THE WEST BENGAL UNIVERSITY OF HEALTH SCIENCES

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Website: www.thewbuhs.org

Syllabus for

MASTERS OF PHYSIOTHERAPY PROGRAMME

DURATION - 2 YEARS

THE WEST BENGAL UNIVERSITY OF HEALTH SCIEN

Regulations for the MPT (Post graduate degree in Physiotherapy)

1. ELIGIBILITY AND ADMISSION PROCEDURE

Candidates who have passed B.Sc. (PT) / BPT degree/BPT Condensed degree (2 years) from this University or any other University in India or abroad recognized as equivalent by The West Bengal University of Health Sciences

No Candidate shall be admitted for the post graduate course unless the candidate has obtained and produced the eligibility certificate issued by The West Bengal University of Health Sciences. The candidate has to make the application to the University with the following documents along with the prescribed fee.

1. B.P.T./B.Sc (P.T.)/B.P.T. Condensed (2 years) provisional / degree certificate issued by the respective University.
2. Marks cards of all the University examinations passed.
3. Proof of SC/ST etc.

Candidates should obtain the eligibility certificate before the last date for admission as notified by the University.

2. REGISTRATION:

A candidate admitted to the course in any of the affiliated Institution of West Bengal University of Health Sciences, shall register to the University by a remitting the prescribed fees along with the application form for registration duly filled in and forwarded to the controller of Examinations of this University through the head of the affiliated Institutions with this stipulated date.

3. DURATION OF COURSE:

The period of certified study for the Master of Physiotherapy shall be a full time course and its duration shall extend over a period of 2 academic years for the award of the degree.

4. COMMENCEMENT OF THE COURSE: The course will commence on 1st August of every year.

5. SYNOPSIS OF DISSERTATION: should be submitted by six month from the date of commencement of the course.

6. COURSE OF STUDY:

The course of study, subjects and teaching schedule for 1st and 2nd year MPT Course is shown separately in table A & B.

TABLE - A 1st year MPT

SUBJECTS	TEACHING HOURS Theory	Practicals/ Clinicals	Total
Paper I –Basic Sciences			
A.			
i. Exercise Physiology	50		50
ii. Biomechanics & Pathomechanics	50		50
iii. P.T. Education practice & Education technology	50		50
B.			
iv. Biostatistics and Research Methodology	75	55	130
Paper II –Physiotherapy Modalities & Assessment			
i. Physiotherapy Modalities & Physical Assessment	100	120	220
ii. EMG & Nerve conduction studies	50	50	100
iii. Mobilization and Manipulation.	25	25	50
Clinical Training	~~800~~	800	
Seminars, Journal Clubs, Case presentations, Teaching skills, Field works etc.	-	150	150
Total Hours	~~400~~	1200	1600

TABLE – B 2nd Year MPT

SUBJECTS	TEACHING HOURS		
	Theory	Practicals/ Clinicals	Total
Paper III - Advanced Physiotherapy Management A			
i. Advanced Physiotherapy in Orthopaedics			
ii. Geriatrics Rehabilitation	100	200	300
iii. PT in Obstrectics and Gynecology			
Paper IV – Advanced Physiotherapy Management B			
i. Advanced Physiotherapy in Neurology — 50 hr	100	200	300
ii. Advanced Physiotherapy in Cardio-respiratory			
Paper V- Elective			
i. Elective Neurology	100	200	300
ii. Elective Sports			
iii. Elective Orthopaedic Physiotherapy			
Clinical Training		800	800
Seminars	-	150	150
			1850

7. METHOD OF TRAINING:

The post graduate course for MPT degree shall be on a full time training pattern with graded responsibilities in the management and treatment of patients entrusted to his / her care. Training should include involvement in laboratory, experimental work and research studies. The participation of students in all facets of educational process is essential. Every candidate should take art in seminars, group discussions, clinical rounds, case demonstrations, clinics, journal review meetings and other continuing education activities. Every candidate should be required to participate in the teaching and training programs of undergraduate students.

8. MONITORING PROGRESS OF STUDIES (Internal Monitoring)

It is essential to monitor the learning progress of each candidate through continuous appraisal and regular assessment. It not only helps teachers to evaluate students, but also students to evaluate themselves. The monitoring be done by the staff of the department based on participation of students in various teaching / learning activities. It may be structured and assessment be done using checklists that assess various aspects. Model checklists are given in table III to IX in section III which may be copied and used.

9. WORK DAIRY

Every candidate shall maintain a work dairy and record his / her participation in the training programmers conducted by the department such as journal reviews, seminars etc.

Special mention may be made of the presentations by the candidate as well as details of clinical or laboratory procedures, if any, conducted by the candidate. The work diary shall be scrutinized and certified by the Head of the Department and presented in the University examination.

PERIODIC TESTS

The college may conduct two tests, one of them be annual test at the end of the first year and the other at the end of the second year three months before the final examination. The test includes written theory papers, practical, viva voce and clinical in the pattern of university examination. Records and marks obtained in such tests will be maintained by the Head of the Department and sent to the University along with application form.

10. ATTENDANCE

A candidate is required to attend a minimum of 80% of training and of the total classes conducted during each academic year of the MPT course. Provided further, leave of any kind shall not be counted as part of academic term without prejudice to minimum 80% of training period every year. Any student who fails to complete the course in this manner shall not be permitted to appear for the University Examinations.

A. Teaching & Learning experience

(a) Journal Review meetings	-	Minimum six in two years
(b) Seminars	-	Minimum four in two years
(c) Clinical presentation	-	Minimum 25 cases in two years
(d) Special clinics	-	Minimum 20 in two years
(e) Inter departmental meetings	-	Minimum 5 in two years
(f) Community work, camps / field visits	-	Minimum four in tow years
(g) Clinical rounds	-	Minimum 250 in two years
(h) Dissertation work	-	Minimum 200 hours in two years
(i) Participation in conferences/ Presentation of papers	-	Minimum 2 in two years

(j) Teaching Activities – UG Teaching
(k) Learning Activities: Self Learning, Use of computers & library
(l) Participation in departmental activities:
(m) Any other – Specify (e.g. CME)

Rotation and posting in other departments if any – minimum 2 months in 1 speciality.

B. GRADED RESPONSIBILITY IN CARE OF PATIENTS (Structured Training Schedule for clinical & elective subjects only)

Table C

Category	I year MPT	II year MPT
O	20 Cases	20 Cases
A	20 Cases	30 Cases
PA	100 Cases	60 Cases
PI	20 Cases	50 Cases

Key O- Observes
A- Assisted a senior Physiotherapist
PA- Performed procedure under the direct supervision of a senior specialist.
PI – Performed Independently.

11. DISSERTATION

Every candidate pursuing MPT degree course is required to carry out work on a selected research project under the guidance of a recognized post graduate teacher. The results of such work shall be submitted in the form of dissertation.

The dissertation is aimed to train a graduate student in research methods and techniques. It includes identification of a problem, formulation of a hypothesis, search and review of literature getting acquainted with recent advances, designing of a research study, collection of data, critical analysis, comparison of results and drawing conclusions.

Every candidate shall submit to the Registrar (Academic) of the University in the prescribed proforma, a synopsis containing particulars of proposed dissertation work within 6 months from the date of commencement of the course on or before the dates notified by the university. The synopsis shall be sent through the proper channel.

Such synopsis will be reviewed and the university will register the dissertation topic. No change in the dissertation topic or guide shall be made without prior approval of the university.

The dissertation should be written under the following headings.

1. Introduction
2. Aims or objectives of study.
3. Review of literature
4. Material and methods.
5. Results.
6. Discussion.
7. Conclusion.
8. Summary
9. References.
10. Tables
11. Annexure.

The written text of dissertation shall not be less than 50 pages and shall not exceed 75 pages excluding references, tables, questionnaires and other annexure. It should be neatly typed in double line spacing on one side of paper (A4 size, 8.27" x 11.69") and bound properly. Spiral binding should be avoided. The guide head of the department and head of the institution shall certify the dissertation.

Four copies of dissertation thus prepared shall be submitted to the Registrar (Evaluation) three months before final examination on or before the dates notified by the university.

The examiners appointed by the university shall value the dissertation. Approval of dissertation work is an essential precondition for a candidate to appear in the university examination. Two evaluators (examiners) apart from the guide shall value the dissertation. One of the evaluator is external from outside The West Bengal University of Health Sciences. The other one shall be internal from the another college affiliated to The West Bengal University of Health Sciences. Acceptance from any one evaluator other than the guide will be sufficient for a candidate to be eligible to take up the examination.

12. GUIDE

The academic qualification and teaching experience required for recognition by this university for a postgraduate teacher for guiding MPT candidates shall be:

1. M.Sc. (PT) / MPT staff working on a full time position at an institution recognized by The West Bengal University of Health Sciences.
2. The age of teacher/guide shall not be exceeding 65 years.
3. The guide student ratio shall be 1:2 (This criteria may be relaxed for maximum period of 3 years)
4. Elective subject will be taught by a MPT qualified person with same subject as elective.

CHANGE OF GUIDE

In the event of a recognized guide leaving the college for any reason or in the event of death of guide, guide may be changed with prior permission from the university.

13. SCHEDULE OF EXAMINATION

The examination for MPT course shall be held at the end of each academic year. The university shall conduct two examinations in a year at an interval of 4-6 months between 2 examinations. Not more than 2 examinations shall be conducted in an academic year. No candidate will be eligible to sit for 2nd year examination of the University before passing the 1st year subjects. A supplementary candidate will have to appear in all papers of the examination.

14. SCHEME OF EXAMINATION

Written examination (Theory)
A written examination consisting of 5 question papers, each of three hours duration and each paper carrying 100 marks. Recent advances in physiotherapy may be asked in any or all the 5 papers.
The paper V will be for Elective subject in the branch chosen by candidate.

Table D Particulars of Theory question paper & distribution of marks shown

Sl. No.	Subject	Marks		Total
		Theory	Practical/Viva voce	
Paper –I	Basic Sciences	100	--	100
Paper – II	Physiotherapy Modalities & Assessment	100	140/60	300
Paper – III	Advanced Physiotherapy Management- A	100	140/60	300
Paper-IV	Advanced Physiotherapy Management – B	100	140/60	300
Paper-V	Elective	100	140/60 +50 (Dissertation)	350
Grand total				1350

Clinical Examination – 200 marks

It should be aimed at examining clinical skills and competency of the candidates for undertaking independent work.

Viva-Voce 60 marks.

Viva-Voce examination shall aim at assessing depth of knowledge, logical reasoning, confidence and oral communication skills. Candidate will present dissertation work during viva-voce. However no marks shall be assigned. The marks of Viva-Voce examination shall be included in the clinical examination

EXAMINERS

There shall be 2 examiners in each subject. One of them shall be shall external from outside the university and the other shall be internal, preferably from the same college or as decided by the University. Experience: At least 5 years teaching experience after passing MPT . This criteria may be relaxed for a maximum period of 3 years.

15. CRITERIA FOR DECLARING AS PASS IN UNIVERSITY EXAMINATION

A candidate shall secure not less than 50% marks in each head of passing which shall include (1) Theory (2) practical including clinical & viva-voce examination.

A candidate securing less than 50% of marks as described above shall be declared to have failed in the examination. Failed candidate may appear in any subsequent examination upon payment of fresh fee to the Registrar (Evaluation).

Declaration of distinction

A successful candidate passing the University examination in first attempt will be declared to have passed the examination with distinction, if the grand total aggregate marks are 75 percent and above in Part-I & Part-II taken together. Distinction will not be awarded for candidates passing any part of the examination in more than one attempt.

TYPE OF QUESTIONS IN WRITTEN PAPER

Theory – 100 Marks each paper

1. Long Essay (2 questions) - 2 x 20 = 40 Marks
2. Short Essay (6 Questions) - 6 x 10 = 60 Marks

Practical Examination – 200 Marks

Note: All cases for clinical examination should be on patients and not on models.

Paper –II, III & IV

1. General Long case (2) - 2 x 40 = 80 Marks
2. Short cases (3) - 3 x 20 = 60 Marks
3. Viva-Voce on all cases = 60 Marks

Paper – V

1. Elective Long case (2) - 2 x 40 = 80 Marks
2. Short cases (3) - 3 x 20 = 60 Marks
3. Viva –Voce on all cases = 60 Marks.
4. Dissertation =50 Marks

29.4.10

- ~~[illegible]~~ Exam format
- Internal mark / tests.
- PT Neuro & Cardio
- Regular postings
- Intern posting
- Proper classrooms. (Need of 6 classrooms for 3 courses & 2 batches.)

TO DO

- Proposal for change in syllabus
- ~~[illegible]~~ for change postings
- Educational visits
- UG teaching.
- Publications
- Common classes ~~[illegible]~~ PO/OT
- ID Card
- Purchase.

15 x 2 = 30
10 x 2 = 20
5 x 5 = 25
75 + 25 Internal = 100

Ist year MPT
Paper I- Basic Sciences
Section - A

1.Exercise Physiology

Basic Physiology:
Muscle: Muscle and its contraction, Architecture of skeletal muscle, Type of muscle fiber, Response to exercise.
Blood and Circulation: Cardiac cycle, Pressure during cardiac cycle, Haemodynamics, Pressure, Flow and resistance, Transport mechanisms, Regulation of circulation during exercise, Cardiac output & O_2 uptakes, Cardio vascular response to exercise.
Respiration: Lung compliance, Airway resistance, Pulmonary ventilation at rest and during exercise, Diffusion in lung tissues, Ventilation & Perfusion, Regulation of breathing, Exercise and its effect on respiratory system.

Energy System:
ATP-CP, Glycolysis, Aerobic energy system, Metabolism of fat, carbohydrate, protein, **Evaluation and training** of various energy system, Test of maximal anaerobic power, Test of maximal aerobic power – measurement of oxygen uptake, Treadmill test, Bicycle ergometer test, Principle and protocol of aerobic training, **Adaptation** to training
Physical Training:
Training principles, continuous vs. intermittent exercise training methods, Disuse, Isometric strength training, Dynamic strength training. Endurance training, Retraining, Recovery after exercise, Mechanical efficiency technique, Body composition, Stretching, Plyometrics, Psychological aspects, Muscular soreness.
Applied work Physiology:
Factors affecting sustained physical work, Assessment of workload in relation to work capacity, Measurement of oxygen uptake in a typical work situation, Assessment of load exerted on specific muscles. Classification of work,
Fatigue:
General Physical fatigue, Local muscular fatigue, Shift work.
Physical Performance:
Factors governing the selection of fuel for muscular exercises, Food for the athlete, Energy balance, Regulation of food intake, Ideal body weight, Obesity, Slimming diets, Optional supply of nutrients.
Factors affecting performance:
High altitude-limiting factors, Sports, Adaptation of high altitude, Aerobic & Anaerobic power, metabolic effects. **Ergogenic aids -**Effect of Anabolic steroid, Growth hormone, Amphetamine, Caffeine and Doping.
Exercise for special population:
Diabetic mellitus, Hypertension, Cardio vascular disease.

2. Bio Mechanics &Pathomechanics

Biomechanics of human motion:
General principles. Force, Axis and Planes, Center of gravity, Levers. Classification of Force systems, the linear force system, Resultant force, Equilibrium, Parallel forces in one plane, Composition and Resolution of forces, Concurrent force system, Friction and Shear force.

Biomechanical property of bones:
Elasticity of bones, Stress, Resistance of bone compression, