



DR. C.V. RAMAN UNIVERSITY

Madhya Pradesh, Khandwa AN AISECT GROUP UNIVERSITY

SYLLABUS & SCHEME OF EXAMINATION
BACHELOR OF PHYSIOTHERAPY

(Session 2019-20 & Onwards)

B.P.T. SECOND YEAR

STAFF PATTERN FOR SECOND YEAR B.P.T.

Subjects

Pathology
 Microbiology
 Biochemistry
 Pharmacology
 General Medicine
 including Pediatrics & Geriatrics
 General Surgery
 Obstetrics & Gynecology
 Prof.
 Exercise therapy
 Yoga
 Electrotherapy

Staff Required

1 M.D. Pathology, Lecturer/ Asst. Prof.
 1 M.D. Microbiology , Lecturer/ Asst. Prof.
 1 M.D. Biochemistry , Lecturer/ Asst. Prof.
 1 M.D. Pharmacology , Lecturer/ Asst. Prof.
 1 M.D. Medicine , Lecturer/ Asst. Prof.

 1 M.S. Surgery , Lecturer/ Asst. Prof.
 1 M.S. Obstetrics & Gynecology , Lecturer/ Asst.

 1 Asst. Professor of Physiotherapy
 1 Asst. Professor of Physiotherapy/Yoga therapy
 1 Asst. Professor of Physiotherapy

SECOND YEAR B.P.T. SCHEME OF EXAMINATION

Course Details			External Assessment		Internal Assessment			
Course Code	Course Name	Total Marks	Major		Minor		Sessional ***	
			Max marks	Min Marks	Max Marks	Min Marks	Max Marks	Min Marks
Theory Group								
PBPT 201	Pathology & microbiology	100	60	30	20	10	20	10
PBPT 202	Biochemistry & pharmacology	100	60	30	20	10	20	10
PBPT 203	Medicine including pediatrics & geriatrics	100	60	30	20	10	20	10
PBPT 204	General surgery, obstetrics & gynecology	100	60	30	20	10	20	10
PBPT 205	Exercise therapy (yoga)	100	60	30	20	10	20	10
PBPT 206	Electrotherapy	100	60	30	20	10	20	10
Practical & Viva			Term and Practical Exam		Lab Performance		Sessional	
PBPT 205	Exercise therapy (yoga)	100	60	30			40	20
PBPT 206	Electrotherapy	100	60	30			40	20
Grand Total		800						

Minimum Passing Marks are equivalent to Grade C+

- Lectures T- Tutorials P- Practical

Major- Term End Theory Exam/ Practical Exam

Minor- Pre University Test

Sessional weightage – Attendance 50%, Three Class Tests/Assignments 50%

N.B.- Viva marks will be added in theory marks along with internal assessment theory; candidate have to get min. 50% marks in theory and viva collectively for passing the examination.

SCHEME OF EXAMINATION FOR SECOND YEAR B.P.T.

There shall be Six subjects for the Second year B.P.T. Examination.

The subjects Qualification of the examination and the pattern of examination will be as follows.

1. PATHOLOGY & MICROBIOLOGY

The University examination shall be of 80 marks with Section – A : Pathology and Section – B : Microbiology the university theory examination marks for Pathology shall be 40 and for Microbiology 40 marks respectively. There shall be two paper setters and two evaluators, one from Pathology and one from Microbiology . Section- A, which will be set by Pathology examiner (40 marks) and Section-B, by Microbiology (40 marks) examiner. Recognized teachers in pathology and microbiology with five years of experience shall be on the panel of examiners, 50% shall be the minimum passing marks. Internal assessment will be of 10 marks in each subject. Total internal assessment will be 20 Marks.

The pattern of University theory examination will be as under for 80 Max. Marks.

There will be two section i.e. Section-A: Pathology and Section-B: Microbiology of 40 Max. Marks each section and distribution of marks for questions will be as under

No. & Type of Question	Marks for each question	Total Max. Marks
05 Very Short Answer Questions (Answer to be given in 50-60 words)	02	10
02 Short Answer Questions (Answer to be given in 250-300 words)	8	16
01 Essay Type Questions (Answer to be given in 450-500 words)	14	14
		40

2. BIOCHEMISTRY & PHARMACOLOGY

The University examination shall be of 80 marks with Section – A : Biochemistry and Section – B : Pharmacology the university theory examination marks for Biochemistry shall be 40 and for Pharmacology 40 marks respectively. There shall be two paper setters and two evaluators, one from Biochemistry and one from Pharmacology . Section- A, which will be set by Biochemistry examiner (40 marks) and Section-B, by Pharmacology (40 marks) examiner. Recognized teachers in Biochemistry and Pharmacology with five years of experience shall be on the panel

of examiners, 50% shall be the minimum passing marks. Internal assessment will be of 10 marks in each subject. Total internal assessment will be 20 Marks.

The pattern of University theory examination will be as under for 80 Max. Marks.

There will be two section i.e. Section-A: Biochemistry and Section-B: Pharmacology of 40 Max. Marks each section and distribution of marks for questions will be as under

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No. & Type of Question	Marks for each question	Total Max. Marks
05 Very Short Answer Questions (Answer to be given in 50-60 words)	02	10
02 Short Answer Questions (Answer to be given in 250-300 words)	8	16
01 Essay Type Questions (Answer to be given in 450-500 words)	14	14
		40

3. MEDICINE INCLUDING PEDIATRICS & CERIATRICS

There shall be one paper setter external or internal for theory examination . Recognized teachers in Medicine after M.D. (Medicine) with five years of teaching experience shall be on the panel of examiner, 50% shall be the minimum passing marks. Internal assessment will be of 20 marks. The pattern of University theory examination will be as under for 80 Max. Marks.

No. & Type of Question	Marks for each question	Total Max. Marks
5 Very Short Answer Questions (Answer to be given in 50-60 words)	02	10
4 Short Answer Questions (Answer to be given in 250-300 words)	10	40
2 Essay Type Questions (Answer to be given in 450-500 words)	15	30
		80

4. GENERAL SURGERY, OBSTETRICS & GYNECOLOGY

The University examination shall be of 80 marks with Section – A : General Surgery and Section – B : Obstetrics & Gynecology, the university theory examination marks for General Surgery shall be 40 and for Obstetrics & Gynecology 40 marks respectively. There shall be two paper setters and two evaluators, one from General Surgery and one from Obstetrics & Gynecology . Section- A, which will be set by General Surgery examiner (40 marks) and Section-B, by Obstetrics & Gynecology (40 marks) examiner. Recognized teachers in General Surgery and Obstetrics & Gynecology with five years of experience shall be on the panel of examiners, 50% shall be the minimum passing marks. Internal assessment will be of 10 marks in each subject. Total internal assessment will be 20 Marks.

The pattern of University theory examination will be as under for 80 Max. Marks.

There will be two section i.e. Section-A: General Surgery and Section-B: Obstetrics & Gynecology of 40 Max. Marks each section and distribution of marks for questions will be as under

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No. & Type of Question	Marks for each question	Total Max. Marks
05 Very Short Answer Questions (Answer to be given in 50-60 words)	02	10
02 Short Answer Questions (Answer to be given in 250-300 words)	8	16
01 Essay Type Questions (Answer to be given in 450-500 words)	14	14
		40

5. EXERCISE THERAPY INCLUDING YOGA

There shall be one paper setter external or internal for theory examination and two examiners, one internal (Chairman) and one external for practical examinations. Recognized teachers in Physiotherapy after M.P.T. (Physiotherapy) or B.P.T. with five years of teaching experience shall be on the panel of examiner. The viva marks shall be added to university theory examination marks and 50% shall be the passing marks for both theory and practical university examination respectively.

The pattern of University theory examination will be as under for 100 Max. Marks.

No. & Type of Question	Marks for each Question	Total Max. Marks
10 Very Short Answer Questions (Answer to be given in 50-60 words)	02	20
5 Short Answer Questions (Answer to be given in 250-300 words)	10	50
2 Essay Type Questions (Answer to be given in 450-500 words)	15	30
		100

6. ELECTROTHERAPY

No. & Type of Question	Marks for each Question	Total Max. Marks
10 Very Short Answer Questions (Answer to be given in 50-60 words)	02	20
5 Short Answer Questions (Answer to be given in 250-300 words)	10	50
2 Essay Type Questions (Answer to be given in 450-500 words)	15	30
		100

There shall be one paper setter external or internal for theory examination and two examiners, one internal (Chairman) and one external for practical examinations. Recognized teachers in Physiotherapy after M.P.T. (Physiotherapy) or B.P.T. with five years of teaching experience shall be on the panel of examiner. The viva marks shall be added to university theory examination marks and 50% shall be the passing marks for both theory and practical university examination respectively.

The pattern of University theory examination will be as under for 100 Max. Marks.

BACHELOR OF PHYSIOTHERAPY (BPT): SECOND YEAR

PATHOLOGY & MICROBIOLOGY

Total No. of Hrs. :-100

COURSE OBJECTIVES:-

- Rationale for understanding of the subject for Physiotherapy students
- Brief concept of pathological basis of disease and infectious disease prevention

COURSE OUTCOME:-

CO1- Demonstrate understanding of patho-physiological processes which govern the maintenance of homeostasis, mechanisms of their disturbance and the morphological and clinical manifestations associated with it.

CO2- Demonstrate understanding of the mechanisms and patterns of tissue response to injury such that he/she can appreciate the pathophysiology of disease processes and the clinical manifestations.

SCHEME OF EXAMINATION

The University examination shall be of 80 marks with Section – A : Pathology and Section – B : Microbiology the university theory examination marks for Pathology shall be 40 and for Microbiology 40 marks respectively. There shall be two paper setters and two evaluators, one from Pathology and one from Microbiology . Section- A, which will be set by Pathology examiner (40 marks) and Section-B, by Microbiology (40 marks) examiner. Recognized teachers in pathology and microbiology with five years of experience shall be on the panel of examiners, 50% shall be the minimum passing marks. Internal assessment will be of 10 marks in each subject. Total internal assessment will be 20 Marks.

The pattern of University theory examination will be as under for 80 Max. Marks.

There will be two section i.e. Section-A: Pathology and Section-B: Microbiology of 40 Max. Marks each section and distribution of marks for questions will be as under

No. & Type of Question	Marks for each question	Total Max. Marks
05 Very Short Answer Questions (Answer to be given in 50-60 words)	02	10
02 Short Answer Questions (Answer to be given in 250-300 words)	8	16
01 Essay Type Questions (Answer to be given in 450-500 words)	14	14
		40

SECTION A: PATHOLOGY

Total no. of teaching Hrs. – 40

COURSE CONTENTS :-

1. Brief outline of cell injury, degeneration, necrosis and gangrene.
2. Brief concepts of inflammation and Repair, Degeneration, Necrosis and Gangrenes.
Inflammation : Definition, vascular and cellular phenomenon, differences between transudate and exudate , granuloma.
3. Deficiency Diseases vitamin A, vitamin B, vitamin C, vitamin D.
4. Vascular disturbances: Oedema, Thrombosis, Embolism, Hemorrhage and Shock.
5. Blood Disorder: Anemia, Leukemia, Hemorrhagic disorders.
6. Neoplasia: Brief overview of Tumors, Definition, Classification, Etiology and spread of tumors, Benign versus Malignant tumors
7. In brief about:
 - a. Respiratory system diseases- Etio-pathogenesis, gross pathology of conditions - aging , Pneumonia, Bronchitis, Bronchiectasis, COPD, Asthma, Emphysema, Pulmonary Tuberculosis, Lung cancers, Restrictive Lung disease and Occupational Lung diseases
 - b. Cardiovascular system: – Etio-pathogenesis, gross pathology of conditions- aging, IHD, myocardial infarction, CCF, HT, Rheumatic heart disease, Congenital heart disease, Arteriosclerosis, Thrombo-angitis, Vasomotor-Raynaud's, venous thrombosis, Gangrene, Lymph edema.
 - c. Alimentary system – Peptic ulcer, Carcinoma of stomach
Ulcerative lesions of Intestine.
 - i. Liver – Hepatitis, Cirrhosis and Hepatoma.
 - ii. Pancreas – Pancreatitis, Carcinoma of Pancreas, Diabetes.
8. Details about:
 - a. CNS and PNS: Etio-pathogenesis, gross pathology of conditions - Aging, Meningitis, Encephalitis, Parkinson's, Amyotrophic lateral sclerosis, Ataxias, Multiple Sclerosis, stroke, Neuropathies (Carcoat Marie Tooth's disease, Compression and entrapments, diabetic, G.B syndrome), Poliomyelitis and post-polio syndrome, Myasthenia Gravis, brief outline of C.N.S. Tumours and peripheral nerve lesions.
 - b. Musculoskeletal system (Bones and Joints): Etio-pathogenesis, gross pathology of conditions - osteomalacia, Osteoporosis, Osteomyelitis, Osteoarthritis, rheumatoid arthritis, Gout, spondyloarthropathy, Osteonecrosis, bone tumors, Myofascial pain syndrome. Biological responses to trauma, bone and soft tissue immobilization
 - c. Muscle – Poliomyelitis, Myopathies, Volkman's ischemic contracture.
 - d. Skin – Scleroderma, Psoriasis, Autoimmune disorders.
9. In brief about
 - a. Urinary system – Nephrotic syndrome, Nephritis, Glomerulonephritis.
 - b. Prostate –Prostatitis, BPH, Carcinoma of Prostate.

(c) Endocrine – Thyroid, Thyroiditis, Thyroid Tumours.

(d) Salivary gland – Salivary gland tumours.

Note:- No Questions should be asked from practical demonstration in theory paper.

Practical

(8hrs.)

1. Normal total and differential WBC count, Hemoglobin, RBC.

2. Demonstration of slides:

- Anemia
- Leukemia
- Acute inflammation – Appendix
- Chronic inflammation – Non – specific.
- Tuberculosis of lymph Node – specific inflammation.
- Leprosy – Skin and Leprabacilli.
- Squamous cell carcinoma – skin.
- Osteogenic sarcoma – Bone tumor.
- Osteoclastoma – Bone tumor.
- Ewings – Bone tumour.
- Multiple Myeloma – Bone tumor.

SECTION B : MICROBIOLOGY

Total no. of teaching Hrs.= 40

COURSE CONTENTS:-

I. GENERAL MICROBIOLOGY

1. Introduction and historical background.
2. Classification of Microorganisms.
3. Morphology of bacteria.
4. Sterilization and disinfect ion.
5. Immunity – Antigens and Antibodies, General overview of antigen antibody reaction and practical applications.

II. SYSTEMIC MICROBIOLOGY

6. Gram Positive cocci – Staph, Strepto, Pneumococci.
7. Gram-negative cocci –Gonococci and Meningococci.
8. Gram positive bacilli – Tubercule bacilli, Lepra bacilli, Clostridium tetani, Clostridium perfringens.
9. Gram negative bacilli – Salmonella, Coliforms, pseudomonas, proteus etc.

10. Anaerobic non – sporing cocci and bacilli.
11. Virology – General introduction, brief description of polio virus, Rubella Hepatitis-B and AIDS (diagnosis, prevention and treatment).
12. Spirochetes- Syphilis (congenital and acquired).
13. Malaria
14. Mycology – Actinomycosis, Maduramycosis, Mucosal Candidiasis
15. Applied microbiology as relevant to diseases of bones, joints, Muscles, Skin, Infection and Burns.

III. DEMONSTRATION

16. Demonstration of collection of clinical specimen.
17. Demonstration of morphology and culture of organisms.
18. Demonstration of simple Gram's and Ziehl- Neelsen staining.
19. Sterilization and Disinfection techniques.
20. Demonstration of serological tests for syphilis, Hepatitis.

SUGGESTED READINGS:

- 1 Chakraborty, P. Textbook of Microbiology NCB, Calcutta 1999
- 2 Ananth Narayan, R. Text Book of Microbiology Orient Longman, Madras 1986
- 3 Chatterjee, K. D. Parasitology: Protozoology and helminthology Chatterjee, Calcutta 1965
- 4 Cotran, Ramzi S Pathologic Basis of Disease W. B. Saunders, Singapore 1999
- 5 Vinay Kumar Basic Pathology Harcourt 1997
- 6 Nagalotimath, S.J. Textbook of Pathology CBS, New Delhi 1998
- 7 Talib, V. H. Essential Parasitology Mehta, New Delhi 2001

BACHELOR OF PHYSIOTHERAPY (BPT) SECOND YEAR

BIOCHEMISTRY & PHARMACOLOGY

Total No. of Hrs.-100

BPT 2ND YEAR

COURSE OBJECTIVE: –

The Objective of the Course in Pharmacology is that after 40 hours of lecture of lectures and demonstration the students will be able to understand and correlate the Biochemical process involved with drugs in human body and their clinical importance especially in physiotherapeutic, in addition, the students will be able to fulfill with 75% accuracy (as measured by written, oral, practical and internal evaluation) the following objective of the courses.

COURSE OUTCOME:-

- 1- able to understand and correlate the biochemical process involved with drugs in human body
- 2- able to correlate the physiologic and pharmacologic actions of these drugs, their primary beneficial, adverse effect and contraindications, with a particular emphasis on how drug therapy can impact physical rehabilitation.
- 3- Demonstrate understanding of basic Biochemistry principles in human processes and metabolism
- 4- Relate biochemistry knowledge with underlying mechanism.

SCHEME OF EXAMINATION

The University examination shall be of 80 marks with Section – A : Biochemistry and Section – B : Pharmacology the university theory examination marks for Biochemistry shall be 40 and for Pharmacology 40 marks respectively. There shall be two paper setters and two evaluators, one from Biochemistry and one from Pharmacology . Section- A, which will be set by Biochemistry examiner (40 marks) and Section-B, by Pharmacology (40 marks) examiner. Recognized teachers in Biochemistry and Pharmacology with five years of experience shall be on the panel of examiners, 50% shall be the minimum passing marks. Internal assessment will be of 10 marks in each subject. Total internal assessment will be 20 Marks.

The pattern of University theory examination will be as under for 80 Max. Marks.

There will be two section i.e. Section-A: Biochemistry and Section-B: Pharmacology of 40 Max. Marks each section and distribution of marks for questions will be as under

No. & Type of Question	Marks for each question	Total Max. Marks
05 Very Short Answer Questions (Answer to be given in 50-60 words)	02	10
02 Short Answer Questions (Answer to be given in 250-300 words)	8	16
01 Essay Type Questions (Answer to be given in 450-500 words)	14	14
		40

Note: A brief description of metabolic pathways mentioned herein is indicated. Details and structures are to be avoided.

COURSE OBJECTIVE: –

The Objective of the Course in Pharmacology is that after 40 hours of lecture of lectures and demonstration the students will be able to understand and correlate the Biochemical process involved with drugs in human body and their clinical importance especially in physiotherapeutic, in addition, the students will be able to fulfill with 75% accuracy (as measured by written, oral, practical and internal evaluation) the following objective of the courses.

COURSE OUTCOME:-

- 1- able to understand and correlate the biochemical process involved with drugs in human body
- 2- able to correlate the physiologic and pharmacologic actions of these drugs, their primary beneficial, adverse effect and contraindications, with a particular emphasis on how drug therapy can impact physical rehabilitation.
- 3- Demonstrate understanding of basic Biochemistry principles in human processes and metabolism
- 4- Relate biochemistry knowledge with underlying mechanism.

COURSE CONTENTS:-

I. Basic Biophysics: Concept of Acid base, buffer, Henderson- Hasselbach equation, brief knowledge of biophysical process such as Osmosis. Viscosity, Surface tension, Dialysis with special emphasis on their biomedical implication. A brief study of Radio-isotopes and their clinical applications.

II. General Biochemistry with Biomedical functions

1. Nutrition: Basic principles of nutrition; Carbohydrates, Proteins and Lipid caloric requirement and balance diet.

2. Carbohydrates: Definition, classification with examples and general functions.

Metabolism - Glycolysis, T.C.A Glycogen metabolism, Blood Sugar regulation, Diabetes and diabetic keto-acidosis

3. Lipids: Definition, classifications and general functions. Essential fatty acids, cholesterol, Blood lipids. Brief review of lipoproteins. Metabolism-Oxidation of fatty acids, cholesterol synthesis, and fatty liver.

4. Proteins: Definition, classification, and Bio-medical Importance.

5. Study of hemoglobin and immunoglobulins with functions.

6. Plasma Proteins and functions. Metabolism: General reactions of amino acids. Formation and fate of ammonia - Urea cycle.

7. Nucleic Acids: Brief overview of the structure of RNA and DNA including Nucleosides and Nucleotides. Study of few biologically important nucleotides.

8. Tissue chemistry: Chemistry of connective tissue, bone and teeth. Composition function and chemical mediators of nerve structure of muscle tissue. General Biochemistry of muscle contraction and relaxation.

9. Enzymes: Definition, classification with examples. Factors affecting enzyme action. Brief study of enzyme inhibition. Clinical importance of enzymes.

10. Vitamins: Definition, classification and functions. Dietary source, Daily requirement and deficiency disorders.

III. Bioenergetics

Study of Plasma Membrane, Review of laws of thermodynamics as applicable to biological systems. Concept of free energy charge. High-energy compounds and Respiratory chain.

IV. General Metabolism

(Note: A brief outline of metabolic pathway herein is indicated. Details and Structure are to be avoided).

- a) Carbohydrate metabolism: Glycolysis, TCA, Glycogen metabolism, blood sugar regulation, Diabetes and Diabetic Ketoacidosis. Lipids Metabolism: Beta-oxidation of Fatty acids, Fatty acid synthesis, cholesterol synthesis, Ketosis and Fatty liver.
- b) Protein Metabolism: General reaction of Amino acids, Formation and fate of Ammonia, Urea cycle.
- c) Purine and Pyrimidine: Only catabolism of Purine to be Stressed in detail with special emphasis on Gout. General breakdown of Pyrimidine and associated disorders.

V. Water and Electrolyte Balance

General outline of fluid compartments of the body with their water and electrolyte content and balance, Dehydration.

Book References

1. Textbook of Biochemistry by West and Todd.
2. Textbook of Medical Biochemistry by Chatterjee and Shinde
3. Principles of Biochemistry by A. Lehninger.
4. Textbook of Biochemistry by A.C. Deb
5. Ahuja, Lakshmi CBS Quick Review in Biochemistry CBS, New Delhi
6. Chatterji, M N Text Book of Medical Biochemistry Jaypee, Bangalore
7. Deb, A.C. Fundamentals of Biochemistry CBA, Calcutta
8. Lehninger, A.L. Principles of Biochemistry CBS, Delhi

SECTION : B – PHARMACOLOGY

Total No. of Teaching Hrs. = 40 Hrs.

COURSE OBJECTIVE:-

The objective of the course in Pharmacology is that after 40 hours of lectures and demonstration, the students shall be able to understand and correlate the biochemical process involved with drugs in human body and their clinical importance especially in physiotherapeutic, in addition, the students shall be able to fulfill with 75% accuracy (as measured by written, oral, practical and internal evaluation) the following objectives of the courses.

- a) To understand pharmaco-kinetics, pharmaco-dynamics.
- b) Usage of common drugs with (indications, contraindications, side effects).
- c) To understand the drug actions that may affect the physical therapy treatment.
- d) Course is not prescription oriented.

COURSE OUTCOME:-

CO1- able to understand and correlate the biochemical process involved with drugs in human body

CO2- able to correlate the physiologic and pharmacologic actions of these drugs, their primary beneficial, adverse effect and contraindications, with a particular emphasis on how drug therapy can impact physical rehabilitation.

CO3- Demonstrate understanding of basic Biochemistry principles in human processes and metabolism

CO4- Relate biochemistry knowledge with underlying mechanism.

COURSE CONTENTS:-

I. General Pharmacology (Brief description only)

1. Definition of drug, Pharmacokinetics and Pharmacodynamics.
2. Broad categories of adverse drug reactions.
3. Alcohols
4. Analgesics and Antipyretics, anti-inflammatory drugs.
5. Sedatives.
6. Stimulants.
7. Drugs acting on muscles- Muscle relaxants, Muscle stimulants.
8. Anti-parkinsonism agents
9. Drugs modifying B.P.
10. Hypolipidemia.
11. Anticoagulants.
12. Thyroxin and Anit thyroid drugs.
13. Anti-diabetics.
14. Glucocorticoids.
15. Calcium, Phosphorus, Calcitonin and Parathormone.
16. Narrow spectrum antibiotics.
17. Broad-spectrum antibiotics.
18. Anti – Cancer Drugs.

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19. Drugs acting on respiratory systems: Respiratory stimulants and respiratory depressants, Bronchodilators, Expectorants. Anti-Asthmatics, Anti-tussive.
20. Vitamins.
21. Ovarian hormones, Anabolic steroids, Estrogen, Progesterone, Androgen.
22. Locally acting drugs: Anodynes, Local anesthetic drugs, Counter-irritants Rubefacient, Soothing agent, Anti-microbial.

BOOKS SUGGESTED :-

1. Pharmacology by Satoskar
2. Clinical Pharmacology by Lawrence.
3. Textbook of Pharmacology by B.N. Ghose.
4. Tripathi, K.D. Essential of Medical Pharmacology New Delhi

BACHELOR OF PHYSIOTHERAPY (BPT) SECOND YEAR

MEDICINE INCLUDING PAEDIATRICS & GERIATRICS

Total No. of Hrs.- 130

Theory: - 100 Hrs.

Practical :30 Hrs.

SCHEME OF EXAMINATION

There shall be one paper setter external or internal for theory examination . Recognized teachers in Medicine after M.D. (Medicine) with five years of teaching experience shall be on the panel of examiner, 50% shall be the minimum passing marks. Internal assessment will be of 20 marks. The pattern of University theory examination will be as under for 80 Max. Marks.

No. & Type of Question	Marks for each question	Total Max. Marks
5 Very Short Answer Questions (Answer to be given in 50-60 words)	02	10
4 Short Answer Questions (Answer to be given in 250-300 words)	10	40
2 Essay Type Questions (Answer to be given in 450-500 words)	15	30
		80

Description

This course follows the basic course on Anatomy, Physiology, Psychology, Sociology, Pathology and Microbiology and provides knowledge about relevant aspects of General Medicine with emphasis on physiotherapeutic.

MEDICINE & GERIATRICS

Total No. of Hrs - 80

COURSE OBJECTIVE:-

The objective of this course is that students at the end of course shall have a broad understanding about common medical diseases, which they would be handling as a physiotherapist. They should have a brief idea about Etiology, pathology, Type and Degree of Disability the patient will have as a result of the disease, so that he/she as a physiotherapist with physician should help the patient to achieve cure and/or ameliorate his/her illness and sufferings.

To understand a Paediatrics patient and its special needs in relation to physical therapy

COURSE OUTCOMES:-

- 1- Understand the anatomy, physiology and various conditions in Obstetrics and Gynaecological conditions relevant to Physiotherapy.
- 2- Assess and provide physiotherapeutic techniques in Obstetrics and Gynaecological conditions for relief of pain, relaxation, conditioning and posture.
- 3- Describe aetiology, Patho-physiology, principles of diagnosis and management of common surgical problems including emergencies, in adults and children
- 4- Acquire understanding of principles of operative surgery, including pre-operative, operative and post-operative care and monitoring and the impairments that follow the surgical procedures
- 5- Describe the post-surgical care and precautions in amputations, thoracic, abdominal and vascular surgeries

COURSE CONTENTS:-

A. Infections

Outline briefly the Etiology, symptoms and brief management of the following disease.

Bacterial – Tetanus, Typhoid.

Viral – Herpes simplex, Herpes Zoster, Measles, Hepatitis –B. and HIV.

Protozoal – Filariasis, Malaria, Amoebiasis.

B. Diseases of blood.

Define and describe clinical aspects of Nutritional Anaemias.

Brief description of Bleeding Disorder with emphasis to Haemophilia.

Lymphadenopathy and splenomegaly.

Leukaemia – acute and chronic.

C. Diseases of Liver

Jaundice

Viral Hepatitis.

Cirrhosis of Liver

D. GIT Diseases (Brief description)

1. Peptic Ulcer

2. Diarrhea and Dysentery.

E. Renal Diseases

1. Brief description of acute and Chronic renal Failure. Urinary Tract Infection.
Acute Nephritis, Nephrotic Syndrome.

F. Nutritional and Metabolic Disease.

1. Balanced normal diet.
2. Protein Calorie Malnutrition
3. Avitaminosis of both water and fat-soluble vitamins.
4. Diabetes mellitus – Definition, Classification and complications, brief description of management of diabetes mellitus.
5. Obesity – Etiology and management.
6. Hyper and Hypo-thyroidism.
7. Calcium Homeostasis.
8. Gigantism and Acromegaly.

G. Diseases of Bones, Joints and Connective tissue

1. Brief introduction to understanding of Auto immune diseases.
2. Rheumatic fever and Rheumatoid arthritis – Aetio pathogenesis, Clinical features, complications, diagnosis and briefly outline the management.
3. Brief description of Systemic Lupus Erythematosus.
4. Polyarteritis Nodosa, Dermatomyositis, Scleroderma.
Osteoarthritis – Aetiopathogenesis, clinical feature, diagnosis, complication and management.

H. Genetics and Diseases

1. Common inherited disorders.
2. Prevention of genetic disorders.

I. Miscellaneous

1. Allergy
2. Drug reactions.

J. Dermatology

1. Common skin infections.
2. Psoriasis
3. Leprosy- aetiopathogenesis, clinical features and treatment.
4. Venereal diseases – Syphilis, HIV etc., brief description and prevention (lecture demonstration only).

K. Radiology

(Both in normal and Pathological conditions).

Radiology of Bone and joints.

Radiology of chest including Heart.

L. Geriatrics

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Physiology of ageing, manifestations of diseases in old people and general principles of management. Common Geriatric Disorders and their management, Implications of aging in physical therapy. lung disease, Pleurisy & Pulmonary embolism

PAEDIATRICS

Total No. of Hrs.- 20

1. Normal Growth and development of child – motor, mental, language and social from birth to 12 years including physical , social, adaptive development.
2. Pathological presentations of growth and development disorders
3. Common infectious diseases in children: Brief description of following infectious diseases along with outline of management: Tetanus, diphtheria, Mycobacterial, measles, chicken pox, gastroenteritis, HIV, and Malaria
4. Immunization programmes – WHO schedule, different vaccinations, rationale; special consideration to various disease eradication programmes like Pulse-Polio
5. Child and nutrition - Nutritional requirements, malnutrition syndrome, Vitamins (A, B, C, D & K) and Minerals (iron, calcium phosphorus, iodine) deficiencies in children and management in brief
6. Clinical presentation, management & prevention of the following: - Cerebral palsy, Poliomyelitis, Muscular dystrophy
7. Childhood rheumatism-types, clinical presentation, & management in brief
8. Acute CNS infections: clinical presentation, complications and management of bacterial and tubercular infections in brief
9. Clinical presentation, management & prevention of the following respiratory conditions: URI, LRI, bronchiolitis, asthma, TB (in brief)
10. Clinical presentation, management & prevention of the following cardiac conditions: Rheumatic heart disease, SABE, Congenital heart disease - ASD, VSD, PDA (in brief)

PRACTICAL:-

Students shall be posted for one month in general Medicine ward. They shall do clinical checking and ward work to acquaint themselves to General Medicine and pediatrics.

BOOK REFERENCES:-

1. Davidson Principles and Practice of Medicine (Churchill Livingstone)
2. Chemberlin, E.N.and Ogilvie, C.Symptoms and signs in Clinical Medicine Jhon Wright
- 3 Swash, Michael Hutchison's Clinical Methods W B Saunders, London
- 4 Ghai, O. P. Essential Pediatrics Interprint, New Delhi
- 5 Haslett, C.Davidson's Principal and Practice of Medicine Churchill Livingstone,London
- 6 Golwalla, Aspi F. Medicine For Student NBD, Mumbai
- 7 Behrman, R.Nelson's Text Book of Pediatrics W B Saunders, London
- 8 Kasper, D.L Harrison 's Principles of Internal Medicine Mc-Graw Hill, New York

BACHELOR OF PHYSIOTHERAPY (BPT) SECOND YEAR

GENERAL SURGERY, OBSTETRICS & GYNECOLOGY

Total No. of teaching Hrs.- 150+40

SCHEME OF EXAMINATION

The University examination shall be of 80 marks with Section – A : General Surgery and Section – B : Obstetrics & Gynecology, the university theory examination marks for General Surgery shall be 40 and for Obstetrics & Gynecology 40 marks respectively. There shall be two paper setters and two evaluators, one from General Surgery and one from Obstetrics & Gynecology . Section- A, which will be set by General Surgery examiner (40 marks) and Section-B, by Obstetrics & Gynecology (40 marks) examiner. Recognized teachers in General Surgery and Obstetrics & Gynecology with five years of experience shall be on the panel of examiners, 50% shall be the minimum passing marks. Internal assessment will be of 10 marks in each subject. Total internal assessment will be 20 Marks.

The pattern of University theory examination will be as under for 80 Max. Marks.

There will be two section i.e. Section-A: General Surgery and Section-B: Obstetrics & Gynecology of 40 Max. Marks each section and distribution of marks for questions will be as under

No. & Type of Question	Marks for each question	Total Max. Marks
05 Very Short Answer Questions (Answer to be given in 50-60 words)	02	10
02 Short Answer Questions (Answer to be given in 250-300 words)	8	16
01 Essay Type Questions (Answer to be given in 450-500 words)	14	14
		40

Course Description

This course follows the basic course on Anatomy, Physiology, Psychology, Sociology, Pathology and Microbiology and provides knowledge about relevant aspects of general surgery, Plastic surgery, Pediatrics, E.N.T. Ophthalmology, Obstetrics and Gynecology and Radiology with emphasis on physiotherapeutic.

COURSE OBJECTIVES:-

The objective of this course is that students at the end of course shall have a broad understanding about common surgical diseases, which they would be handling as a physiotherapist. They should have a brief idea about etiology, pathology and type and degree of disability the patient will have as a result of the disease, so that he/she as a Physiotherapist with surgeon should help the patient to achieve cure and/or ameliorate his/her illness and sufferings

SECTION:A- GENERAL SURGERY

(INCLUDING NEUROSURGERY, E.N.T AND OPHTHALMOLOGY)

Theory : 110 Hrs.

Practical : 40 Hrs.

General Surgery Theory:- No. of Hrs. 50

COURSE CONTENTS:-

1.Introduction: Description of events frequently accompanying general Anesthesia, Blood transfusion and physiological response of the body.

2.Wounds, scars, ulcers, boils, carbuncles etc.

3.Principles of pre- and post –operative physical examination, investigations, postoperative complications and their management.

4.Abdominal surgery: Incisions, complications and management of following:

Nephrectomy, Appendectomy, Herniorrhaphy, Mastectomy, Thyroidectomy, Colostomy, Adrenalectomy, Cystectomy, Hysterectomy, Prostatectomy, Cholecystectomy, Ileostomy, Incisional hernia and its prevention.

5.Burns: Causes, Classification, Medical management and precautions in the acute stage, complications of burns and their management.

6.Plastic Surgery:

- a. Principles of plastic surgery, post – operative management and complications.
- b. Cineplasty.
- c. Principles of cosmetic surgery.
- d. Skin grafting.
- e. Surgery of Hand with emphasis on management of traumatic & leprosy hand.
- f. Burns and plastic surgery management.

7. Neurosurgery THEORY-Total Hrs.- 40

A) Neurophysiology: Reviews in brief the neurophysiologic basis of tone and Disorders of tone and Posture, Bladder control, Muscle conduction, Movement and Pain.

B) Clinical Features and Management: Briefly outline the clinical features and management of the following neurological disorders.

1. Congenital and Childhood disorders

- a) Hydrocephalus.
- b) Spinal Bifida.

2. Trauma - Broad localization, first aid and management of sequelae of Head injury and Spinal Cord injury.

3. Diseases of the Spinal Cord:

- a) Craniovertebral junction anomalies.
- b) Syringomyelia.
- c) Cervical and lumbar disc disease
- d) Tumours.
- e) Spinal arachnoiditis.

