tissue injuries:

1. Shoulder joint: Impingement Syndrome, rotator cuff injury, Bicipital tendinitis, Supraspinatus tendinitis, Adhesive Capsulitis, scapular dyskinesia, Subacromial bursitis
2. Elbow Joint:collateral ligament injury, tennis elbow, golfers elbow, olecranon bursitis
3. Wrist joint: wrist sprains, flexor tendon injuries, extensor tendon injuries, trigger finger, VIC, Dequirvains disease, Dupeytren's contracture

Module V : Amputations
Definition, levels of amputation of lower and upper limbs, indications, complications.

Module VI : Deformities
Clinical features, complications, medical and surgical management of the following Congenital and Acquired deformities.

Congenital Deformities of upper limb – Hand anomalies- syndactyly, polydactyly and ectrodactyly. Arthrogryposis multiplex congenital, Limb deficiencies- Amelia and Phocomelia. Klippel feil syndrome. Osteogenesis imperfect (fragile ossium),
Acquired Deformities of upper limb

Module VII

1. Disease of Bones and Joints: Causes, Clinical features, Complications, Management-medical and surgical of the following conditions:
    a. Infective conditions: Osteomyelitis (Acute / chronic).TB of spine and major joints like shoulder, hip, knee, ankle, elbow etc.
    b. Bone Tumors: classification, clinical features, management - medical and surgical of the following tumors: Osteoma. Osteosarcoma, Osteochondroma. Enchondroma, Ewing's sarcoma. Gaint cell tumor. Multiple myeloma. Metastatic, tumors.
    c. Metabolic Bone Diseases: Rickets. Osteomalacia, Osteopenia, Osteoporosis
2. Inflammatory and Degenerative Conditions: causes, clinical feature, complications, deformities, radiological features, management- conservative and surgical for the following conditions:
    a. Osteoarthritis. Rheumatoid arthritis, Ankylosing spondylitis, Gouty arthritis, Psoriatic arthritis, Hemophilic arthritis, charcot's joints.
    b. Connective Tissue Disorders- Systemic Lupus Erythematosus, Scleroderma, Dermatomyositis, Poliomyelitis, Mixed connective tissue Disease (MCTD)

Practicals:

Independent Clinical Orthopaedic evaluation, presentation & recording of :

a) 2 post-operative cases of fractures of upper limb
b) 2 acute soft tissue injury of upper limb [including nerve injury]
c) 2 case of Deformities of upper limb
d) 1 cases of infections of bones and joints
e) 1 case of Metabolic bone disease joints
f) 1 case of amputation

Observation: Instruments used in orthopaedic surgery, Internal Fixator, External Fixator, orthopaedic Tractions, Implants.

Reference Books:

1. Apley's System of Orthopaedics and Fractures by Louis Solomon, David Warwick, and Selvadurai Nayagam (2010)
2. Text book of Orthopedics.— J. Maheswari.
3. Orthopedic Principles - A Resident's Guide by David Ip (2005)
4. Campbell's Operative Orthopaedics by S. Terry Canale and James H. Beaty (2007)
5. Outline of Orthopedics — John Crawford Adams.
6. Outline of Fracture — John Crawford Adams.

Fifth Semester
Physiotherapy in Orthopaedics I

Subject code: BPT 502

Course Objectives:

- At the end of the course candidate will be able to identify, discuss & analyse, the Musculoskeletal Conditions in terms of Biomechanical & Kinesiology basis & understand the same with the provisional diagnosis, routine radiological & Electrophysiological investigations & arrive at appropriate functional diagnosis with clinical reasoning.
- Candidate be able to plan & Prescribe as well as acquire the skill of executing short & long term Physiotherapy treatment by selecting appropriate modes of Mobilization/ Manipulations, Electro-Therapy, Therapeutic exercise & appropriate Ergonomic advise for the relief of pain, restoration / Maintenance of function & rehabilitation for maximum functional independence in A.D.L. at home & work place.

Module -1

PT assessment and management of upper limb fractures and dislocations.
Fractures of clavicle and scapula, Fractures of greater tuberosity and neck of humerus, Fracture shaft of humerus, Supracondylar fracture of humerus, radial head. Fracture of forearm – monteggia, galeazzi fracture, Colle's fracture, Smith's fracture, Scaphoid fracture, Fracture of the metacarpals, Fracture of the phalanges,

Module II
PT assessment, aims, and management and home program of the following conditions

Shoulder joint: Impingement Syndrome, rotator cuff injury, Bicipital tendinitis, Supraspinatus tendinitis, Adhesive Capsulitis, scapular dyskinesia
Elbow Joint:collateral ligament injury, tennis elbow, golfers elbow, olecranon bursitis
Wrist joint: wrist sprains, flexor tendon injuries, extensor tendon injuries, trigger finger, VIC, Dequirvains disease, Dupeytren's contracture

Module -III
Amputation: Level of amputation of upper limb and lower limb, stump care, stump bandaging, Pre and postoperative physiotherapy management, pre and post prosthetic management including check out of prosthesis, training.

Module -IV
Deficiency disease
Physiotherapy Management of the following conditions
Rickets, Osteomalacia, Osteoporosis and other deficiency disorders

Module -V
PT assessment, aims, and management and home program of the following conditions
Rheumatoid arthritis, Ankylosing spondylitis, Gouty arthritis

Practical

Various physiotherapy modalities and treatment techniques for the above mentioned conditions to be demonstrated and practiced by the students in clinical setup.

Reference Books:

1. Cash textbook orthopedics and Rheumatology for physiotherapists – Downie
2. Orthopaedic Rehabilitation- Brotzman & Kelvin K Wilk
3. Tidy's physiotherapy- Tomson et. al
4. Essentials of orthopedics and applied physiotherapy - Joshi and Kotwal
5. Tetraplegia & Paraplegia- Ida Bromley- W.B. Saunders.
6. Orthopedics physiotherapy- Donatelli & Wooden
7. Rheumatological Physiotherapy- Carol David & Jill Loyd
8. Physiotherapy for amputee- Engstrom & Van de van
9. Sports Injury: Diagnosis and management: Norris Butterworth

Fifth Semester
Physiotherapy in General Medicine & General Surgical conditions-I

Subject code: BPT 503

Course Objectives:

At the end of the course the candidate will be able to:

1. Acquire knowledge of rationales of basic investigative approaches in the medical system and surgical intervention, regimes in general surgeries (special emphasis on abdominal surgeries)
2. Select strategies for cure, care and prevention, adopt restorative and rehabilitative measures for maximum possible functional independence of a patient at home, work and in community.
3. Evaluate, grade and treat non healing wounds.

