SHRI
DHARMASTHALA
MANJUNATHESHWARA
UNIVERSITY

Ordinance Governing
II Year BPT Course
Curriculum 2021-22

SHRI DHARMASTHALA MANJUNATHESHWARA UNIVERSITY

(A State Private University established under the Shri Dharmasthala Manjunatheshwara University
Act No 19 of 2018 of Government of Karnataka and Notification No. ED 261 URC 2018 dated 19th December 2018)

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|| Om Shri Manjunathaya Namaha ||

Shree Kshethra Dharmasthala

Edition Year : 2021-22

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THE LOGO

Poojya Dr D. Veerendra Heggade, Hon'ble Chancellor of the University, while searching for an appropriate Logo for the University, saw a photograph picked from Temple Architecture showing Wings of a Bird, sculpted in Indian style and wanted it to be incorporated in the logo for the University, as the Wings symbolize 'Spreading of Knowledge beyond Boundaries'. Further it was felt that the Central theme of the logo should be 'Rudra' (The Linga) with wings on each side. In this way, the logo of the University was conceptualized.

Hence:

1. The central part represents **Rudra** who Demolishes Darkness.
2. The Three **horizontal lines on The Linga** stand for Samyak Darshan (Right Belief), Samyak Gyan (Right Knowledge) and Samyak Charitra (Right Conduct).
3. The **Wings** symbolize spreading of Knowledge across the boundaries.
4. Base line **"Truth Liberates"** highlights the Purpose of Education: to liberate oneself unconditionally. It shows that it is not discipline, nor knowledge nor the efforts to freedom that liberate but Truth is what liberates you from all your conditioning and ignorance.

The overall significance of Shri Dharmasthala Manjunatheshwara University's Logo is:

Darkness of ignorance is destroyed by the flow of knowledge to bring Liberty to everyone, by realizing the truth. And, it should spread globally without the boundaries as hindrance.

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VISION

Shri Dharmasthala Manjunatheshwara University will set the highest standards of teaching and learning by awakening the intelligence of the students and nurturing the creativity hidden in them by creating an environment where the ancient wisdom blends with modern science, to transform them into whole human beings to face the challenges.

MISSION

- To ensure that the journey of education is inspiring, pleasant and enjoyable.
- Attract the best of teachers and students.
- Achieve high principles of trust, love and spirituality in the students.
- Create a collaborative, diverse and exclusive community.
- Transform the student of today to be a leader of tomorrow and a better human being.
- Produce passionate teachers.
- Evolve innovative teaching techniques.
- Create a peaceful environment.
- Prepare the student to face the social challenges.
- Create a University of which the Nation is proud of.
- Be an effective partner in Nation Building.
- Create an Eco-friendly University.
- Create a University based on the principles of beauty, love and justice.

||Om Shanti! Om Shanti! Om Shanti||

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SDMU/ACAD/BPT/F-4/Notfn-151/334/2020

Date: 26-12-2020

NOTIFICATION

Ordinance governing Curricula of BPT Year II – 2020

Ref:

1. Minutes of the 4th Meeting of Standing Committee of the Academic Council (Ref. No. SDMU/SCAC/F-101/340/2020 Dated: 23-12-2020)
2. Minutes of the 2nd Meeting of Joint Faculties (Letter No: SDMU/JF/F-29/321/2020; Dated: 23-12-2020)
3. Minutes of the 3rd Meeting of Board of Studies – Physiotherapy (Ref. No. SDMU/BOS-PT/OF-04/85/2020-21 Dated: 29-06-2020)

In exercise of the powers conferred under Statutes 1.4 (Powers and functions - Para ix & x), 1.5b (Powers and functions - Para b & c) & 1.8 (Powers and functions - Para i) of Shri Dharmasthala Manjunatheshwara University, the Academic Council has accorded its approval for the notification on the ordinance governing the Curricula of BPT Year II – 2020.

The ordinance shall be effective from the date of notification.

Lt. Col. U. S. Dinesh (Retd.)
REGISTRAR
REGISTRAR,
Shri Dharmasthala Manjunatheshwara University, Dharwad

Shri Dharmasthala Manjunatheshwara University * Dharwad *

To: The Principal, SDM College of Physiotherapy.

Copy for information to:

1. Hon'ble Chancellor, Shri Dharmasthala Manjunatheshwara University, Dharwad
2. Vice Chancellor - Shri Dharmasthala Manjunatheshwara University.
3. Pro Vice-Chancellor (Academics) - Shri Dharmasthala Manjunatheshwara University.
4. Controller of Examinations, Shri Dharmasthala Manjunatheshwara University.
5. Chairperson, Board of Studies - Physiotherapy
6. University Office for Records File
7. Office of the Registrar

Shri Dharmasthala Manjunatheshwara University
Physiotherapy Syllabus – BPT II Year

Second year BPT [Duration 13 -24 months]						
Sl. No.	Subject	Teaching hours				
		Weekly Class hours	Total	Theory	Practical	Clinics
Main Subjects: For University Examination						
1	Pathology (BPT1107 A)	2	60	45	15	
2	Microbiology (BPT1107 B)	2	60	45	15	
3	Pharmacology (BPT1108)	2	60	60		
4	Exercise Therapy (BPT1109)	8	280	120	160	
5	Electrotherapy (BPT1110)	8	260	100	160	
Subsidiary subjects: Not for University Examination						
6	Ethics and Admin (BPT1195)	1	30	30		
7	First Aid & CPR (BPT1196)	1	30	10	20	
8	Constitution of India (BPT1197)	1	30	30		
9	Introduction to treatment (BPT1198)	1	30	30		
10	Clinical Training	10	400			400
	Total	**36**	**1240**	**470**	**370**	**400**

BPT - II								
Sl. No	Subject	Theory				Practical		Total
		Written		Viva-Voce	Internal Assessment	Practical	Internal Assessment	
		Time	Maximum Marks	Maximum Marks	Maximum Marks	Maximum Marks	Maximum Marks	Maximum Marks
1	Section A-Pathology	3 Hrs	40	-	10	-	-	100
	Section B-Microbiology		40	-	10	-	-	
2	Pharmacology	3 Hrs	80	-	20	-	-	100
3	Exercise Therapy	3 Hrs	100	30	20	40	10	200
4	Electrotherapy	3 Hrs	100	30	20	40	10	200

PATHOLOGY

Course Description

This subject follows the basic subjects of Anatomy, Physiology and Biochemistry and it forms a vital link between preclinical subjects and clinical subjects. Pathology involves the study of causes and mechanisms of diseases. The knowledge and understanding of Pathology of diseases is essential to institute appropriate treatment or suggest preventive measures to the patient.

Subject Title Duration Total Hours Theory Practical	: PATHOLOGY : 13 – 24 Months : 60 : 45 Hrs : 15 Hrs
Total Hours / Week Seminars / Tutorials	: 2Hrs : 1 Hour / Week
Method of Assessment	: Written

Sl No	TOPIC	TEACHING HOURS
1.	**Basics of general pathology** • Introduction to pathology • Cell injuries: causes, mechanism, pathogenesis • Reversible cell injury: types, morphological changes including cellular swellings, hyaline change, mucoid change • Irreversible cell injury: apoptosis/ autolysis, types of necrosis & gangrene, calcification (dystrophic & metastasis) • Intracellular accumulations - fatty changes, • Extra cellular accumulations: pathologic calcifications: classification, pathogenesis and morphology • Extra cellular accumulations: amyloidosis • Intracellular accumulations - protein accumulations, glycogen accumulations, pigments - melanin / hemosiderin	6

2	**Inflammation and repair** • Acute inflammation: features, causes, vascular and cellular events • Morphologic variations • Inflammatory cells and mediators • Chronic inflammation: causes, types, classification, non – specific & granulomatous with examples • Wound healing: primary and secondary union, factors affecting the healing process • Repair and regeneration • Healing in specific site including bone, nerve and muscle healing	3
3	**Growth disturbances and neoplasia** • Atrophy, hypertrophy, hyperplasia, aplasia, hypoplasia, metaplasia, malformation, agenesis, dysplasia • Neoplasia: definition, classification, biological behavior • Carcinoma and sarcoma, differences between benign and malignant • Carcinogenesis: environmental carcinogens, chemical, viral, occupational, heredity • Cellular oncogenesis, prevention of cancer, precancerous lesions • Malignant neoplasia: grades and stages, local & distant spread • Prevention of cancer • Tumor and host interactions: systemic effects	3
4	**Circulatory disturbances** • Hyperemia/Ischemia and hemorrhage • Edema: pathogenesis and types • Chronic venous congestion: lung, liver, spleen, systemic pathology • Thrombosis and embolism: formation, fate and effects • Infarction: types, common sites • Gangrene: types and etio - pathogenesis • Shock: pathogenesis, types, morphologic changes	3

5	**Cardio-pulmonary pathology** • Obstructive lung diseases • Restrictive lung diseases • Hypertension and hypertensive heart disease • Peripheral vascular diseases (arterial and venous) with vasomotor diseases • Ischemic heart disease & myocardial infarction • Cardiac failure • Congenital heart diseases • Endocarditis, rheumatic heart disease	3
6	**Nervous system** • Congenital disorders • Inflammations and infections • Demyelinating disorders • Sensory motor polyneuropathies • Neuromuscular junction disorders and myopathies Inflammations and Infections: TB Meningitis, Pyogenic Meningitis, viral meningitis and Brain Abscess Tuberculosis, Cysticercosis CNS Tumors, Astrocytoma, Neuroblastoma, Meningioma, Medulloblastoma	2
7	**Musculoskeletal system** • Osteomyelitis • Rickets / osteomalacia, osteoporosis • Hyperparathyroidism • Rheumatoid arthritis & osteoarthritis • Suppurative arthritis • Fibromyalgia • Gout Paget's disease Tumors of Bone and Connective tissue	3

8	**Endocrine pathology** Diabetes Mellitus: Types, Pathogenesis, Pathology, Laboratory diagnosis Non-neoplastic lesions of Thyroid: Iodine deficiency goiter, autoimmune Thyroiditis, Thyrotoxicosis, myxedema, Hashimoto's thyroiditis. Tumours of Thyroid: Adenoma, Carcinoma: Papillary, Follicular, Medullary, Anaplastic. Adrenal diseases: cortical hyperplasia, atrophy, tuberculosis, tumours of cortex and medulla. Diseases of Parathyroid-	3
9	**Haematology -** Constituents of blood and bone marrow, Regulation of hematopoiesis. Anemia: Classification, clinical features & lab diagnosis. Nutritional anemias: Iron deficiency anemia, Folic acid,Vit. B 12 deficiency anemia including pernicious anemia. Hemolytic Anaemias: Classification and Investigations. Hereditary hemolytic anaemias: Thalessemia, Sickle cell anemia, Spherocytosis and Enzyme deficiencies. Acquired hemolytic anaemias i. Alloimmune, Autoimmune ii. Drug induced, Microangiopathic Pancytopenia - Aplastic anemia. Hemostatic disorders, Vascular and Platelet disorders & lab diagnosis. Coagulopathies – (i) Inherited (ii) Acquired with lab diagnosis. Leukocytic disorders: Leukocytosis, Leukopenis, Leukemoid reaction. Leukemia: Classification, clinical manifestation, pathology and Diagnosis. Multiple myeloma and disproteinemias. (i) Blood transfusion; Grouping and cross matching, untoward reactions, transmissible infections including HIV & hepatitis, Blood-components & plasma-pheresis.	4

10	Alimentary tract: Oral Pathology: Ulcers, leukoplakia, Carcinoma, oral cavity diseases and tumour of salivary gland & esophagus and precancerous lesions, Esophagus inflammatory, functional disorders and tumours. Stomach: Gastritis, Ulcer & Tumours. Tumours and tumour like condition of the small and large Intestine: Polyps, carcinoid, carcinoma, Lymphoma. Pancreatitis and pancreatic tumours : i) Exocrine, ii) Endocrine Salivary gland tumours : Mixed, Warthin's	4
11	Hepato – biliary pathology. Jaundice: Types, aetio-pathogenesis and diagnosis. Hepatitis: Acute, Chronic, neonatal. Alcoholic liver disease Cirrhosis: Postnecrotic, Alcoholic, Metabolic and Portal hypertension Liver abscesses; Pyogenic, parasitic and Amoebic. Tumours of Liver 15. Lymphatic System Diseases of the gall bladder: Cholecystitis, Cholelithiasis, Carcinoma.	4
12	Lymphatic System Lymphadenitis - Non specific and granulomatous. Causes of Lymph Node enlargements. Reactive Hyperplasia, Primary Tumours - Hodgkin's and Non hodgkin's Lymphomas, Metastatic Tumours. Causes of Splenic Enlargements	2
13	Dermatopathology Skin tumors : Squamos cell carcinoma, Basal cell carcinoma, Melanoma	1
14	Miscellaneous Nutritional disorders Genetic diseases	1
15	Immunopatholgy Hypersensitivity Amyloidosis SLE AIDS	2

16	Infectious diseases - Tuberculosis Leprosy Syphilis	1

PRACTICAL (15 Hours):

Demonstration of Slides – The students may be demonstrated the common histopathological, hematological and cytological slides and specimens and charts and their interpretations.

Recommended Text books*:*

1. Text book of pathology: Harshmohan
2. General systemic pathology: Churchill Livingstone
3. Text book of Pathology: Robbins

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MICROBIOLOGY

Course Description:
The microbiology subject will be covered in the second year of the BPT course. Microbiology of various pathogens closely associated with the physiotherapy practice is included in the syllabus. Basic concepts of transmission of pathogens, clinical features, the immunological response to the pathogens, and approach to the laboratory diagnosis of various infectious conditions will be explained. Special emphasis will be paid to Biomedical Waste Disposal and Personal Protective Equipment. Prophylaxis of important preventable infections will be highlighted.

Subject Title Duration Total Hours Theory Practical Lecture + Practical	: MICROBIOLOGY : 13 – 24 Months : 60 : 45 Hrs : 15 Hrs : 2 Hours / Week
Method of Assessment	: Written

List of lectures

Sl No	TOPIC	TEACHING HOURS
	General Microbiology [5 Hours]	
1	Definitions: infection, infectious disease, parasite, host, vector, fomite, contagious disease, epidemic, endemic, pandemic, zoonosis, epizootic. Normal flora of the human body. Routes of infection and spread; endogenous and exogenous infections; source at reservoir of infections.	1 hour
2	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.	1 hour
3	Sterilization and disinfection	1 hours
4	Antimicrobials: Mode of action, Antibiotic	1 hours

Sl No	TOPIC	TEACHING HOURS
	susceptibility tests and its interpretation and Antibiotic Resistance	
5	Culture media and Culture methods	1 hour
	Immunology [4 Hours]	
6	Basic principles of immunity, Structure and function of immune system and immune response.	1 hour
7	Antigen, Antibody and Complement system	1 hour
8	Antigen-antibody reactions, serological diagnosis, Immunization	1 hour
9	Hypersensitivity	1 hour
	Bacteriology [11 Hours]	
10	Staphylococci	1 hour
11	Streptococci including Pneumococci, Enterococci	1 hour
12	*Corynebacterium diphtheriae, Listeria monocytogenes*	1 hour
13	*Bacillus anthracis, Bacillus cereus*	1 hour
14	*Clostridium tetani, Clostridium botulinum*	1 hour
15	*Clostridium perfringens Clostridium difficile* and Non-sporing anaerobes	1 hour
16	Gram negative bacteria – Enterobacteriaceae - *E. coli*, Klebsiella, Proteus	1 hour
17	Salmonella Spp	1 hour
18	Shigella, Vibrio	1 hour
19	Pseudomonas, Acinetobacter	1 hour
20	*Mycobacterium tuberculosis*, *Mycobacterium. Leprae* and Atypical mycobacteria	1 hour
	General Virology [9 Hours]	
21	General properties of viruses	1 hour
22	Virus Host Interaction	1 hour
23	Antiviral Drug and Immunoprophylaxis of viral disease	1 hour
24	Herpes viruses, Influenza viruses	1 hour
25	Poliomyelitis	1 hour
26	Rabies	1 hour

Sl No	TOPIC	TEACHING HOURS
27	Hepatitis virus	1 hour
28	HIV infections	1 hour
29	Covid -19, SARS, H1N1	1 hour
	Mycology [4 Hours]	
30	General properties of fungi and Antifungal agents	1 hour
31	Superficial mycoses	1 hour
32	Subcutaneous and deep mycoses	1 hour
33	Opportunistic mycotic infections including Mycotoxins	1 hour
	Clinical/Applied Microbiology [12 Hours]	
34	Diarrhoea	1 hour
35	Upper respiratory tract infections	1 hour
36	Lower respiratory tract infections	1 hour
37	Meningitis and encephalitis	1 hour
38	Urinary tract infections	1 hour
39	Pyrexia of Unknown Origin	1 hour
40	Sexually transmitted diseases	1 hour
41	Pelvic inflammatory disease	1 hour
42	Wound infection	1 hour
43	Malaria, Filariasis, Zoonotic diseases and Arthropod borne infections	1 hour
44	Rheumatic heart disease, Syphilitic aneurism of aorta, Congenital rubella syndrome	1 hour
45	Standard biosafety precautions, Biomedical waste management and PPE	1 hour

PRACTICAL (Hours): 15

1. Demonstration of Microscopes and its uses
2. Sterilization and disinfection - Demonstration of common sterilization equipment
3. Sterilization and disinfection – Disinfectants and their uses
4. Demonstration of Culture media
5. Gram Stain - Demonstration
6. ZN Stain – Demonstration
7. Albert's stain – Demonstration

