2nd year B.P.T.

SUBJECT: PATHOLOGY & MICROBIOLOGY

(Subject Code: BPT- 201)

Subject Title & Code	**PATHOLOGY (BPT- 201)**
Duration **Total Hours** **Theory** **Practical**	**New:70 Hours** **60** **10**
Total Hrs/week	**3 hrs**
Method of Assessment	**Theory**

Objectives- At the end of the course, the student will be able to-

1) Acquire the knowledge of concepts of cell injury & changes produced thereby in different tissues & organs-; capacity of the body in healing process

2) Recall the Etio – pathogenesis, the pathological effects & the clinico –

pathological correlation of common infections & non-infectious diseases.

3) Acquire the knowledge of concepts of neoplasia with reference to the Etiology,

gross & microscopic features, diagnosis, & prognosis in different tissues, &

organs of the body.

4) Correlate normal & altered morphology of different organ systems in different

diseases needed for understanding disease process & their clinical significance
(with special emphasis to neuro-musculo-skeletal & cardio-respiratory systems)
5) Acquire knowledge of common immunological disorders & their resultant effects on the human body.
6) Understand in brief, about the Hematological diseases & investigations necessary to diagnose them & determine their prognosis.

Syllabus:

1) **General Pathology**- Cell injury-causes, mechanism & toxic injuries with
special reference to Physical, Chemical, & ionizing radiation b) Reversible injury (degeneration)- types-morphology,- swelling, hyaline, fatty changes, c) Intra-cellular accumulation-hyaline mucin, d) Irreversible cell injury-types of necrosis- apoptosis – calcification-dystrophic & metastasis, e)Extra-cellular accumulation-amylidosis, calcification-Pathogenesis- morphology …… **(6 Hours)**

2) **Inflammation & Repair …… (10 Hours)**
a) Acute inflammation – features, causes, vascular & cellular events,
b) Morphologic variations, c) Inflammatory cells & mediators,
d) Chronic inflammation:- causes, types, non-specific & granulomatous – with
examples, e) wound healing by primary & secondary union factors promoting & delaying healing process. f) Healing at various sites-including-bones, nerve & muscle g)- Regeneration & repair

3**) Immuno – pathology – (basic concepts) …… (3 Hours)**

a) Immune system:- organization-cells- antibiodies- regulation of immune

responses, b) Hyper-sensitivity, c) Secondary immuno-deficiency including HIV,

d) Organ transplantation

4**) Circulatory disturbances …… (5 Hours)**

a)Edema - pathogenesis - types - transudates / exudates, b) Chronic venous congestion- lung, lever, spleen, c) Thrombosis – formation – fate – effects,

d) Embolism – types- clinical effects, e) Infarction – types – common sites

f) Gangrenes – types – actiopathogenesis g) Shock – Pathogenesis, types, morphologic changes

5) Deficiency disorders – Vitamins A,B,C,D, …….. (2 Hours)

6) **Growth Disturbance …… (4 Hours)**

a)Atrophy-malformation, agenesis, dysplasia, b) Neoplasia classification, histogenesis, biologic behavious, difference between benign & malignant tumour

c) Malignant neoplasms- grades-stages-local & distal spread, d) Carcinogenesis – environmental carcinogens, e) Chemical, Occupational, heredity, viral,

f) precancerous lesions & ca in situ g) Tumor & host interactions – systemic effects-metastatic or direct spread of tumors affecting bones, spinal cord, leading to paraplegia, etc.

7) **Medical Genetics – (In Brief) …… (1 Hour)**

8) **Specfic Patholgy …… (40 Hours)**

A]- CVS

a) Atherosclerosis - Ischimic heart diseases – myocardial infarction – Pathogenesis / Pathology b) Hypertension c) C.C.F. d)- Rh H.D.
e)- Peripheral vascular diseases

B)- Respiratory –

a)- COPD, b)- Pneumonia (lobar, broncho, viral), c)- T. B. Primary, secondary – morphologic types, d)- pleuritis, complications, e)- Lung collapse - atelectasis

C) NeuroPathology

a)-Reaction of nervous tissue to injury – infection & ischaemia
b)- Pyogenic meningitis, TBM, Viral, c)- Cerebro – vascular diseases – atherosclerosis – Thrombosis, embolism, aneurysm, hypoxia, infarction & hemorrhage. d)- effects of Hypotension on CNS e)- Coma
f)- Polio myelitis- Leprosy- Demyelinating diseases – Parkinsonism – Cerebral
palsy- metachromatic leucodystrophy – Dementia – Hemiplegia / paraplegia –
Pathogenesis & pathology of Wilson's disease g)- SOL- (in brief)
h)- Peripheral nerve injury

9) Muscle diseases – Muscular dystrophy-hypertrophy-Psudo-hypertrophy-altrophy- Polio-myelitis Myositis ossoficance, neorosis, regeneration-Myotonia

10) Neuro – muscular junction – Myasthenia gravis – Myasthenic syndrome.