4. Peripheral Nerve Disorders:

- a) Peripheral nerve injuries: Localization and Management
 - b) Entrapment Neuropathies.
5. Intracranial tumours: Broad Classification, Signs and Symptoms.
 6. Pre-operative assessment, Indications and Contraindications for Neurosurgery.
 7. Management of Pain, Electrical Stimulation of Brain and Spinal cord.

PRACTICAL

Clinical assessment of neurological function to be taught through bedside or demonstration in clinics, of the following:

- Basic history taking to determine whether the brain, spinal cord or peripheral nerve is involved.
 - Assessment of higher mental function such as Orientation, Memory, Attention, Speech and Language.
1. Assessment of Cranial nerves.
 2. Assessment of Motor system.
 3. Assessment of Sensory function, Touch, Pain and Position.
 4. Assessment of Tone-Spasticity, Rigidity and Hypotonia.
 5. Assessment of Cerebral function.
 6. Assessment of Higher cortical function - Apraxia.
 7. Assessment of Gait Abnormalities.

Students shall be posted for 10 hrs. in Neurosurgery units. They shall do clinical checking and ward work to acquaint themselves to neurological and surgical conditions.

8. Ophthalmology: Etiology, symptomatology and treatment of visual defects emphasis on Errors of Refraction, Squint, Conjunctivitis, Trachoma, Corneal ulcers, Iritis, Cataract, Retinitis, Detachment of retina and Glaucoma (lecture demonstration only-10 Hrs.)

9. E.N.T.:- Etiology, symptomatology and treatment of sinusitis, Rhinitis, Acute and Chronic Otitis, Otosclerosis, Mastoidectomy and loss of hearing. (lecture demonstration only-10 Hrs.)

BOOK REFERENCES

1. Surgery by Nan.
2. Surgery by Baily & Love –
3. Short Practice of Surgery by Rain & Ritelife.
4. Russell, R.C.G. Short practice In Surgery Arnold, London
5. Gupta, R. L. Text Book of Surgery Jaypee, New Delhi

SECTION:B- OBSTETRICS AND GYNECOLOGY

Total teaching Hrs.- 40 Hrs.

COURSE OBJECTIVES:-

To understand common gynaecological conditions and procedures (in brief)

To understand implications of gynaecological conditions and procedures on physical therapy

COURSE CONTENTS:-

1. Brief Anatomy and physiology of female reproductive system .
2. Basic principles of clinical examination, investigation, diagnosis, prognosis of female reproductive system disorders .
3. Menstruation and its disorders.
4. Physiological changes during pregnancy.
5. Antenatal care and diagnosis of pregnancy including high-risk pregnancy.
6. Labour, stage of labour, normal and abnormal labour, Delivery and management of neonate.
7. Puerperium& postnatal care, social obstetrics- maternal & perinatal mortality.
8. Pelvic pain and its management : Musculo-skeletal problems in an obstetric patient, management
9. Importance Gynecological condition, a short review of PID, Tumors, malignancies, infertility, Endometriosis, Ectopic pregnancy, Vesicular mole.
10. Prenatal and post-natal care
11. Prolapse Uterus, causes of incontinence of urine, type and management.
12. Pelvic inflammatory diseases
13. Abortion and birth control.
14. Surgical consideration in obstetrics and gynecology.

PRACTICAL

Students shall be posted for one month in General Surgery, plastic and burns, obstetrics and Gynecology & Radiology units. They will do clinical checking and ward work to acquaint themselves to General Surgical and Obs. & Gyn. conditions.

SUGGESTED READINGS:-

1. Gynaecology and Obstetrics in the Health care of a Woman by Seymoul L. Romney, Mary Jane Gray, J. A. Merrill.
2. Shaw's Textbook of Gynecology.
3. Jeffcoat's Principles of Gynecology.
4. General Surgical Operations by R.M. Kirk and R.C.N. Williamson.
5. Howkins, John Shaw's Textbook of Gynecology Orient-Longman, Bangalore
6. Datta, D.C. Textbook of Obstetrics NCBA, Calcutta
7. Mudaliar, A.L. Clinical Obstetrics Orient-Long main, Bangalore
8. Percival, Robert Manual of Obstetrics ELBS, London

BACHELOR OF PHYSIOTHERAPY (BPT): SECOND YEAR
EXERCISE THERAPY INCLUDING YOGA

Total No. of teaching Hrs. - 200

Theory :- 120hrs.

Practical:- 80hrs.

SCHEME OF EXAMINATION

There shall be one paper setter external or internal for theory examination and two examiners, one internal (Chairman) and one external for practical examinations. Recognized teachers in Physiotherapy after M.P.T. (Physiotherapy) or B.P.T. with five years of teaching experience shall be on the panel of examiner. The viva marks shall be added to university theory examination marks and 50% shall be the passing marks for both theory and practical university examination respectively.

The pattern of University theory examination will be as under for 100 Max. Marks.

No. & Type of Question	Marks for each question	Total Max. Marks
10 Very Short Answer Questions (Answer to be given in 50-60 words)	02	20
5 Short Answer Questions (Answer to be given in 250-300 words)	10	50
2 Essay Type Questions (Answer to be given in 450-500 words)	15	30
		100

COURSE DESCRIPTION

In these courses, the student shall learn principles, techniques and effects of exercise as a therapeutic modality in the restoration of physical function.

COURSES OBJECTIVE:-

To understand the principles of exercise therapy and its application as a treatment modality. The objectives of this course is that after 200 hours of lectures, demonstrations, practical and clinical, the students shall be able to list the indications and contraindications of various types of exercise and demonstrate the different techniques and describe their effects. In addition, the students shall be able to fulfill with 75% accuracy (as measured by written, oral and practical internal evaluation) the following objective of the course.

COURSE CONTENTS:-

1. Introduction to Exercise Therapy.
2. Exercise and physiology of body.
3. Psychogenic and Pharmacological aspects of exercise.
4. Classification of movements in details :
 - **Active voluntary movements** : Free, assisted and resisted
 - Indication, contraindications, advantages and techniques of various types of active exercises
 - Clinical methods of strengthening of various muscle groups.
 - **Involuntary movements**
 - **Passive movements**: Definition, types- Relaxed, forced and stretching type.
 - Indications, contraindications, advantages and Techniques of various passive movements.
5. Voluntary Movements :- Free exercises, assisted exercises, Resisted exercise .
 - A. Free exercises – Classification technique effects of free exercise on various systems
 - B. Resisted exercises – technique and types of resistance, SET system (heavy resisted exercise, Oxford method, Delorme method, McQueen’s method)
6. Relaxed passive movement- Definition, Classification of relaxed passive movements, Technique, effects and uses of relaxed passive movements.
7. Muscle strength – Anatomy and Physiology of muscle tissue, Causes of muscle weakness/paralysis, Prevention of muscle weakness/paralysis. Type of muscle work and contractions, Torque of muscle work, Muscle assessment M.R.C. grading, Principles of muscle strengthening/re-education, early re-education of a paralyzed muscle etc. , Strengthening technique, Endurance training, Therapeutic Gymnasium.
8. Manual Muscle Testing: Concept, introduction, significance and limitations. Grade systems, Techniques of Muscle testing. Emphasis on skills to grade upper, lower limb, neck and trunk muscles including trick movements.
9. Joint movement-Classification of joint movements, Causes for restrictions of joint movement, prevention of restriction of joint range of motion. principles of mobilization of joint, increasing its range of motion, technique of mobilization of stiff joint. Accessory movements- glides, traction and approximation, Mobilization of peripheral, spinal joints, techniques and grading in detail.
10. Manipulation therapy: Introduction, Principles of therapy, Indications and Contraindication (no clinical application of these techniques).
11. Goniometry:- Measurement of various joints range in normal and disease condition. Different techniques of goniometry. Limb length measurements.
12. Passive stretching- Aims, Principles, Indications, Techniques & contra indications
13. Relaxation: Description of fatigue and spasm & factors. General causes, signs and symptoms of fatigue. Principle to obtain relaxation in various positions, effects and uses, Techniques of Relaxation- local and General with indication.
14. Neuromuscular coordination and P.N.F : Basic theory of proprioceptive –neuromuscular facilitation techniques, Functional Re-education Exercises.
15. Re-education of muscles:
 - Concept, technique, spatial and temporal summation.
 - Various reduction techniques and facilitating methods.

