Ordinance Governing Bachelor of Physiotherapy (BPT) Degree Course

Syllabus / Curriculum 20012-13

KLE UNIVERSITY

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VISION

To be an outstanding University of excellence ever in pursuit of newer horizons to build self reliant global citizens through assured quality educational programs.

MISSION

- To promote sustainable development of higher education consistent with statutory and regulatory requirements.
- To plan and continuously provide necessary infrastructure, learning resources required for quality education and innovations.
- To stimulate to extend the frontiers of knowledge, through faculty development and continuing education programs.
- To make research a significant activity involving staff, students and society.
- To promote industry/organization, interaction/collaborations with regional / national / international bodies.
- To establish healthy systems for communication among all stakeholders for vision oriented growth.
- To fulfill the national obligation through rural health missions.

OBJECTIVES

The objectives are to realize the following at university and its constituent institutions:

- To implement effectively the programs through creativity and innovation in teaching, learning and evaluation.
- To make existing programs more careers oriented through effective system of review and redesign of curriculum.
- To impart spirit of enquiry and scientific temperament among students through research oriented activities.
- To enhance reading and learning capabilities among faculty and students and inculcate sense of life long learning.
- To promulgate process for effective, continuous, objective oriented student performance evaluation.
- To ordinate periodic performance evaluation of the faculty.
- To incorporate themes to build values, civic responsibilities & sense of national integrity.
- To ensure that the academic, career & personal counseling are in-built into the system of curriculum delivery.
- To strengthen, develop and implement staff and student welfare programs.
- To adopt and implement principles of participation, transparency and accountability in governance of academic and administrative activities.
- To constantly display sensitivity and respond to changing educational, social, and community demands.
- To promote public- private partnership.

INSIGNIA

The Emblem of the University is a Philosophical statement in Symbolic.

The Emblem…

A close look at the emblem unveils a pillar, a symbol of the "University of Excellence" built on strong values & principles.

The Palm and the Seven Stars…

The Palm is the palm of the teacher - the hand that acts, promises & guides the students to reach for the Seven Stars…

The Seven Stars signify the 'Saptarishi Dnyanamandal', the Great Bear- a constellation made of Seven Stars in the sky, each signifying a particular Domain. Our culture says: The true objective of human birth is to master these Knowledge Domains.

The Seven Stars also represent the Saptarishis, the founders of KLE Society whose selfless service and intense desire for "Dnyana Dasoha" laid the foundation for creating the knowledge called KLE Society.

Hence another significance of the raised palm is our tribute to these great Souls for making this University a possibility.

Empowering Professionals…

'Empowering Professionals', inscription at the base of the Emblem conveys that our Organization with its strength, maturity and wisdom forever strive to empower the student community to become globally competent professionals. It has been a guiding force for many student generations in the past, and will continue to inspire many forth coming generations.

NOTIFICATION

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CONTENTS

Section-I

PREAMBLE

The disability profile has been increasing as indicated in the recent surveys by Government of India. New fields like community health centers, industrial health centers, homes for elderly, hospices, rehabilitation centers, schools for disabled, research centers, sports medicine and training centers, non-governmental organizations show an inadequate participation from qualified Physiotherapists. Hence, there is a growing need for the qualified Physiotherapists in our country.

Physiotherapy is an allied health care profession characterized by the treatment of various diseases and disorders with the help of skilled use of physiologically-based movement techniques, supplemented when necessary by electrotherapy and other physical means for the prevention and treatment of injury and disease. It is used to assist the process of rehabilitation and restoration of function, including the achievement of personal independence. The work of the Physiotherapist is therefore essential to ensure a good quality of life of individuals ranging from children to the elderly with various disabilities like physical, neurological, psychosocial and sensory, rehabilitation needs and their integration in the community. The specific objective of the therapist is to function as an integral part of a multidisciplinary team to enable those whose abilities in productivity, self-maintenance and leisure are threatened, restricted or lost due to impairment, developmental delay, ageing or lack of opportunity, to become full and productive members of the community. Physiotherapists are therefore of paramount importance in the effective operation of the health care, social welfare and education systems. Physiotherapists play an important role in preventive medicine which includes all pathologies of musculo-skeletal, neuromuscular & cardiovascular system at all ages.

The first three years of study have been designed to equip students with all the basic training needs of a Physiotherapist for general practice, including implementation of treatment after effective Physiotherapy assessment, good communication and interpersonal skills and commitment to ethical and social responsibility. The fourth year of study leads to the award of a Bachelor of Physiotherapy and is designed to meet the research and administrative and management needs of the profession, including exposure to clinical electives. The practical and clinical education training will provide the opportunity for translation of theoretical knowledge into hands-on practice of immediate relevance and will further help students in acquiring professional competence. Graduates with this degree can either pursue higher studies like Master of Physiotherapy and post graduate diploma or seek employment locally and internationally. Physiotherapists are employable in a wide range of areas like clinics, hospitals, hospices, homes for elderly, schools, industries, sports medicine centers etc and can also choose private practice after they are awarded the Bachelor of Physiotherapy degree.

Section-II

GOALS OF PHYSIOTHERAPY EDUCATION

Various Goals of education & training in physiotherapy at KLE University are as follows:

- Teach common problems of heath and disease and the National Health programs.
- Take up responsibilities of physiotherapist and be capable of functioning independently in both urban and rural environment.
- Provide educational experience that allows hands on experience both in hospital as well as in community setting.
- Make maximum efforts to encourage integrated teaching methods.
- Use learner oriented methods which encourage clarity of expression, independence of judgment, scientific habits, problem solving abilities, self initiated and self directed learning.
- Use of active methods of learning such as group discussions, seminars, role play, field visits, demonstrations, peer interaction, etc which would enable to develop personality, communication skills and other qualities which are necessary.
- Shift the role of physiotherapy teachers from merely imparting knowledge to that of a facilitator and motivator of student learning.
- Establish a physiotherapy education unit for faculty development, preparation of learning resource materials and for imparting evaluation methods.

Section-III

AIMS AND OBJECTIVES OF BPT COURSE

Aims: The Physiotherapy graduates during training in the Institution should acquire adequate knowledge, necessary skills and reasonable attitudes which are required for carrying out all activities, appropriate to general physiotherapy practice involving the prevention, diagnosis and treatment of anomalies and diseases of the human body. The graduate also should understand the concept of community physiotherapy education and be able to participate in the rural health care delivery programs existing in the country.

Objectives: The objectives are dealt under three headings such as knowledge and understanding, skills and attitudes.

Knowledge and understanding: The graduate should acquire the following during the period of training:

- Adequate knowledge of the scientific foundations on which Physiotherapy is based and good understanding of various relevant scientific methods, principles of biological functions and is able to evaluate and analyze scientifically various established facts and data.
- Adequate knowledge of the development, structure, and function of the human system both in health and disease and their relationship and effect on general state of health and also bearing on physical and social well being of the patient.
- Adequate knowledge of clinical disciplines and methods which provide coherent picture of anomalies, lesions, and diseases of the human body and preventive, diagnostic, and therapeutic aspects of Physiotherapy practice.
- Adequate clinical experience required for general Physiotherapy practice.
- Adequate knowledge of the constitution, biological and behavior of persons in health and sickness as well as the influence of the natural and social environment of the state of heath in so far as it affects Physiotherapy.

Skills: A graduate should be able to demonstrate the following skills necessary for practice of physiotherapy:

- Able to diagnose and manage various common Physiotherapy problems encountered in general physiotherapy practice keeping in mind the expectations and the rights of the society to receive the best possible treatment available wherever possible.
- Acquire the skill to prevent and manage complication if encountered while carrying out various surgical and other procedures.
- Possess skill to carry out certain investigative procedures and ability to interpret laboratory findings.
- Promote over all health (fitness) and prevent diseases whenever possible.
- Competent in the control of pain and anxiety during Physiotherapy treatment.

Attitudes: A graduate should develop during the training period the following attitudes:

- Willingness to apply the current knowledge of Physiotherapy in the best interest of the patients and the community.
- Maintain a high standard of professional ethics and conduct and apply these in all aspects of professional life.
- Seek to improve awareness and provide possible solutions for overall health problems and needs of the community.
- Willingness to participate in the Department of Physiotherapy Education (DOPE) programs to update the knowledge and professional skills from time to time.
- To participate implementation of the national health programs.

Section-IV

REGULATIONS GOVERNING BPT DEGREE COURSE

Eligibility: A candidate seeking admission to first year BPT course should have passed Pre-University examination of Karnataka Pre-University Board with English as one of the subjects and Physics, Chemistry and Biology as optional subjects OR should have passed any other examination conducted by Boards/Councils/ Intermediate examination established by State/Central Governments or equivalent studies within India or abroad, with English as one of the subjects and Physics, Chemistry and Biology as optional subjects. The candidate should have completed 17 years of age on or before 31st day of December of the year of admission. The selection of students to the physiotherapy course shall be based on:

i) A Candidate must have passed in the qualifying examination individually in the subjects of Physics, Chemistry, Biology and English obtaining not less than 40% marks taken together and should also have scored 40% marks in English language.

ii) The candidate must appear for KLE UGAIET competitive entrance examination and must have come in the merit list by securing not less than 40% marks in Physics, Chemistry and Biology taken together.

Duration of the Course: Every student shall undergo a period of certified study extending over 4 academic years from the date of commencement of his/her study for the subject comprising the physiotherapy curriculum to the date of completion of the examination followed by six months compulsory rotatory internship.

Academic terms: All candidates admitted beyond the last date stipulated by the University shall have to appear for first professional examination after completion of the prescribed duration.

Attendance: Every candidate should have attendance not less than 75% of total classes conducted in theory and practical in each calendar year calculated from the date of commencement of the term to the last working day as notified by the University, in each of the subjects prescribed to be eligible to appear for the University examination. A candidate lacking in the prescribed attendance and progress in any subjects in theory or practical/clinical shall not be permitted to appear for the University examination in those subjects.

Internal assessment: It shall be based on regular evaluation of periodic tests of assignments, clinical presentations, theory & practical test. There should be a minimum of at least 3 sessional examinations and the average of best two marks should be sent to the University before the University examination as per notification. Proper record should be maintained for all students & should be available for scrutiny. The marks of periodical tests should be displayed on the student notice board.

Schedule of Examination: There will be two examinations in a year, i) an annual examination and ii) a supplementary examination to be conducted as per notification issued by the University from time to time. The particulars of subjects for various examinations and distribution of marks are shown separately in tables V TO VIII.

Eligibility for Examination: To be eligible to appear for University examination a candidate:

a) Should have undergone satisfactorily the approved course of study in the subject or subjects for the prescribed duration.
b) Should have attended at least 75% of the total number of classes in theory and practical jointly to become eligible to appear for examination in those subject/subjects.
c) Should secure at least 35% of total marks assigned for internal assessment in particular subject in order to be eligible to appear in the University examination of that subject.
d) Who fails in any other subject/subjects of first year BPT, has to put one academic term before he/she becomes eligible to appear for the next examination.
e) Shall fulfill any other requirement that may be prescribed by the University from time to time.

Criteria for Pass: For declaration of pass in any subject in the university examination, a candidate should pass both in Theory & Practical examinations components separately as stipulated below:

a) For a pass in theory a candidate shall secure not less than 50% marks in aggregate i.e., marks obtained in written examination and internal assessment (theory) added together.
b) For a pass in practical examination, a candidate shall secure not less than 50% marks in aggregate, i.e., marks obtained in university practical examination, viva–voce examination and internal assessment (practical) added together.
c) A candidate not securing 50% marks in theory and practical examination in a subject shall be declared to have failed in that subject and is required to appear for both theory and practical, again in the subsequent examination in the subject.

Declaration of class:

a) A candidate having appeared in the entire subject in the same examination and passed that examination in the first attempt and secure 75% of marks or more of grand total marks prescribed will be declared to have passed the examination with distinction.
b) A candidate having appeared in the entire subject in the same examination and passed that examination in the first attempt and secure 60% of marks or more but less than 75% of grand total marks prescribed will be declared to have passed the examination in First class.
c) A candidate having appeared in the entire subject in the same examination and passed that examination in the first attempt and secure 50% of marks or more but less

than 60% of grand total marks prescribed will be declared to have passed the examination in Second class.

d) A candidate passing the University examination in more than one attempt shall be placed in pass class irrespective of the percentage of marks secured by him/her in the examination.

[Please note fraction of marks should not be rounded off for causes (a), (b) and (c)]

Grading structure: This will be as shown below taking into account that the pass mark for all subjects is 50% grade point average (GPA) under the GPA, the following letter grades & their grade point equivalent are used

Letter Grade	Grade Point	Percentage Mark
A^+	4.00	$90 \leq x < 100$
A		$80 \leq x < 90$
A^-		$70 \leq x < 80$
B^+	3.00	$65 \leq x < 70$
B		$60 \leq x < 65$
C	2.00	$50 \leq x < 60$
F	0	$x \leq 50$

Carry over: A candidate who has failed in their respective year university examination can carry over a maximum of two subjects to their next year, but will have to pass the subjects in the subsidiary examination before writing the examination of the next academic year.

Internship: There shall be six months of Internship after the final examination for candidate declared to have passed the examination in all the subjects. Internship should be done in a teaching hospital recognized by the university. No candidate shall be awarded degree certificate without successfully completing six months internship. The internship should be rotatory and cover all clinical branches concerned with physiotherapy.

Section- V

SUBJECTS AND TEACHING SCHEDULE

Table I: FIRST YEAR BACHELOR OF PHYSIOTHERAPY (I BPT)

Subject code	Name of the subject	Teaching hours		
		Theory	Practical	Total
PT 1101	Human Anatomy	120	100	220
PT 1102	Human Physiology	120	100	220
PT 1103	Human Biochemistry	100	-	100
PT 1104	Human Biomechanics	150	100	250
PT 1105	Part-A Psychology Part-B Sociology	50 50	-	100
PT 1106	Basic Nursing and First Aid*	60	-	60
PT 1107	Computer application and Management in Physiotherapy*	50	-	50
PT 1108	Clinical Education and Training	-	650	650
	TOTAL	**700**	**950**	**1650**

*No University examination

Table II: SECOND YEAR BACHELOR OF PHYSIOTHERAPY (II BPT)

Subject code	Name of the subject	Teaching hours		
		Theory	**Practical**	**Total**
PT 1109	Exercise Therapy	100	200	300
PT 1110	Electrotherapy & Physical Agents	100	200	300
PT 1111	Prosthetics and Orthotics	100	100	200
PT 1112	Part-A Pathology Part -B Microbiology	50 50	-	100
PT 1113	Pharmacology	100	-	100
PT 1114	Constitution of India*	50	-	50
PT 1115	Clinical Education & Training	-	600	600
	TOTAL	**550**	**1100**	**1650**

*No University examination

Table III: THIRD YEAR BACHELOR OF PHYSIOTHERAPY (III BPT)

Subject code	Name of the subject	Teaching hours		
		Theory	**Practical**	**Total**
PT 1116	General Medicine	100	100	200
PT 1117	General Surgery	100	100	200
PT 1118	Community Medicine	100	100	200
PT 1119	Clinical Orthopedics	100	100	200
PT 1120	Part-A Neurology Part-B Neurosurgery	50 50	100	200
PT1121	Research Methodology and Ethics	40	-	40
PT 1122	Clinical Education & Training	-	600	650
	TOTAL	**540**	**1100**	**1640**

Table IV: FOURTH YEAR BACHELOR OF PHYSIOTHERAPY (IV BPT)

Subject code	Name of the subject	Teaching hours		
		Theory	Practical	Total
PT 1123	Physiotherapy in Medicine	100	100	200
PT 1124	Physiotherapy in Surgery	100	100	200
PT 1125	Community Physiotherapy & Rehabilitation	100	70	170
PT 1126	Physiotherapy in Orthopedics	100	100	200
PT 1127	Physiotherapy in Neurology & Neurosurgery	100	100	200
PT 1128	Evidence based Physiotherapy*	30	-	30
PT 1129	Clinical Education & Training	-	650	650
	TOTAL	**530**	**1120**	**1650**

*No University Examination

Section- VI

Table V: SCHEME OF EXAMINATION FOR I BPT

Sl. No.	Subject	Theory			Practical			Grand Total
		Written		Internal Assessment	Practical	Viva Voce	Internal Assessment	
		Time	Maximum Marks	Maximum Marks	Maximum marks	Maximum marks	Maximum marks	
1	Human Anatomy	3hours	80	20	50	30	20	200
2	Human Physiology	3hours	80	20	50	30	20	200
3	Human Biochemistry	3hours	80	20	-	-	-	100
4	Human Biomechanics	3hours	80	20	50	30	20	200
5	Part-A Psychology Part-B Sociology	3hours	40 40	10 10	-	-	-	100

Table VI: SCHEME OF EXAMINATION FOR II BPT

Sl. No.	Subject	Theory			Practical			Grand Total
		Written		Internal Assessment	Practical	Viva Voce	Internal Assessment	
		Time	Maximum Marks	Maximum Marks	Maximum marks	Maximum marks	Maximum marks	
1	Exercise Therapy	3hours	80	20	50	30	20	200
2	Electrotherapy & Physical Agents	3hours	80	20	50	30	20	200
3	Prosthetics and Orthotics	3hours	80	20	-	-	-	100
4	Part-A Pathology Part-B Microbiology	3hours	40 40	10 10	-	-	-	100
5	Pharmacology	3hours	80	20	-	-	-	100

Table VII: SCHEME OF EXAMINATION FOR III BPT

Sl. No.	Subject	Theory			Practical			Grand Total
		Written		Internal Assessment	Practical	Viva Voce	Internal Assessment	
		Time	Maximum Marks	Maximum Marks	Maximum marks	Maximum marks	Maximum marks	
1	General Medicine	3hours	80	20	-	-	-	100
2	General Surgery	3hours	80	20	-	-	-	100
3	Community Medicine	3hours	80	20	-	-	-	100
4	Clinical Orthopedics	3hours	80	20	-	-	-	100
5	Part-A Neurology Part-B Neurosurgery	3hours	40 40	10 10	-	-	-	100
6	Research Methodology and Ethics	3hours	80	20	-	-	-	100

Table VIII: SCHEME OF EXAMINATION FOR IV BPT

Sl. No.	Subject	Theory			Practical			Grand Total
		Written		Internal Assessment	Practical	Viva Voce	Internal Assessment	
		Time	Maximum Marks	Maximum Marks	Maximum marks	Maximum marks	Maximum marks	
1	Physiotherapy in Medicine	3 hours	80	20	50	30	20	200
2	Physiotherapy in Surgery	3 hours	80	20	50	30	20	200
3	Community Physiotherapy & Rehabilitation	3 hours	80	20	50	30	20	200
4	Physiotherapy in Orthopedics	3 hours	80	20	50	30	20	200
5	Physiotherapy in Neurology & Neurosurgery	3 hours	80	20	50	30	20	200

Guidelines for University Theory Examinations

Type of Questions	**Marks**	
	For 80 marks Paper	**For 40 marks Paper**
Multiple choice question	20(twenty question of one marks)	10(ten question of one marks)
Long Essay Question	20(2questions x10)	10(1question s x10)
Short essay type	20 (4 questions X 5)	10 (2questions x 5)
Very short answer questions	20(10questions x2)	10(5Questions x2)
Total	**80**	**40**
Duration	**3Hours**	**1Hours and 30 minutes**

Guidelines for University Practical Examinations (I&II Year BPT)

Type of Questions	**Marks**
Lab Experiment 1(Long)	20
Lab Experiment 2(Short)	15
Lab Experiment 3(Short)	15
Total	**50**
Viva Voice	**30**
Duration	**8Hours**
Students allotted	**25/day**

Guidelines for University Practical Examinations (IV Year BPT)

Type of Questions	**Marks**
One long case	20
Two short case 2x15	30
Total	**50**
Viva voice	**30**
Duration	**8Hours**
Students allotted	**25/day**

Maximum Duration to complete the course = Double the duration of course. If a candidate fails to complete the course in that period then he/she have to reregister.
Maximum Number of attempts = 08

Section-VII- A

FIRST YEAR BPT (BPT I) SUBJECTS AND COURSE CONTENTS

HUMAN ANATOMY (SUBJECT CODE: PT 1101)

Teaching Hours: 220 hours (Theory: 120 hours and Practical: 100hours)
Maximum Marks: 200 (Theory: 100 and Practical & Viva - voce 100)
Assessment: Written, Oral and Practical, Internal and University examination.
Internal Examination: 20 marks Theory and 20 marks Practical.
University Examination: 80 marks Theory, and 40 marks Practical and Viva – voce

Objectives: The objectives are to develop an understanding about various integral parts of human body, their structure, function and location with reference to the surface anatomy with an emphasis on musculoskeletal, nervous and cardio respiratory systems.

Theory Contents

1. General anatomy

- Introduction to anatomy, terms and terminology
- Regions of body, cavities and systems outline
- Surface anatomy – musculo-skeletal and cardiopulmonary
- Cell structure and function of cell organelles (brief outline only)
- Connective tissue & its modification, tendons, membranes, special connective tissue
- 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
- 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

2. Upper extremity

- Bony architecture
- Joints – structure, range of movement
- Muscles – origin, insertion, actions, nerve supply
- Major nerves – course, branches and implications of nerve injuries
- Development of limb bones, muscles and anomalies
- Radiographic identification of bone and joints

3. Lower extremity

- Bony architecture
- Joints – structure, range of movement
- Muscles – origin, insertion, actions, nerve supply
- Major nerves – course, branches and implications of nerve injuries
- Development of limb bones, muscles and anomalies
- Radiographic identification of bone and joints

4. 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

5. Thorax

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

6. Head and neck

- Cranium
- Facial Muscles
- Central nervous system – disposition, parts and functions
- Cerebrum
- Cerebellum
- Midbrain & brain stem
- Blood supply & anatomy of brain
- Spinal cord- anatomy, blood supply, nerve pathways
- Pyramidal, extra pyramidal system
- Thalamus, hypothalamus
- Ventricles of brain, CSF circulation
- Development of nervous system & defects (brief description)
- Cranial nerves – special emphasis on V, VII, X, XI, XII (course, distribution and palsies)
- Sympathetic nervous system, its parts and components (brief description)
- Parasympathetic nervous system (brief description).

7. Miscellaneous

- Histology: cells, tissues of the various organs of the body, epithelium, connective tissues, neuro- musculo- skeletal systems and blood vessels and lymphoid tissue
- Embryology in brief covering neuro-musculo-skeletal developmental aspects
- Endocrine - system – pituitary, thyroid, parathyroid (brief description)
- Special senses (brief description): nerve receptors, eye, ear, labyrinth
- 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 Contents

1. Topics for dissection

- Upper extremity, lower extremity, head & neck, brain and spinal cord, thorax and abdomen.
- Surface anatomy of all the above

2. Practical demonstrations

- Histology- identifying the bone, cartilage, all connective tissues, blood vessels, nervous system cells
- Embryology- models, charts & x-rays

3. Demonstrations (in a cadaver)

- All muscles of the whole body.
- Organs in thorax and abdomen
- All joints with periarticular structures
- Points of palpation of peripheral nerves and blood vessels of upper and lower limbs
- Brain parts and spinal cord

4. Surface marking

- Lung, pleura, fissures and lobes of lungs, heart, liver, spleen, kidney, cranial nerves, spinal nerves and important blood vessels

5. Identification of body prominences on inspection and by palpation especially of extremities

Suggested Readings

1. Standring Susan: Gray's Anatomy – The Anatomical Basis of Clinical Practice. 39th Ed, Elsevier Churchill Livingstone, London, 2005.
2. Anne MR, Dalley AF: Grant's Anatomy. 11th Ed, Lippincott Williams, Baltimore, 2005.
3. Snell RS: Clinical Anatomy for Medical Students. 7th Ed, Little Brown Publishers, Boston, 1995.
4. Derek F: Anatomy – Palpation & Surface Markings, Butterworth Heinman, London, 1997.
5. Romanes GJ: Cunningham Manual of Practical Anatomy. Vol I, II, III, 15th Ed, Oxford Medical Publication, Oxford, 1986 (Reprinted with corrections 2002).
6. Chaurasia BD: Human Anatomy – Regional and Anatomy – Dissection & Clinical. 4th Ed, Vol I, II, III, CBS Publications & Distributors, New Delhi, 2004.
7. Faruqi NA: Handbook of Osteology. 1st Ed, CBS Publications & Distributors, New Delhi, 2007.
8. Inderbir Singh: Text Book of Human Histology. 4th Ed, Jaypee Brothers, New Delhi, 2002.
9. Inderbir Singh: Text Book of Human Embryology. 6th Ed, McMillan India Ltd, New Delhi, 1996.
10. Sinnatamby SC: Last's Anatomy – Regional & Applied. 10th Ed, Churchill Livingstone, Edinburgh, 1999.

HUMAN PHYSIOLOGY (SUBJECT CODE: PT 1102)

Teaching Hours: 220 hours (Theory: 120 hours and Practical: 100hours)
Maximum Marks: 200 (Theory: 100 and Practical and viva-voce: 100)
Assessment: Written, Oral and Practical, Internal and University examinations
Internal Examination: 20 marks Theory and 20 marks Practical
University Examination: 80 marks Theory, 80 marks Practical and Viva – voce

Objectives: The objectives are to develop thorough understanding of the Physiological functions of the various systems of human including exercise and work physiology in relation to physical therapy with major emphasis on Cardio-Respiratory, Musculo-skeletal and Nervous Systems body; and the clinical application of various physiological functions.

Theory Contents

1. General physiology
- Structure of cell membrane
- Transport across cell membrane
- Functional morphology of the cell
- Intercellular communication
- Homeostasis

2. Cardiovascular system
- Dynamics of blood & lymph flow
- Anatomical, biophysical consideration of arterial, arteriolar & capillary venous level, Lymphatic circulation
- Origin and spread of cardiac excitation
- Basic idea of electrocardiogram
- Mechanical events of cardiac cycle, cardiac output, its regulation
- Local & systemic regulatory mechanisms of CVS, humeral & neural
- Cerebral, coronary, splanchnic, skin, placental & fetal circulation
- Heart sounds

3. 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

4. Cardio respiratory adjustments in health & disease
- Exercise, high altitude, deep sea diving
- Hypoxia, hypercapnia, hypocapnia, oxygen treatment
- Asthma, emphysema, artificial respiration

5. Blood
- W.B.C., R.B.C., platelets formation & functions
- Plasma, blood groups
- Haemostasis, immunity

6. Nerve – muscle, synaptic & junction transmission

- Nerve – general concept
- Nerve cell – structure
- Genesis of resting membrane potential & action potential
- Their ionic basis, all or none phenomenon
- Ionic basis of nerve conduction
- Classification & types of nerve fibre
- Mixed nerves & compound action potential
- Concept of nerve injury & wallerian degeneration
- Muscle properties and functions
- Electric & mechanical responses & their basis
- Concept of isometric & isotonic muscle contraction
- Electrical events in postsynaptic neurons
- Inhibition & facilitation at synapses
- Chemical transmission of synaptic activity
- Principal neurotransmitter system
- Neuromuscular junction, structure & events occurring during excitation

7. Functions of nervous system (descriptive)

- Reflexes, monosynaptic, polysynaptic, withdrawal reflex, properties of reflexes
- Sense organ, receptors, electrical & chemical events in receptors
- Ionic basis of excitation
- Sensory pathways for touch, temperature, pain, proprioception, others
- Control of tone & posture: integration at spinal, brain stem, cerebellar, basal ganglion levels, along with their functions & clinical aspects
- Autonomic nervous system & hypothalamus
- Higher functions of nervous system
- Learning & memory, neocortex,
- Limbic functions, sexual behaviour, fear & range, motivation
- Physiology of pain, its psychosomatic aspects, and physiology of biofeedback(in brief)
- Cerebellum and its function

8. Renal system

- Glomerular filtration rate, clearance, tubular function
- Water excretion, concentration of urine-regulation of Na, Cl, K excretion
- Physiology of urinary bladder

9. Digestive system

- Digestion & absorption of nutrients
- Gastrointestinal secretions & their regulation
- Liver & Pancreas

10. Exercise & work physiology

- Introduction to work and exercise physiology
- Effects of exercise on neuro-muscular system, cardio-pulmonary system, musculoskeletal system, hormonal system, blood, metabolic functions, oxygen transport
- Effects of exercise on body fluid and electrolyte balance, mobility and body composition
- Effect of gravity / altitude /acceleration / pressure on physical parameters

11. Neural control of development and movement

- Normal human developmental process
- Growth, development and maturation
- Reflex and reaction maturation
- Sensory – motor integration
- Perception and cognition
- Motor control and motor learning

12. Reproductive System

- Sex differentiation, Physiological anatomy of female and male reproductive organs.
- Female reproductive system- Menstrual cycle, Functions of ovary, Action of estrogen and progesterone, Control of secretion of ovarian hormones, Test for ovulation, Fertilization, Implantation, Pregnancy tests, Parturition, Maternal changes during pregnancy
- Lactation
- Male reproductive system- Spermatogenesis, Semen
- Contraceptive methods

13. Miscellaneous

- Special senses: vision, audition, taste, smell
- Endocrinology
- Male & female reproductive system
- Skin
- Physiology of aging

Practical Contents

1. Clinical assessment

- Examination of peripheral pulsations
- Recording of blood pressure (in postures like lying, sitting, standing and after exercise)
- Examination of cardio vascular system and pulmonary system
- Examination of nervous system including higher functions, sensory system, motor system, reflexes and cranial nerves

2. Hematology

- Study of microscope and its uses
- Determination of RBC count, WBC count, differential count, ESR, hemoglobin, PCV
- Calculation of blood indices
- Determination of blood groups, bleeding time, clotting time

3. Recommended demonstrations

- Pulmonary function tests (spirometry), artificial respiration, normal ECG interpretation, perimetry, ergography & work done

4. Amphibian experiments

- Instruments used for frog experiments: kymograph, heart liver, muscle trough, stimulator (for demonstrations)
- Muscle- nerve preparation of frog (G.S.Preparation) with recording of simple muscle twitch (for practicals)
- Effect of the following on G.S.Preparation: (demonstrations and dry charts explanation)
  i. Varying strengths of the stimuli
  ii. Two successive stimuli and multiple successive stimuli
  iii. Genesis of tetanus and clonus

iv. Fatigue phenomena
v. Load on muscle contraction and work done
vi. Velocity of impulse transmission with calculation
vii. Temperature on muscle contraction

- Normal cardiogram of amphibian heart with properties of cardiac muscle

Suggested Readings

1. Guyton AC, Hall JE: Textbook of Medical Physiology. 10th Ed, W.B.Saunders, Philadelphia, 2006.
2. Ganong FW: Review of Medical Physiology. 22nd Ed, Mc Graw Hill Lange Medical Books, New York, 2005.
3. Vander AJ, Sherman JH, Luciano DS: Human Physiology – The mechanisms of body function. 8th Ed, McGraw Hill Inc, New York, 2001.
4. Bell GH, Esmile SD, Paterson RC: Text book of Physiology, 11th Ed, Churchill Livingstone, USA, 1988.
5. Keele CA, Neil E, Joels N: Samson & Wright's Applied Physiology. 13th Ed, Oxford University Press, London / Mohan Makhijani & Rekha Printers, New Delhi, 1982.
6. McArdle WD, Katch FI, Katch VL: Exercise Physiology: Energy, Nutrition, and Human Performance. 6th Ed, Lippincott Williams & Wilkins, 2006.
7. Toratora GJ & Grabowski RS: Principles of Anatomy and Physiology, 7th Ed, Harper Collins College Publishers, USA, 1993.
8. Sembulingam K & Sembulingam P: Essentials of Medical Physiology. 4th Ed, Jaypee Brothers, New Delhi, 2006.
9. Chaudhuri: Concise Medical Physiology. 6th Ed, New Central Book Agency, Kolkata, 2008.
10. Bijlani R L: Understanding Medical Physiology, 3rd Ed, Jaypee Brothers, New Delhi, 2004.

HUMAN BIOCHEMISTRY (SUBJECT CODE: PT1103)

Teaching Hours: 100 hours (Theory: 100 hours)
Maximum Marks: 100 (Theory: 100)
Assessment: Written, Internal and University examinations
Internal Examination: 20 marks Theory
University Examination: 80 marks Theory

Objectives: The objective is to enable the student to understand biochemical basis of life sciences.