8. Demonstration of bacterial motility by hanging drops method
9. Serological tests - Demonstration of Serological test – agglutination, precipitation – RA, ASO
10. Serological tests - Demonstration of Serological test ELISA – HBsAg, HIV, HCV
11. Nephelometry – CRP, RA
12. Immunochromatography – HIV, HBsAg, Dengue, Chikungunya, Leptospirosis, HCV, Malaria card test for antigen detection
13. Demonstration of Fungus
14. Hand washing and PPE– Demonstration
15. Biomedical waste management

***Recommended Text books**:*

1. Ananthanarayan and Paniker's Textbook of Microbiology
2. Essentials of Medical Microbiology by Apurva Sastry and Sandhya Bhat
3. Textbook of Medical Mycology by Jagdish Chander
4. Medical Parasitology - by Rajesh Karyakarte and Ajit Damle

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PHARMACOLOGY

Course Description

This course introduces the student to basic pharmacology of common drugs used, their importance in the overall treatment including Physiotherapy. The student after completing the course will be able to understand the general principles of drug action and the handling of drugs by the body. The objectives are to develop an understanding of basic pharmacology, usage of common drugs for the treatment of various diseases with emphasis on musculoskeletal, neuromuscular and cardio respiratory diseases and disorders. The student will be aware of the contribution of both drug and physiotherapy factors in the outcome of treatment.

Subject Title Duration Total Hours Theory Practical	:PHARMACHOLOGY : 13 – 24 Months : 60 : 60 Hrs : NIL
Total Hours / Week Seminars / Tutorials	: 2 Hrs : 1 Hour / Week
Method of Assessment	: Written

Sl No	TOPIC	TEACHING HOURS
1.	**General Pharmacology** Introduction, Definitions, Classification of drugs, Sources of drugs, Routes of drug administration, Pharmacokinetics, Pharmacodynamics, Factors modifying drug response and Adverse drug reactions	12 Hours
2.	**Autonomic Nervous system** General considerations – The Sympathetic and Parasympathetic Systems, Receptors, Cholinergic and Anti-Cholinergic drugs, Adrenergic and Adrenergic blocking drugs and Peripheral muscle relaxants	7 hours
3.	**Cardiovascular Pharmacology**	7 Hours

	Drugs Used in the Treatment of Heart Failure, Diuretics, Antihypertensive Drugs, Anti anginal drugs, Ischemic Heart Disease and Treatment of Myocardial infarction	
4.	**Drugs Used in the Treatment of Vascular Disease and Tissue Ischemia** Drugs for anemia, Lipid-Lowering agents, Coagulants, Anticoagulants, Thrombolytics, Anti-platelet agents, Cerebral Ischemia and Peripheral Vascular Disease	7 Hours
5.	**Neuropharmacology** Opioid analgesics, Sedative-Hypnotic Drugs, Antianxiety Drugs, Drugs Used in Treatment of Mood Disorders, Antipsychotic drugs, Antidepressants, Atypical Antidepressants and Drugs for mania	7 Hours
6.	**Disorders of Movement** Drugs used in Treatment of Parkinson's Disease, Antiepileptic Drugs, drugs for Spasticity and Skeletal Muscle Relaxants	3 Hours
7.	**Drugs used in Inflammatory/Immune Diseases** Nonsteroidal Anti-Inflammatory Drugs (NSAIDs), Glucocorticoids, Anabolic steroids	3 Hours
8.	**Drugs Used in the Treatment of Neuromuscular Immune/Inflammatory Diseases:** Myasthenia gravis, Idiopathic Inflammatory Myopathies, systemic lupus Erythmatosus, Scleroderma, Demyelinating Disease	2 Hour
9.	**Drugs Used in Treatment of Arthritic Diseases** Rheumatoid Arthritis, Osteoarthritis, Gout . Drugs used in Sports medicine	2 Hour
10.	**Respiratory Pharmacology** Drugs used in Treatment of Obstructive airway Diseases and Allergic Rhinitis	2 Hour
11.	**Gastrointestinal Pharmacology** Drugs for Peptic Ulcer Disease, Constipation and Diarrhoea	2 Hour
12.	**Drugs Used in Treatment of Diabetes Mellitus** Insulin, Oral Hypoglycemics	2 Hour
13.	**Geriatrics Pharmacology and the geriatric Population** Adverse effects of special concern in the Elderly, Dementia, Postural hypotension	2 Hour

Recommended Textbooks

1. Essential of Medical Phramacology by Tripathi
2. Text book of Medical Pharmacology by Padmaja udaykumar

EXERCISE THERAPY

Course Description:

In this course, the students will learn the principles and effects of exercise as a therapeutic modality and will learn the techniques in the restoration of physical functions

Subject Title Duration Total Hours Theory Practical	:EXERCISE THERAPY : 13 – 24 Months : 280 : 120 Hrs : 160 Hrs
Total Hours / Week Seminars / Tutorials	: 8 Hrs : 1 Hour / Week
Method of Assessment	: Written, Oral, Practical

Sl. No	TOPIC	HOURS
1.	**Introduction to Exercise Therapy** The aims of Exercise Therapy, The techniques of Exercise Therapy, Approach to patient's problems, Assessment of patient's condition – Measurements of Vital parameters, Starting Positions – Fundamental positions & derived Positions, Planning of Treatment	05 Hours
2.	**Methods of Testing** a. Functional tests b. Measurement of Joint range: ROM-Definition, Normal ROM for all peripheral joints & spine, Goniometer-parts, types, principles, uses., Limitations of goniometry, Techniques for measurement of ROM for all peripheral joints- **revision** c. Tests for neuromuscular efficiency 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.	15 Hours