Module I : Management of wound ulcers

- Wound- Stages of wound Healing
- Ulcer Boils, carbuncles
- Scar assessment and management

Module : II Abdominal Incision

- Types of abdominal Incision: Vertical, Transverse and Thoraco-abdominal
- Complication of Bed rest/Immobilisation

Module : III Physiotherapy in pre and post-operative stages

- Appendicectomy,
- cholecystectomy,
- hernia Surgery
- Splenectomy,
- Nephrectomy
- Mastectomy

Module : IV Physiotherapy in Burn

- Post-operative P.T. assessment and management of Burns and their complications.
- Skin grafting and flaps
- Physiotherapy in Plastics and Reconstructive Surgery

Module : V Geriatric Rehabilitation

- Introduction to gerontology
- Physiological changes with ageing
- Physiotherapy evaluation and assessment of elderly patient
- Fall prevention and management

Practical

- Assessment and practical demonstration of treatment of scar.
- Examination of Abdominal incision
- Assess the complication of bed rest and measures to prevent them.
- Pre and Post-operative surgical Rehabilitation techniques
- Assessment of burn and practical on management techniques post burn.
- Evaluation of Elderly
- Assessment of fall risk

Reference Books:

1. Tidy's Physiotherapy
2. Cash Physiotherapy in General conditions
3. Physical Rehabilitation by Susan Sullivan
4. Management Principle for Physical Therapists

Fifth Semester
Research Methodology & Biostatistics-I

Subject code: BPT 504

Course Objectives:

1. To develop skills of critical thinking and selection of research strategy
2. To acquire skills to review literature, formulate problems, research writing and publishing

Module I : Introduction to Research methodology

- Meaning of research
- Objective of research
- Types of research & research approaches
- Phases of Research
- Research Ethics.

Module II : Research Problem and Research Question

- Statement of research problem.
- Criteria for evaluating research problem
- Define Research Question
- Developing Answerable research Question
- Formulation of Hypothesis.
- Research Proposal

Module III : Experimental Design

- Group Design
- Single system design

Biostatistics

Module IV : Introduction to Biostatistics

- Definition of Statistics
- Characteristics of statistics
- Importance of the study of statistics
- Limitation of Statistics
- Descriptive and inferential statistics,

Module V : Tabulation of Data:

- Basic principles of graphical representation
- Data Representation- Frequency distribution tables

- Types of diagrams
- Normal probability curve.
- Skewness and kurtosis.

Module VI : Measures of central tendency

- Need for measures of central Tendency
- Definition and calculation of mean – ungrouped and grouped
- Meaning, interpretation and calculation of median ungrouped and grouped
- Meaning and calculation of mode

Module VI : Sampling & Assignment

- Methods of sampling
- Methods of Assignment

Reference books:

1. Research methods for Clinical Therapists by Carolyn M Hicks
2. Foundation of clinical Research by Portney & Watkins
3. Physical Therapy Research: Principles & Applications by Elizabeth Domholdt
4. Methods in Biostatistics: for medical students & research workers by B.K. Mahajan
5. Fundamentals of Statistics by S.C Gupta

Fifth Semester
Clinical Cardiothoracic Conditions

Subject code: BPT 505

Course Objectives:

Following the basic science and clinical science course, this course introduces the Student in cardio-thoracic conditions which commonly cause disability.

The objective of this course is that after lectures and demonstration in addition to clinics the student will be able to demonstrate an understanding of Cardio-thoracic conditions causing disability and their management.

Module I : Anatomy and Physiology

Respiratory system : Upper respiratory tract, Lower respiratory tract – Trachea, Bronchial tree, Bronchopulmonary segments, Respiratory unit, hilum of lung, Muscles of respiration, Pleura, intra pleural space, intra pleural pressure, surfactant, Mechanics of respiration – Chest wall

movements, lung & chest wall compliance, V/Q relationship, airway resistance, Respiratory centre, Neural & chemical regulation of respiration, Lung volumes and lung capacities, Spiro meter, lung function test, Pulmonary circulation, Lung sounds, cough reflex

Cardiovascular systems : Chambers of heart, semi lunar and atria ventricular valves, Coronary circulation, conductive system of heart, Cardiac cycle, ECG, Heart sounds, Blood pressure, pulse, cardiac output

Module II : Cardio Vascular system

Define, etiology, pathogenesis, clinical features, complications conservative and surgical management of the following conditions

i. Ischemia heart disease
ii. Myocardial infarction
iii. Heart failure
iv. Cardiac arrest
v. Rheumatic fever
vi. Hypertension
vii. Infective endocarditis
viii. Myocarditis & cardiomyopathy

Module III : Cardiovascular Disease

Clinical manifestations of Cardiovascular disease ; Definition, Etiology, Clinical features, signs and symptoms, complications, management and treatment of following diseases and disorders of the heart : Pericarditis, Myocarditis, Endocarditis, Rheumatic Fever – resulting in valve disorders, Ischemic Heart Disease, Coronary Valve Disease, Congenital disorders of the Heart, Cardiac Arrest ;

Examination and Investigations of diseases of arteries and veins ; Hypertension : Definition, causes, classification, types, assessment, investigations and management.

Disorders of the Heart – Definition, Clinical features, diagnosis and choice of management for the following disorders : Congenital Heart diseases – Acyanotic congenital heart disease & Cyanotic congenital heart disease : Patent Ductus Arteriosus, Coarctation of Aorta, Atrial Septal Defect, Ventricular Septal Defect, Tetraology of Fallot, Transposition of Great Vessels ; Acquired Heart Disease – Mitral Stenosis & Insufficiency, Aortic Stenosis and Insufficiency, Ischemic Heart Disease – Coronary Artery Disease, Cardiac tumors.

Module IV : Respiratory System

Clinical manifestations of Lung disease ; Patterns of lung disease – Chronic Obstructive Lung Disease and Restrictive Lung Disease ;

Definition, Etiology, Clinical features, signs and symptoms, complications, management and treatment of following lung diseases : Chronic Bronchitis, Emphysema, Asthma, Bronchiectasis, Cystic Fibrosis,

Upper Respiratory Tract Infections, Pneumonia, Tuberculosis, Fungal Diseases, Interstitial Lung Diseases, Diseases of the pleura,

Respiratory failure – Definition, types, causes, clinical features, diagnosis and management.

Chest wall disorders- Definition, Clinical features, diagnosis and choice of management for the following disorders – chest wall deformities, chest wall tumors, Spontaneous Pneumothorax, Pleural Effusion, Empyema Thoracis, Lung abscess, Bronchiectasis, Tuberculosis, Bronchogenic Carcinoma, Bronchial Adenomas, Metastatic tumors of the Lung, tracheal Stenosis, Congenital tracheomalacia, Neoplasms of the trachea, Lesions of the Mediastinum. Carcinoma of the female breast.

Practical:
Examination of the Cardiovascular System Investigations : ECG, Exercise Stress Testing, Radiology ; Clinical manifestations of Cardiovascular diseases
Examination of the Respiratory System – Investigations : Chest Radiographs, Pulmonary Function Testing, Arterial Blood Gas Analysis, Clinical manifestations of Respiratory diseases

Reference Books:

1. Davidson's Principles & Practice of Medicine, Haslett Et al
2. Harrison's Principles of Internal Medicine, Edited by Dennia L. Kasper Et al

Fifth Semester
Radiology & Radiodiagnosis
(Non-University)

Subject code: BPT 506

Course Objectives: This course covers the study of common diagnostic and therapeutic imaging tests. At the end of the course students will be aware of the indications and implications of commonly used diagnostic imaging tests as they pertain to patient's management. The course will cover that how X-Ray, CT, MRI, Ultrasound and Other Medical Images are created and how they help the health professionals to save lives.

Module I : Introduction
a. History
b. A New Kind of Ray
c. How a Medical Image Helps
d. What Imaging Studies Reveal

Module II : Radiography
a. Equipment components
b. Procedures for Radiography & Mammography
c. Benefits versus Risks and Costs
d. Indications and contraindications.
e. Image Interpretation in X-ray Film of different common conditions

Module III : Fluoroscopy
a. What is Fluoroscopy?

b. Equipment used for fluoroscopy
c. Indications and Contra indications
d. How it helps in diagnosis
e. The Findings in Fluoroscopy
f. Benefits versus Risks and Costs.

Module IV : Computed Tomography (CT)

a. What is Computed Tomography?
b. Equipment used for Computed Tomography
c. Indications and Contra indications
d. How it helps in diagnosis
e. Image Interpretation in Computed Tomography of different common conditions
f. Benefits versus Risks and Costs.

Module V : Magnetic resonance imaging (MRI)

a. What is MRI?
b. Equipment used for MRI
c. Indications and Contra indications
d. How it helps in diagnosis
e. The Findings in MRI of different common conditions
f. Benefits versus Risks and Costs
g. Functional MRI.

Module VI : Ultrasound

a. What is Ultrasound?
b. Equipment used for Ultrasound
c. Indications and Contra indications
d. How it helps in diagnosis
e. The Findings in Ultrasound
f. Benefits versus Risks and Costs.

Module VII : Endoscopy

a. What is Endoscopy?
b. Equipment used for Endoscopy
c. Indications and Contra indications
d. How it helps in diagnosis
e. The Findings in Endoscopy
f. Benefits versus Risks and Costs.

Reference Books:

1. Textbook of Radiology and Imaging 7th Edition
2. Clinical Radiology by Richard daffner
3. Diagnostic Radiology by Chaudhury, Gupta, khandelwal

Sixth Semester
Clinical Orthopaedics-II

Subject code: BPT 601

Course Objectives:
This subject follows the basic science subjects to provide the knowledge about orthopaedic conditions the therapist would encounter in their practice. The objective of this course is that after completion of the lectures and discussion the student will be able to demonstrate an understanding of orthopaedic conditions causing disability, list the etiology, clinical features and methods of investigations and management.

Module I : Fractures of Lower Limb
Causes, clinical features, mechanism of injury, complications, conservative and surgical management of the following fractures: Fractures of Femoral Neck, trochanters, Fracture shaft femur, Supracondylar fracture of femur, Fractures of the condyles of femur, Fracture patella, Fractures of tibial condyles, Both bones fracture of tibia and fibula, Pott's fracture Bimalleolar fracture, Trimalleolar fracture, Fracture calcaneum, Fracture of talus, Fracture of metatarsals, stress fractures, Fracture of phalanges.

Dislocations of Lower Limb
Mechanism of injury, clinical features, complications and management of the following dislocations of hip, patella and Knee.

Module II : Fracture of Spine
Mechanism of injury, clinical feature, complications, Management of fracture of Cervical, thoracic & lumber Spine, Fracture of Pelvis

Module III : Regional conditions
Mechanism of injury of each, clinical features, managements- conservative and surgical of the following injuries:

1. Hip Joint: IT band syndrome, Piriformis Syndrome, trochanteric Bursitis, Hamstring Strain
2. Knee Joint; Meniscal injuries, Cruciate injuries, Medial and lateral collateral injuries, chondromalacia patellae
3. Ankle Joint: Ankle sprain, planter fasciitis, calcaneal spur, achillis tendinitis, metatarsalgia
4. Spine: LBP, PIVD, Spondylosis, Spondylolisthesis, Lumbosacral strain, Lumberalization & sacralization, Coccidynia

Module IV : Deformities
Clinical features, complications, medical and surgical management of the following Congenital and Acquired deformities.

Congenital Deformities of lower limb – CTEV, CDH, Flat foot,
Deformities of spine : Cervical rib, Torticollis, Scoliosis, Kyphosis, Lordosis

Acquired Deformities- Acquired, Genu varum, Genu valgum, Genu recurvatum, Coxa vara, Pes cavus, Hallux rigidus, Hallux valgus, Hammer toe, Metatarsalgia.

Module VI : Neuromuscular Disorders

Definition, causes, clinical feature, complications, management. (Multidisciplinary approach) medical and surgical of the following conditions:
Cerebral palsy, Poliomyelitis, Leprosy.

Module VII : Orthopedic Surgeries

Indications, Classification, Types, Principles of management of the following Surgeries: Arthrodesis, Arthroplasty, Osteotomy, External fixators, Spinal stabilization surgeries.

Practicals:

Independent Clinical Orthopaedic evaluation, presentation & recording of :

a) 2 post operative cases of fractures of Lower limb
b) 2 acute soft tissue injury of lower limb [including nerve injury],
c) 2 cases of degenerative arthritis of extremity joints,
d) 2 degenerative arthritis of spine,
e) 2 chronic backaches
f) 1 case of deformity of lower limb

Reference Books:

1. Apley's System of Orthopaedics and Fractures by Louis Solomon, David Warwick, and Selvadurai Nayagam (2010)
2. Text book of Orthopedics.— J. Maheswari.
3. Orthopedic Principles - A Resident's Guide by David Ip (2005)
4. Campbell's Operative Orthopaedics by S. Terry Canale and James H. Beaty (2007)
5. Outline of Orthopedics — John Crawford Adams.
6. Outline of Fracture — John Crawford Adams.

Sixth Semester
Physiotherapy in Orthopaedics II

Subject code: BPT 602

Course Objectives:

- At the end of the course candidate will be able to identify, discuss & analyze, the Musculoskeletal Conditions in terms of Biomechanical & Kinesiology basis & understand the same with the provisional diagnosis, routine radiological & Electrophysiological investigations & arrive at appropriate functional diagnosis with clinical reasoning.
- Candidate be able to plan & Prescribe as well as acquire the skill of executing short & long term Physiotherapy treatment by selecting appropriate modes of Mobilization / Manipulations, Electro-Therapy, Therapeutic exercise & appropriate Ergonomic advise for the relief of pain, restoration / Maintenance of function & rehabilitation for maximum functional independence in A.D.L. at home & work place.

Module I

PT assessment and management of lower limb fractures and dislocations.
Fractures of Femoral Neck, trochanters, Fracture shaft femur, Supracondylar fracture of femur, Fractures of the condyles of femur, Fracture patella, Pott's fracture Bimalleolar fracture, Trimalleolar fracture, Fracture calcaneum, Fracture of talus, Fracture of metatarsals, Fracture of phalanges.
PT assessment and management of cervical spine, thoracic spine, lumber spine

Module -II

PT assessment, aims, and management and home program of the following conditions
Hip Joint: IT band syndrome, Piriformis Syndrome, Hamstring Strain
Knee Joint; Meniscal injuries, Cruciate injuries, Medial and lateral collateral injuries, chondromalacia patellae, Patellar Tendinitis
Ankle Joint: Ankle sprain, planter fasciitis, calcaneal spur, achillis tendinitis, metatarsalgia
Spine: Neck pain, LBP, PIVD, Spondylosis, Spondylolisthesis, Lumbosacral strain, Coccidynia

Module -III

Physiotherapy Management of Deformities of Lower limb

Congenital Deformities of lower limb – CTEV, CDH, Flat foot,
Acquired Deformities- Acquired, Genu varum, Genu valgum, Genu recurvatum, Coxa vara, Pes cavus, Hallux rigidus, Hallux valgus, Hammer toe, Metatarsalgia.
Deformities of spine : Cervical rib, Torticollis, Scoliosis, Kyphosis, Lordosis

Module IV

PT assessment, aims, and management and home program of the following conditions
Cerebral palsy, Poliomyelitis, Leprosy

Module V

PT assessment, aims, and management and home program of the following Orthopedic
Surgeries: Arthrodesis, Arthroplasty, Osteotomy, Spinal stabilization surgeries.