11) **Bone & Joints** - a)fracture healing – Osteomyelitis – rickets – Osteomalacia Bone tumors- Benign, Malignant, Metastatic and synovial sarcoma.

a. Osteoporosis b) Spondylosis, P.I.D.- Scoliosis – Haemarthrosis – Gout – T.B. c) Arthritis – degenerative – inflammatory – RA- Ankylosing spondylitis –

Tenosynovitis

12) Urinary – commonly encountered in paralytic bladder, common urinary tract

infections (brief)- urinary calculi-

13) G.I. system- (1hr)- Gastric/ duodenal ulcer, enteric fever, TB, enteritis, Gastritis (related to consumption of NSAID)

14) Endocrine – Hyperthyroidism – Diabetes

15) Hepatic diseases (1hr)- Cirrhosis – emphasis to systemic effects of portal

hypertension

16) Skin-Melanin pigment disorders – Vitiligo – Tenia versicolor- Psoriasis-

Bacterial/fungal infections – cutaneous TB, Soleroderma, SLE, Leprosy Alopacia

17) Clinical pathology – (including Demonstrations)

a) Anemia – (deficiency) – T.C./D.C./ Eosinophilia, E.S.R., C.P.K,

b) Muscle / skin / nerve biopsy c)- Microscopic appearance of muscle necrosis –

fatty infiltration d)- Lab investigation in liver & renal failure

INTERNAL ASSESSMENT

Two exams – terminal and prelim of 80 marks each – Total 160 marks

TEXT BOOKS –

1.Text book of Pathology - by Harsh Mohan

2.Pathologic basis of desease by Cotran, Kumar, Robbins

3.General Pathology – by Bhende

Microbiology

Didactic – 30 hrs

Subject Title & Code	**MICROBIOLOGY**
Duration **Total Hours** **Theory**	**30**
Total Hrs/week **Lectures**	**1 hr**
Method of Assessment	**Theory**

Objectives: At the end of the course, the candidate will have sound knowledge of the agent responsible for causing human infections, pertaining to C.N.S., C.V.S. musculoskeletal, & Respiratory system.

1. General Microbiology [5 Hours]

Definitions: infections, parasite, host, vector, fomite, contagious disease, infectious disease, epidemic, endemic, pandemic, Zoonosis, Epizootic, Attack rate. Normal flora of the human body. Routes of infection and spread; endogenous and exogenous infections; source at reservoir of infections.

Bacterial cell. Morphology limited to recognizing bacteria in clinical samples Shape, motility and arrangement. Structures, which are virulence, associated.
Physiology: Essentials of bacterial growth requirements.
Sterilization, disinfection and universal precautions in relation to patient care and disease prevention. Definition of asepsis, sterilization, disinfection. **Hospital aquired infections, Basic methods of sterilization.**

2. Immunology [5 Hours]
Basic principles of immunity immunobiology : lymphoid organs and tissues. Antigen, Antibodies, antigen and antibody reactions with relevance to pathogenesis and serological diagnosis.
Humoral immunity and its role in immunity Cell mediated immunity and its role in immunity. Imunology of hypersensitivity, Measuring immune functions.
Basic lab test: Principles, relevance- Elisa, Widal's, VDRL, COOMB's, Serology

3. Bacteriology [12 Hours]
To be considered under the following headings
Morphology, classification according to pathogenicity, mode of transmission, methods of prevention, collection and transport of samples for laboratory diagnosis, interpretation of laboratory reports. Basic importance of staining- Gram's, Ziel-Neilson, Acid-fast bacilli etc… Staphylococci, Streptococci and Pneumococci, Mycobacteria: Tuberculosis, M.leprae, atypical mycobacteria, Enterobacteriaceae, Vibrois : V. cholerae and other medically important vibrios, Campylobacters and Helicobacters, Pseudomonas, Bacillus anthracis,

Sporing and non-sporing anaerobes: Clostridia, Bacteroides and Fusobacteria,

4. General Virology [8 Hours]

General properties: Basic structure and broad classification of viruses. Pathogenesis and pathology of viral infections. Immunity and prophylaxis of viral diseases. Principles of laboratory diagnosis of viral diseases. List of commonly used antiviral agents. Common Diseases- Measel,Mumps,Rubella , polio, hepatitis, CMV.

5. Mycology [3 Hours]

General properties of fungi. Classification based on disease: superficial, subcutaneous, deep mycosel opportunistic infections including Mycotoxins, systemic mycoses**.eg: Candidiasis, Aspergillosis**. General principles of fungal diagnosis, Rapid diagnosis. Method of collection of samples. Antifungal agents.

6. Clinical/Applied Microbiology [12 Hours]

Streptococcal infections: Rheumatic fever and Rheumatic heart disease, Meningitis. Tuberculosis, Pyrexia of unknown origin, leprosy, Sexually transmitted diseases, Poliomyelitis, Hepatitis, Acute-respiratory infections,

Central nervous System infections, Urinary tract infections, Pelvic inflammatory disease, Wound infection, Opportunistic infections, HlV infection, Malaria,

Filariasis, Zoonotic diseases.