Theory Contents

1. Biochemical perspective

- Historical background
- Stabilizing forces in bimolecules
- Properties of water
- Cellular organelles and cell membranes

2. Nutrition

- Basic principles of nutrition
- Nutritional aspects of carbohydrates, proteins, lipid, fibers
- Composition of food, caloric requirement, balance diet, dietary recommendations, nutritional supplementation
- Calorimetry with energy values: calorimeters, RQ and its significance
- BMR – definition, normal values, factors affecting BMR.
- Energy requirements (with age/sex), thermogenesis, specific dynamic action of food.
- Energy expenditure for various activities including exercises
- Obesity, starvation, gout, hyperuricemia, peptic ulcers, nutritional disorders of nervous system and cardiovascular system

3. Carbohydrates

- Definition, classification, chemistry, common carbohydrates, their sources and composition, their general functions
- Digestion and absorptions of carbohydrates
- Glycosis (aerobic, anaerobic, energetic regulation, cori's cycle), glycogenesis and Glycogenolysis (their regulation, role of liver and muscle glycogen), gluconeogenesis, citric acid cycle with its energetics.
- Dietary Fibers: classification, importance
- Hormonal regulation of blood sugar level
- Clinical aspects: metabolic disorders of glycogen, lactose intolerance, diabetes mellitus, diabetic keto-acidosis, diabetes insipidus, hypoglycemia

4. Proteins

- Definition, classification of proteins and aminoacids, their bio-medical importance and general functions.
- Enzymes: definition, co-enzymes, factors affecting enzyme activity.
- Digestion and absorption of proteins.
- Clinical aspects: PEM, kwashiorkor, marasmus, common protein deficiency disorders

5. Lipids

- Definition, classifications of lipids and fatty acids, examples and functions of common lipids essential fatty acids and their importance
- General functions
- Lipoproteins: classification, sources, functions
- Digestion and absorption of lipids.
- B-oxidation and its energetics with regulation
- Fat metabolism in adipose tissue, fatty acid biosynthesis with its regulation and energetics.
- Cholesterol and its importance.
- Clinical aspects: ketone body formation and utilization, common hyper lipo- proteinaemias

6. Vitamins

- Definition, classification, individual vitamin sources
- Co-enzyme forms
- Digestion, absorptions and transport.
- Functions of each vitamin with RDA
- Clinical aspects: vitamin deficiencies and toxicity

7. Minerals

- Individual minerals: calcium, phosphate, iron
- magnesium, fluoride, selenium, molybdenum, copper
- Digestion, absorption, transport, excretion, functions
- Disorders

8. Blood, lymph and cerebrospinal fluid

- Overview
- Composition
- Clinical aspects

9. Hemoglobin, porphyrins and bile pigments

- Overview
- Haem and porphyrin biosynthesis
- Haem catabolism
- Metabolism of bile pigments
- Clinical aspects: anemias, jaundice, porphyrias and thalassemias

10. Immunochemistry (in brief)

- Immunoglobulins
- Classification
- Determination of immunoglobulins
- Antigens, heptens
- Immunopotency

11. Homeostasis mechanism

- General outline of fluid compartments of the body with their water and electrolyte content and osmolality, electrolyte and water balance
- Extra and intra cellular sodium, potassium, buffers, pH, buffer systems
- Acid – base balance (role of lungs and kidneys)
- Clinical aspects: dehydration, acidosis and alkalosis

12. Muscle biochemistry

- Muscle structure
- Inorganic constituents

- Molecular events in muscle contraction
- Connective tissue biochemistry (muscle, collagen, glycoproteins and proteoglycans)

13. Molecular biology (In brief)
- Nucleotides: chemistry and metabolism
- DNA structure
- Molecular genetics
- Gene therapy

14. Molecular endocrinology (In brief)
- Mechanism of hormonal actions and regulations
- Hormones & neurotransmitters
- Hormones acting at cell surface and inside the cell
- Clinical aspects

15. Clinical biochemistry
- Relevance of blood levels of glucose, urea, Ca, phosphates, regulation of blood pH, bicarbonate, enzymes, lipids and lipoproteins, urine levels of sugar, creatinine, proteins.
- Competitive inhibitors, clinically important enzymes
- Liver and renal function Tests

Suggested Readings

1. Murray RK, Garnner K, Mayes PA, Rodwell VW: Harper's Biochemistry. 26th Ed, Appleton & Lange, Connecticut, 1993.
2. Montgomery, Conway, Spector, Chappell: Biochemistry - A Case Oriented Approach. 6th Ed, Mosby Publishers, Missouri, 1996.
3. Devlin TM: Textbook of Biochemistry with clinical correlation. 5th Ed, Wiley-Liss, New York, 2002.
4. Nelson DL, Cox MM: Lehinger Principles of Biochemistry. 4th Ed, W.H.Freeman, New York, 2005.
5. Apps DK, Cohen BB, Steel CM: Biochemistry – A concise textbook for medical students, 5th Ed, ELBS with Bailliere Tindall, London, 1992.
6. Deb AC: Fundamentals of Biochemistry. 8th Ed, New Central Book Agency, Kolkata, 2004.
7. Satyanarayana U, Chakrapani U: Biochemistry. 3rd Ed, Arunabhasen Books & Allied (P) Ltd, Kolkata, 2006.
8. Dandekar SP: Prep manual for Under Graduate Medical Biochemistry. 2nd Ed, Urban & Schwarzenberg P Ltd, New Delhi, 2002.
9. Vasudevan DM, Sreekumari S: Textbook of Biochemistry for Medical Students. 5th Ed, Jaypee Brothers, New Delhi, 2007.
10. Chatterjee MN & Shinde R: Textbook of Biochemistry. 2nd Ed, Jaypee Brothers, New Delhi, 1995.

HUMAN BIOMECHANICS (SUBJECT CODE: PT 1104)

Teaching Hours: 250 hours (Theory: 150 hours and Practical: 100hours)
Maximum Marks: 200 (Theory: 100 and Practical: 100)
Assessment: Written, Oral and Practical, Internal and University examinations
Internal Examination: 20 marks Theory and 20 marks Practical
University Examination: 80 marks Theory, 80 marks Practical and viva – voce

Objectives: The objective is to enable the student to understand the basic principles of Biomechanics, application of kinetics and kinematics on human movements.

Theory Contents

1. Bio - Mechanics and its principles

- Definition of mechanics and biomechanics
- Force - definition, diagrammatic representation, classification of forces, concurrent, coplanar and co-linear forces, composition and resolution of forces
- Momentum - principles, and practical application
- Motion, types of motion, theories of motion, Newton's laws of motion and their application.
- Torque and friction
- Gravity - definition, line of gravity, centre of gravity
- Equilibrium - supporting base, types, and equilibrium in static and dynamic state.
- Energy, work and power: potential and kinetic energy, work and power, speed, velocity and inertia
- Elasticity: definition, stress, strain, Hook's law, stress strain curve, Young's modulus
- Anatomic pulleys with examples
- Application of the principles to human body

2. Axis and planes

- Axes and planes of movement and gravity
- Application with reference to human body

3. Levers

- Definition
- Functions and classification of levers
- Application of levers in physiotherapy
- Order of levers with example of lever in human body
- Levers at home and at work

4. Bio - Mechanics of muscles and soft tissues

- Muscle structure and function
- Classification of muscles
- Types of muscle work
- Ranges of muscle work
- Angle of pull of muscles with importance of muscle work
- Application of the above concepts with reference to joints, muscle and movement
- Biomechanics of cartilage, tendon and ligament
- Effects of injury, immobilization and aging

5. **Bio – mechanics of joints**
   - Joint structure and function
   - Classification, designs and properties of connective tissues
   - Motions and functions of joints
   - Joint lubrication: theories and application
   - Biomechanics of bone
   - Visco-elastic properties and behavior of bone and soft tissues
   - Open and closed kinematic chain movements
   - Effects of injury, immobilization and aging

6. **Bio-mechanics of all peripheral joints** (shoulder, elbow, wrist, hand, hip, knee, ankle, foot and temporo-mandibular joints), vertebral column, and rib cage

7. **Posture & movement analysis**
   - Gait - definition & description, alignments, phases of gait cycle, determinants of gait, gait kinetics and kinematics, GRF, support, moment during gait cycle & energy consumption
   - Posture: definition & description, static and dynamic postures, alignments of various joints, centre of gravity, planes & muscular moments, and analysis of posture

8. **ADL analysis**
   - Supine to sit, prone to sit, sit to stand, kneel to stand, squat to stand
   - Lifting analysis
   - Hand functions (prehensions and precisions)

9. **Therapeutic gymnasium**

   Equipments and tools with their uses and therapeutic application
   - Springs: properties, springs in series and parallel
   - Pulleys: properties, types, mechanical advantage
   - Resistance devices: types, weights, different tools used to apply resistance
   - Elastic tools: elasticity, recoil, extensibility
   - Explanation and mechanical principles of various equipments in an ideal gymnasium: parallel bars, wall bars, springs, pulleys, suspension unit, CPM unit, cervical and lumbar traction, shoulder wheel, overhead pulley systems, quadriceps table, DeLormes' shoe, weights, therabands, shoulder ladder, tilt table, equilibrium board, wobble board, treadmill, bicycle ergometer, medicine balls, gym ball, plinth, staircase, re-education board, bolster, wedges
   - Walking aids and crutches: types and uses
   - Hydrotherapy unit (in brief)

10. **Starting positions**
    - Fundamental and derived positions
    - Description and muscle work including base of support and equilibrium
    - Effects and uses of individual positions in exercises

11. **Goniometry:** principles, types, application of goniometry

Practical Contents

1. Goniometry measurement for all the peripheral and vertebral joints
2. Identification of the various tools and equipments in therapeutic gymnasium with their uses
3. Identification of walking aids, crutches, parallel bars with their uses
4. Parts of suspension therapy unit and their uses
5. Analysis of activities of daily living
6. Normal posture and gait analysis
7. Starting positions and their derived positions

Suggested Readings

1. Levangie PK, Norkins CC: Joint Structure and Function: A Comprehensive Analysis. 3rd Ed, Jaypee Brothers Medical Publishers, New Delhi, 2001.
2. Smith, Weiss, Lehmkuhl: Brunnstrom's Clinical Kinesiology. 5th Ed, Jaypee Brothers, New Delhi, 1998.
3. Hollis M, Cook PF: Practical Exercise Therapy. 4th Ed, Blackwell, Oxford, 1999.
4. Gardiner DM: Principles of Exercise Therapy. 4th Ed, CBS Publishers, New Delhi, 1999.
5. Lippert LS: Clinical Kinesiology for Physical Therapy Assistants. 3rd Ed, Jaypee Brothers, New Delhi, 2002.
6. Jones and Barker: Human Movement Explained.3rd Ed, Butterworth- Heine, London, 2000.
7. Norkin C, White JD: Measurement of Joint Motion: A Guide to Goniometry. 2nd Ed, Jaypee Brothers, Daryaganj, 1995.
8. Kisner C, Kolby LA: Therapeutic Exercise Foundation and Technique. 3rd Ed, Jaypee Brothers, New Delhi, 1996.
9. Campion MR: Hydrotherapy: Principles and Practice, 1st Ed, Butterworth, Oxford 2000.
10. Palastanga N, Field D, Soames R: Anatomy and Human movement – Structure & Function. 5th Ed, Elsevier LTd, Philadelphia, USA, 2006.

PSYCHOLOGY & SOCIOLOGY (SUBJECT CODE: PT 1105)

Teaching Hours: 100 hours (Theory: 100 hours)
Maximum Marks: Theory: 100
Assessment: Written, Internal and University examinations
Internal Examination: 20 marks Theory
University Examination: 80 marks Theory

Note: This course is to be taught by two teachers (Psychologist & Sociologist / Medical Sociologist).

PSYCHOLOGY (Part-A)

Teaching Hours: 50 hours (Theory: 50 hours)
Maximum Marks: 50 (Theory: 50)
Assessment: Written, Internal and University examinations
Internal Examination: 10 marks Theory
University Examination: 40 marks Theory

Objectives: The objective is to enable the student understand the specific psychological factors and their effects in physical illness thus aid them to have a holistic approach in dealings with their patients during admission, treatment, rehabilitation and discharge.

Theory Contents

1. Introduction
- What is psychology?
- Fields of application of psychology
- Scope of psychology

2. Learning
- Theories of learning
- Principles of learning
- Factors affecting learning

3. Memory
- Forgetting
- Theories of memory and forgetting
- Methods to improve memory

4. Intelligence
- Theories of intelligence
- Influence of heredity and environment on the individual
- Tests of intelligence

5. Personality
- Theories of personality
- Factors influencing personality
- Assessments in personality
- Personality disorders

6. Behavior

- Normal and abnormal behavior
- Development and growth of behavior in infancy and childhood, adolescence, adulthood and old age

7. Thinking

- Definition
- Thinking process
- Problem solving
- Decision making
- Creative thinking

8. Motivation

- Theories
- Types of motivation

9. Emotions

- Theories of emotions
- Stress
- Conflicts
- Frustration

10. Attitudes

- Theories
- Attitudes and behavior
- Factors in attitude change

11. Emotional and behavioral disorders of childhood and adolescence (in brief)

- Disorders of under and over controlled behavior
- Eating disorders

12. Mental deficiency

- Mental retardation
- Learning disabilities
- Autistic behavior

13. Anxiety disorders

- Phobias, panic disorder
- Generalized anxiety disorder
- Obsessive compulsive disorder
- Post –traumatic stress disorder

14. Somatoform and dissociate disorders

- Conversion disorder
- Somatization disorder
- Dissociate amnesia & dissociate fugue

15. Patho-physiological disorders

- Stress and health

16. Severe psychological disorders

- Mood disorders
- Psychosis

17. Counseling

- Definition
- Aims and principles
- Quality of a good counselor

18. Psychotherapy

- Brief introduction to paradigms in psychopathology and therapy

19. Communication

- Effective and faulty
- Audiovisual aids and its effects on communication

20. Psychological need of pediatric and geriatric patients

SOCIOLOGY (Part–B)

Teaching Hours: 50 hours (Theory: 50 hours)
Maximum Marks: 50 (Theory: 50)
Assessment: Written, Internal and University examinations
Internal Examination: 10 marks Theory
University Examination: 40 marks Theory

Objectives: The objective is to enable the student understand the basic sociology concepts, principles and social process, social institutions (in relation to the individual, family and community) and the various social factors affecting the family in rural and urban communities in India will be studied.

Theory Contents

1. Introduction

- Meaning-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

2. Socialization

- Meaning and nature of socialization
- Primary, secondary, and anticipatory socialization
- Agencies of socialization

3. Social groups

- Concepts of social groups
- Influence of formal and informal groups on health and sickness
- The role of primary groups and secondary groups in the hospital and rehabilitation settings

4. Community

- Rural community – meaning and features – health hazards of rural population
- Urban community – meaning and features – health hazards of urban population

5. Family

- The family - meaning and definition, functions
- Changing family patterns
- Influence of family on the individual health, family, and nutrition
- The effects of sickness on family and psychosomatic disease and their importance to physiotherapy

6. Culture and health

- Concept of culture
- Cultures and behavior
- Cultural meaning of sickness
- Culture and health disorders

7. Social change

- Meaning of social changes & factors of social change
- Human adaptation and social change
- Social change and stress
- Social and deviance
- Social change and health program
- The role of social planning in the improvement of health and in rehabilitation

8. Social security

- Social security and social legislation in relation to the disabled

9. Social worker

- Meaning of social work
- The role of a medical social worker

10. Social Factors in health and disease

- The meaning of social factors
- The role of social factors and illness

11. Social problems of disabled

- Consequences of the following 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

Suggested Readings

Psychology & Sociology

1. Morgan CT, King RA, Weisz JR, Schopler J: Introduction to Psychology.7th Ed, Tata McGraw Hill, New Delhi, 1993.
2. Munn NL, Farnald LD, Fernald PS: Introduction to Psychology. 3rd Ed, Houghton Mifftin Company, Boston or Oxford & IBH Publishers, New Delhi, 1972.
3. Worchle S, Shebilske W: Principles and Applications - Psychology. 5th Ed, Prentice Hall, Englewood Cliffs, New Jersy, 1994.
4. Nolen HS: Abnormal Psychology. 2nd Ed, McGraw Hill Higher Education, New York, 2001.
5. Cushman LA, Scherer MJ: Psychological Assessment in Medical Rehabilitation. 1st Ed, American Psychological Association, USA, 1995.
6. Bond.J. & Bond.S: Sociology & Health Care – An Introduction for Nurses & other Health Professions. 2nd Ed, Churchill Livingstone, Edinburgh, 1994.
7. Taylor S & Field D: Sociology for Health & Health Care. 4th Ed, Blackwell Publishing, USA, 2007.
8. Shankar Rao CN: Sociology Primary Principles. 3rd Ed, S. Chand & Company Ltd., New Delhi, 2001 (reprint).
9. Bhusan Vidya, Sachdeva.DR: Introduction to Sociology. 3rd Ed, Kitab Mahal, Patna, 2004.
10. Dibyendunarayan B: Sociology for Physiotherapists. 1st Ed, Jaypee Brothers, New Delhi, 2006.

BASIC NURSING AND FIRST AID (SUBJECT CODE: PT 1106)
(For college examination only)

Teaching Hours: 60 hours (Theory: 50hoursand 10 practical)
Maximum Marks: 50 (Theory: 50)
Assessment: Written examination
College Examination: 50 marks Theory

Objectives: The objective is to enable the student understand the basic nursing concepts and first aid for various ailments commonly seen by physiotherapists.

Theory Contents

1. Overview of nursing
- Definition
- Scope of nursing
- Principles
- Philosophy

2. Inter-personnel relationships
- Importance
- Characteristics
- Principles
- Phases
- Accelerating factors
- Barriers
- Therapeutic relationship

3. Environment safety
- Essential factors to well being
- Temperature, humidity, noise, light and other environmental factors
- Safety measures

4. Nursing position
- Positions and their uses
- Comfort measures
- Devices and their uses

5. Bed making
- Definition and types
- Purposes of bed making
- Principles of bed making
- General rules
- Open and closed beds
- Fowler bed
- Occupied bed
- Cardiac bed

6. Rest and sleep

- Beneficial effects of rest
- Effects of prolonged rest
- Physiology of sleep
- Factors affecting sleep
- Sleep disorders
- Nursing measures to ensure rest and sleep

7. Bandaging

- Overview
- General rules
- Types
- Applications

8. Surgical dressing

- Overview
- Types and dressing materials
- Purposes
- Principles
- Procedure
- Observation

9. Lifting and transporting patients

- Overview
- General instructions
- Lifting patient in bed
- Wheelchair transfer
- Stretcher transfers

10. Bedside procedures and management

- Temperature, recordings, sites, thermometers
- Peripheral pulses, recording, normal and abnormal pulses and their interpretations
- Respiration, observation and recording
- Blood pressure, measurement and recording
- Observation of stool, urine and sputum
- Types of catheters
- Uses and care of catheters
- Principles of catheterizations
- Enema overview and types
- Purpose of enema
- Procedure for enema

11. Nourishment

- Overview
- Methods of nourishments
- Feeding for helpless patient
- Tube feeding
- Drips
- Transfusion
- Parental administration of medicine

- Types of injections
- Purpose of injection
- Factors that favor absorption
- Complications of injection
- Drugs and fluid administered
- Size and safety measures while administering medications
- Selection of equipments for injections
- Principles involved in administration of injections
- General instructions for administration of medications
- Procedure of administration of medication
- Oral, subcutenoues, intradermal, intramuscular and intravenous injections

11. Care of rubber goods
- Types of rubber goods
- Uses and care

12. Aseptic technique
- Asepsis
- General precautions
- Medical aseptic practices
- Hand washing, gown technique, face masks and gloves
- Transferring forceps

13. Sterilization and disinfection
- Overview
- Uses, advantages and disadvantages
- Methods of sterilization
- Disinfection, types of disinfections
- Common antiseptics and disinfectants

14. First aid management
- Overview
- Basic and advanced life support
- Minor trauma and injuries
- Poisoning
- Snake and animal bites
- Electric shock
- Cardiopulmonary resuscitation

15. Clinical education and demonstration
- Nursing procedures
- First aid pertaining to musculoskeletal, neuromuscular and cardio respiratory ailments

Suggested Readings

1. Patricia A Potter, Anne G perry: Basic Nursing Theory and Practice,3 Ed,CV mosby, Missori,1995.
2. Elhart, Firsich, Rees: Scientific Principles in Nursing, 8Ed, CV Mosby, USA, NR Brothers India, 1978.
3. Sorensen & Luckmann's: Basic Nursing, A Psychophysiologic Approach: 3Ed, WB Saunders, Philadelphia, 1994.
4. Gardner AW, Royalnee PJ: New Advanced First Aid, 3Ed, John wirght and sons Ltd, Bristol, England, 1984.
5. Lilly P Telu: Manual of Nursing Arts Procedures, 3Ed, Vikas Publishing house Pvt Ltd, New Delhi, 1993.
6. Basavnthappa BT: Fundamentals of Nursing: Jaypee Brothers, New Delhi, 2004.
7. Gupta LC, Sahu VC: Practical Nursing Procedure: 2Ed, Jaypee Brothers, New Delhi, 1991.
8. Ahuja KK: Human Resource Management, Kalyani Publishers, Ludhiana, 1997.

COMPUTER APPLICATION AND MANAGEMENT IN PHYSIOTHERAPY (SUBJECT CODE: PT 1107)

(For college examination only)

Teaching Hours: 50 hours (Theory)
Maximum Marks: 50 (Theory: 50)
Assessment: Written examination
College Examination: 50 marks Theory

Objectives: The objective is to enable the student to understand the basic concepts in computer and its practical application in physiotherapy. The student will also be able to understand and implement the basic management skills required for personal, hospital, department and financial aspects of physiotherapy.

Theory Contents

1. Introduction to computers

- Basic concept of computers
- Features of computers
- Advantages
- Role of computers

2. Data processing

- Definition
- Data entry
- Types
- Common activities in processing
- Characteristics of information
- Application areas

3. Hardware concepts

- Definition
- Classification
- Architecture
- Storage device
- Characteristics of components of hardware
- Applications
- Concept of damage

4. Software concepts

- Definition
- Classification
- Different operating system
- Applications
- Precautions and management of virus
- Principles of programming

5. Computer application

- Research
- Libraries
- Museum
- Education

- Medicine
- Information system
- Physiotherapy

6. Computer application in physical therapy

- Principles and practices in EMG
- Exercise testing equipment
- Laser
- Any computerized equipment

MANAGEMENT

1. Management

- Introduction
- Branches
- Nature and scope of management process
- Principles – General and Health sector including physiotherapy
- Theories

2 .Personnel Management

- Basic concepts
- Policies
- Procedures
- Performance Appraisal

3. Planning and Organization

- Planning Cycle
- Principles of Organizational Charts
- Planning Change
- Resource and quality management
- Planning of Physiotherapy Department/Center

4. Finance

- Budget
- Income generation in Physiotherapy

5. Hospital management

- Organization
- Staffing
- Information & communication
- Coordination with other services of hospital
- Cost of services
- Monitoring and evaluation

6. Self Management

- Preparing for first job
- Resume writing
- Personality management
- Time management
- Career development

Suggested Readings

1.Kulkarni .G.K :Hospital Management, accounting, Planning and Control.

2. Srinivasan. R and Chunawalla. SA : Principles and practices of Management

3.Francis CM: Hospital administration 2nd edition

4. Liewlyn Devis. R and Maculay B.M.C : Hospital Planning and Administration

5. Welner EM : Human Services Management, Analysis and application 2nd edition

6. Rose Mary M.C.,Mohan, Elizabeth Barton and Maurice Piot: A guide for middle level management in primary health care: WHO, Geneva 1986.

Section-VII- B

SECOND YEAR BPT (BPT II) SUBJECTS AND COURSE CONTENTS

EXERCISE THERAPY (SUBJECT CODE: PT 1109)

Teaching Hours: 300 hours (Theory: 100 hours and Practical: 200hours)
Maximum Marks: 200 (Theory: 100 and Practical and viva-voce: 100)
Assessment: Written, Oral and Practical, Internal and University examinations
Internal Examination: 20 marks Theory and 20 mark Practical
University Examination: 80 marks Theory and 80 marks Practical & Viva – voce

Objectives: To develop an understanding of theoretical knowledge and practical skills pertaining to various therapeutic movements used in the treatment of various diseases and disorders by physiotherapists.

Theory Contents

1. **Fundamental concepts**
   - Mechanical principles
   - Physiology of muscle performance
   - Types of muscle contraction and muscle work
   - Strength of muscle contraction
   - Nervous control of movement
   - Range of muscle work
   - Goals of therapeutic exercises

2. **Human movements**
   - Overview
   - Classification
   - Effects & uses
   - Techniques
   - Indications, precautions & contraindications

3. **Joint mobility**
   - Overview
   - Causes of hypomobility & hypermobility
   - Mobility grading
   - Soft tissue mobilization
   - Joint mobilization
   - Joint manipulation
   - Indications, contraindications & precautions
   - Clinical applications

4. **Soft tissue manipulations or therapeutic massage**
   - Overview
   - Effects
   - Classification
   - Techniques
   - Indications

- Contraindications
- Clinical applications

5. Relaxation
- Overview
- Types
- Methods
- Techniques
- Advantages
- Clinical applications

6. Hydrotherapy
- Overview
- Principles and properties of water
- Effects
- Indications, precautions and contraindications
- Clinical applications

7. Suspension
- Overview
- Principles
- Types
- Equipments
- Techniques
- Effects and uses
- Indications, precautions and contraindications
- Clinical applications

8. Body measurements
- Vital parameters
- Anthropometric measurements
- Goniometry
- Manual muscle testing
- Limb length
- Chest expansion
- Angle of pelvic inclination

9. Posture
- Overview
- Postural mechanism
- Fundamental & derived postures
- Good & bad postures
- Causes / factors affecting posture
- Postural analysis
- Postural retraining

10. Aerobics
- Overview
- Energy systems, energy expenditure, efficiency
- Physiologic response
- Exercise program and its determinants
- Physiologic changes that occur with training
- Clinical applications

11. Human gait

- Overview
- Normal gait
- Pathological gaits
- Gait analysis
- Walking aids, measurements & training
- Pre crutch training

12. Balance

- Overview
- Physiology
- Assessment
- Training
- Clinical applications

13. Proprioceptive neuromuscular facilitation (PNF)

- Overview
- Principles
- Techniques
- Effects and uses
- Patterns
- Clinical applications

14. Coordination

- Overview
- Nervous control
- Causes of inco-ordination
- Tests for co-ordination
- Principles of reeducation
- Frenkel's exercises
- Clinical applications

15. Yogasanas

- Overview
- Classification
- Techniques
- Indications, precautions and contraindications
- Clinical application

16. Postural drainage

- Overview
- Review of bronchial tree anatomy
- Principles
- Techniques to optimize oxygen transport
- Cough enhancement techniques
- Techniques to optimize airway clearance
- Indications, precautions and contraindications
- Clinical applications

17. Stretching

- Overview
- Causes of soft tissue shortening

- Types of stretching
- Techniques
- Indications, precautions and contraindications
- Clinical applications

18. Specific exercises
- Kegel's exercises
- Burger's exercises
- William's exercises
- Breathing exercises
- Facial exercises
- Group exercises
- Recreational exercises
- Vestibular exercises
- Neurodynamic exercises

19. Exercise prescription
- Overview
- Principles
- Prescriptions for various sports, diseases and disorders

20. Mechanical agents
- Overview
- Compression
- Traction
- Effects and uses
- Indications, precautions and contraindications
- Clinical applications

21. Functional reeducation
- Overview
- Limb activities
- Trunk activities
- Gait re-education
- Transfer activities
- Purpose and uses
- Clinical applications

Practical Contents

1. Demonstrate and assess- anthropometric measurements, strength, range of motion, coordination, balance, posture and gait
2. Demonstrate and perform exercise with or without equipment (e.g., passive, active assisted, active, resisted, neuromuscular coordination i.e. Frenkel's exercises, vestibular, muscle patterning, PNF, suspension)
3. Demonstrate and perform - joint mobilization, joint manipulation, soft tissue techniques (e.g., massage, friction, stretching)
4. Explain fitness / conditioning / endurance exercise programs
5. Demonstrate posture training and re education techniques
6. Gait mobility education and training with or without equipment including crutch measurement techniques
7. Neurodynamic techniques (e.g., nerve gliding/flossing exercises, balance training / proprioceptive training)

8. Techniques to optimize oxygen transport and facilitate airway clearance (e.g., postural drainage, secretion clearance, forced expiratory techniques)
9. Mechanical agents (e.g., traction, continuous passive movement)

Suggested Readings

1. Carolyn Kisner, Lynn Allen Colby: Therapeutic Exercise. 3rd Ed, Jaypee brothers, New Delhi, 1996.
2. Gardiner DM: Principles of Exercise Therapy. 4th Ed,CBS publisher, Delhi, 1985.
3. Hollis.M & Fletcher Cook: Practical Exercise Therapy. 4th Ed, Wiley-Blackwell, Oxford, 1999.
4. Hislop HJ & Montgomery J: Daniel's & Worthinghams Muscle Testing.:Techniques of Manual Examination. 6th Ed, WB Saunders, Philadelphia , 2003
5. Basmajain JV & Wolf SL: Therapeutic Exercise. 5th Ed, Williams& Wilkins, USA, 1990
6. Payne RA: Relaxation Techniques.1st Ed, Churchill Livingstone, New York, 1995.
7. Holey EA, Cook EM: Evidence Based Therapeutic Massage – A practical guide for therapists. 2nd Ed, Elsevier, New York, 2003.
8. Campion.M.R: Hydrotherapy: Principles & Practice. 1st Ed, Butterworth – Heinmann, Woburn, MA, 1997
9. Hall CM & Brody LT: Therapeutic Exercise - moving toward function. Lippincott Williams & Wilkins, USA, 2004.
10. Skinner JS: Exercise testing & Exercise prescription for special cases: theoretical basis and clinical application. 3rd Ed, Lippincott Williams & Wilkins, New York, 2005.

ELECTROTHERAPY AND PHYSICAL AGENTS (SUBJECT CODE: 1110)

Teaching Hours: 300 hours (Theory: 100 hours and Practical: 200hours)
Maximum Marks: 200 (theory: 100 and practical & viva-voce: 100)
Assessment: Written, Oral & Practical, Internal and University examination
Internal Examination: 20 marks theory and 20 marks practical
University Examination: 80 marks Theory and 80 marks Practical & Viva – voce

Objectives: To develop an understanding of theoretical knowledge and practical skills pertaining to various electrotherapeutic modalities & physical agents.

Theory Contents

1. Medical electronics

- Introduction to electrical physics
- Electricity definition, types & properties
- Electrical resistance, Ohm's law, resistance in series & parallel
- Fuse, amplifier and filter, condensers, valves and transformers
- Magnetism, electromagnetic induction & electromagnetic spectrum
- Electrical burns, prevention and management
- Electric shock, complications, management, prevention & earthing techniques

2. Electrotherapeutics

- Muscle nerve physiology
- Propagation of action potential
- Motor unit, motor point, topography of motor points
- Tissue impedance, measurement, lowering of skin resistance
- Electrodes, types of electrodes and sites for placement of electrodes
- Interrupted direct current: definition, production, physiological and therapeutic effects, methods and techniques of application, indications, contraindications, dangers and precautions
- Faradic current: definition, production, modifications, methods and techniques of application physiological and therapeutic effects of faradic current, indications, contraindications, dangers and precautions
- Galvanic current: definition, anodal galvanism, cathodal galvanism, medical galvanism, surgical galvanism, iontophoresis, physiological and therapeutic effects, indications, contraindications, dangers and precautions
- High voltage pulsed galvanism: definition, effects, indications and contraindications
- Sinusoidal & didynamic current: definition, effects, indications and contraindications
- Transcutaneous electrical nerve stimulation, definition, parameters, mechanisms of pain relief, indications, contraindication and precautions
- Microamperage electrical nerve stimulation: definitions, effects, mechanism of action, indications and contraindications
- Interferential current: definition, principle of production biological effects, indications, dosages contraindications and precautions
- Russian current: definition, effects, indications, dosages and contraindications
- Rebox current: definition, effects, indications, dosages and contraindications

3. Electrodiagnosis

- Overview of electrodiagnosis, merits and demerits
- Electrodiagnositic tests such as strength duration curve, rheobase, chronaxie, faradic galvanic test, neurotisation time, galvanic titanic ratio, nerve conduction test
- Electromyography and nerve conduction velocity studies
- Evoked potentials (outline)

4. Thermotherapy

- Short wave diathermy: definition, production, methods of application, technique of application, electrodes, physiological & therapeutic effects, indications, dosage, contraindications, dangers, precautions
- Pulsed short wave diathermy: definition, effects, uses and contraindications
- Long wave diathermy: definition, effects, indications and contraindications
- Micro wave diathermy: definition, production, physiological &therapeutic effects, indications, techniques of application, dosage, contraindications dangers and precautions
- Therapeutic ultrasound: definition, frequency, production, continuous & pulsed mode ultrasound, physiological & therapeutic effects, indications, contraindications, methods and techniques of applications, dosages, phonophoresis, dangers and precautions
- Paraffin wax bath: principle of wax application, composition of wax bath therapy unit, methods of application, physiological & therapeutic effects, indication, contraindication and dosages
- Moist heat therapy: hydro collator packs, methods of applications, indications, contraindications and precaution
- Contrast bath: overview, methods of application, indications and contraindications
- Whirl pool bath: overview, methods of application, indications and contraindications
- Fluidotherapy: overview, methods of application, indications and contraindications

5. Phototherapy

- Infra red radiation: definition, production, generators, types, method of application, cosine law, law of inverse square, Grotthus' law and other laws pertaining to infra red irradiation, indications and contraindications
- Ultraviolet rays: overview, types, production, generators like kromayer lamp, high pressure mercury vapor lamp, physiological and therapeutic effects, sensitizers, filters, test dosages, indications, contraindications, dangers and precautions
- Light amplification by stimulated emission of radiation (LASER): definition, types of laser, production, biological effects, indications, dosages, contraindications, precautions

6. Cryotherapy

- Overview of cryotherapy
- Physiological & therapeutic effects
- Methods of cryotherapy applications
- Indications, contraindications, dangers and precautions

7. Biofeedback

- Overview and types of biofeedback
- Indications, merits and demerits of biofeedback

8. Advanced electrotherapy

- Computerization in electrotherapy
- Programming of parameters for treatment of various conditions
- Combination therapy
- Recent advances as published in research articles in journals

Practical Contents

1. Preparation and testing of machines or modalities
2. Preparation of patient for application of physical agents
3. Screening of patients for contraindications prior to application of physical agents
4. Techniques of application of various physical agents
5. Technique of performing electrodiagnositc tests

Suggested Readings

1. Forster & Palastanga: Clayton's Electrotherapy Theory & Practice. 9th Ed, Bailliere Tindall, WB Saunders, New York, 2000.
2. Khan J: Principles & Practice of Electrotherapy. 3rd Ed, Churchill livingstone, Edinburgh, 1994.
3. Nelson RM, Hayes KW, Currier DP: Clinical Electrotherapy. 3rd Ed, Appleton & Lange, London, 1999.
4. Baxter DG: Therapeutic Laser, Theory & Practice. 1st Ed, Churchill Livingstone, New York, 1994.
5. Lehmann JF: Therapeutic heat & cold. 3rd Ed, Williams & Wilkins, Philadelphia, 1982.
6. WatsonT: Electrotherapy evidence based practice, 12th Ed, Churchill Livingstone, New York, 2008.
7. Khatri SM: Basics of Electrotherapy. Jaypee Brothers, New Delhi, 2003.
8. Sheila Kitchen: Electrotherapy Evidence based practice. 11th Ed, Elsevier, New York, 2006.
9. Behrens BJ, Mechlovitz SL: Physical agents-theory and practice for Physical therapists Assistant. 1st Ed, FA Davis, Philadelphia, 1996.
10. Robinson AJ, Lynn SM: Clinical Electrophysiology: Electrotherapy and Electrophysiologic Testing, 4th Ed, Williams & Wilkins Lippincott,, USA, 2008.