Practical

Various physiotherapy modalities and treatment techniques for the above mentioned conditions to be demonstrated and practiced by the students in clinical setup. The examination pattern will be as following

One Long Case: based on the History 10 marks, Evaluation 10 marks, Treatment Plan on Patient 20 marks

Two Short Case: Simulated (25 marks)

Five spots: spots based on, X – ray (limb, spine), Orthosis, Prosthesis, Metal implants etc 3 minutes each spot and 3marks per spot (3x5)

Reference Books:

1. Cash textbook orthopedics and Rheumatology for physiotherapists – Downie
2. Orthopaedic Rehabilitation- Brotzman & Kelvin K Wilk
3. Tidy's physiotherapy- Tomson et. al
4. Essentials of orthopedics and applied physiotherapy - Joshi and Kotwal
5. Tetraplegia & Paraplegia- Ida Bromley- W.B. Saunders.
6. Orthopedics physiotherapy- Donatelli & Wooden
7. Rheumatological Physiotherapy- Carol David & Jill Loyd
8. Physiotherapy for amputee- Engstrom & Van de van
9. Sports Injury: Diagnosis and management: Norris Butterworth

Sixth Semester

Physiotherapy in General Medicine & General Surgical conditions -II

Subject code: BPT 603

Course Objectives:

At the end of the course the candidate will be able to:

1. Develop knowledge about the role and physiotherapy management in cancer.
2. Acquire the knowledge of evaluation and physiotherapeutic treatment for obstetric and gynecological conditions
3. Acquire the knowledge of various conditions where physiotherapy plays a vital role in the rehabilitation (dermatology and ENT conditions)

Module : I Physiotherapy in Oncology

- Principles of Onco-rehabilitation
- Management of complication of Chemotherapy and Radiotherapy
- Physiotherapy Lymphedema management

Module II : Physiotherapy in Obstetrics and Gynaecology

Principles of Physical Therapy Management with:

- Pelvic Floor Care
- Incontinence and prolapse uterus
- Pelvic inflammatory disease
- Musculo-skeletal and other problems associated with pregnancy, labour and caesarean section
- Physiotherapy in Ante-natal and post-natal care

Module III : Physiotherapy in Dermatology

- Dermatological conditions: Psoriasis, Vitiligo, Acne vulgaris
- Leprosy (including Neuro-muscular complications)

Module IV : Physiotherapy in ENT

Sinusitis, non-suppurative and chronic suppurative otitis media, labrynthitis, mastoidectomy, chronic rhinitis, laryngectomy, pharyngeo – laryngectomy, facial palsy.

Practical

- Evaluation and management techniques for complication of cancer
- Management technique of lymphedema.
- Evaluation of urinary incontinence.
- Exercises in ante-natal and post-natal cases.
- Practical application of electrotherapy in management of skin condition
- Evaluation and management of complication after leprosy

- Physiotherapy management of ENT condition and complication like facial palsy

Reference Books:

1. Tidy's Physiotherapy
2. Cash Physiotherapy in General conditions
3. Physical Rehabilitation by Susan Sullivan
4. Management Principle for Physical Therapists

Sixth Semester
Research Methodology & Biostatistics-II

Subject code: BPT 604

Course Objectives:

1. To develop skills of critical thinking and selection of research strategy
2. To acquire skills to review literature, formulate problems, research writing and publishing

Module I : Non-Experimental

Introduction to non-experimental research
Different types of non-experimental research

Module II: **Methods of data collection:**

- Primary and Secondary Data
- Variables

Module III: Measurement & scaling techniques:

- Measurement in research
- Scales of Measurements
- Reliability and validity
- Rate, ratio, proportion, incidence and prevalence.

Module IV: Implementing Research

- Research Proposal
- Critical Analysis of article
- Article Writing
- Referencing and Citation

Biostatistics

Module V : Measures of Dispersion

- Absolute Measures
- Relative measures

Module VI : Testing of Hypothesis

- Steps in Testing of Hypothesis
- Type I and type II errors.
- Level of significance, p value, Confidence Interval

Module VII : Statistical Methods

Basis Concept and Introduction

- Parametric test and non-parametric test,

- Correlation and regression
- Concept of t test, f test and chi square test
- Overview of available softwares used in analysis and research

Reference books:

1. Research methods for Clinical Therapists by Carolyn M Hicks
2. Foundation of clinical Research by Portney & Watkins
3. Physical Therapy Research: Principles & Applications by Elizabeth Domholdt
4. Methods in Biostatistics: for medical students & research workers by B.K. Mahajan
5. Fundamentals of Statistics by S.C Gupta

Sixth Semester
Professional Ethics & Administration

Subject Code: BPT 605

Course Objectives:
The student will be able to learn about the basic ethical principles applied Physiotherapy practices and the code and rules of professional conduct. Besides ethical principles the students will get to know about the basic idea of administrative practices done in Physiotherapy or multi-speciality hospitals

Module I :
History of physiotherapy, Ethical principles in health care, Ethical principles related to physiotherapy, Scope of practice, enforcing standards in health profession-promoting quality care.

Module II :
Constitution & Functioning of the Indian association of Physical therapy and World confederation of Physical therapy (WCPT) and DCPTOT

Module III :
1. Professionalism in physiotherapy-Accountability, altruism, compassion/caring, excellence, integrity, professional duty, social responsibility.
2. Professional code of conduct (APTA)- attitude, therapist patients relationship, confidentiality, patients autonomy, professional responsibility, practices, endorsement of products/services, consumer protection, pro bono service etc.

3. Standards of professional Practice- ethical and legal consideration, administration of physical therapy service, patient/client management, education & research.

Module IV :

Malpractice and negligence, Legal aspects: Consumer protection act, Legal responsibility of physiotherapist for their action in professional context and understanding liability and obligations in case of medico-legal action

Module V : Administration

1. Introduction: Branches of administration, Nature and scope of administration, How to be an
2. Effective administrator, Planning hospital administration as part of a balanced health care program.
3. Principles of hospital administration and its applications to physiotherapy.
4. Planning and organization: Planning cycle, Principles of organizational charts, Resource and
5. quality management, Planning change -innovation
6. Financial issues including budget and income generation
7. Hospital administration: Organization, Staffing, Information, Communication, Coordination,
8. Cost of services, Monitoring and evaluation.
9. Organization of physiotherapy department: Planning, Space, Manpower, Other basic resources.

Reference Books:

1. Medical Ethics by C M Francis
2. Francis C M – Hospital Administration
3. Davies, R and Macaulay, BMC – Hospital Planning and Administration
4. Consumer Protection Act – 1986, Government of India, New Delhi.