SCHEME OF EXAMINATION (THEORY ONLY)

#-Pathology – 50 marks + Microbiology – 30 marks = 80 marks + I.A. – 20 marks = Total 100 marks

There shall be NO L A.Q.s in this paper

#Emphasis to be given to topics related to Muskulo Skeletal / Neurological /

Cardiovascular / Respiratory conditions & Wound / Ulcers /

Section A: Pathology

Section I- M.C.Q. based on Single best answer in MUST KNOW are- time 20 min

Q-1 based on Pathology [1 x 20] ---------- 20 marks

S.A.Q. based on Pathology

Q-2 To answer Any FIVE out of Six [5 x 3] ---------- 15 marks

Q-4 To answer any THREE out of Four [3 x 5] ---------- 15 marks

Section B: Microbiology

Q-2 Based on Microbiology [1 x 10] ---------- 10 marks

S.A.Q. based on Microbiology

Q-5 Answer any FOUR out of Five [4 x 5] ---------- 20 marks

INTERNAL ASSESSMENT

Two exams – terminal and prelim of 80 marks each – Total 160 marks

TEXT BOOKS

Text books of Microbiology – by R. Ananthnarayan & C.K. Jayram Panikar

1. Short text book of Medical Microbiology by Sathish Gupta
2. Text book of microbiology by Chakraborthy

SUBJECT: SOCIOLOGY/ COMMUNITY HEALTH & BIO-STATISTICS (Subject Code: BPT- 202)

Subject Title & Code	**SOCIOLOGY/ COMMUNITY HEALTH & BIO-STATISTICS (BPT- 202)**
Duration **Total Hours** **Theory**	**Total New:90 Hours** **90**
Total Hrs/week	**3 hrs**
Method of Assessment	**Theory**

A – Community Health (40 Hours)

Objectives – At the end of the course, the candidate shall be able to understand the contents given in the syllabus.

SYLLABUS

1) Health and Disease :Definitions, concepts, dimensions and indicators of health, concept of well being, natural history of Disease, Concept of disease control and prevention, population medicine, The role of socio economic and cultural environment in heath and disease ……..6hrs
2) Epidemiology: Definition, scope. Principles of Epidemiology and Epidemiology methods, component and aims, basic measurement ,methods, uses of Epidemiology , Disinfection , Screening for disease :concept of screening ,Aims and Objectives ,uses and types of screening ……..7hrs
3) Epidemiology of infectious diseases, communicable diseases ,Respiratory disease ,*intestinal* disease ,Arthropod born disease Zoonoses, surface infection, Hospital acquired disease (general review) ,In detail about communicable diseases like Leprosy, Polio, HIV, Tuberculosis , Brusillosis ……11hrs
4) Epidemiology of chronic non-communicable diseases ,cardiovascular diseases ,coronary heart disease, Hypertension, Rheumatic Heart Disease, Cancer, Obesity ,Accidents ,Blindness ……3hrs
5) Host defenses ,Immunization agents, Hazards of Immunization National immunization schedule, Immunization schedule for hospital staff …2hrs
6) Public health administration: overview of the health administration set up at Central & state level HEALTH FOR ALL,

Internationals health organizations WHO ect.
…… 6hrs

7) Health programmes in India: Vector born disease control programme, National leprosy eradication programme, National tuberculosis programme, National AIDS control programme, ,National control programme of Blindness, ,National cancer control programme, ,National iodine deficiency disorders programme, National mental health programme, ,National Diabetic control programme, National sanitation and water supply programme …… 4hrs
8) Demography and family planning: Demographic cycle ,Fertility, Family planning –objective of national family planning programme and family planning methods, A general idea of advantage and disadvantages of the methods
……. 3hrs
9) Preventive Medicine in Obstetrics, Pediatrics : MCH problems ,Antenatal, intranatal and post natal care ,New born baby care, breast feeding, preterm baby, pre school child, under five clinic
……9hrs

10) Preventive Medicine in Geriatrics
…….2hrs

11) Nutrition and Health: Classification of foods, Nutritional profiles of principal foods, Nutritional problems in public health, Nutritional deficiency, Osteomalacia, Rickets ,PEM
…….. 4hrs
12) Socio-economical &cultural issues related to morbidity owing to the physical disability due to Auto-immune &

hereditary Myopathies, Cerebral palsy, RA, Non seropositive arthritis,
multiple sclerosis ……. 7hrs

13) Socio-economical &cultural issues related to morbidity owing to the physical disability due to Neuro-motor origin such as in MR, Head injury, Paraplegia, Quadriplegia …….. 4hrs

14) Socio-economical &cultural issues related to morbidity owing to the physical disability due to Occupational exposure OCCUPATINAL HEALTH: Occupational environment, Occupational hazards, Occupational disease, prevention of Occupational diseases Social security and other measures for the protection from Occupational hazard accidents and diseases Special information regarding AMPUTATION,HAND INJURIES, ASTHAMA,COPD…… 10hrs