PROSTHETICS AND ORTHOTICS (SUBJECT CODE: PT1111)

Teaching Hours: 200 (Theory: 100 hours and Practical: 100hours)
Maximum Marks: Theory: 100 marks.
Assessment: Written, Internal and University examination.
Internal Examination: 20 marks Theory.
University Examination: 80 marks Theory.

Objectives: The objectives are to develop an understanding of basic orthotic and prosthetic devices, their uses, prescriptions, check outs and training for various musculoskeletal, neuromuscular disorders.

Theory Contents

1. **Overview**
   - Historical aspects
   - Uses of orthotics and prosthetics
   - Equipments
   - Materials

2. **Classification**
   - Overview
   - Classification of orthotics
   - Classification of prosthetics
   - Classification of adaptive devices

3. **Biomechanical principles**
   - Internal force system
   - External force system
   - Biomechanical analysis
   - Pathomechanical analysis
   - Biomechanics of orthosis and prosthesis

4. **Role of physiotherapist**
   - Prescription of orthotic and prosthetic devices
   - Check outs of orthotic and prosthetic devices
   - Training with orthotic and prosthetic devices
   - Ergonomic modifications

5. **Adaptive devices**
   - Overview
   - Adaptive devices for ADL
   - Sitting devices for multiple disabled
   - Adaptive devices for recreational activities
   - Adaptive devices for sports

6. **Foot wear modifications**
   - Types of footwear and their parts
   - Functions of foot wear
   - Foot wear modification for deformities
   - Foot wear modification for foot ulcers

- Role of foot wear in enhancement of sports performance
- Prevention of sports injuries by foot wear modifications

7. Orthotics
- Overview
- Upper limb
- Lower limb
- Spinal
- Orthotics for neurological disorders
- Orthotics for musculoskeletal disorders
- Fitting and alignment techniques
- Clinical applications
- Maintenance of orthoses

8. Prosthetics
- Upper limb
- Lower limb
- Aesthetic
- Clinical applications
- Fitting and alignment techniques
- Complications of prosthetics
- Prosthetic adaptation in competitive sports and recreation
- Amputee gait
- Non-prosthetic management of amputee
- Energy expenditure in prosthetic gait
- Maintenance of prosthesis & stump

9. Wheel chairs
- Overview
- Classification
- Prescription
- Maintenance
- Modifications
- Training

10. Psychological aspects
- Overview
- Psychological adaptations
- Counseling
- Patient clubs and self help groups

Suggested Readings

1. Bella J M: Amputation and Prosthetics: A case study Approach, Jaypee Brothers, New Delhi, 2 Ed, 2002.
2. Kent K Wu Foot: Orthoses Principles and clinical application, Williams and Wilkins, London, 1990.
3. Ron Seymour: Prosthetics and Orthotics Lower limb and spinal, Lippincott Williams and Wilkins, New York, 2002.
4. Lunsardi MM, Nielsen CC: Orthotics and prosthetics in rehabilitation, Butterworth Heinemann, New Delhi, Oxford, 2000.
5. Edelstein J E and Bruckner J: Orthotics A comprehensive clinical approach Jaypee brothers, New Delhi, 2004.
6. Shurr D G, Michael J W, Cook TM: Prosthetics and Orthotics Prentice hall, Michigan, 2 Ed, 2001.
7. Bowker JH, Michael JW: Atlas of limb prosthetics: surgical, prosthetics, and rehabilitation principles, Mosby, Michigan, 2 Ed, 1992.
8. Gerhardt JJ, Philip SK, Zetti JH: Immediate and early prosthetics management: Rehabilitation aspects. Huber Michigan, 2 Ed, 1986.
9. Bussell MH: New advances in prosthetics and orthotics, an issue of Physical Medicine and Rehabilitation clinics, Elsevier Health Sciences Division, 2006.
10. Janardhanam K: Topics on prosthetics and Orthotics, Educom System, Chennai, 2003.

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PATHOLOGY AND MICROBIOLOGY (SUBJECT CODE: PT1112)

Teaching Hours: Theory: 100 hours
Maximum Marks: Theory: 100 marks
Assessment: Written, Internal and University examinations
Internal Examination: 20 marks Theory
University Examination: 80 marks Theory

PATHOLOGY (Part-A)

Teaching Hours: Theory: 50 hours
Maximum Marks: Theory: 50 marks
Assessment: Written, Internal and University examinations
Internal Examination: 10 marks Theory
University Examination: 40 marks Theory

Objectives: To develop an understanding of theoretical knowledge of basic pathology of diseases affecting various systems with an emphasis to cardiovascular, pulmonary, neuromuscular and musculo-skeletal systems.

Theory Contents

1. Basics of general pathology

- Introduction to pathology
- Cell injuries: causes, mechanism, pathogenesis
- Reversible cell injury: types, morphological changes including cellular swellings, hyaline change, mucoid change
- Irreversible cell injury: apoptosis/ autolysis, types of necrosis & gangrene, calcification (dystrophic & metastasis)
- Intracellular accumulations - fatty changes, protein accumulations, glycogen accumulations, pigments - melanin / hemosiderin
- Extra cellular accumulations: amyloidosis, pathologic calcifications: classification, pathogenesis and morphology

2. Inflammation and repair

- Acute inflammation: features, causes, vascular and cellular events
- Morphologic variations
- Inflammatory cells and mediators
- Chronic inflammation: causes, types, classification, non – specific & granulomatous with examples
- Wound healing: primary and secondary union, factors affecting the healing process
- Repair and regeneration
- Healing in specific site including bone, nerve and muscle healing

3. Growth disturbances and neoplasia

- Atrophy, hypertrophy, hyperplasia, aplasia, hypoplasia, metaplasia, malformation, agenesis, dysplasia
- Neoplasia: definition, classification, biological behaviour
- Carcinoma and sarcoma, differences between benign and malignant
- Carcinogenesis: environmental carcinogens, chemical, viral, occupational, heredity
- Cellular oncogenesis, prevention of cancer, precancerous lesions

- Malignant neoplasia: grades and stages, local & distant spread
- Tumor and host interactions: systemic effects

4. Circulatory disturbances

- Hyperemia/Ischemia and hemorrhage
- Edema: pathogenesis and types
- Chronic venous congestion: lung, liver, spleen, systemic pathology
- Thrombosis and embolism: formation, fate and effects
- Infarction: types, common sites
- Gangrene: types and etio - pathogenesis
- Shock: pathogenesis, types, morphologic changes

5. Cardio-pulmonary pathology

- Obstructive lung diseases
- Restrictive lung diseases
- Hypertension and hypertensive heart disease
- Peripheral vascular diseases (arterial and venous) with vasomotor diseases
- Ischemic heart disease & myocardial infarction
- Cardiac failure
- Congenital heart diseases
- Endocarditis, rheumatic heart disease

6. Nervous system

- Congenital disorders
- Inflammations and infections
- Demyelinating disorders
- Sensory motor polyneuropathies
- Neuromuscular junction disorders and myopathies

7. Musculoskeletal system

- Osteomyelitis
- Rickets / osteomalacia, osteoporosis
- Rheumatoid arthritis & osteoarthritis
- Fibromyalgia

MICROBIOLOGY (Part-B)

Teaching Hours: Theory: 50 hours
Maximum Marks: Theory: 50 marks
Assessment: Written, Internal and University examinations
Internal Examination: 10 marks Theory
University Examination: 40 marks Theory

Objectives: To develop an understanding of theoretical knowledge of basic microbiology, the agents causing infections in humans with an emphasis on neuromuscular, musculo-skeletal, and cardiopulmonary systems.

Theory Contents

1. Basics of microbiology

- Brief history
- Basic definitions of the terminologies used in microbiology
- Normal flora of the human body
- Sources and reservoir of infections
- Routes of infection and its spread with endogenous and exogenous infections
- Asepsis, sterilization, disinfection and universal precautions for patient care and disease prevention and antimicrobials

2. Immunology

- Basic principles of immunology
- Immunity (innate immunity & acquired immunity)
- Antigens, antibodies & their reactions in relation to pathogenesis with serological diagnosis
- Humoral & cell mediated immune response
- Hypersensitivity
- Immuno-deficiency disorders
- Autoimmune disorders
- Intradermal skin test to test hyper sensitivity

3. Bacteriology

- Disease producing organisms
- Cocci – staphylococci, streptococci, pneumococci, meningococci
- Bacilli – mycobacterium (tuberculosis & leprae), bacillus anthracis, sporing and non sporing anaerobes
- Enteric bacteria – E. coli, salmonella, shigella, vibrio & pseudomonas
- Spirochetes
- Campylobacter & helicobacter

4. Virology

- General properties: basic structure and broad classification of viruses
- Pathogenesis, pathology, immunity, prophylaxis, laboratory diagnosis of viral diseases
- Antiviral agents

5. Mycology

- Fungi
- Classification & laboratory diagnosis of fungal infections
- Pathogenic fungi
- Yeast – cryptococcus

- Yeast – candida
- Opportunistic fungi

6. Clinical microbiology

- Pathogenesis, immunity, prophylaxis, laboratory diagnosis of following diseases:
- In detail about the infection of central and peripheral nervous system, cardio - respiratory system and musculo-skeletal systems, skin & VD
- In brief about urinary tract infections, pelvic inflammatory disease, wound infection, opportunistic infections, HIV infection, malaria, filariasis, zoonotic diseases

Suggested Readings

1. Cotran RS, Vinay Kumar, Collins T, Robbins SL: Robbins Pathologic Basis of Disease. W.B. Saunders, Singapore, 1999
2. Goodman CC, Boissonnault WG: Pathology: Implications for the Physical Therapist. W.B.Saunders, Singapore, 1998
3. Cressee J, Underwood E: General and Systemic Pathology. 4th Ed, Churchill Livingstone, New York, 2008
4. Harsh Mohan: Textbook of Pathology. 5th Ed, Anshan Publications, New Delhi, 2005
5. Copstead LEC, Banasik JL: Pathophysiology. 3rd Ed, W.B.Saunders, Philadelphia, 2005.
6. David G, Slack CB, Peutherer JF: Medical Microbiology. 16th Ed, Churchill Livingstone, Imprint of Elsevier, New Delhi, 2002.
7. Brooks GF, Butel JS, Morse SA: Jawetz, Melnick & Adelberg's Medical Microbiology. 23rdEd, LANGE, McGraw Hill, 2004.
8. Pommerville JC: Almaco's Fundamentals of Microbiology. 17th Ed, Jones and Bartlett, 2004.
9. Baron EJ, Peterson LR, Finegold SM: Bailey and Scott's Diagnostic Microbiology. 9th Ed, Mosby, Missouri, 1994.
10. Ananthanarayan, Paniker: Text Book of Microbiology, Orient Blackswan,Madras, 2006.

PHARMACOLOGY (SUBJECT CODE: PT1113)

Teaching Hours: Theory: 100 hours.
Maximum Marks: Theory: 100 marks.
Assessment: Written, Internal and University examination.
Internal Examination: 20 marks Theory.
University Examination: 80 marks Theory.

Objectives: The objectives are to develop an understanding of basic pharmacology, usage of common drugs for the treatment of various diseases with emphasis on musculoskeletal, neuromuscular and cardio respiratory diseases and disorders.

Theory Contents

1. General pharmacology

- Overview
- Classification of drugs
- Sources of drugs
- Pharmaco-kinetics
- Pharmaco-dynamics
- Factors modifying drug response
- Adverse effects

2. Pharmacology in peripheral nervous system and autonomic nervous system

- Overview
- Classification
- Cholinergic and anti-cholinergic drugs
- Action, therapeutic and adverse effects
- Indication and contraindications
- Adrenergics and antiadrenergics

3. Pharmacology in central nervous system

- Overview
- Classification
- Action, therapeutic and adverse effects
- Indication and contraindications

4. Pharmacology in inflammatory / immune conditions

- Overview
- Classification
- Action, therapeutic and adverse effects
- Indication and contraindications

5. Pharmacology in cardiovascular system

- Overview
- Classification
- Action, therapeutic and adverse effects
- Indication and contraindications

6. Pharmacology in respiratory system

- Overview
- Classification
- Action, therapeutic and adverse effects
- Indication and contraindications
- Pulmonary effects of general anesthetic agents

7. Immunological agents and vaccines (In brief)

- Overview
- Classification
- Purpose and uses

8. Antimicrobial agents

- Overview
- Classification
- Action, therapeutic and adverse effects
- Indication and contraindications

9. Pharmacology in endocrine system

- Overview
- Classification
- Action, therapeutic and adverse effects
- Indication and contraindications

10. Pharmacology in sports

- Overview
- Frequently used drugs
- Indications and contraindications
- Doping

Suggested Readings

1. Craig CR, Stitzel RE: Modern Pharmacology with Clinical Applications. 6th Ed, Lippincott Williams & Wilkins, USA, 2004.
2. Ciccone CD: Pharmacology in Rehabilitation. 2nd Ed, F.A.Davis Company, Philadelphia, 1996.
3. Bennett PN, Bronen MJ: Clinical Pharmacoloy. 9th Ed, Churchill Livingstone, UK, 2003.
4. Richard AH, Pamela CC. Mycek MJ, Gertner SB, Perper MM: Pharmacology, 2nd Ed, Lippincott, University of Michigan, 1992.
5. Gladson Barbara: Pharmacology for Physical therapists. Paperback, New York, 2005.
6. Tripathi: Essentials of Medical Pharmacology. 5th Ed, Jaypee brothers, New Delhi, 2004.
7. Satoskar RS & Bhandark: Pharmacology and Pharmacotherapeutics. Vol I & Vol II, 14th Ed, Popular Prakashan, Mumbai, 1994.
8. Seth SD: Textbook of Pharmacology. 2nd Ed, Churchill Livingstone Pvt Ltd., New Delhi, 2000.
9. Sengupta PR: Medical Pharmacology. 1st Ed, Modern Publication, New Delhi, 2004.
10. Bhattacharya SK, Sen P, Ray A: Pharmacology. 2nd Ed, Elsevier Publication, New Delhi, (reprinted) 2005.

CONSTITUTION OF INDIA (SUBJECT CODE: PT 1114)

(For college examination only)

Teaching Hours: 50 hours
Maximum Marks: 50 (Theory: 50)
Assessment: Written examinations
College Examination: 50 marks Theory

Objectives: The objective is to enable the student understand the fundamental rights, directive principles and duties of citizens of India as per the constitution of India.

Theory Contents

1. Historical aspects

- Government of India act 1919
- Government of India act 1935
- The cabinet mission plan
- The constituent assembly
- Drafting structure of the constitution

2. Structure of the constitution

- Meaning
- Preamble and interpretation
- Sovereign
- Socialist
- Secular
- Democratic
- Republic
- Parts
- Schedules

3. Changing the constitution

- Amendments
- List of major amendments
- Restrictions on fundamental rights
- Territorial changes
- Transitional provisions
- Judicial review

4. Fundamental rights and duties

- Contents
- Significance

5. Directive principles of states policies

- Fundamental rights
- Need to balance

6. Special rights

- Dalits and backwards
- Women and children

- Religious and linguistic minorities

7. Election commission and public service commissions

- Overview
- Functioning

Suggested Readings

1. Baruah, Aparajita (2007). Preamble of the Constitution of India: An Insight & Comparison. Eastern Book Co. ISBN 9788176299960.
2. Basu, Durga Das (1984). Introduction to the Constitution of India (10th Ed.). South Asia Books. ISBN 0836410971.
3. Jayapalan, N. (1998). Constitutional History of India. Atlantic Publishers & Distributors. ISBN 8171567614.
4. Khanna, Hans Raj (1981). Making of India's Constitution. Eastern Book Co. ISBN 9788170121084.
5. Pylee, M.V. (2004). Constitutional Government in India. S. Chand & Co. ISBN 8121922038.
6. Sen, Sarbani (2007). The Constitution of India: Popular Sovereignty and Democratic Transformations. Oxford University Press. ISBN 9780195686494.
7. Sharma, Dinesh; Singh, Jaya; Maganathan, R.; et al. (2002). Indian Constitution at Work. Political Science, Class XI. NCERT.
8. J.C. Joharii: The Constitution of India—A Politico-Legal Study— Sterling Publication, Pvt.Ltd. New Delhi.
9. J.N Pandey: Constitution Law of India, Allahabad, Central Law Agency, 1998.
10. Granville Austin: The Indian Constitution—Corner Stone of a Nation— Oxford, New Delhi, 2000.

Section-VII- C

THRID YEAR BPT (BPT III) SUBJECTS AND COURSE CONTENTS

GENERAL MEDICINE (SUBJECT CODE: 1116)

Teaching Hours: 200 hours (Theory: 100 hours and Practical: 100hours)
Maximum Marks: 100 (Theory: 100)
Assessment: Written, Internal and University examinations
Internal Examination: 20 marks Theory
University Examination: 80 marks Theory

Objective: The objectives are to develop an understanding about various medical diseases commonly referred for physiotherapy treatment.

Theory Contents

1. Infective diseases
- Overview
- Principles & ethics of medicine
- Upper respiratory tract infection
- Urinary tract infection
- Sexually transmitted diseases
- Management
- Prevention

2. Deficiency diseases
- Overview
- Rickets
- Kwashiorkor

3. Diseases of the metabolism & endocrine system
- Overview
- Thyroid diseases
- Diabetes
- Osteoporosis
- Obesity
- Hyperlipidemia

4. Diseases of the respiratory system
- Common infectious diseases
- Diseases of pleura
- Occupational lung diseases
- Obstructive lung diseases
- Interstitial lung diseases
- Respiratory failure
- Investigations
- Management

5. Cardio-vascular diseases

- Congenital heart disease
- Ischemic heart diseases
- Hypertension
- Arrhythmia
- Valvular heart disease
- Rheumatic fever
- Infective endocarditis
- Cardiac failure
- Syncope and presyncope
- Peripheral vascular diseases
- Investigations
- Management

6. Diseases of digestive system

- Overview
- Common diseases
- Gastric & duodenal ulcers
- Hematemesis
- Investigations
- Management

7. Diseases of the blood

- Overview
- Anemia
- Hemophilia
- Leukemia
- Investigations
- Management

8. Rheumatic diseases

- Overview
- Classification
- Types
- Management

9. Dermatology

- Overview
- Acne, psoriasis& alopecia
- Pressure sores
- Hansen's disease
- Investigations
- Management
- Phototherapy

10. Psychiatry

- Overview
- Neuroses
- Psychoses
- Mental retardation
- Dementia
- Childhood behavioral disorders
- Investigations
- Management

11. Poisoning:

- Overview
- Types
- Management

12. Geriatric medicine

- Overview
- Aging process
- Diseases and disorders of aging
- Investigations
- Management

Practical Contents

1. History taking
2. Physical examination of patient
3. Clinical demonstrations
4. Interpretation of investigations
5. Differential diagnosis and diagnosis
6. Observation of medical management

Suggested Readings

1. Boon NA, Colledge NR, Walker BR, Hunter JA: Davidson's Principles and Practice of Medicine. 20th Ed, Churchill Livingstone, Edinburgh, 2006.
2. Fauci, Braunwald, Kasper, Longo, Jameson, Loscalzo: Harrison's principles of internal medicine. Vol I & II, 17th Ed, McGraw Hill, New York, 2008.
3. McPhee, Papadakins, Tierncy: Current medical diagnosis and treatment. 46th Ed, McGraw Hill, New York, 2007.
4. Swash M: Hutchinson's clinical methods. 21st Ed, Saunders, Edinburgh, 2002.
5. Ogilvie & Evans: Chamberlain's symptoms and signs in clinical medicine – An introduction to medical diagnosis. 12th Ed, Butterworth Heinmann, oxford, 1997.
6. Douglas, Nicol & Robertson: Macleod's clinical examination. 11th Ed, Elsevier – Churchill Livingstone, Edinburgh, 2005
7. Shah SN: API text book of Medicine. Vol I & II, 8th Ed, The Association of Physicians of India, Mumbai, 2008.
8. Golwalla SA, Golwalla AF: Medicine for students. 21st Ed, National book depot, Mumbai, 2005.
9. Das PC: Textbook of medicine. 4th Ed, Current books international, Kolkata, 2000.
10. Mehta PJ, Joshi SR, Mehta NP: Practical Medicine. 17th Ed, National Book Depot, New Delhi, 2005.

GENERAL SURGERY (SUBJECT CODE: 1117)

Teaching Hours: 200 hours (Theory: 100 hours and Practical: 100hours)
Maximum Marks: 100 (Theory: 100)
Assessment: Written, Internal and University examination
Internal Examination: 20 marks Theory
University Examination: 80 marks Theory

Objective: The objectives are to develop an understanding about various surgical conditions commonly referred for physiotherapy treatment.

Theory Contents

1. Shock
- Overview
- Types
- Clinical features
- Management

2. Wounds and ulcers
- Overview
- Types
- Healing
- Investigations
- Management

3. Burns
- Overview
- Causes
- Clinical features
- Classification
- Management
- Skin grafting

4. Thoracic surgeries
- Overview
- Indications
- Investigations
- Incisions
- Common surgical conditions
- Common surgical procedures

5. Cardiac surgeries
- Overview
- Indications
- Investigations
- Incisions
- Common surgical conditions
- Common surgical procedures

6. Vascular surgeries

- Overview
- Peripheral vascular diseases
- Aneurysms & gangrene
- Amputations
- Signs and symptoms
- Investigations
- Surgical management

7. Abdominal surgeries

- Overview
- Indications
- Investigations
- Incisions
- Common surgical conditions
- Common surgical procedures

8. Ophthalmology

- Overview
- Common diseases & disorders
- Surgical management
- Visual rehabilitation

9. Ear, nose & throat surgery

- Overview
- Otitis media
- URTI
- Sinusitis
- Facial palsy
- Rhinitis
- Investigations
- Management
- Tracheostomy

10. Obstetrics and gynecology

- Overview
- Pregnancy and labor
- Postnatal period and lactation
- Investigations
- Incisions
- Common surgical conditions
- Common surgical procedures

11. Surgical oncology

- Overview
- Classification of tumors
- Clinical features
- Investigations
- Management

Practical Contents

1. History taking
2. Physical examination of patient
3. Clinical demonstrations
4. Diagnosis
5. Observation of surgeries

Suggested Readings

1. Russell RCG, Williams NS, Bulstrode CJK: Bailey & Love's short practice of surgery. 24th Ed, Arnold, London, 2004.
2. Mowschenson PM: Aids to undergraduate surgery. 3rd Ed, Churchill Livingstone, Edinburgh, 1989.
3. Farquharson M & Moran B: Farquharson's textbook of operative general surgery. 9th Ed, Hodder Arnold, London, 2005.
4. Lumley JSP: Hamilton Bailey's demonstrations of physical signs in clinical surgery. 18th Ed, Butterworth Heinman, Oxford, 1997.
5. Doherty MG: Current surgical diagnosis and treatment. 12th Ed, Lange medical books, New York, 2006.
6. S. Das: A concise textbook of surgery. 3rd Ed, Dr. S.Das, Calcutta, 2001.
7. S. Das: A manual on clinical surgery. 6th Ed, Dr. S. Das, Calcutta, 2004.
8. Dutta DC: Text book of obstetrics / Textbook of gynecology. 5th / 6th Ed, New central book agency (P) ltd, Kolkata, 2003/2004.
9. Basak KS: Essentials of ophthalmology. 3rd Ed, Current books international, Kolkata, 2004.
10. Bhargava KB, Bhargava SK & Shah TM: A short textbook of E.N.T diseases. 7th Ed, Usha publications, Mumbai, 2005.

COMMUNITY MEDICINE (SUBJECT CODE: 1118)

Teaching Hours: 200 hours (Theory: 100 hours and Practical: 100hours)
Maximum Marks: 100 (Theory: 100)
Assessment: Written, Internal and University examinations
Internal Examination: 20 marks Theory
University Examination: 80 marks Theory

Objective: The objectives are to develop an understanding about various community health problems commonly referred for physiotherapy treatment.

Theory Contents

1. Concept of health and disease

- Overview
- Dimensions and indicators of health
- Concept of well-being
- Determinants of health
- Natural history of disease
- Disease control and prevention
- Modes of intervention
- Population medicine

2. Principle of epidemiology and epidemiological methods

3. Epidemiology of communicable diseases

- Overview
- Respiratory infections, intestinal infections
- Arthropod-borne infections, zoonoses, surface infections
- Hospital acquired infections

4. Screening for diseases

- Overview
- Aims and objectives
- Uses

5. Epidemiology of non-communicable diseases and conditions

- Overview
- Principles, methods & uses
- Modes of disease transmission
- Host defenses and immunizing agents
- Hazards of immunization
- Disease prevention and control
- Disinfection
- Chronic non-communicable diseases

6. Health education

- Overview
- Aims and objectives
- Approaches to health education
- Models of health education
- Contents of health education
- Principles of health education

- Practice of health education
- Principles & process of communication
- Methods & tools of health education, role of profession in health education
- Health education team,
- Elements of planning a health education program

7. Nutrition and health

- Overview
- Classification of foods
- Nutritional profiles of principal foods
- Nutritional problems in public health
- Community nutrition programs

8. Environment and health

- Overview
- Components of environment
- Water and air pollution and public health
- Pollution control
- Disposal of waste
- Medical entomology

9. Occupational health

- Overview
- Occupational environment
- Occupational hazards
- Occupational diseases
- Prevention of occupational diseases
- Social security
- Compensation acts

10. Mental Health

- Overview
- Mentally healthy person
- Types of mental illness
- Causes of mental ill health
- Prevention
- Mental health services
- Alcohol and drug dependence

11. Preventive medicine in obstetrics, pediatrics & geriatrics

- Overview
- Antenatal, intra natal and post natal care
- Care of children
- Child health problems
- Rights of child and national policy for children
- Social welfare programs for women and children
- Geriatric health problems
- Social welfare programs for elderly

12. Public health administration

- Overview
- State level health programs
- National level health programs

- National leprosy eradication program
- National tuberculosis program
- National AIDS control program
- Universal immunization program
- National cancer control program
- National mental health program
- National diabetes control program
- National family welfare and planning program
- National sanitation and water supply program
- Polio eradication program

13. Disaster management

- Overview
- Natural and man made disasters
- Disaster impact and response
- Relief phase
- Epidemiologic surveillance and disease control
- Nutrition rehabilitation
- Disaster preparedness
- Agencies for disaster control & management

14. Public-private partnership

- Overview
- Agencies
- Need & importance

15. Hospital waste management

16. Demography and family planning

Practical Contents

1. History taking
2. Field visit in community, PHC & SHC
3. Surveys for diseases and disorders
4. Screening and examination
5. Observation of medical interventions in community

Suggested Readings

1. Park K: Park's textbook of preventive and social medicine. 18th Ed, M/s Banarasidas Bhanot, Jabalpur, 2005.
2. Rothman J, Levine R: Reventive practice – Strategies for physical therapy and occupational therapy. 1st Ed, W.B.Saunders Co, 1992.
3. Matzen RN, Lang RS: Clinical preventive medicine. 1st Ed, Mosby, Missouri, 1993.
4. Abramson JH, Abramson ZH: Survey methods in community medicine. 5th Ed, Churchill Livingstone, Edinburgh, 1999.
5. Jekel JF, Katz DL, Elmore JG: Epidemiology, Biostatistics and Preventive Medicine, 2nd Ed, Saunders, Philadelphia, 2001.
6. Rao SB: Principles of community medicine. 4th Ed, AITBS Publishers & distributors, New Delhi, 2005.
7. Rahim A: Principles and practice of community medicine. 1st Ed, Jaypee brothers, New Delhi. 2008.
8. Pruthvish S: Community based rehabilitation of persons with disabilities. 1st Ed, Jaypee brothers, New Delhi, 2006.
9. Gupta MC & Mahajan BK: Textbook of preventive and social medicine. 3rd Ed, Jaypee Brothers, New Delhi, 2003.

10. Gupta P & Ghai OP: Text book of preventive and social medicine. 2nd Ed, CBS Publishers and distributors, New Delhi, 2007.

CLINICAL ORTHOPEDICS (SUBJECT CODE: 1119)

Teaching Hours: 200 hours (Theory: 100 hours and Practical: 100hours)
Maximum Marks: 100 (Theory: 100)
Assessment: Written, Internal and University examinations
Internal Examination: 20 marks Theory
University Examination: 80 marks Theory

Objective: The objectives are to develop an understanding about various orthopedic conditions commonly referred for physiotherapy treatment.

Theory Contents

1. Fundamental concepts

- History of orthopedics
- Causes of injuries
- Classification of injuries
- Fracture biomechanics
- Soft tissue healing
- Fracture healing

2. Soft tissue injuries

- Overview
- Types
- Soft tissue injuries of extremities
- Investigations
- Management

3. Fractures and dislocations

- Overview
- Fractures & dislocations of upper extremity
- Fractures & dislocations of lower extremity
- Fractures & dislocations of spine
- Investigations
- Orthopedic management

4. Low back pain and neck pain

- Overview
- Causes
- Types
- Disorders
- Investigations
- Management

5. Arthritic disorders

- Overview
- Types
- Osteoarthritis & rheumatoid arthritis
- Spondyloarthropathies
- Hemophilic arthritis & charcot's joint
- Gout and psoriatic arthritis

- Investigations
- Management

6. Deformities

- Overview
- Congenital & acquired deformities
- Congenital malformations
- Extremity deformities
- Spinal deformities
- Management

7. Infective diseases of bones and joints

- Overview
- Causes
- Clinical features
- Types
- Investigations
- Management

8. Metabolic bone diseases

- Overview
- Rickets & osteomalacia
- Osteopenia &. osteoporosis
- Investigations
- Management

9. Neuromuscular disorders

- Overview
- Cerebral palsy
- Poliomyelitis
- Spinal dysraphism
- Leprosy
- Investigations
- Surgical management

10. Sports injuries

- Overview
- Types
- Investigations
- Management

11. Bone Tumors

- Overview
- Classification
- Types
- Clinical features
- Investigations
- Surgical management

12. Surgical procedures

- Overview
- Amputations
- Illizarov

- Arthrodesis
- Arthroplaty

Practical Contents

1. History taking
2. Physical examination of patient
3. Clinical demonstrations
4. Diagnosis
5. Observation of surgeries

Suggested Readings

1. Terry SC: Campbell's operative orthopedics. Vol 1,2,3,4, 10th Ed, Mosby, Philadelphia, 2003.
2. Magee DJ: Orthopedic Physical Assessment. 4th Ed, W.B.Saunders & Co, Philadelphia, 2003.
3. Craig EV: Clinical Orthopedics. 1st Ed, Lippincott Williams & Wilkins, Philadelphia, 1999.
4. Weinstein SL, Buckwalter JA: Turek's orthopedics principles and their applications. 5th Ed, J.B.Lippincott Co, Philadelphia, 1994.
5. Hertling D & Kessler RM: Management of common musculoskeletal disorders. 3rd Ed, Lippincott Willams & Wilkins, Philadelphia, 1996.
6. Norris Christopher: Sports Injuries – Diagnosis and management. 3rd Ed, Butterworth Heinmann, Edinburgh, 2004.
7. Ebnazer John: Essentials of orthopedics for physiotherapists. 1st Ed, Jaypee brothers, New Delhi, 2003.
8. Maheshwari J: Essential Orthopedics. 3rd Ed, Mehta Publishers, New Delhi, 2005.
9. Natarajan M & Mayilrahanan N: Natarajan's textbook of orthopedics & traumatology. 4th Ed, M.N.Orthopedic hospital, Chennai, 1994.
10. Pandey S & Pandey AK: Clinical orthopedics Diagnosis. 2nd Ed, Jaypee brothers, New Delhi, 2000.

NEUROLOGY & NEUROSURGERY (SUBJECT CODE: 1120)

Teaching Hours: 200 hours (Theory: 100 hours and Practical: 100hours)
Maximum Marks: 100 (Theory: 100)
Assessment: Written, Internal and University examination.
Internal Examination: 20 marks Theory
University Examination: 80 marks Theory

NEUROLOGY (PART – A)

Teaching Hours: 100 hours (Theory: 50 hours and Practical: 50hours)
Maximum Marks: 50 (Theory: 50)
Assessment: Written, Internal and University examination.
Internal Examination: 10 marks Theory
University Examination: 40 marks Theory

Objective: The objectives are to develop an understanding about various neurological and neurosurgical conditions commonly referred for physiotherapy treatment.

Theory Contents

1. Neurological disorders
- Overview
- Evaluation
- Electro diagnostic tests

2. Peripheral and cranial nerve disorders
- Overview
- Neuropathies
- Neuritis
- Gullain Barrie syndrome
- Facial palsy
- Trigeminal neuralgia
- Hansen's disease

3. Autonomic disorders
- Overview
- Dysautonomia
- Reflex sympathetic dystrophy

4. Movement disorders
- Parkinson's disease
- Ataxia
- Dystonia
- Hemiballismus
- Chorea
- Athetosis

5. Neuromuscular disorders
- Overview

- Classification
- Signs and symptoms
- Spinal muscular atrophy
- Myopathies
- Myotonia
- Muscular dystrophy
- Myasthenia gravis
- Eaton-Lambert syndrome
- Botulism

6. Infective diseases of brain and spinal cord

- Overview
- Etiology
- Classification
- Signs & symptoms
- Meningitis, encephalitis
- AIDS, brucellosis

7. Specific conditions

- Cerebrovascular disorders
- Motor neuron disorders
- Vestibular conditions
- Transverse myelitis
- Sub acute combined degeneration
- Multiple sclerosis
- Dementia

8. Pediatric Neurology

- Overview
- Congenital disorders
- High risk babies
- Developmental delays
- Cerebral palsy
- Learning disabilities
- Poliomyelitis
- Down's syndrome
- ADHD
- Autism

9. Metabolic disorders

- Overview
- Classification
- Screening
- West's syndrome
- Wilson's syndrome

NEUROSURGERY (PART – B)

- **Teaching Hours:** 100 hours (Theory: 50 hours and Practical: 50hours)
- **Maximum Marks:** 50 (Theory: 50)
- **Assessment:** Written, Internal and University examination.
- **Internal Examination:** 10 marks Theory
- **University Examination:** 40 marks Theory

Theory Contents

1. Pre and post surgical assessment and management in neurosurgical conditions.

- Traumatic brain injury
- Spinal cord injury
- Peripheral nerve injuries
- Spina bifida
- Aneurysms
- Syringomyelia
- Hydrocephalus
- Brain tumors and spinal tumors

2. Neurosurgical procedures

- Overview
- Nerve repair and grafting
- Neurovascular surgeries
- Rhizotomies
- Stereotactic surgeries
- Spinal decompression
- Surgeries for cerebral palsy
- Surgeries for poliomyelitis
- Complications

3 .Spinal cord pathologies

- Syringomyelia
- Craniovertebral junction anomalies
- Tumours
- Intervertebral disc and nerve root pathologies.