Seventh Semester
Clinical Neurology and Neurosurgery -I

Subject code: BPT 701

Course Objectives:

- To understand clinical manifestations of Neurological and Psychological disorders
- The rationale and implications of psychological disorders on disability
- To understand the management of neural & psychological disorders

Module -I

Nervous system: Disorders of Neurological functions in the light of Anatomy and Physiology (Brief description only) - Cerebrum, Cerebellum, Spinal Cord, Major Nerve Tracts, Motor System, Sensory System, Autonomic System, Reflexes, Communication & CSF.

Clinical examination of a neurological patient, General manifestations of nervous system disease & principles of diagnosis & management, Cranial Nerves and special senses with major emphasis on V, VII, X, XI, & XII

Module -II

Introduction, clinical features, assessment, diagnosis, medical & surgical Management of following conditions:

- Brief Description of Headache, migraine, raised intra-cranial pressure
- Disorders of cerebral circulation - ischaemia, haemorrhages (CVA), HT encephalopathy
- Demyelinating diseases (brief description) - acute disseminated encephalomyelitis, multiple sclerosis
- Convulsive disorders (brief description) - epilepsy (GM, PM, Psychomotor), tetany

Module -III

Metabolic and intoxication disorders (brief description) - Alcoholism, Drug addiction, heavy metals poisoning (lead, mercury, copper), Organo-phosphorous poisoning, electric shock, tetanus, botulism

Module -IV

Introduction, clinical features, assessment, diagnosis, medical & surgical Management of following conditions:

Peripheral nerve disorders: traumatic/ compression or entrapment neuropathy, polyneuritis, GB syndrome, diabetic polyneuropathy and spinal radiculopathies. Special emphasis on brachial and lumbosacral plexuses and major nerves – radial, ulnar, median, femoral, and sciatic nerve

Module -V

Extra pyramidal syndromes - Parkinson's disease, Chorea, Athetosis, Dystonia, Hemiballismus, Spasmodic Torticollis Developmental and degenerative syndromes –

cerebral palsy, kernicterus, hereditary ataxias, motor neuron disease, Peroneal muscular atrophy Inflammatory conditions (brief description) – meningitis (bacterial, tubercular), viral encephalitis, syphilis, rabies.

Practical

The syllabus for practical examination shall be relevant portion of the theory

Reference Books:

1. Principles of Neurology by Adams and Victor
2. Dejong's The Neurologic Examination by William W. Campbell
3. Neurology & Neurosurgery Illustrated by Lindsay
4. A short Textbook of Psychiatry by Niraj Ahuja

Seventh Semester

Physiotherapy in Neurological Conditions-I

Subject code: BPT 702

Course Objectives:

- The subject serves to integrate the knowledge gained by the students in neurology and neurosurgery with skills to apply these in clinical situations of dysfunction and neurological pathology.
- The student will be able to identify disabilities due to neurological dysfunction, plan and set treatment goals
- The student will be able to apply the skills gained in exercise therapy and electrotherapy in these clinical situations to restore neurological function.

Module I: Basics of Neuroanatomy

Cerebrum, Cerebellum, spinal cord, major nerve tracts, motor system, sensory system, autonomic system, reflexes, CSF

Module II: Clinical examination of a neurological patient

Chief complaints, History taking – Present, Past, medical, familial, personal histories, Observation, Palpation, Higher mental function, Motor Examination – Muscle power, Muscle tone, Spasticity, Flaccidity, deep tendon reflexes, Superficial reflexes, Sensory examination – Superficial, Deep and Cortical

sensations, Special tests – Romberg's, Kernig's sign, Brudenzki sign, Tinels's sign, Slum test, Lehermitte's sign, Bells Phenomenon, Gower's sign, Sun set sign, Battle's sign, Glabellar tap sign, etc,

Balance examination, coordination examination, Assessment tools & Scales – Modified Ashworth scale, Berg balance scale, FIM, Barthel index, Glasgow coma scale, Mini mental state examination, Rancho Los Amigos Scale for Head injury, APGAR score, ASIA scale, Reflex Grading.

Module III: Evaluation and Management Brain Injury

Cerebrovascular accidents -

Definition, etiology, classification – thrombotic, embolic, hemorrhagic Clinical findings, management

Head injury

Types and Mechanisms of head injury Clinical features, potential complications

Physiotherapy principles of immediate and postoperative therapeutic management

Module IV: Evaluation and Management of CNS Infections

Etiology, Pathophysiology, Clinical features, assessment and management of

- Meningitis
- Tuberculous infection of CNS
- Tabes dorsalis
- Encephalitis

Module V: Evaluation and Management of Muscle Disorders and Movement Disorders

- Parkinson disease
- Dystonia, Chorea, Ballism, Athetosis
- Ataxia- Cerebellar, Friedreich.
- Neurological Gaits - Hemiplegic gait, Parkinson gait, High step gait, Hyperkinetic gait, Hypokinetic gait, Waddling gait, Scissoring gait, Spastic gait, Choreaform Gait, Diplegic Gait, and Myopathic Gait.

Module VI: Basic Principle and concept of Neurological Treatment Approaches

- Bobath Neurodevelomental Therapy
- Proprioceptive Neuromuscular Facilitation.
- Motor Relearning Program
- Rood's approach

Practical

Principles of Assessment

- Skills in history taking: Present, Past, medical, familial, personal histories
- Assessment of higher mental function -Consciousness, Orientation, Wakefulness, memory

Cranial Nerve

- Clinical assessment of neurological function of Cranial nerve

Sensory Function Examination

- Sensory examination –Superficial, Deep and Cortical sensations

Motor System Examination

- Reflexes –Developmental reflexes, deep tendon reflexes, Superficial reflexes
- Assessment of motor function: grading of muscle power, tone (Hypotonia, Hypertonia - spasticity and rigidity, Ataxia, Athetosis, Chorea) and assessment of range of motion.

Neurological Treatment Approaches

- Bobath & Neurodevelomental Therapy- Techniques
- Proprioceptive Neuromuscular Facilitation- Techniques
- Motor Relearning Program
- Rood's approach

Movement Disorder Examination

- Assessment of Balance and coordination
- Assessment of gait - both normal and abnormal (spastic, ataxic and paralytic patterns)
- Functional Analysis, Assessment tools & Scales – Modified Ashworth scale, Berg balance scale, FIM, Barthel index, Glasgow coma scale, Mini mental state examination, Rancho Los Amigos Scale for Head injury, APGAR score, ASIA scale

Reference Books:

1. Cash Text Book for Physiotherapists in Neurological Disorders-Jaypee Bros. Publication 5th edition
2. Proprioceptive Neuro Muscular Facilitation- By A.Susan
3. Right In The Middle-Patracia Devis,2nd edition
4. Stroke Rehabilitation--Margaret Johnson,3rd edition
5. Neurological Rehabilitation- Umphred Davis 6th edition
6. Neurological Physiotherapy-Problem solving approach: Susan Edwards, 2nd edition
7. Adult Hemiplegia: Evaluation and treatment: Berta Bobath, 2nd edition
8. Physical Rehabilitation by Susan O Sullivan

Seventh Semester

Physiotherapy in Cardiothoracic & Cardiopulmonary Conditions-I

Subject code: BPT 703

Course Objectives: The subject is designed to provide knowledge in assessing and planning physiotherapy interventions for various Cardiothoracic conditions.
The student must be able to reassess the patient as necessary, to monitor the patient in regard to treatment, to monitor the patient's vital signs, student must know emergency drugs indication and contra-indication, care in intensive care unit (ICU) and to provide appropriate interventions to the patient.

Module I : Investigations and tests

Exercise tolerance Testing – Cardiac & Pulmonary, Radiographs, PFT, ABG, ECG, Hematological and Biochemical Tests. Bedside assessment of the patient-Adult & Pediatric

Module II :

Physiotherapy techniques to increase lung volume – controlled mobilization, positioning, breathing exercises, Neurophysiological Facilitation of Respiration, Mechanical aids - Incentive Spirometry, CPAP,IPPB.

Physiotherapy techniques to decrease the work of breathing – Measures to optimize the balance between energy supply and demand, positioning, Breathing re-education – Breathing control techniques, mechanical aids – IPPB, CPAP, BiPAP.

Module III :

Physiotherapy techniques to clear secretions – Hydration, Humidification & Nebulization, Mobilisation and Breathing exercises, Postural Drainage, Manual techniques – Percussion, Vibration and Shaking, Rib Springing, ACBT, Autogenic Drainage, Mechanical Aids – PEP, Flutter, IPPB, Facilitation of Cough and Huff, Nasopharyngeal Suctioning.

Module IV :

Drug therapy – Drugs to prevent and treat inflammation, Drugs to treat Bronchospasm, Drugs to treat Breathlessness, Drugs to help sputum clearance, Drugs to inhibit coughing, Drugs to improve ventilation, Drugs to reduce pulmonary hypertension, Drug delivery doses, Inhalers and Nebulisers.

Module V :

Neonatal and Pediatric Physiotherapy – Chest physiotherapy for children, the neonatal unit, Modifications of chest physiotherapy for specific neonatal disorders, Emergencies in the neonatal unit.

Practical

Practical shall be conducted for all the relevant topics discussed in theory in the following forms:
1. Bedside case presentations and case discussions
2. Lab sessions consisting of evaluation and assessment methods on student models, treatment techniques and practice sessions.

Reference Books:

1. Cash`s Text book for Physiotherapists in Chest, Heart & Vascular diseases- Jaypee bros. Publication
2. Cash`s text book in General Medical & Surgical conditions for Physio therapists
3. Chest Physical therapy & Pulmonary rehabilitation-by Donna Frownfilter
4. Cardiopulmonary Physical therapy by Irwin Scott

Seventh Semester
Physiotherapy in Sports- I

Subject code: BPT 704

Course Objectives: This course will help the students to learn about sports injuries and to prevent them on and off the field. To provide about the basic idea of assessment and management also.

Module I

Pre-exercise evaluation
Sporting emergencies and on field assessment,
Principles of management of soft and hard tissue injuries

Module II

- Fitness testing
- Strength training for children & adolescents
- Environmental effects on training
- Exercise testing

Module III

Physiological effects of exercise on body systems –

- Muscular system,
- Endocrine system,
- Cardio-respiratory system,
- Nervous system

Module IV

- Principles of injury prevention
- Principles of training & Rehabilitation in sports injuries
- Risk factors in sports (intrinsic & extrinsic)

Module V

- Nutrition in sports
- Diet planning
- Pre game meal
- Carbohydrate loading & bicarbonate loading

Practical

Various Physiotherapy modalities and treatment techniques for above mentioned conditions should be demonstrated and practice by the students.

Reference Books:

1. Principles of sports medicine by Brukner & Karim.
2. Athletic Injuries in sports by Magee.
3. Physical Therapies in Sports and Exercise by Kolt, G.S and Mackler.
4. Sports Injuries: Diagnosis and Management by Norris, C.M.
5. Orthopedic Physical Rehabilitation by Brotzman.
6. Sports Injuries: Diagnosis and Management by Garrick, J.G
7. Fundamentals of Sport Injuries and management Anderson, M.K.
8. Sport Injuries, Fu, and Stone.
9. Athletic Injuries and Rehabilitation James E.Z.
10. Running Injuries Guten, Gray N.
11. Soft Tissues: Trauma and sports Injury, Mclatchie, and Lennox.
12. Evaluation of Orthopedic and Athletic Starkey, and Ryan.

Seventh Semester

Community based Rehabilitation & Bioengineering-I

Subject code: BPT 705

Course Objectives:

- The subject serves to integrate the knowledge gained by the students in community medicine and other areas with skills to apply these in clinical situations of health and disease and its prevention.
- The objective of the course is that after the specified hours of lectures and demonstrations the student will be able to identify rehabilitation methods to prevent disabilities and dysfunctions due to various disease conditions and plan and set treatment goals and apply the skills gained in rehabilitating and restoring functions.

Module I :

Rehabilitation: Definition, Types

Community: Definition of Community, Multiplicity of Communities, The Community based approach, Community Entry strategies, CBR and Community development, Community initiated versus community oriented programme, Community participation and mobilization

Module II :

Introduction to Community Based Rehabilitation: Definition, Historical review, Concept of CBR, Need for CBR, Difference between Institution based and Community based Rehabilitation, Objectives of CBR, Scope of CBR, Members of CBR team, Models of CBR

Module III :

- Principles of Community based Rehabilitation. W.H.O.`s policies-about rural health care concept of primary /tertiary health centers-district hospitals etc-Role of P.T.-Principles of a team work of Medical person/P.T./O.T. audiologist/speech therapist /P.&O./vocational guide in C.B.R. of physically handicapped person , Agencies involved in rehabilitation of physical handicapped - Legislation for physically handicapped. Concept of multipurpose health worker. Role of family members in the rehabilitation of a physically handicapped.

- Planning and management of CBR Programmes, CBR Programmed planning and management, Ownership and Governance, Decentralization and CBR, Management of CBR, Programmed sustainability, Communication and Coordination, Community participation, mobilization and awareness, CBR programme influence on promoting and developing public policies

Module IV :

- Disability: Definition of Impairment, Handicap and Disability, Difference between impairment, handicap and disability, Causes of disability, Types of disability, Prevention of disability, Disability in developed countries, Disability in developing countries. Disability Surveys: Demography. Screening: Early detection of disabilities and developmental disorders, Prevention of disabilities- Types and levels

- Disability Evaluation: Introduction, What, Why and How to evaluate, Quantitative versusQualitative data, Uses of evaluation findings

Module V :
Role of Social work in CBR: Definition of social work, Methods of social work, History of social work, Role of social worker in rehabilitation

Module VI : Bioengineering

- Principles of Orthotics
- Types, indications, contra indications assessment (check out), Uses and fitting- region wise, Upper extremity, lower extremity and spine
- Fabrication of simple splints and assistive & adaptive devices for upper and lower extremity – indications and applications

Practical:
- Field visits to urban and rural PHC's., Visits to regional rehabilitation training center, Regular mobile camps, Disability surveys in villages, Disability screening,
- Demonstration of Evaluation and Physiotherapy prescription techniques for musculoskeletal, neuromuscular, cardio-respiratory, paediatric, gynecological and geriatric problems in community,
- Demonstration of evaluation and prescription techniques for ambulatory and assistive devices, Fabrication of low cost assistive devices with locally available materials.