15) Environment and Health : concept of Environment Water pollution ,Diarrhea disease , water purification, Air pollution, food and milk pollution and purification …….. 8hrs

16) Hospital waste management Source of hospital waste, waste management ……. 2hrs

17) Disaster management Natural and man made disaster, Disaster impact and response, Relief phase ,Rehabilitation, Disaster preparedness …….2hrs

B. Sociology (40HRS)

SYLLABUS

1) Introduction : definition –relevance with physiotherapy ……. 1hr

2) Scope of sociology: it's relationship to anthropology, psychology, social psychology ……. 3hrs

3) Socialization : meaning and nature of Socialization ,primary ,secondary Socialization …….. 3hrs

4) Social Investigations: case study, social survey, questionnaire, interview and opinion poll methods, Importance of its study with reference to health care professionals …… 2hrs

5) Social groups: Concepts –influence of formal & informal groups on health & diseases, Role of primary & secondary groups in hospital ……. 2hrs

6) Family: meaning and definition, types of family, effects of sickness in the family and psychosomatic disease and their importance to physiotherapy …….. 2hrs

7) Community: Role of rural & urban communities, Role of community in determining beliefs, practices and home remedies, Health hazards of rulities, Health hazards of urbanities ……. 4hrs

8) Culture: impact on human behavior, culture meaning of sickness, Response to sickness & choice of treatment …… 2hrs

9) Cast system: different cast system, effect on socialization ……2hrs

10) Social change: meaning of social change, factors of social change, human adaptation, social change and deviance, health programme social change and stress……..4hrs

11) Social control: Role of norms , folkways, customs, religion, law & other means of social control ……. 2hrs

12) Social security: social legislation in relation to the disabled

13) Social problems: population exploration, Poverty and unemployment, Beggary, Juvenile delinquency, Prostitution, Problems of women employment, Divorce, Alcoholism, Geriatric problem …… 8hrs

14) Hospital socialization …… 2hrs

15) MSW ……. 1hr

16) Leadership & group work …….. 2hrs

C. Biostatistics (10 Hours)

Syllabus-

1] Introduction-uses of statistical methods in Physio therapy – measurement scales, variables, & their measurements, Symbolic Data,

operations .. ……2 hrs

2] Statistical data-Tabulation-calculation of central tendency ,& dispersion- Linear regression ,& correlation –presentation of data in diagrammatic & graphic form,…… 2 hrs

3] Probability & sampling – as a mathematical system population & samples- sampling distribution, sampling methods…….. 2 hrs

4] ANOVA/ T-test/ F-test …… 2 hrs

5] Principles of research methodology …….. 2

SCHEME OF EXAMINATION THEORY – 80 + 20 I.A. MARKS = 100 MARKS]

Theory – 80 marks + Internal Assessment 20 marks = 100 marks

Section A: Community Health & Sociology (60 Marks)

Q1. MCQ's …… 20 Marks

Q2. Short Answer Questions (Any 5 out of 6)… 5 marks each……..25 Marks

Q3. Short Notes (Any 4 out of 5) …… 5 marks each……. 20 Marks

Section B: Biostatistics(20 Marks)

Q1. Short Answer Questions (Any 4 out of 5) …….. 20 Marks

INTERNAL ASSESSMENT

1 Terminal & 1 Preliminary Examination of 100 marks each as per University pattern.

Internal Assessments marks should be calculated out of 20

SUBJECT: PSYCHOLOGY & PSYCHIATRY

(Subject Code: BPT- 203)

Subject Title & Code	**PSYCHOLOGY & PSYCHIATRY (BPT- 203)**
Duration **Total Hours** **Theory**	**New:90 Hours** **90**
Total Hrs/week	**3 hrs**
Method of Assessment	**Theory**

Objective: At the end of the course, the candidate will

1] be able to define the term Psychology, & its importance in the Health delivery

system, & will gain knowledge of Psychological maturation during human
development & growth; & alterations during aging process.
2] be able to understand the importance of psychological status of the person in
health & disease; environmental & emotional influence on the mind & personality.
3] Describe in brief the various treatment modalities commonly used.

A. PSYCHOLOGY -[DIDACTIC-40 HRS]

Syllabus :-

1] Psychiatric History & examination of mental status.
2] Classification of Mental disorders
3] Schools of thought – Psycho-analytical theory, Behaviourism, gestalt,
Stucturalism, Functionalism [In Brief]
4] Learning – Role of learning in human life – Conditioning
5] Emotions- nature & relationship with autonomic nervous system- Theories of
emotions
a] James Lange theory, b] Schachter Singer theory, c] Cannan Bard theory
6] Memory – types – Forgetting causes
7] Attention & perception Nature of attention [in brief] Nature of perception Principles of grouping
8] Conflict & Frustration – Types –Common Defense mechanism stress-common reactions to frustrations.