	Anthropometric Measurements: Muscle girth – biceps, triceps, forearm, quadriceps, calf Static power Test Dynamic power Test Endurance test Speed test Measurement of Limb Length: true limb length, apparent limb length, segmental limb length. Measurement of the angle of Pelvic Inclination.	
3.	**Relaxation** Definitions: Muscle Tone, Postural tone, Voluntary Movement, Degrees of relaxation, Pathological tension in muscle, Stress mechanics, types of stresses, Effects of stress on the body mechanism, Indications of relaxation, Methods & techniques of relaxation-Principles & uses: General, Local, Jacobson's, Mitchel's, additional methods.	05 Hours
4.	**Passive Movements** Causes of immobility, Classification of Passive movements, Specific definitions related to passive movements, Principles of giving passive movements, Indications, contraindications, effects of uses , Techniques of giving passive movements.	05 Hours
5.	**Physiology of muscle performance:** Structure of skeletal muscle, chemical & mechanical events during contraction &relaxation, muscle fibre type, motor unit, force gradation. Causes of decreased muscle performance Physiologic adaptation to training: Strength & Power, Endurance.	05Hours
6.	**Active Movements** Types of active movements: • Free exercise: Classification, principles, techniques, indications, contraindications, effects and uses • Active Assisted Exercise: principles, techniques, indications, contraindications, effects and uses • Assisted-Resisted Exercise: principles, techniques, indications, contraindications, effects and uses • Resisted Exercise: Definition, principles, indications, contraindications, precautions &	05Hours

	techniques, effects and uses 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	
7	**Strength training regimes** • Isotonic: de Lormes, Oxford, MacQueen, Circiut weight training • Isometric: BRIME (Brief Resisted Isometric Exercise), Multiple Angle Isometrics • Isokinetic regimens	03 Hours
8.	**Proprioceptive Neuromuscular Facilitation** • Definitions & goals • Neurophysiologic principles of PNF • Technical principles Muscular activity, Diagonals patterns of movement: upper limb, lower limb Procedure: components of PNF • Techniques of facilitation Mobility: Contract relax, Hold relax, Rhythmic initiation Strengthening: Slow reversals, repeated contractions, timing for emphasis, rhythmic stabilization Stability: Alternating isometric, rhythmic stabilization Skill: timing for emphasis, resisted progression Endurance: slow reversals, agonist reversal	05Hours
9.	**Suspension Therapy** • Definition • Principles • Equipments & accessories • Indications & contraindications • Benefits of suspension therapy • Types of suspension therapy: axial, vertical, pendular • Techniques of suspension therapy for upper limb,lower limb and spine	05 Hours
10.	**Functional Re-education** Lying to sitting: Activities on the Mat/Bed, Movement and stability at floor level; Sitting activities and gait; Lowerlimb and Upperlimb activities.	05 Hours

11.	**Aerobic Exercise** • Definition and key terms • Energy systems • Physiological response to aerobic exercise • Examination and evaluation of aerobic capacity – Exercise Testing • Determinants of an Exercise Program • The Exercise Program, Normal and abnormal response to acute aerobic exercise • Physiological changes that occur with training • Application of Principles of an Aerobic conditioning program for patients – types and phases of aerobic training.	05 Hours
12.	**Stretching** • Definition of terms related to stretching • Tissue response towards immobilization and elongation • Determinants of stretching exercise • Techniques and types of stretching • Effects of stretching • Inhibition and relaxation procedures • Precautions and contraindications	04 Hours
13.	**Manual Therapy & Joint Mobilization** • Manual therapy-Definition • Schools of Manual Therapy- Maitland, Kaltenborn, Mulligan Principles, Grades, Indications and Contraindications, Effects and Uses, Techniques of mobilization for upper limb, lower limb and spine • Biomechanical basis for mobilization • Precautions and limitations.	07 Hours
14.	**Balance** • Physiology of balance: contributions of sensory systems, processing sensory information, generating motor output • Components of balance (sensory, musculoskeletal, biomechanical) • Causes of impaired balance • Examination & evaluation of impaired balance • Activities for treating impaired balance: mode,	06 Hours

	posture, movement • Precautions & contraindications • Types of Balance retraining	
15.	**Co-ordination Exercise** • 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.	05Hours
16.	**Posture** • Definition • Active and Inactive Postures • Postural Mechanism • Patterns of Posture • Principles of re-education: corrective methods and techniques • Patient education.	05 Hours
17	**Walking Aids** Walking aids measurement (Revision.) Clinical application Pre crutch Training and crutch gaits.	04 Hours
18	**Massage** • History and Classification of Massage • Technique Principles • Indications and Contraindications • Technique of Massage Manipulations • Physiological and Therapeutic Uses of Specific Manipulations	06 Hours
19	**Hydrotherapy** • Definitions • Goals and Indications • Precautions and Contraindications • Properties of water • Use of special Equipments	04 Hours

	• Techniques • Effects and uses • Merits and demerits	
20	**Breathing exercises and Postural Drainage**	06 Hours
21	• **Individual and Group Exercises** • Advantages and Disadvantages • Organisation of Group exercises • Recreational Activities and Sports	04 Hours
22	**Introduction to Yoga** • Asanas – Principles and elements • Pranayamas – Principles, Methods and Techniques	06 Hours

PRACTICALS [160 HOURS]

The students of exercise therapy are to be trained in Practical Laboratory work for all the topics discussed in theory. The student must be able to evaluate and apply judiciously the different methods of exercise therapy techniques on the patients. They must be able to-

1. 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
4. Demonstrate the PNF techniques
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
13. Demonstrate to apply the technique of passive movements
14. Demonstrate various techniques of Active
15. movements
16. Demonstrate techniques of strengthening muscles using resisted exercises

17. Demonstrate techniques for measuring limb length and body circumference.
18. Demonstrate performance of specific exercises example- breathing exercise, kegel's exercise etc
19. Demonstrate postural drainage techniques.
20. Clinical observation- Students of 2nd year will have a rotatory posting in various units of physiotherapy for clinical observation. During this period students are supposed to present a minimum of one case to the concerned staff every month.

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.
11. Physiotherapy in obstetrics and gynaecology by Jill Mantle, J Haslam, Sue Barton, Margie Polden.