Reference Books:

1. Rehabilitation Medicine by Howard A Rusk.
2. Rehabilitation Medicine by Joel A De lisa
3. Physical Rehabilitation – Assessment and Treatment – Sullivan & Schmitz F. A. Davis.
4. Occupational Therapy and Physical Dysfunction. Principles, Skills and Practices – Hand Splinting - Tuner, Forster & Johnson – Churchill Livingstone
5. Hand Splinting – Wilson – W. B. Saunders.
6. Orthotics in Rehabilitation : Mckee and Morgan – F. A. Davis

Eighth Semester
Clinical Neurology and Neurosurgery -II

Subject code: BPT 801

Course Objectives:

- To understand clinical manifestations of Neurological and Psychological disorders
- The rationale and implications of psychological disorders on disability
- To understand the management of neural & psychological disorders

Module -I

Introduction, clinical features, assessment, diagnosis, medical & surgical Management of following:

- Disorders of Spinal cord and Cauda Equina- spinal cord injury, paraplegia, quadriplegia, spina-bifida, transverse myelitis, Neurogenic bladder and bowel disease
- Muscle disorders – Progressive muscular dystrophy, polymyositis, myasthenia gravis, floppy infant syndrome
- Autonomic nervous system (brief description)– clinical features of autonomic disorders, autonomic dysreflexia, autonomic nervous system and pain

Module -II

Introduction, Indications and Complications of following Neuro surgeries: Craniotomy, Cranioplasty, Stereotactic surgery, Deep brain stimulation, Burr-hole, Shunting, Laminectomy, Hemilaminectomy, Rhizotomy, Microvascular decompression surgery, Endarterectomy, Embolization, Pituitary surgery, Ablative surgery - Thalamotomy and Pallidotomy, Coiling of aneurysm, Clipping of aneurysm, and Neural implantation.

Psychiatry

Module -III

(Brief outline only)

Principles of psychiatric examination Modalities of psychiatric treatment Psychiatric illness and physical therapy link

Brief description of Etio-pathogenesis, manifestations, and management of psychiatric illnesses - i. Anxiety neurosis ii. Depression iii. Obsessive compulsive neurosis iv. Psychosis v. Maniac-depressive psychosis vi. Drug induced psychosis vii. Post-traumatic stress disorder viii. Psychosomatic reactions: Stress and Health, theories of Stress – Illness

Module -IV

Brief description of Etio-pathogenesis, manifestations, and management of psychiatric illness

i. Organic brain syndrome
ii. Dementia

iii. Drug dependence and alcoholism
iv. Somatoform and Dissociate Disorders – conversion reactions, Somatization, Dissociate Amnesia, and Dissociate Fugue
v. Multiple Personality & Depersonalization disorder

Module -V

i. Child psychiatry: Brief descriptions of manifestations, and management of childhood disorders - attention deficit syndrome, and behavioral disorders
ii. Mental deficiency- (descriptive)
    a. Mental retardation,
    b. Learning disabilities
    c. Autistic behavior

Practical

The syllabus for practical examination shall be relevant portion of the theory

Reference Books:

1. Principles of Neurology by Adams and Victor
2. Dejong's The Neurologic Examination by William W. Campbell
3. Neurology & Neurosurgery Illustrated by Lindsay
4. A short Textbook of Psychiatry by Niraj Ahuja

Eighth Semester

Physiotherapy in Neurological Conditions-II

Subject code: BPT 802

Course Objectives:

- The subject serves to integrate the knowledge gained by the students in neurology and neurosurgery with skills to apply these in clinical situations of dysfunction and neurological pathology.
- The student will be able to identify disabilities due to neurological dysfunction, plan and set treatment goals
- The student will be able to apply the skills gained in exercise therapy and electrotherapy in these clinical situations to restore neurological function.

Module I: Evaluation and Management of Muscle Disorders

- Myopathies
- Muscular dystrophy
- Spinal muscular atrophy
- Poliomyelitis, Post-Polio Syndrome.

Module II: Evaluation and Management of Peripheral Nerve Injuries and Disorders

- Gullain Barr Syndrome
- Peripheral nerve injuries
- Entrapment neuropathies
- Peripheral neuropathies- Median nerve palsy, Ulnar nerve palsy, Radial nerve palsy, sciatic nerve palsy, Common peroneal nerve palsy,

Module III: Evaluation and Management Spinal Cord Disorders

- Spinal cord injury: Types and Mechanisms of spinal cord injury, Clinical features, potential complications
- Physiotherapy principles of immediate and postoperative therapeutic management

Module IV: Diseases and disorders of the spinal cord

Physiotherapy assessment & Management of the following

- Craniocerebral junction anomalies
- Syringomyelia
- Transverse Myelitis
- Subacute Combined Degeneration of the cord

Module V: Demyelinating & Degenerative Disorders of Nervous System

- Acute disseminated encephalomyelitis
- Multiple sclerosis
- Motor Neuron Disease

Module VI: Paediatric Neurology

Paediatric Examination, Developmental milestones, developmental reflexes, Neuro developmental screening tests. Evaluation & Management - History, Observation, Palpation, Milestone Examination, developmental reflex Examination, Higher mental function, Cranial nerve examination, Motor & Sensory examination, Reflex testing, differential Diagnosis, Balance & Coordination examination, Gait analysis, Functional analysis, List of Problems & Complications, short & Long Term goals, Management of systemic complications, Management of Mechanical Complications,

Use of various neurological approaches & Modalities in Risk babies, Minimum brain damage, Developmental disorders, Cerebral palsy, Autism, Down's Syndrome, Hydrocephalus,, Spina bifida, and syringomyelia.

Practical

Neurological Examination for above mentioned conditions should be demonstrated and practice by the students with the following:

- Evaluation and assessment of Muscular disorder cases.

- Evaluation and assessment Spinal Cord Disorders.
- Evaluation and assessment Management of Peripheral Nerve Injuries and Disorders.
- Evaluation and assessment Pediatric cases.

Reference Books:

1. Cash Text Book for Physiotherapists in Neurological Disorders-Jaypee Bros. Publication 5th edition
2. Proprioceptive Neuro Muscular Facilitation- By A. Susan
3. Right In The Middle-Patracia Devis,2nd edition
4. Stroke Rehabilitation--Margaret Johnson,3rd edition
5. Neurological Rehabilitation- Umphred Davis 6th edition
6. Neurological Physiotherapy-Problem solving approach: Susan Edwards, 2nd edition
7. Adult Hemiplegia: Evaluation and treatment: Berta Bobath, 2nd edition
8. Physical Rehabilitation by Susan O Sullivan

Eighth Semester
Physiotherapy in Cardiothoracic & Cardiopulmonary Conditions-II

Subject code: BPT 803

Course Objectives: The subject is designed to provide knowledge in assessing and planning physiotherapy interventions for various Cardiothoracic conditions.
The student must be able to reassess the patient as necessary, to monitor the patient in regard to treatment, to monitor the patient's vital signs, student must know emergency drugs indication and contra-indication, care in intensive care unit (ICU) and to provide appropriate interventions to the patient.

Module I :
Physiotherapy assessment and management of Obstructive lung conditions
Physiotherapy assessment and management of Restrictive lung conditions.