9] Abnormal Psychology [in brief] a] Introduction b] deference between normal &
abnormal psychology, c] Causes, d] Anxiety disorders – Phobias, Obsessive –
compulsive, Hysterical convulsion disorder e] Affective disorders – Depression,
mania, Bipolar disorders; f] Psychotic disorders – Types of Schizophrenia

B.PSYCHIATRY

Didactic: 50 Hours

Syllabus-

1]-Psychiatric History, & examination of mental status
2]-Classification of Mental disorders
3]-Scizophrenia & its types-brief Psychotic disorder, delusional disorder, schizo-affective disorders, post-partum psychosis, mood disorders,-organic mental disorders,Anxiety disorder, phobia, obsessive compulsive, dissociative conversion disorder, hypochondriasis ,post-traumatic disorder ,personality disorder,-substance related disorders-adjustment & impulse control disorder,-psycho-sexual disorders,-psycho-somatic disorder,-psychiatric emergencies-suicide-stress management-disorders of infancy-childhood -& adolescence- disruptive behavior ,conduct disorder,-

attention deficit, & hyper-reactivity-eating disorder ,tic disorder, elimination disorder,-child abuse, eneuresis

4]-Management-ECT, Chemotherapy, group therapy,, psycho therapy, cognitive behavioral therapy behavioral therapy

SCHEME OF EXAMINATION THEORY – 80 + 20 I.A. MARKS = 100 MARKS]

Section A: Psychology

Q1. MCQ's …….…… 10 Marks

Q2. Short Answer Questions (Any 3 out of 5)… 5 marks each……. 15 Marks

Q3. Short Notes (Any 5 out of 6) …… 5 marks each……. 15 Marks

Section B: Psychiatry

Q1. MCQ's …….…… 10 Marks

Q2. Short Answer Questions (Any 3 out of 5)… 5 marks each……. 15 Marks

Q3. Short Notes (Any 5 out of 6) …… 5 marks each……. 15 Marks

INTERNAL ASSESSMENT

1 Terminal & 1 Preliminary Examination of 100 marks each as per University pattern.

Internal Assessments marks should be calculated out of 20

SUBJECT: EXERCISE THERAPY (Subject Code: BPT-204)

Subject Title & Code	Exercise Therapy (BPT- 204)
Duration Total Hours Theory Practical	250 90 160
Total Hrs/week Lectures Practicals Seminars	8 3hrs/week 5hrs/week
Method of Assessment	Theory and Practical

Objective: – At the end of the course, the candidate will be able to –

1] Analyze Normal human posture [static & dynamic] & various Normal musculo

skeletal movements during Gait, activates of daily living, & also the normal

describe the movements of the Thorax during berating, ; in terms of Biomechanical & Physiological Principles.

2] Apply the biomechanical principles for the efficacy in the assessment methods
for mobility, stability, muscle strength and endurance.

3] Describe the Biophysical properties of connective tissue, & effect of mechanical loading, & factors which influence the Muscle strength, & mobility
& stability of articular & periarticular soft tissues

4] Describe the physiological effects, - Therapeutic uses, merits / demerits of
various exercise modes.

5] Demonstrate various therapeutic exercises on self, also acquire the skill of
application on Models.

6] Acquire the skill of assessment of isolated & group muscle strength, & Range
of motion of the joints subjectively & objectively

Syllabus:

1] Biomechanics of joints of the skeletal system…….....
(25Hours)
[spine, extremities, T.M. joint & Thoracic cage] – Factors determining mobility &
stability (Dynamic) of joint

2] Kinetics & Kinematics of various activities of daily living e.g. supine to sitting,

sitting to standing, squatting, climbing up & down, lifting, pulling, pushing,
overhead activities, walking running, jogging…… (3 Hours)

3. Manual Therapy & Peripheral Joint Mobilization……. [4 Hours]
Schools of Manual Therapy, Principles, Grades, Indications and Contraindications, Effects and Uses – Maitland, Kaltenborn, Mulligan Biomechanical basis for mobilization, Effects of joint mobilsation, Indications and
contraindiactions, Grades of mobilization, Principles of mobilization, Techniques of mobilization for upper limb, lower limb, Precautions.

4.Manual Muscle Testing: Introduction to MMT, Principles & Aims, Indications & Limitations, Techniques of MMT for group & individual muscles : Techniques of MMT for upper limb /Techniques of MMT for lower limb / Techniques of MMT for spine.
…….. (5 Hours)

5. Resistance Training ……. (8 Hours)
a)Assessment of muscle strength, [group/individual] subjective & objective
methods 1/10 RM dynamometry – Endurance exercises
b) Factors that influence the strength of the normal muscle/hypertrophy,
recruitment of motor units, change after training / type of contraction Isometric /
Isotonic / Isokinetic Eccentric.
c) General principles of strength training :- overload / intensity/ Motivation/

learning/ duration/ frequency/ reversibility/ specificity
Types of resisted exercises: Manual and Mechanical resistance exercise, Isometric exercise, Dynamic exercise: Concentric and Eccentric, Dynamic exercise: Constant versus variable resistance, Isokinetic exercise, Open-Chain and Closed-Chain exercise. Specific exercise regimens ,Isotonic: de Lormes, Oxford, Circiut weight training Isometric:, Multiple Angle Isometrics Isokinetic regimens