Practical Contents

1. History taking
2. Physical examination of patient
3. Clinical demonstrations
4. Diagnosis
5. Observation of treatment procedures

Suggested Readings

1. Snell RS: Clinical neuroanatomy. 6th Ed, Lippincott Williams and Wilkins, Philadelphia, 2009.

2. Ropper AH & Brown RH: Adams & Victor's principles of neurology. 8th Ed, Mc Graw Hill professional, New York, 2005.
3. Lindsay KW & Bone I: Neurology & Neurosurgery Illustrated. 4th Ed, Churchill Livingstone, Edinburgh, 2004.
4. Fauci AS, Braunwald E, Kasper DL, et al: Harrison's Prinicples of internal medicine. 17th Ed, Mc Graw Hill Professional, Berkshire, UK, 2008.
5. Campbell WW: Dejong's the neurological examination. 6th Ed, Lippincott Williams & Wilkins, Philadelphia, 2005.
6. Shah SN: API textbook of medicine. 7th Ed, Mesh Publishing house pvt Ltd, New Delhi, 2003.
7. Mehta PJ & Golwalla AF: Mehta practical medicine. 16th Ed, The national book depot, Mumbai, 2003.
8. Ghai OP, Gupta P & Paul VK: Ghai essential pediatrics. 6th Ed, CBS Publishers & Distributors, New Delhi, 2005.
9. Patten J: Neurological differential diagnosis. 2nd Ed, Elsevier Science, Ireland, 1997.
10. Ahuja N: Ahuja's a short textbook of psychiatry. 6th Ed, Jaypee Brothers, New Delhi, 1996.

RESEARCH METHODOLOGY AND ETHICS (SUBJECT CODE: 1121)

Teaching Hours: 40 hours (Theory: 40 hours)
Maximum Marks: 100 (Theory: 100)
Assessment: Written, Internal and University examination.
Internal Examination: 20 marks Theory
University Examination: 80 marks Theory

Objectives: On successful completion of this unit, it is expected that students will be able to understand basic research methodology and ethics in physiotherapy.
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Theory Contents

RESEARCH METHODOLOGY

1. Basic concepts

- Meaning and definition
- Research process
- Research types and approaches
- Objectives of research in physiotherapy
- Barriers for research in physiotherapy
- Research problem or research question

2. Research ethics

- Overview
- Helsinki's declaration
- Plagiarism

3. Literature search

- Overview
- Steps in literature search
- Purpose
- Methods and techniques

4. Research designs

- Meaning and definition
- Types of research designs
- Steps in preparation of research designs
- Factors affecting research designs

5. Sampling

- Overview
- Principles
- Methods
- Designs
- Process

6. Research variables

- Overview
- Types

- Reliability and validity
- Specificity and sensitivity

7. Pilot study and pre-testing
- Overview
- Need
- Advantages

8. Data collection
- Overview
- Sources
- Methods
- Types

9. Biostatistics
- Steps in data processing
- Tabulation
- Measures of central tendency
- Tests of significance

10. Research report
- Overview
- Types
- Publication

ETHICS

- Introduction, History & General Principles of ethics involving human participants.
- Ethical consideration in physiotherapy practice- State, National & international rules & regulations governing physiotherapy practice.
- Informed consent process
- Good clinical practices (GCP)
- Ethical codes and conduct for physiotherapy profession.
- Influence of values & valuing on patient care
- Documentation skills- History, examination, treatment planning, organization & execution.

Suggested Readings

1. Jenkins, S., Price CJ, & Straker L. (1998). The researching therapist. A practical guide to planning, performing and communicating research. Edinburgh: Churchill Livingstone.
2. Domholdt, E. (2000) Physical therapy research: Principles and applications, 2nd ed. WB Saunders, Philadelphia, USA.
3. American physical therapy association: Guide to physical therapy practice, 2nd edition 2001.
4. Professionalism in physical therapy: History, practice and development by Laura Lee Swisher and Catherine G.Page,(Elsevier publication 2005)
5. Handbook of Research Method – Sproull, Screcrow Press, 1998.
6. Elements of Research in Physical Therapy, Currier D. P, Williams & Wilkins, Baltimore, 1990, Ed 3.
7. Effective documentation for physical therapy professionals by Eric shamus & Debra(McGraw Hill company 2004).
8. Carolyn Hicks: Research for physiotherapists: project design and analysis, 2 Ed, Churchill Livingstone, New York, 1995.

9. Thomas JR, Nelson JK: Research Methods in Physical Activity. 4th Ed, Human Kinetics, New Zealand, 2001.

Section-VII- D

FOURTH YEAR BPT (BPT IV) SUBJECTS AND COURSE CONTENTS

PHYSIOTHERAPY IN MEDICINE (SUBJECT CODE: PT1123)

Teaching Hours: 200 hours (Theory: 100 hours and Practical: 100hours)
Maximum Marks: 200 (Theory: 100 and Practical and viva 100)
Assessment: Written, Oral and Practical, Internal and University examinations
Internal Examination: 20 marks Theory and 20 marks practical
University Examination: 80 marks Theory, 80 marks practical and Viva – voce

Objectives: The objectives are to develop an understanding about common medical conditions and diseases commonly seen by physiotherapists and their physiotherapeutic treatment including rehabilitation.

Theory Contents

1. Basics of cardiology

- Overview
- Common signs and symptoms
- Physical examination /patient evaluation
- ECG and other common laboratory investigations
- Exercise stress testing
- Holter monitoring and symptoms
- Echocardiography
- Cardiac radiology
- Cardiac catheterization

2. Basics of pulmonology

- Overview
- Common signs and symptoms
- Physical examination /patient evaluation
- PFTs and other laboratory investigations
- Bronchoscopy
- Pulmonary radiography
- Other diagnostic procedures

3. Angiology

- Overview
- Common signs and symptoms
- Physical examination / patient evaluation
- Invasive and non invasive investigations

4. Cardiac diseases and physiotherapy

- Overview
- Rheumatic heart disease
- Heart failure
- Diseases of pericardium
- Ischemic heart disease
- Myocardial infarction

- Hypertension & hypotension
- Cardiac arrhythmias
- Cardiac emergencies

5. Respiratory diseases and physiotherapy

- Overview
- Diseases of nose, pharynx and larynx
- Bronchitis and bronchiolitis
- Bronchiectasis
- Bronchial asthma
- Chronic obstructive pulmonary disease
- Pneumonias
- Pulmonary tuberculosis
- Cystic fibrosis
- Atelectasis
- Occupational lung disorders
- Lung cancer
- Disorders of ventilation
- Disorders of pleura, mediastinum and diaphragm
- Respiratory failure
- Congenital anomalies

6. Diseases of vascular system and physiotherapy

- Atherosclerosis
- Diseases of veins
- Diseases of arteries
- Diseases of aorta
- Pulmonary hypertension
- Pulmonary embolism

7. Exercise and cardio-vascular & respiratory System

- Effects of aerobic exercises on cardio-vascular and respiratory system
- Age related changes in cardio- vascular and respiratory system
- Beneficial effects of aerobic exercises in patients with coronary artery disease
- Oxygen debt
- Athlete heart

8. Pharmacology

- Drug therapy for common cardio- vascular disorders
- Drug therapy for common respiratory disorders
- Drugs used in aerosol therapy

9. Cardiac rehabilitation program

- Overview
- History
- Definition
- Structure
- Stratification of risk factors
- Program planning and implementation
- Exercise prescription

10. Pulmonary rehabilitation program

- Overview

- History
- Definition
- Components program planning and implementation
- Exercise prescription
- Breathing re-education
- Principles of lung expansion therapy
- Principles of airway clearance therapy

11. Exercise testing protocols/ tests

- Overview
- Definition
- Indications
- Common protocols used in adults
- Common protocols used in pediatrics
- Anaerobic testing
- Bicycle ergometry

12. Miscellaneous

- Physiotherapy for neonate and child with respiratory dysfunction
- Pulmonary rehabilitation of a patient with spinal cord injury
- Physiotherapy of a ventilator dependent patient
- Physical rehabilitation in patient with diabetes, edema , obesity and renal dysfunction
- Physiotherapy in skin conditions - acne vulgaris, leprosy, psoriasis, vitiligo, alopecia, hyperhydrosis

Practical Contents

1. Cardiac system examination- techniques of inspection, palpation percussion and auscultation and their documentation
2. Blood pressure measurements
3. Palpation of various peripheral pulses
4. Respiratory system examination- techniques of inspection, palpation percussion and auscultation and their documentation
5. Interpretation of ECGs, PFTs, chest and cardiac radiographs and other laboratory Investigations
6. Proprioceptive neuromuscular facilitatory techniques used in respiration
7. Facilitatory and inhibitory techniques for respiratory muscles
8. Coughing and huffing techniques, postural drainage positions
9. Thorax mobilization techniques
10. Compressive bandaging techniques
11. Other manual techniques and relaxation exercises used cardio-respiratory disorders

Suggested Readings

1. Frownfelter D & Dean E: Principles and practice of cardiopulmonary physiotherapy. 2nd Ed, Churchill Livingstone, New York, 1995.
2. Hillegass E & Sadowsky SH: Essentials of cardiopulmonary physical therapy. 2nd Ed, Saunders, Philadelphia, 2001.
3. Pryor JA & Ammani SP: Physiotherapy for respiratory and cardiac problem – Adults and Pediatrics. 4th Ed, Churchill Livingstone, London, 2008.
4. Malone DJ & Lindsay KLB: Physical therapy in acute care – as clinician's guide. 1st Ed, Slack Incorporated, USA, 2006.
5. Balado Donna: Acsm's guidelines for exercise testing and prescription. 6th Ed, Lea Febiger, USA, 1995.
6. Moffet M & Frownfelter D: Cardiovascular / Pulmonary Essentials – Applying the preferred physical therapist patterns. 1st Ed, Slack Incorporated, USA, 2007.
7. Cash JE & Downie P: Cash's text book of chest, heart and vascular disorders for physiotherapists. 1st Ed, Mosby pub, UK, 1987.
8. Cash JE & Downie P: Cash's textbook of general medical and surgical conditions for physiotherapists. Lippincott, Philadelphia, 1984.
9. Shah SN: API textbook of medicine. 7th Ed, Mesh Publishing house pvt Ltd, New Delhi, 2003.
10. Fauci AS, Braunwald E, Kasper DL, et al: Harrison's Prinicples of internal medicine. 17th Ed, Mc Graw Hill Professional, Berkshire, UK, 2008.

PHYSIOTHERAPY IN SURGERY (SUBJECT CODE: PT1124)

Teaching Hours: 200 hours (Theory: 100 hours and Practical: 100hours)
Maximum Marks: 200 (Theory: 100 and Practical and viva 100)
Assessment: Written, Oral and Practical, Internal and University examination
Internal Examination: 20 marks Theory and 20 mark practical.
University Examination: 80 marks Theory, 80 marks practical and Viva – voce

Objectives: The objectives are to develop an understanding about common surgical ailments and procedures commonly seen by physiotherapists and their physiotherapeutic treatment including rehabilitation.

Theory Contents

1. Thoracic surgeries and physiotherapy

- Overview
- Anatomy of thoracic cage
- Incisions
- Indications
- Complications
- Chest wall surgeries
- Lung transplant
- Types and care of drains
- Pre and post surgery evaluation
- Pulmonary rehabilitation

2. Cardiac surgeries and physiotherapy

- Overview
- Anatomy of heart and great vessels
- Incisions
- Surgeries in congenital heart diseases
- On pump and off pump surgeries
- Pacemakers
- Valvular surgeries
- CABG
- Heart transplantation
- Pre and post surgical evaluation
- Cardiac rehabilitation

3. Vascular surgeries and physiotherapy

- Overview
- Anatomy of the vascular system
- Surgeries in arterial disorders
- Surgeries in lymphatic disorders
- Surgeries in venous disorders
- Pre and post surgical evaluation

4. Abdominal Surgeries and physiotherapy

- Overview
- Layers of abdominal wall
- Abdominal quadrants

- Types of Incisions and surgeries
- Indications
- Complications

5. Burns and physiotherapy

- Overview
- Skin anatomy and physiology
- Types
- Classification
- Evaluation
- Hypertrophic scars and keloids
- Scar management
- Splints in burns

6. Wounds and physiotherapy

- Overview
- Definition
- Types and classification
- Stages
- Types of dressings
- Evaluation

7. Ulcers and physiotherapy

- Overview
- Definition
- Characteristics
- Types
- Evaluation
- Decubitus ulcers-stages and grades
- Diabetic foot and care
- Anesthetic hand and foot care

8. Reconstruction surgeries and physiotherapy

- Overview
- Principles
- Indications
- Skin grafts and flaps
- Implants
- Tendon transfers

9. Surgeries in oncology and physiotherapy

- Overview
- Breast
- Head and neck
- Oral cavity
- Bone
- Pre and post surgical evaluation
- Palliative care

10. Intensive care unit and physiotherapy

- Overview
- Evaluation
- Monitoring
- Basic life support
- Invasive and non invasive ventilation

- Nebulization and humidification
- Medical gas therapy
- Neonatal and pediatric intensive care

11. Obstetrics and gynecology and physiotherapy

- Overview
- Anatomy and physiology of female reproductive system
- Pregnancy and stages of labor
- Musculoskeletal and cardio-respiratory problems in pregnancy
- Antenatal, perinatal and post natal care
- Urinary and fecal incontinence
- Prolapse uterus and rectum
- Evaluation in obstetrics and gynecology

Practical Contents

1. Pre and post surgical evaluation of cardiac and pulmonary systems
2. Investigations and their interpretation: Chest x-ray, ECG, PFTs, ABG
3. Examination of arterial, venous and lymphatic disorders
4. Examination of abdomen
5. Assessment of burns, interpretation of burn charts
6. Examination of wound and ulcer
7. Equipments used in ICU: artificial airways, AMBU, aerosol therapy, mechanical ventilators, CPAP, BiPAP, drains, catheters, lines, pacemakers, IABP, pulse oximetry, suctioning apparatus
8. Positioning and other chest physiotherapy techniques
9. Exercise testing and prescription
10. Obstetric and gynecological assessment and exercise training

Suggested Readings

1. Frownfelter D & Dean E: Principles and practice of cardiopulmonary physiotherapy. 2nd Ed, Churchill Livingstone, New York, 1995.
2. Hillegass E & Sadowsky SH: Essentials of cardiopulmonary physical therapy. 2nd Ed, Saunders, Philadelphia, 2001.
3. Pryor JA & Ammani SP: Physiotherapy for respiratory and cardiac problem – Adults and Pediatrics. 4th Ed, Churchill Livingstone, London, 2008.
4. Malone DJ & Lindsay KLB: Physical therapy in acute care – as clinician's guide. 1st Ed, Slack Incorporated, USA, 2006.
5. Balado Donna: Acsm's guidelines for exercise testing and prescription. 6th Ed, Lea Febiger, USA, 1995.
6. Moffet M & Frownfelter D: Cardiovascular / Pulmonary Essentials – Applying the preferred physical therapist patterns. 1st Ed, Slack Incorporated, USA, 2007.
7. Cash JE & Downie P: Cash's text book of chest, heart and vascular disorders for physiotherapists. 1st Ed, Mosby pub, UK, 1987.
8. Cash JE & Downie P: Cash's textbook of general medical and surgical conditions for physiotherapists. Lippincott, Philadelphia, 1984.
9. Glenn Lrion: Comprehensive wound management. 2nd Ed, Slack Incorporated, USA, 2002.
10. Mantle J, Haslan J, Barton S: Physiotherapy in obstetrics and gynecology. 2nd Ed, Butterworth Heinmann, UK, 2004.

COMMUNITY PHYSIOTHERAPY & REHABILITATION (SUBJECT CODE: PT 1125)

Teaching Hours: 170 hours (Theory: 100 hours and Practical: 70hours)
Maximum Marks: 200 (Theory: 100 and Practical and viva 100)
Assessment: Written, Oral and Practical, Internal and University examination
Internal Examination: 20 marks Theory and 20 mark practical.
University Examination: 80 marks Theory, 80 marks practical and Viva – voce

Objectives: The objectives are to develop an understanding of theoretical knowledge pertaining to community physiotherapy and rehabilitation.