Module II
Introduction to ICU : ICU monitoring –Apparatus, Airways and Tubes used in the ICU - Physiotherapy in the ICU – Common conditions in the ICU – Tetanus, Head Injury, Lung Disease, Pulmonary Oedema, Multiple Organ Failure, Neuromuscular Disease, Smoke Inhalation, Poisoning, Aspiration, Near Drowning, ARDS, Shock; Dealing with an Emergency Situation in the ICU.

Module III

- Management of breathlessness.
- Pulmonary Rehabilitation.
- Physiotherapy following Lung surgeries
- Respiratory failure – Oxygen Therapy and Mechanical Ventilation.

Module IV

- Physiotherapy management following cardiac surgeries.
- Cardiac Rehabilitation.
- Physiotherapy management following PVD.

Module V

- Abdominal Surgeries - Management of Pulmonary Restorative Dysfunction following surgical procedures on Abdomen and Thorax.
- Management of Amputations following Diabetes, PVD - Prosthesis in amputations of lower limbs following ulcers and gangrenes.
- Home program and education of family members in patient care.
- Treatment, Response to exercise and Implications of Physiotherapy in the following disease conditions: Hypertension, Diabetes, Renal Failure and Obesity.

Practical:

Practical shall be conducted for all the relevant topics discussed in theory in the following forms:
1. Bedside case presentations and case discussions
2. Lab sessions consisting of evaluation and assessment methods on student models, treatment techniques and practice sessions.

Reference Books:

1. Cash`s Text book for Physiotherapists in Chest, Heart & Vascular diseases- Jaypee bros. Publication
2. Cash`s text book in General Medical & Surgical conditions for Physio therapists
3. Chest Physical therapy & Pulmonary rehabilitation-by Donna Frownfilter
4. Cardiopulmonary Physical therapy by Irwin Scott

Eighth Semester
Physiotherapy in Sports- II

Subject code: BPT 804

Course Objectives: This course will help the students about the basic idea of understanding an athlete's psychology, pharmacology in sports, dope and doping procedures etc. along with the traumatology in sports.

Module I

- Sports Psychology, Spirit & moral values,
- Doping in sports & performance enhancing drugs.
- Special aids in performance
- Protective equipment used in sports

Module II

Measurement of fitness components and sports skills

- Measurement of muscular strength
- Measurement of muscular endurance
- Measurement of flexibility
- Determination exercise endurance

Module III

Sports injuries

- Spine – PIVD, Kissing spine, cervical whiplash injuries, facet joint syndrome, SI Joint dysfunction
- Hip – Muscle strain, Piriformis syndrome, ITB syndrome, osteitis pubis
- Knee – menisci, cruciate, collateral, osteochondritis, chondromalacia patellae, Biceps femoris tendonitis, swimmers knee, patello-femoral pain syndrome
- Leg & ankle – shin splint, achillis tendonitis & rupture, TA bursitis, ankle sprain, Plantar fascitis, turf toe syndrome
- Head & face – Maxillo-facial injuries, helmet compression syndrome

Module IV

Sports injuries

- Shoulder – instability, rotator cuff injury, biceps tendonitis and rupture, pectoralis major rupture, scapular dyskinesis and acromio-clavicular joint injuries

- Elbow – tennis elbow, golfer's elbow
- Wrist and hand – carpal tunnel syndrome, gamekeeper's thumb

Module V

Sports in Special age groups:

- Female athletic triad
- Younger athlete- Musculo-skeletal problems, management, children with chronic Illness and nutrition
- Older athlete- Physiological changes with aging, benefits, risks of exercise in Elderly, exercise prescription guidelines for elderly

Practical

Various Physiotherapy modalities and treatment techniques for above mentioned conditions should be demonstrated and practice by the students.

Reference Books:

1. Principles of sports medicine by Brukner & Karim.
2. Athletic Injuries in sports by Magee.
3. Physical Therapies in Sports and Exercise by Kolt, G.S and Mackler.
4. Sports Injuries: Diagnosis and Management by Norris, C.M.
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10. Running Injuries Guten, Gray N.
11. Soft Tissues: Trauma and sports Injury, Mclatchie, and Lennox.
12. Evaluation of Orthopedic and Athletic Starkey, and Ryan.

Eighth Semester
Community Based Rehabilitation & Bioengineering-II
Subject code: BPT 805

Course Objectives:

- The subject serves to integrate the knowledge gained by the students in community medicine and other areas with skills to apply these in clinical situations of health and disease and its prevention.
- The objective of the course is that after the specified hours of lectures and demonstrations the student will be able to identify rehabilitation methods to prevent disabilities and dysfunctions due to various disease conditions and plan and set treatment goals and apply the skills gained in rehabilitating and restoring functions.

Module I :

- Role of Government in CBR: Laws, Policies, Programmes, Human Rights Policy, Present rehabilitation services, Legal aspects of rehabilitation
- Role of voluntary Organizations in CBR: Charitable Organizations, Voluntary health agencies
- National level and International NGO's, Multilateral and Bilateral agencies. International Health Organizations: WHO, UNICEF, World bank.

Module II :

- National District Level Rehabilitation Programme: Primary rehabilitation unit, Regional training center, District rehabilitation center, Primary Health center, Village rehabilitation worker, Anganwadi worker
- Extension services and mobile units: Introduction, Need, Camp approach

Module III :

- Role of Physiotherapy in CBR: Screening for disabilities, Prescribing exercise programme, Prescribing and devising low cost locally available assisstive aids, Modifications physical and architectural barriers for disabled, Disability prevention, Strategies to improve ADL, Rehabilitation programmes for various neuromusculoskeletal and cardiothoracic disabilities.

- Screening and rehabilitation of paediatric disorders in the community: Early detection of high risk babies, Maternal nutrition and education, Rehabilitation of Cerebral Palsy, Polio, Downs Syndrome, Muscular Dystrophies etc., Prevention and rehabilitation of mental retardation and Behavioural disorders, Immunization programmes, Early intervention in high risk babies, Genetic counselling

Module IV :

Vocational training in rehabilitation: Introduction, Need, Vocational evaluation, Vocational rehabilitation services

Module V :

Industrial Health & Ergonomics - Occupational Hazards in the industrial area accidents due to

1. Physical agents-e.g.-Heat/cold, light, noise, Vibration, U.V. radiation, Ionizing, radiation,
2. Chemical agents-Inhalation, local action, ingestion,
3. Mechanical hazards-overuse/fatigue injuries due to ergonomic alteration & ergonomic evaluation of work place-mechanical stresses per hierarchy
4. Psychological hazards- e.g.-executives, monotonicity & dissatisfaction in job, anxiety of work completion with quality, Role of P.T. in Industrial setup & Stress management relaxation modes.

Module VI : Bioengineering

- Principles of Prosthetics
- Types, indications, contraindications, assessment check out, uses and fitting - region wise, upper extremity, lower extremity Prosthesis.

Practical:

- Field visits to urban and rural PHC's., Visits to regional rehabilitation training center, Regular mobile camps, Disability surveys in villages, Disability screening,
- Demonstration of Evaluation and Physiotherapy prescription techniques for musculoskeletal, neuromuscular, cardio-respiratory, paediatrics, gynecological and geriatric problems in community,
- Demonstration of evaluation and prescription techniques for ambulatory and assistive devices, Fabrication of low cost assistive devices with locally available materials.

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