6. Measurement of Limb Length: true limb length, apparent limb length, segmental limb length, Anthropometric Measurements: Muscle girth – biceps, triceps, forearm, quadriceps, calf …… (2 Hours)

7. Principles of P.N.F. [no practical …… (3 Hours)

8. Suspension Therapy [5 Hours]
Definition, principles, equipments & accessories, Indications & contraindications, Benefits of suspension therapy Types of suspension therapy: axial, vertical, pendular ,Techniques of suspension therapy for upper limb
Techniques of suspension therapy for lower limb

9.Stretching [3 Hours]
Definition of terms related to stretching; Tissue response towards immobilization and elongation, Determinants of stretching exercise, Effects of stretching, Inhibition and relaxation procedures, Precautions and contraindications of stretching, Techniques of stretching.

10. Breathing exercises-Goals-Inspiratory-Expiratory/Segmental-Forced expiratory, coughing-huffing/ Modified Inspiratory / Active cycle of breathing
Bronchial Hygiene-postural drainage positions/ humidification 12/ 6 Minute walk test – on models …….. (6 Hours)

13. Co-ordination Exercise [6 Hours]
Anatomy & Physiology of cerebellum with its pathways Definitions: Co-ordination, Inco-ordination Causes for Inco-ordination, Test for co-ordination: equilibrium test, non equilibrium test Principles of co-ordination exercise Frenkel's Exercise: uses of Frenkel's exercise, technique of Frenkel's exercise, progression, home exercise.

14. Posture [4 Hours]
Definition, Active and Inactive Postures, Postural Mechanism, Patterns of Posture, Abnormal postures.

15. Walking Aids [3 hours]
Types: Crutches, Canes, Frames; Principles and training with walking aids

16] Functional Re-education …….. (4 Hours)
Mobility, Bed / Wheel chair mobility, ambulation, Application of mat exercises [to practice on self & on models

17. Gait and normal gait cycle, components. …… (8 Hours)

Practicals …… (160 Hours)
Demonstrate the technique of measuring using goniometry

2. Demonstrate muscle strength using the principles and technique of MMT

3. Demonstrate the techniques for muscle strengthening based on MMT grading

5. Demonstrate exercises for training co-ordination – Frenkel's exercise

6. Demonstrate the techniques of massage manipulations

7. Demonstrate techniques for functional re-education

8. Assess and train for using walking aids

9. Demonstrate mobilization of individual joint regions

10. Demonstrate to use the technique of suspension therapy for mobilizing and strengthening joints and muscles

11. Demonstrate the techniques for muscle stretching

12. Assess and evaluate posture and gait

15. Demonstrate techniques of strengthening muscles using resisted exercises

16. Demonstrate techniques for measuring limb length and body circumference.

SCHEME OF EXAMINATION

Theory – 80 marks + Internal assessment 20 marks, ----------
Total 100 marks

Practical / laboratory – 80 marks, + I.A. 20 marks ----------
Total 100 marks

THEORY--- Model question paper ----

Section A-Q-1-M.C.Q. based on Single best answer – MUST KNOW area – 20marks

Section B SAQ-Q-2] Answer any FIVE out of six [5 x 3] ----------
15 marks

Q-3] Answer any THREE out of Four [3 x 5] ----------
15 marks

* Section –C-L.A.Q. – 4] [Compulsory] Based on Kinesiology ------- 15 marks

5] Therapeutic application for Muscle training / Posture / Gait -------
15 marks

OR

Q-6] Therapeutic application for Mobility / Pulmonary function ------ 15 marks

*[LAQ should give Break up of 15 marks – e.g. [3+5+7] etc]

PRACTICAL

1. Long case – Muscle training / Mobility /Pulmonary Function training (35 marks)

2. Two Short Case :- Based on M.M.T. /Coordination/Posture / Gait/ Funct-reed etc.

(20 X 2 =40 marks)

3. Journal (5 marks)

INTERNAL ASSESSMENT

THEORY

Two papers - terminal and prelim examination of 80 marks each **Total - 160 marks**

THEORY--- Model question paper ----

Section A-Q-1-M.C.Q. based on Single best answer – MUST KNOW area – 20marks

Section B SAQ-Q-2] Answer any FIVE out of six [5 x 3] ----------
15 marks

Q-3] Answer ant THREE out of Four [3 x 5] ----------
15 marks

* Section –C-L.A.Q. – 4] [Compulsory] Based on Kinesiology ------- 15 marks

5] Therapeutic application for Muscle training / Posture / Gait ------- 15 marks

OR

Q-6] Therapeutic application for Mobility / Pulmonary function ------ 15 marks

*[LAQ should give Break up of 15 marks – e.g. [3+5+7] etc]

I.A. to be calculated out of 20 marks.