Theory Contents

COMMUNITY PHYSIOTHERAPY

1. Basic concepts
- Overview
- Historical aspects
- Need for community physiotherapy
- Holistic approach towards health and disease

2. Health care delivery systems
- Overview
- Public and private sectors
- Indigenous systems of medicine
- Voluntary health agencies
- National health programs
- Non-governmental and governmental organizations

3. Patient evaluation in community
- Overview
- Objectives
- Tools
- Screening tests
- Multiple system assessment
- Environmental barriers

4. Interventions in community
- Overview
- Responding in emergency situations
- Types of interventions
- Referral
- Aids and appliances, training and their substitutes
- Transfers & positioning
- Self care & skin care
- Community resources
- Utilization of assistants & care givers
- Therapeutic recreation

5. Specific community physiotherapy

- Stroke
- Spinal cord injury
- Amputation
- Traumatic brain injury
- Degenerative joint diseases
- Poliomyelitis
- Cerebral palsy and mental retardation
- Obstetrics and gynecology conditions
- Postural deformities

6. Community physiotherapy awareness

- Overview
- Need
- Critical issues
- Patient and family education
- Models of disability
- Disability prevention
- Means

7. Community based rehabilitation

- Overview
- Principles
- IBR and CBR
- Funding and accountability
- CBR personnel
- Multi-professional collaboration
- Rural rehabilitation
- Extension services

8. Legislative and ethical issues for persons with disabilities

- Overview
- Disability certificate
- Provisions and rights
- Acts and policies

REHABILITATION

9. Fundamental concepts of rehabilitation

- Overview
- Objectives
- Team
- Role of professionals
- Approaches and systems

10. Disability, impairment & handicap

- Overview
- Causes
- Types
- Evaluation
- Prevention
- Management
- Self care and ADL

11. Disability & issues

- Health issues
- Financial
- Socioeconomic
- Legislation
- Organizations & services

12. Environmental modifications

- Overview
- Barriers
- Home modifications
- Work place modifications
- Transport
- Living attitudes

13. Aids, appliances and adaptive devices

- Overview
- Prescription
- Training
- Maintenance

14. Vocational, social and psychological rehabilitation

15. Specific rehabilitation

- Industrial rehabilitation
- Geriatric rehabilitation
- Pediatric rehabilitation
- Neuro-rehabilitation
- Orthopedic rehabilitation
- Community based rehabilitation
- Cardiac rehabilitation
- Sports rehabilitation
- Cancer rehabilitation

Suggested Readings

1. Park K: Park's textbook of preventive & social medicine. 14th Ed, M/S Banarsidas Bhanot, Jabalpur, India, 1994.
2. Braddom RL: Physical Medicine and Rehabilitation. 3rd Ed, W.B.Saunders, Philadelphia, 2006.
3. Hoeman SP: Rehabilitation / restorative care in the community. 1st Ed, C.V.Mosby Company, St.Louis, 1990.
4. Piyush Gupta O.P.Ghai; T.B. of Preventive & social medicine 2nd edition CBS publishers & distributors 2007.
5. Karan OC, Greenspan S: Community rehabilitation services for people with disabilities. 1sr Ed, Butterworth Heinmann, USA, 1995.
6. Demeter SL, Andersson BJG, Smith GM: Disability evaluation. 1st Ed, Mosby publishers, Missouri, 1996.
7. Compton A, Ashwin H: Community care for health professional. 2nd Ed, Butterworth Heinmann, Cornwall, 2000.

8. Cooper Grant: Essential Physical medicine and rehabilitation. 1st Ed, Human Press Inc, New Jersy, 2000.
9. Curtis Kathleen: The physical therapist's guide to health care. 1st Ed, SLACK incorporated, USA, 1999.
10. Sunder S: Textbook of rehabilitation. 2nd Ed, Jaypee brothers, New Delhi, 2002.

PHYSIOTHERAPY IN ORTHOPEDICS (SUBJECT CODE: PT1126)

Teaching Hours: 200 hours (Theory: 100 hours and Practical: 100hours)
Maximum Marks: 200 (Theory: 100 and Practical and viva 100)
Assessment: Written, Oral and Practical, Internal and University examinations
Internal Examination: 20 marks Theory and 20 marks practical
University Examination: 80 marks Theory, 80 marks practical and Viva – voce

Objectives: The objectives are to develop an understanding about various orthopedic ailments and sports injuries commonly seen by physiotherapists and their physiotherapeutic treatment including rehabilitation.

Theory Contents

1. Historical aspects

- History of orthopedics
- History of orthopedic physiotherapy
- History of sports physiotherapy

2. Fractures and physiotherapy

- Fracture healing
- Classifications of fractures
- Clinical assessment of fractures
- Investigations for diagnosis of fractures
- Complications of fractures
- Upper extremity fractures
- Lower extremity fractures
- Spinal fractures

3. Joint instability and physiotherapy

- Classification of joint instabilities
- Clinical assessment of instabilities
- Investigations for instabilities
- Instabilities of upper extremity joints
- Instabilities of lower extremity joints
- Spinal instabilities: spondylolisthesis

4. Arthritic disorders and physiotherapy

- Types of arthritic disorders
- Clinical assessment of arthritic disorders
- Investigations for arthritic disorders
- Complications of arthritic disorders
- Spondyloarthropathies: ankylosing spondylosis, cervical and lumbar spondylosis
- Rheumatic disorders: RA, non articular rheumatism
- Degenerative joint disorders: Osteoarthritis, frozen shoulder

5. Soft tissue dysfunctions and physiotherapy

- Biomechanical properties of soft tissues
- Soft tissue healing
- Classification of soft tissues dysfunctions
- Clinical assessment of soft tissue dysfunctions
- Investigations for soft tissue dysfunctions

- Soft tissue dysfunctions of upper extremity joints
- Soft tissue dysfunctions of lower extremity joints

6. Manual therapy
- History of manual therapy
- Articular neurology
- Principles of manual therapy approaches : Maitland, McKenzie and Mulligan
- Indication and contra indication for manual therapy

7. Sports physiotherapy
- Over view of sports including types
- Role of physiotherapist in sports
- Common sports injuries
- Classification of sports injuries
- Sports psychology
- Evaluation of sports injuries
- Sports pharmacology
- Physiotherapy management including rehabilitation in sports

8. Surgical procedures and physiotherapy
- Amputation and management
- Prosthetic prescription
- Arthrodesis and osteotomy
- Arthroplasty
- Arthroscopy
- Tendon transfers
- Soft tissue release surgeries : tenotomy, myotomy and Z-plasty
- External fixators and internal fixators
- Surgeries in cerebral palsy and poliomyelitis

9. Deformities and physiotherapy
- Torticollis
- Thoracic outlet syndrome
- CTEV,CDH
- Pes Cavus, pes planus
- Scoliosis, kyphosis, lordosis
- Coxa vara, coxa valga
- Genu valgum-varum- recurvatum

10. Low back pain, neck pain and physiotherapy
- Classification of low back pain and neck pain
- Evaluation of low back pain and neck pain
- Proplapse intervertebral disc
- Lumbar cord compression
- TB spine
- Sacralization and lumbarization
- Sacroiliac joint dysfunction
- Whiplash injuries
- Fibromyalgia

11. Miscellaneous conditions with physiotherapy
- Bone tumors
- Metabolic bone diseases
- Perthes diseases

- RSD
- Myositis ossifican

Practical Contents

1. Evaluate/assess status of musculoskeletal structures, soft tissue integrity, muscle
2. Evaluate/assess pain, muscle performance, range of motion, length and girth of body parts, posture, functional mobility and gait with and without equipment
3. Perform structure specific tests (eg: ligament, tendon, muscle)
4. Determine client need for orthotic, prosthetic and assistive devices
5. Position, move and drape client for effective, comfortable treatment and privacy
6. Identify appropriate outcome measures and barriers to client progress
7. Establish measurable short- and long-term goals for clients
8. Identify precautions and contraindications to treatment
9. Perform therapeutic exercises, taping , mobilization, soft tissue manipulations, neurodynamic release, gait training and prosthetic training
10. Prioritize client's problems and associated treatments

Suggested Readings

1. Hertling D & Kessler RM: Management of common musculoskeletal disorders – Physical therapy principles & methods. 3rd Ed, JB Lippincott JB, Philadelphia, 1996.
2. Magee DJ: Orthopaedic physical assessment. 4th Ed, W.B.Saunders, Philadelphia, 2002.
3. Reid DC: Sports injury assessment and rehabilitation. Churchill Livingstone, New York, 1992.
4. Butler DS: Mobilisation of the nervous system. Churchill Livingstone, Edinburgh, 1991.
5. Donatelli RA & Wooden MJ: Orthopaedic physical therapy. 3rd Ed, Churchill Livingstone, New York, 2001.
6. Downie PA: A Cash's textbook of orthopaedics and rheumatology. Jaypee brothers, New Delhi, 1993.
7. Walker J, Randy Jr: Grieve's Modern Manual Therapy: The vertebral column. 2nd Ed, Churchill Livingstone Inc, New York, 1995.
8. McKenzie R: 7 steps to pain free life: How to rapidly relieve back and neck pain using McKenzie method. 1st Ed, Penguin Group, New York, 2000.
9. Brotzman BS & Wilk K: Clinical orthopedic rehabilitation. 2nd Ed, Mosby, New York, 2003.
10. Hangaveld E & Bank K: Maitland's Peripheral Manipulation. 4th Ed, Elsevier Butterworth Heinmann, Philadelphia, Philadelphia, 2001.

PHYSIOTHERAPY IN NEUROLOGY AND NEUROSURGERY (SUBJECT CODE: PT1127)

Teaching Hours: 200 hours (Theory: 100 hours and Practical: 100hours)
Maximum Marks: 200 (Theory: 100 and Practical and viva 100)
Assessment: Written, Oral and Practical, Internal and University examinations
Internal Examination: 20 marks Theory and 20 marks practical
University Examination: 80 marks Theory, 80 marks practical and viva – voce

Objectives: The objectives are to develop an understanding about various neurological ailments and neuro-surgeries commonly seen by physiotherapists and their physiotherapeutic treatment including rehabilitation.

Theory Contents

1. Neurological evaluation

- Overview
- Development
- CNS evaluation
- PNS evaluation
- ANS evaluation
- Neurological gaits
- Electro diagnostic tests
- Functional assessment scales

2. Congenital and acquired disorders and physiotherapy

- Overview
- High risk babies
- Developmental delays
- Spina bifida
- Hydrocephalus
- Cerebral palsy
- Learning disabilities
- Autism
- ADHD
- Meningitis and encephelitis

3. Inherited muscle disorders and physiotherapy

- Overview
- Spinal muscular atrophy
- Myopathies and myotonias

4. Traumatic disorders and physiotherapy

- Overview
- Traumatic brain injury
- Spinal cord injury
- Peripheral nerve injuries

5. Peripheral and cranial nerve disorders and physiotherapy

- Overview
- Neuralgia

- Neuritis
- Neuropathies
- Nerve injuries
- Facial palsy
- Trigeminal neuralgia
- Dysphagia
- Hansen's disease

6. Hypokinetic disorders and physiotherapy

- Overview
- Parkinson's disorder
- Cerebellar ataxia
- Down's syndrome

7. Hyperkinetic disorders and physiotherapy

- Overview
- Dystonia
- Hemiballismus
- Chorea
- Athetosis

8. Neurovascular disorders and physiotherapy

- Overview
- Cerebrovascular accidents
- Hematomyelia
- Aneurysms

9. Specific conditions and physiotherapy

- Overview
- Motor neuron disorders
- Poliomyelitis and post polio syndrome
- Vestibular conditions
- Transverse myelitis
- Syringomyelia
- Multiple sclerosis
- Sub acute combined degeneration
- Neuromuscular junction disorders

10. Neurosurgeries and physiotherapy

- Overview
- Nerve repair and grafting
- Neurovascular surgeries
- Rhizotomies
- Stereotactic surgeries
- Spinal decompression
- Surgeries for cerebral palsy
- Surgeries for poliomyelitis

11. Autonomic disorders and physiotherapy

- Overview
- Dysreflexia
- Postural hypotension
- Reflex sympathetic dystrophy

12. Neurological therapies and physiotherapy

- Overview
- Principles
- Motor control and motor learning
- Facilitation and inhibition techniques
- Proprioceptive neuromuscular facilitation
- Neurodevelopmental therapy
- Sensory integration therapy
- Bobath and Rood's approach
- Brunnstorm's and Conductive education approach
- Phelps, Fay and Vojta approaches
- Constraint induced movement therapy
- Muscle re-education approach
- Functional re-education

13. Neuro-rehabilitation and physiotherapy

- Overview
- Objectives
- Indications
- Therapeutic tools
- Equipments
- Aids and appliances
- Transfer techniques
- Team

14. Metabolic disorders and physiotherapy

- Overview
- Classification
- Screening
- Phenyl ketonuria
- West's syndrome
- Wilson's syndrome
- Leigh's disease
- Angelman's syndrome

Practical Contents

1. Examination of higher mental status of various neurological patients.
2. Assessment of cognition and perception.
3. Assessment of movement disorders.
4. Demonstration of application of EMG, NCV & SDC tests.
5. Examination and management of various neuromusculoskeletal diseases and disorders.
6. Detailed nervous system assessment: Motor, sensory, cranial nerves, reflexes, bowel and bladder, balance and co-ordination.
7. Determine the patient need for adaptive and assistive devices & aids and appliances.
8. Assessment and management of neurological gaits.
9. Assessment of function in a neurological patient.
10. Perform mat exercises, PNF, transfer techniques and application of various neurological therapy approaches.

Suggested Readings

1. Stokes Maria: Physical management in Neurological rehabilitation – Physiotherapy essentials. 2nd Ed, Mosby, New York, 2004.
2. Petty Nicola: Principles of neuromusculoskeletal treatment and management – A guide for therapists. 1st Ed, Churchill Livingstone, 2004.
3. Nicola Petty: Neuromusculoskeletal examination and assessment – A handbook for therapists. 3rd Ed, Churchill Livingstone, 2005.
4. O'Sullivan SB, Schmitz JT: Physical Rehabilitation, 5th Ed, F. A. Davis Company, USA, 2006.
5. Umphred DA: Neurological rehabilitation. 5th Ed, Mosby, New York, 2006.
6. Carr JH, Shepherd RB: Neurological Rehabilitation – optimizing motor performance. 2nd revised Ed, Butterworth-Heinemann, Oxford, 1998.
7. Downie PA: Cash's Textbook of Neurology for Physiotherapists. Jaypee brothers, New Delhi, 1993.
8. Shepherd RB: Physiotherapy in Pediatrics. 3rd Ed, Butterworth- Heinemann, Oxford, 1995.
9. Tecklin JS: Pediatric Physical Therapy. 4th rev Ed, Lippincott Williams and Wilkins, USA, 2007.
10. Bromley Ida: Tetraplegia and paraplegia – A guide for physiotherapists. 6th Ed, Churchill Livingstone, Philadelphia, 2006.

EVIDENCE BASED PHYSIOTHERAPY (SUBJECT CODE 1128)

(For college examination only)

Teaching Hours: 30 hours (Theory)
Maximum Marks: 50 (Theory: 50)
Assessment: Written examination
College Examination: 50 marks Theory

Objectives: The objectives are to develop an understanding about evidence based physiotherapy and its applications.

Theory Contents

1. Introduction to Evidence Based Practice:

- Definition
- Development of Evidence based knowledge
- Evidence Based Physiotherapy Practice
- Evidence Based Practitioner: The Reflective Practitioner, The E Model, Using the E Model
- Concepts of Evidence based Physiotherapy: Awareness, Consultation, Judgement, Creativity

2. Finding the Evidence

- Measuring outcomes in Evidence Based Practice
- Measuring Health Outcomes
- Measuring clinical outcomes
- Inferential statistics and Causation

3. Searching for the Evidence

- Different sources of evidence ,Electronic
- Bibliographic databases
- World Wide Web
- Literature search

4. Assessing the Evidence

- Evaluating the evidence
- Levels of evidence in research using quantitative methods
- Levels of evidence classification system
- critical review of research using qualitative methods

5. Reviewing the evidence

- Stages of systematic reviews
- Meta analysis
- The Cochrane collaboration

6. Economic evaluation of the evidence

- Types of economic evaluation
- Conducting economic evaluation
- Critically reviewing economic evaluation
- Locating economic evaluation in the literature

7. Practice guidelines:

- Recent trends in health care,
- Clinical Practice Guidelines (CPG),
- Communicating evidence to clients, managers and funders:

8. Research dissemination and transfer of knowledge:

Suggested Readings

1. Evidence-Based Practice in Nursing and Health Care: A Guide to Best Practice ,by Bernadette Melnyk (Editor), Ellen Fineout-Overholt (Editor)
2. Evidence-Based Rehabilitation: A Guide to Practice,by Mary Law
3. Achieving Evidence-Based Practice, by Susan Hamer, BA, MA, RGN, FETC(DIST),
4. The Evidence-Based, Randy A Haye