ELECTROTHERAPY

Course Description

Electrotherapy is the use of electrical energy as a treatment. In this course the student will learn the Principles, Techniques, Effects, Indications, Contra–Indications and the dosage parameters for various indications of electro therapeutic modalities in the restoration of physical function.

Subject Title Duration Total Hours Theory Practical	: ELECTRO THERAPY : 13 – 24 Months : 260 : 100 Hrs : 160 Hrs
Total Hours / Week Seminars / Tutorials	: 8 Hrs : 1 Hour / Week
Method of Assessment	: Written, Oral, Practical

Sl. No.	TOPIC		TEACHING HOURS
1	**Introduction to basic concepts in electricity**		
	A.	Electricity definition, types, Static electricity, Production of electrical charges, Characteristics of charged body, Characteristics of lines of forces, Potential difference and EMG.	**3**
	B.	Current Electricity: Units of Electricity - faraday, volt, ampere, coulomb, watt**.** Resistance in series & parallel, Ohm's law and its application to DC/AC. Fuse. Condensers - definition, principles, types, construction, working and uses	**3**
	C.	Valves and transformers: types, principles, construction and working	**2**

	D.	Magnetism: definition, properties, electromagnetic induction & electromagnetic spectrum.	**1**
	E.	Shock: Micro shock and macro shock, safety precautions and management, earthing techniques.	**1**
	F.	Burns: Electrical and chemical burns, prevention and management.	**1**
2	**Physiology of Nerve and Muscle**		
	A.	Nerve muscle physiology: Resting membrane potential, Action potential, Propagation of action potential, synapse and synaptic transmission.	**2**
	B.	Motor unit, motor point, topography of motor points, Effect of positive and negative electrodes on nerve and Accomodation.	**1**
3	**Principles of Application: Electrode tissue interface**		
	A.	Types of electrodes, size and placement of electrodes - water bath, unipolar, bipolar. Physiology of pain, pain pathways and central control mechanisms. Types and theories of pain, Pain modulation.	**1**
	B.	Electrode tissue impedance, tissue Impedance, Current flow in tissues, Lowering of Skin Resistance, Coupling medium with characteristics.	**1**
4	**Neurophysiology of Pain and Electrotherapy for Pain modulation**		
		Physiology of pain, pain pathways and central control mechanisms. Types and theories of pain, Pain modulation.	**3**
5	**Electrotherapeutics**		

	Section A: Low Frequency Currents		
	A.	Interrupted direct current / galvanic current: definition, modifications, physiological and therapeutic effects, indications, contraindications, dangers and precautions, methods and techniques of application. Effects of interrupted galvanic currents on normally innervated, denervated and partially denervated muscles.	**3**
	B.	Faradic current: definition, production, modified faradic current and sinusoid always current. Parameters of faradic stimulation. Physiological and therapeutic effects of faradic stimulation. Indications, contraindications, dangers and precautions. Techniques of application Group and individual muscle stimulation. Faradic foot bath, faradism under pressure and pelvic floor muscle re-education.	**3**
	C.	Anodal / cathodal galvanism.	**2**
	D.	Ionisation: principles, effects of various techniques of medical ionisation. Iontophoresis: techniques of application, indications, selection of current, commonly used ions and drugs for pain, hyperhydrosis, wound healing.	**2**
	E.	High voltage pulsed galvanism: definition, effects, indications and contraindication, parameters.	**1**
	F.	Sinusoidal & diadynamic current: definition, effects, indications and contraindications.	**1**
	G.	Micro and Macro currents: definitions, effects.	**1**

	H.	Transcutaneous electrical nerve stimulation (TENS): definition, types of electrodes and placement of electrodes, dosage parameters, physiological and therapeutic effects, indications, contraindication and precautions, mechanisms of pain relief. Types of TENS- Conventional, acupuncture, burst, brief, intense and modulated TENS.	**3**
	I.	NMES – Construction component. Neuro muscular diagnostic stimulator – construction component. Components and working Principles.	**1**
	Section B: Medium Frequency Currents		
	A.	Interferential current (IFT): definition, principle of production, static and dynamic interference system, dosage parameters, electrode placement, physiological and therapeutic effects, indications, contraindications and precautions.	**3**
	B.	Russian current: definition, effects, indications, dosages and contraindications	**1**
	C.	Rebox current: definition, effects, indications, dosages and contraindications	**1**
	Section C: High Frequency Currents		
	A.	Short wave diathermy (SWD): definition, frequency and wavelength of SWD, principles of production. Cicrutit diagram and production of SWD, methods of heat production by SWD, types of SWD electrodes, placement and spacing of electrodes, tuning, testing of SWD apparatus, physiological & therapeutic effects, indications, contraindications, dangers, precautions. Dosage parameters and	**4**

		methods of application (capacitor field method and cable method etc).	
	B.	Pulsed short wave diathermy / pulsed electro magnetic energy (PEME): definition, principles and parameters of PEME, physiological and therapeutic effects, indications and contraindications.	**1**
	C.	Long wave diathermy: definition, physiological and therapeutic effects, indications and contraindications.	**1**
	D.	Micro wave diathermy (MWD): definition, wave length and frequency, production of MW, physiological & therapeutic effects, techniques of application, dosage parameters, indications, contraindications, dangers and precautions.	**2**
	E.	Therapeutic ultrasound (US): Definition, Frequency, Piezo Electric effects: Direct, Reverse. Production of US, Treatment Dosage parameters: Continuous & Pulsed mode, Intensity. US Fields: Near field, Far field. Half value distance, standing waves, Attenuation, Coupling Media, Thermal effects, Non-thermal 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. Testing of apparatus. Phonophoresis: Definition, Methods of application, commonly used drugs, Uses. Dosage of US.	**5**
6	**Superficial thermal agents**		
	A.	Paraffin wax bath: principle of wax application - latent heat, composition of wax bath therapy unit, methods of application, physiological & therapeutic effects, indication, contraindication	**3**

		and dangers.	
	B.	Moist heat therapy: hydro collator packs, methods of applications, therapeutic uses, indications, contraindications and precaution.	**2**
	C.	Contrast bath: overview, methods of application, therapeutic uses, indications and contraindications.	**1**
	D.	Cyclotherm**:** Principles of production, Therapeutic uses, Indications & Contraindications.	**1**
	E.	Whirl pool bath: construction, methods of application, therapeutic uses, indications and contraindications.	**2**
	F.	Cryotherapy: definition, principle - latent heat fusion, physiological and therapeutic effects, techniques of application, indications and contraindications, dangers, methods of application with dosages.	**4**
	G.	Fluidotherapy: construction, methods of application, therapeutic uses, indications and contraindications.	**2**
7	**Actino/ Phototherapy**		
	A.	Infra-red radiation: definition, wavelength and parameters, types of IR generators, production of IR, method of application, dosage parameters, cosine law, law of inverse square, Grotthus' law and other laws pertaining to infra- red irradiation, physiological and therapeutic effects, indications and contraindications.	**3**

	B.	Ultraviolet rays: definition, types of UVR. UVR Generators - High and low pressure mercury vapour lamp, Water and air cooled mercury vapour lamp, Kromayer lamp, Fluorescent tube, Theraktin tunnel, PUVA apparatus. Physiological and therapeutic effects, sensitizers and filters, indications, contraindications, dangers and precautions, Test dosage calculation, Calculation of E1, E2, E3, E4 doses. Dosages for different therapeutic effects, distance in UVR lamps.	**5**
	C.	Light amplification by stimulated emission of radiation (LASER): definition, classification, types of laser, principles of production, production of LASER by various methods, methods of application, Dosage parameters, physiological and therapeutic effects, safety precautions of LASER, indications, energy and power density, contraindications, precautions.	**5**
8	**Electrodiagnosis**		
	A.	Overview of electrodiagnosis, merits and demerits	**1**
	B.	Electrodiagnositic tests such as strength duration curve, rheobase, chronaxie, faradic galvanic test, neurotisation time, galvanic titanic ratio	**4**
	C.	Electromyography and Nerve conduction velocity studies	**2**
	D.	Evoked potentials (outline)	**1**
9	**Cervical and Lumbar Intermittent Mechanical Traction**		
		Apparatus, application, dosage, precautions, therapeutic uses, indications and contraindications	**2**

10	**Biofeedback**		
		Overview and types of biofeedback, Indications, merits and demerits of biofeedback	**2**
11	**Electrotherapeutic management of Wound/ Ulcer**		
		Wound healing, physiological basis for use of electrotherapeutic modalities, dosage	**2**
12	**Advanced electrotherapy**		
		Introduction to Shockwave therapy, Combination therapy, Functional Electrical Stimulation, Intermittent pneumatic compression device and Magnetic stimulation.	**4**

PRACTICAL (160 Hours):

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

***Recommended Text books**:*

1. Forster & Palastanga: Clayton's Electrotherapy Theory & Practice. 9th Ed, Bailliere Tindall, WB Saunders, New York, 2000.
2. Kahn J: Principles & Practice of Electrotherapy. 3rd Ed, Churchill Livingstone, Edinburgh, 1994.
3. Nelson RM, Hayes KW, Currier DP: Clinical Electrotherapy. 3rd Ed, Appleton & Lange, London, 1999.
4. Baxter DG: Therapeutic Laser, Theory & Practice. 1st Ed, Churchill Livingstone, New York, 1994.
5. Lehmann JF: Therapeutic heat & cold. 3rd Ed, Williams & Wilkins, Philadelphia, 1982.
6. WatsonT: Electrotherapy evidence based practice, 12th Ed, Churchill Livingstone, New York, 2008.
7. Cameroon MH: Physical agents in rehabilitation- evidence based to practice. 5th Ed, Saunders, 2017.
8. Watson T: Electrotherapy Evidence based practice. 12th Ed, Churchill Livingstone Elsevier, 2008.
9. Behrens BJ, Mechlovitz SL: Physical agents-theory and practice for Physical therapists Assistant. 1st Ed, FA Davis, Philadelphia, 1996.
10. Robinson AJ, Lynn SM: Clinical Electrophysiology: Electrotherapy and Electrophysiological Testing, 4th Ed, Williams & Wilkins Lippincott, USA, 2008.
11. Robertson V, Ward A, Low J and Reed A: Electrotherapy explained- principles and practice. 4th Ed, Elsevier India, 2008

ETHICS & ADMINISTRATION

Subject Title Duration Total Hours Theory / Lecture	: ETHICS AND ADMINISTRATION : 25 – 36 Months : 30 : 1 Hour / Week
Method of Assessment	: Written

ETHICS

1. History of physiotherapy, Ethical principles in health care, Ethical principles related to physiotherapy, Scope of practice, Enforcing standards in health profession-promoting quality care, Professional ethics in research, education and patient care delivery, Informed consent issues, Medical ethics and Economics in clinical decision-making. [3 hours]
2. Rules of professional conduct [2 hours] Physiotherapy as a profession Relationship with patients Relationship with health care institutions Relationship with colleagues and peers Relationship with medical and other professional.
3. Confidentiality and Responsibility, Malpractice and negligence, Provision of services and, advertising, Legal aspects: Consumer protection act, Legal responsibility of physiotherapist for their action in professional context and understanding liability and obligations in case of medico-legal action [2 hours]
4. IAP - Memorandum Of Association & Rules And Regulations [3 hours]

ADMINISTRATION AND SUPERVISION

1. Introduction: Branches of administration, Nature and scope of administration, How to be an effective administrator, Planning hospital administration as part of a balanced health care program. [2 hours]
2. Principles of hospital administration and its applications to physiotherapy. [2 hours]
3. Planning and organization: Planning cycle, Principles of organizational charts, Resource and quality management, Planning change -innovation [2 hours]
4. Financial issues including budget and income generation [2 hours]
5. Hospital administration: Organization, Staffing, Information, Communication, Coordination, Cost of services, Monitoring and evaluation. [2 hours]
6. National health policy and health care system in India [2 hours]
7. Organization of physiotherapy department: Planning, Space, Manpower, Other basic resources. [2 hours]
8. Organizing meetings, committees, and negotiations [1 hour]
9. Personnel management: Personnel performance appraisal system, Quality care delivery from the staff [2 hours]
10. Material management [1 hour] Pharmacy Hospital waste disposal
11. Quality assurance [1hours] Hospital acquired infection
12. Quality assurance through record review and medical audit.
13. Public relations in hospital and human resource management. [1hours]

Recommended books:

1. Medical Ethics by C M Francis.
2. George V Lobo – Current Problems in Medical Ethics
3. Consumer Protection Act – 1986, Government of India, New Delhi.
4. Francis C M – Hospital Administration
5. Davies, R and Macaulay, BMC – Hospital Planning and Administration
6. Health Services Management, Analysis& Application , Wadsworth Publishing Company, Belmont

FIRST AID & CPR

Course Description

At the completion of this course the student of First Aid and CPR must be able to identify and manage situation of common emergencies.

Subject Title Duration Total Hours Theory Practical Lecture + Practical	: FIRST AID & CPR : 13 – 24 Months : 30 : 10 Hours : 20 Hours : 1 Hour / Week
Method of Assessment	: Written, Oral, Practical

1. Importance of First Aid in Physiotherapy.
2. Examination of Vital Signs
3. First Aid in cardiac arrest.
4. First Aid in Respiratory failure.
5. First Aid in Burns.
6. First Aid in Electric shock.
7. First Aid in Drowning.
8. First Aid in Spinal cord injuries.
9. First Aid in Hypovolemic Shock.
10. First Aid in Poisoning
11. Instrumentation used in First Aid (First Aid kit).
12. First Aid in RTA.
13. Indication of CPR.
14. Assessment and technique of CPR.
15. Artificial ventilation.

Recommended Textbooks

1. *First aid in emergency – St-john. Ambulance Association.*
2. *Physiotherapy for burns & Reconstruction – Glassey.*
3. *Surgical & Medical Procedures for Nurses & Paramedical staff – Nathan.*
4. *First aid & management of general injuries & common ailments-Gupta & Gupta*

CONSTITUTION OF INDIA

Subject Title Duration Total Hours Theory Lecture	: CONSTITUTION OF INDIA : 13 – 24 Months : 30 : 30 : 1 Hour / Week
Method of Assessment	: Written

1. Meaning of the term -Constitution making of the Indian Constitution 1946-49
2. The democratic institution created by the Constitution Bicameral system of Legislature at the Centre and in the States.
3. Fundamental Rights and Duties…Their content and significance.
4. Directive Principles of States Policies The need to balance Fundamental Rights with Directive Principles.
5. Special Rights created in the Constitution for: Dalits, Backwards, Women and Children and the Religious and Linguistic Minorities.
6. Doctrine of Separation of Powers-----Legislative, Executive and Judicial and their functioning in India.
7. The Election Commission and State Public Service Commissions.
8. Method of amending the Constitution.
9. Enforcing rights through Writs: Certiorari, Mandamus, Quo warranto and Habeas Corpus.
10. Constitution and Sustainable Development in India.

Recommended Textbooks:

1. *J.C. Joharii: The Constitution of India—A Politico-Legal Study— Sterling Publication, Pvt. Ltd. New Delhi.*
2. *J.N Pandey: Constitution Law of India, Allahabad, Central Law Agency, 1998.*
3. *Granville Austin: The Indian Constitution—Corner Stone of a Nation— Oxford, New Delhi, 2000.*

INTRODUCTION TO TREATMENT

Subject Title Duration Total Hours Theory Lecture	: INTRODUCTION TO TREATMENT : 13 – 24 Months : 30 : 30 : 1 Hour / week
Method of Assessment	: Written, Oral

1. General Information regarding Hospital wards, Patients hospital records and Functioning of department in patient management and departmental clinical units

a. Physiotherapy OPD
b. Neurological Physiotherapy
c. Orthopaedic Physiotherapy
d. Developmental Pediatric Physiotherapy
e. Cardio-Pulmonary Physiotherapy (ICU, NICU and Post-Op ICU, Wards)
f. Health Fitness Physiotherapy- Obesity, Diabetic clinic, Life style modification clinic
g. Geriatric Physiotherapy
h. Industrial Physiotherapy and
i. Community Physiotherapy
j. Women's Health Physiotherapy, Incontinence clinic

2. History taking, assessment, tests, Patient communication, documentation of findings, treatment organization and planning/execution for intervention.
3. Record keeping and information retrieval.
4. Techniques of use of electrotherapy equipments on patients, monitoring of dosages and winding up procedure.
5. Introduction about standardized tests and scales used in various types of cases for assessment and interpretation.
6. Exercise therapy treatment organization and methods of application on various types of cases

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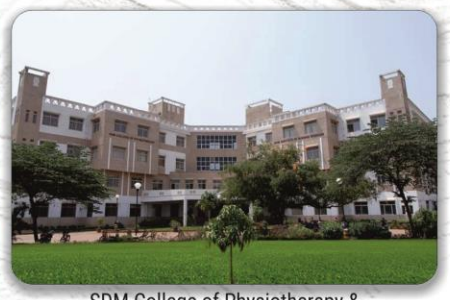

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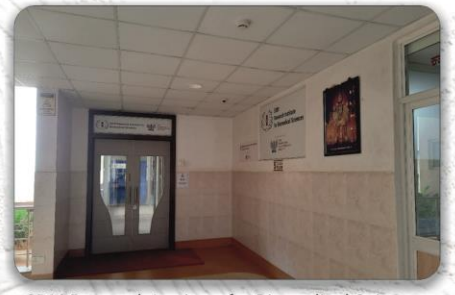

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Panoramic View of Campus