Recommended Textbooks

1. Therapeutic exercise by Barbara Bandy

2. Therapeutic exercise by Carolyn Kisner

3. Principles of exercise therapy by M.Dena Gardiner

4. Practical Exercise therapy by Hollis Margaret

5. Therapeutic exercise by Sydney Litch

6. Therapeutic exercise by Hall & Brody

7. Therapeutic exercise by Basmajjian

8. Physical Rehabilitation by o'Sullivan.

9. Therapeutic massage by Sinha

10. Principles of muscle testing by Hislop.

SUBJECT: ELECTROTHERAPY (Subject Code: BPT-205)

Subject Title & Code	Electrotherapy (BPT- 205)
Duration **Total Hours** **Theory** **Practical**	**New: 220 Hours** **90** **130**
Total Hrs/week **Lectures** **Practicals** **Seminars**	**8** **3hrs/week** **5hrs/week**
Method of Assessment	**Theory and Practical**

Objective: At the end of the course, the candidate will be able to –

1] Describe the Production & Physiological effects, Therapeutic uses, merits,
demerits indication & contraindications of various low/medium & high frequency
modes

2] describe the Physiological effects & therapeutic uses of various therapeutic ions & topical pharmaco -therapeutic agents to be used for the application of
iontophoresis & sono/ phono phoresis

3] Acquire the skill of Application of the Electro therapy modes on models, for the
purpose of Assessment & Treatment.

4] acquire an ability to select the appropriate mode as per the tissue specific & area specific application.

Syllabus

1] Low frequency currents –(10 Hours)

a] Cathodal / Anodal Galvanism, Ionotophoresis – with various ions & pharmacotherapeutic drugs

c] strong surged faradic current under pressure / elevation d] High voltage currents e] Micro –current f] Didynamic currents

2] Medium frequency currents – Beat frequency – types Endovac attachment

advantage of I.F.T. over low frequency currents.(12Hours)

3] Bio-Feedback methods-(8Hours)

4. Faradic Current: Definition, Modifications, Techniques of Application of Individual, Muscle and Group Muscle stimulation, Physiological & Therapeutic effects of Faradic Current, Precautions, Indications & Contra-Indications, Dangers. [4 Hours]

5. Galvanic Current: Definition, Modifications, Physiological & Therapeutic effects of Galvanic Current, Indications & Contra-Indications, Dangers, Effect of interrupted galvanic current on normally innervated and denervated muscles and partially denervated muscles. [4 Hours]

6.Pain: Define Pain, Theories of Pain (Outline only), Pain Gate Control theory in detail. [4Hours]

7. TENS: Define TENS, Types of TENS, Conventional TENS, Acupuncture TENS, Burst TENS,Brief & Intense TENS, Modulated TENS. Types of Electrodes & Placement of Electrodes, Dosage parameters, Physiological & Therapeutic effects, Indications & Contraindications. [5Hours]

8. Nerve Muscle Physiology: Action Potential, Resting membrane potential, Propagation ofAction Potential, Motor unit, synapse,

Accommodation, Stimulation of Healthy Muscle,Stimulation of Denervated Muscle, Stimulation for Tissue Repair. [4 Hours]

9. SWD: Define short wave, Frequency & Wavelength of SWD, Principle of Production of SWD, Circuit diagram & Production of SWD, Methods of Heat Production by SWD treatment, Types of SWD Electrode, Placement & Spacing of Electrodes, Tuning, Testing of SWD Apparatus, Physiological & Therapeutic effects, Indications & Contraindications, Dangers, Dosage parameters [8 Hours]

3. Pulsed Electro Magnetic Energy: Principles, Production & Parameters of PEME, Uses of PEME. [3 Hour]

4. Micro Wave Diathermy: Define Microwave, Wave length & Frequency, Production of MW, Applicators, Dosage Parameters, Physiological & Therapeutic effects, Indications & Contraindications, Dangers of MWD. [4 Hours]

5. Ultrasound: Define Ultrasound, Frequency, Piezo Electric effects: Direct, Reverse, Production of US, Treatment Dosage parameters: Continous & Pulsed mode, Intensity, US Fields: Near field, Far field, Half value distance, Attenuation, Coupling Media, Thermal effects, Nonthermal effects, Principles & Application of US: Direct contact, Water bag, Water bath, Solid sterile gel pack method for wound. Uses of US, Indications & Contraindications, Dangers of Ultrasound. Phonophoresis: Define Phonophoresis, Methods of application, Commonly used drugs, Uses. Dosages of US. [10 Hours]

6. IRR: Define IRR,wavelength & parameters, Types of IR generators, Production of IR, Physiological & Therapeutic effects, Duration & frequency of treatment, Indication & Contraindication. [2 Hours]

7. UVR: Define UVR, Types of UVR, UVR generators: High pressure mercury vapour lamp, Water cooled mercury vapour lamp, Kromayer lamp, Fluorescent tube, Theraktin tunnel, PUVA apparatus.