- Progressive strengthening of various muscle groups in Grade-I-Grade IV.
 - Muscle strengthening technique – PNF - Principles of PNF, indications, contra indications, techniques, limb patterns
16. Co-ordination: Balance – Static and Dynamic , Definition of co-ordinated movements, incoordinated movements , Factors for coordinated movements, causes of incoordination, Discoordination: LMNL & UMNL, cerebellar lesion, loss of kinesthetic sense (Tabes dorsalis, leprosy, syringomyelia). Principles of re-education of coordinated movements , techniques of coordinated exercises, Reeducation of balance and coordination: PNF and Frenkel’s exercises
17. Suspension Therapy: Principles of suspension, Type of suspension, Therapeutic effects and uses of suspension therapy, their application either to mobilize a joint or to increase muscle power.
18. Hydrostatics and Hydrodynamics: History, Properties of water, Specific gravity, Hydrostatic pressure, Archimedes principle, Buoyancy-law of floatation, Effect of buoyancy on movements performed in water, Equilibrium of a floating body, Bernoulli’s theorem, Physiological effects of exercise in water
19. Hydrotherapy : Indication, contraindication, benefits, dangers and precautions
- Hydrotherapy regimes of exercises, Hydrotherapy exercise for all age groups
 - Types of pools and baths
20. Soft tissue manipulations Techniques of application, Kneading and picking up, rolling (back) Clapping, Tapping, Friction.
21. Isometric exercise and Isotonic exercise.
22. Exercises of the shoulder and hip and evaluation.
23. Exercise of hand, foot and evaluation.
24. Exercise of the knee and elbow and evaluation.
25. Spinal exercises including neck exercises.
26. Gait analysis, Pathological gaits, Gait training.
27. Walking aids and crutch walking:- Description of crutch - components, classification - Good crutch, measurements, Crutch use- Preparation, Training, counseling. - Crutch gaits- types, & significance. Crutch complications- Palsy, dependency etc.
28. Types of paraplegic gaits.
29. Oedema: Types and treatment.
30. Group Therapy: Indication, contraindication, types.
31. Yogasanas and Pranayama:
- Physiology and therapeutic principles of yoga, Yogasanas and their scientific studies
 - Concept of total yoga discipline ,Yogasana for physical culture, relaxation and medication.
 - Psycho-physiological aspects yoga procedures , Psychological aspects of yoga, Psycho-social aspects of yoga , Yogasanas for physical fitness, relaxation, flexibility and meditation .
 - Therapeutic application of yoga- Application of Yogasana in flexibility, cardio-respiratory rehabilitation, Neuro motor learning .
 - Yoga a holistic approach

EXERCISE THERAPY INCLUDING YOGA :PRACTICAL

PRACTICAL

Demonstration and learning of active & passive movements of Limbs and spine

Demonstration and practice of Manual Muscle testing, Goniometry

Demonstration and practice of muscle stretching techniques Demonstration and

practice of muscle strengthening techniques Demonstration and practice of

muscle reeducation techniques Demonstration and practice of coordination

exercises (Frankel's) Demonstration and practice of relaxation techniques

Demonstration and practice of all types of soft tissue manipulation, mobilization of peripheral joints, various types of manipulations demonstrated and practiced to Upper limbs, Lower Limbs, Neck and Face appropriately

Demonstration of normal and pathological gaits and crutch walking.

Demonstration and practice of suspension techniques

Demonstration and Practice of Functional Re-education Technique.

Demonstration and Practice of various Yogasana&Pranayama .

PRACTICAL EXAMINATION

Students will be assessed by viva & practical demonstrations based upon learning in theory & practical classes.

SUGGESTED BOOKS FOR READINGS:

- 1 Hollis, M. and Cook, P.F. Practical Exercise Therapy Blackwell, Oxford
- 2 Gardiner, Dena M. Principles of Exercise Therapy CBS, New Delhi
- 3 Lippert, Lynn Clinical Kinesiology for Physical Therapy Jaypee, New Delhi
- 4 Paliarulo, M. A. Introduction to Physical Therapy Mosby, London
- 5 Jones and Barker, Human Movement Explained Butter worth- Heine
- 6 Thomson, Ann Tidy's Physiotherapy Varghese, Mumbai
- 7 Hislop, H.J. and Montgomery, J. Daniels and Worthingham's muscle Testing:
Techniques of Manual Examination W.B.Saunders, Philadelphia
- 8 Norkin Measurement of Joint Motion
- 9 Kisner, C. and Kolby, L.A. Therapeutic Exercise Foundation and Technique Jaypee, New Delhi
- 10 Holey, E. and Cook, E. Therapeutic Massage Harcourt, Singapore
- 11 Bates, Andrea and Hanson, Norm Aquatic Exercise Therapy W.B.Saunders, Philadelphia
- 12 Kendal, F.P. Muscles Testing and Function Lippincott, New York
- 13 Campion, M. R. Hydrotherapy: principles and Practice Butterworth, Oxford
- 14 Perry, Jan F Kinesiology Workbook F A Davis, Philadelphia
- 15 Adler, S.S. PNF in Practice Springer, New York
16. Aids to P.T. by J.M. Lee.
17. Therapeutic Exercise by Basmajian.
18. Aliimco all Volumes.
19. Science and medicine of exercise and sports by Warren R. Johnson.
20. Basic Athletic training by Cramer.
21. Anatomy and physiology of yogic practice by M.M. Gone.
22. The yogi philosophy of physical well being by Yogi Tamacharaka.
23. Yoga stretching and relaxation for sports men by Capt. M. Rajan.

BACHELOR OF PHYSIOTHERAPY (BPT): SECOND YEAR

ELECTROTHERAPY

Total No. of teaching Hrs. - 200

Theory: - 120hrs.

Practical: - 80hrs.

SCHEME OF EXAMINATION

There shall be one paper setter external or internal for theory examination and two examiners, one internal (Chairman) and one external for practical examinations. Recognized teachers in Physiotherapy after M.P.T. (Physiotherapy) or B.P.T. with five years of teaching experience shall be on the panel of examiner. The viva marks shall be added to university theory examination marks and 50% shall be the passing marks for both theory and practical university examination respectively. The pattern of University theory examination will be as under for 100 Max. Marks.

No. & Type of Question	Marks for each question	Total Max. Marks
10 Very Short Answer Questions (Answer to be given in 50-60 words)	02	20
5 Short Answer Questions (Answer to be given in 250-300 words)	10	50
2 Essay Type Questions (Answer to be given in 450-500 words)	15	30
		100

COURSE DESCRIPTION :-

In this course the student shall learn the principles, techniques and effects of electrotherapy as a therapeutic modality in the restoration of physical function.

COURSE OBJECTIVE :-

The objective of this course is that after 200 hours of lectures, demonstration, practical and clinics, the students shall be able to list the indications and contraindications of various types of electrotherapy, modalities and demonstrate the different techniques and describe their effect. In addition, the students shall be able to fulfill with 75% accuracy (as measured by written, oral and practical internal evaluation) the following objective of the course-

- a) To list indications and contraindications of various Modalities.
- b) To understand different techniques of applications, their justification and effects.
- c) Demonstration of individual techniques of applications of various modalities.

COURSE CONTENTS:-

A. LOW FREQUENCY CURRENTS:

I. **Nerve Muscle Physiology** - Resting potential, Action potential, propagation of action potential, in myelinated and unmyelinated nerve fiber, Motor unit, and Synapse and Synaptic transmission of Impulse. Effect of negative and positive electrodes on nerve and accommodation of the nerve.

II. Faradic Current - Definition, Characteristic of original Faradic current, modified faradicplane faradic current interrupted faradic current and surged faradic current, parameters, indication, effect on denervated muscles, innervated muscles, technique of application, group muscles stimulation, individual muscle stimulation, faradic bath, faradic under pressure, pelvic floor muscle reeducation, therapeutic effect of faradic current, contraindication and dangers.

III. Galvanic Current – Classification of Galvanic current

- Plain galvanic current
- Interrupted galvanic current
- Plain Galvanic Current :- Parameters of plain Galvanic current, principle of Iontophoresis technique of Iontophoresis (Bath method, bath and pad method, pad method) Common drugs used in Iontophoresis with its polarity, therapeutic effect, contraindication and dangers of plain galvanic current
- Interrupted Galvanic current (Interrupted direct current I.D.C.)
 - Definition of IDC, parameters, wave form, duration and amplitude of the pulse effect of strength and duration on muscles and nerves technique of stimulation of individual muscles and group muscles, therapeutic effect, contraindication and dangers and precaution of IDC.

III. Electro-Diagnosis -

- S.D. Curve
- Chronaxae and Rheobase
- Nerve Conduction
- EMG
- Nerve Conduction Velocity Measurement (outline only).

IV. TENS:-Definition, parameters and wave form, pain gate theory of pain modulation, techniques of application, therapeutic effect and contraindication.

B. MEDIUM FREQUENCY CURRENTS:

Definitions, effects, indications, techniques of application, contraindications

Interferential therapy:

- Physiological, therapeutic effects & dangers, Indications & contra indications
- Technique and method of applications, Dosimetry.

C. HIGH FREQUENCY CURRENT

I. Short Wave Diathermy:- Introduction, Principle of application (Capacitor field methods and conductive field methods) preparation of patient, Therapeutic effects, contraindication and dangers of SWD.

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

II. Pulsed S.W.D.:-Definition, Characteristic, Principles of Treatment, Therapeutic effects, Indications, Technique of application, Contraindications and dangers.

III. Microwave Diathermy:- Definition, characteristic of wave, properties of microwave, technique of application, Therapeutic effects, contraindication, and dangers, , precautions and potential harmful effects, Dosimetry.

D. ACTINOTHERAPY :

I. Infra-Red:-Introduction, Classification, penetration depth, Techniques of application, Dangers and Contraindications .

II. Ultraviolet Radiation :- Introduction, classification of ultraviolet rays, penetration depth, effect of ultraviolet, Physiological and therapeutic effects- photosensitization, test dose calculation, technique of application, (contact methods non contact methods)
Physiological and Therapeutic effect, Indications and contraindications , Potential harmful effects and dangers, Methods of application, Sensitizes, Filters, Dosage, wavelength, penetration, tolerance, Treatment / Application condition wise.

Comparison between UVR & IR Therapy.

III. LASER:-(Infrared and red light laser, helium/neon laser and semi conductor laser) Definition, principle of application, (contact methods non contact methods) technique of application, Therapeutic effect and potential harmful effects , dose calculation, indications, contraindications and dangers.

E. ULTRASONIC THERAPY:-Introduction and Characteristics of the wave parameters, coupling media, Therapeutic effects, Indications, Contraindication and Dangers, Testing of Apparatus, and Techniques of application and dose.

F . THERMAL THERAPY MODALITIES:

- Therapeutic effects and uses, Techniques and applications
- Indications, contraindications, precautions and Potential harmful effects of various heat modalities:

I. Paraffin wax bath therapy - Introduction, Preparation of wax, preparation of patient, Method of application, Therapeutic Effects, Indications and Contraindications.

II. Hydro collator packs (Heating pad, and Moist heat): - Introduction, methods of application, indication, contra indication.

III. Whirlpool and moist heat Heating pads

IV. Hot air chambers, fluidotherapy .

V. Cryotherapy :- Introduction, Physical Principles, Physiological and Therapeutic effects, Techniques of Application, Indications, precautions and Potential harmful effects of treatment, Contraindications and dangers, Dosimetry.

E. ULTRASONIC THERAPY:

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

Bio Feedback :

Introduction, principles of Bio feedback, therapeutic effects of Bio Feedback, Indication and Contraindications, Techniques of Treatment.

G. Advanced electrotherapy:

- Computerization of electrotherapy modalities
- Programming of parameter of treatment .
- Appropriate Selection and combination of parameters in therapy .

- Combined therapy-Microwave with traction, Ultrasonic therapy with stimulation,IFT or TENS-Principles, uses, indications etc.

ELECTROTHERAPY PRACTICAL

Practical:- No. of Hrs. (80)

- Testing of above apparatus
- Techniques of application of above treatment modalities(Demonstration & Practice)
- Demonstration of Electrical Modalities functioning & Usage
- Demonstration and practice of various motor point stimulations.

- Demonstration and practice of therapeutic application of different low frequency currents.
- Demonstration and practice of Electro diagnosis (demonstration and Practice of following electro diagnostic Measures) F.G. Test, SD curves plotting ,Chronaxae and Rheobase, Reaction of degeneration.
- Demonstration and practice of therapeutic application of the following modalities:

Short-wave diathermy, Ultrasound, Infra red, Wax bath, Hydro collator, Electric muscle stimulator, Interferential currents, TENS, Ultraviolet, Microwave, Lasers, and Electrical Traction.

Note: All the demonstrations are done on normal persons.

PRACTICAL EXAMINATION

Students will be assessed by viva & practical demonstrations based upon learning in Theory and Practical.

SUGGESTED READINGS BOOKS:

- 1 Froster, A. and Palastanga, N. Clayton's Electrotherapy: Theory and Practice AITBS, Delhi
- 2 Jhon, Low and Ann, Reed Electrotherapy Explained: Principles Butterworth Heine, Oxford
- 3 Nelson, R.M. and Currier, D.P. Clinical Electrotherapy Appleton and Lange
- 4 Chemeron, M.H. Physical Agents in Rehabilitation W B Saunders, London
- 5 Michlovitz, S L Thermal Agents in Rehabilitation F A Davis, Philadelphia
- 6.B.K.Nanda, Electrotherapy , Jaypee Publication, New Delhi
7. Jagmohan Singh- Electrotherapy ,Jaypee Publication, New Delhi