Physiological & Therapeutic effects. Sensitizers & Filters. Test dosage calculation. Calculation of E1, E2, E3, E4 doses. Indications, contraindications. Dangers. Dosages for different therapeutic effects, Distance in UVR lamp [8 Hours]

8. LASER: Define LASER. Types of LASER. Principles of Production. Production of LASER by various methods. Methods of application of LASER. Dosage of LASER. Physiological & Therapeutic effects of LASER. Safety precautions of LASER. Classifications of LASER. Energy density & power density [8 Hours]

Section IV – Superficial heating Modalities

1. Wax Therapy: Principle of Wax Therapy application – latent Heat, Composition of Wax Bath Therapy unit, Methods of application of Wax, Physiological & Therapeutic effects, Indications & Contraindication, Dangers. [2 Hours]

2. Contrast Bath: Methods of application, Therapeutic uses, Indications & Contraindications.[1 Hour]

3. Moist Heat Therapy: Hydro collator packs – in brief, Methods of applications, Therapeutic uses, Indications & Contraindications.[1 Hour]

Practical

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

1. Demonstrate the technique for patient evaluation – receiving the patient and positioning the

patient for treatment using electrotherapy.

2. Collection of materials required for treatment using electrotherapy modalities and testing of
the apparatus.

3. Demonstrate placement of electrodes for various electrotherapy modalities

4. Electrical stimulation for the muscles supplied by the peripheral nerves

5. Faradism under Pressure for UL and LL

6. Plotting of SD curve with chronaxie and rheobase

7. Demonstrate FG test

8. Application of Ultrasound for different regions-various methods of application

9. Demonstrate treatment techniques using SWD, IRR and Microwave diathermy

10. Demonstrate the technique of UVR exposure for various conditions – calculation of test dose

11. Demonstrate treatment method using IFT for various regions

12. Calculation of dosage and technique of application of LASER

13. Technique of treatment and application of Hydrocollator packs, cryotherapy, contrast bath,
wax therapy

14. Demonstrate the treatment method using whirl pool bath

15. Winding up procedure after any electrotherapy treatment method

SCHEME OF EXAMINATION

THEORY – 80 MARKS + I.A. – 20 MARKS; TOTAL 100 MARKS

PRACTICAL / LAB – 80 MARKS; I.A. – 20 MARKS TOTAL 100 MARKS

THEORY – Model question paper

Section A- M.C.Q.

Q1] based on Single best answer [20 x 1] ---------- --- 20 marks

[To include all MUST KNOW areas]

Section B-S.A.Q.

Q-2] to answer any FIVE out of Six [5 x 3] [must know area] ---------- 15 marks

Q-3] to answer any THREE out of Four [3 x 5]

Based on Actino Therapy ---------- ------ 15 marks

* Section C-L.A.Q.

Q-4] Should be based on High frequency modes ---------- 15 marks

Q-5] should be based on Low / Medium frequency currents ---------- 15 marks

OR

Q-6] should be based on Low / Medium frequency currents ---------- 15 marks

LAQ should give break up of 15 marks – e.g. [3 +5+7]

PRACTICAL / LABORATORY (80 marks)

1. Long Case – On model Motor points / U.V.R. Test Dose. Faradism under

pressures (35 marks)

2. Two Short Case - One based on Low or medium Freq current

Second based on high Freq. current / Actinotherapeutict.

(20 x 2 = 40 marks)

3. Journal (5 marks)

INTERNAL ASSESSMENT

THEORY

Two papers - terminal and prelim examination of 80 marks each **Total - 160 marks**

Section A- M.C.Q.

Q1] based on Single best answer [20 x 1] ---------- 20 marks

[To include all MUST KNOW areas]

Section B-S.A.Q.

Q-2] to answer any FIVE out of Six [5 x 3] [must know area] ---------- 15 marks

Q-3] to answer any THREE out of Four [3 x 5]

Based on Actino Therapy ---------- 15 marks

* Section C-L.A.Q.

Q-4] should be based on High frequency modes ---------- 15 marks

Q-5] should be based on Low / Medium frequency currents ---------- 15 marks

OR

Q-6] should be based on Low / Medium frequency currents ---------- 15 marks

I.A. to be calculated out of 20 marks.

PRACTICAL

Two exams - terminal and prelim examination of 80 marks each **Total - 160 marks**

1. Long Case – On model Motor points / U.V.R. Test Dose . Faradism under

pressures (35 marks)

2. Two Short Case - One based on Low or medium Freq current

Second based on high Freq. current / Actinotherapy.

(20 x 2 = 40 marks)

3. Journal (5 marks)

I.A. to be calculated out of 20 marks.

Recommended Textbooks

1. *Claytons Electrotherapy by Forster & Plastangs*
2. *Electrotherapy Explained by Low & Reed*
3. *Clinical Electrotherapy by Nelson*
4. *Electrotherapy Evidene based practice by Sheila Kitchen*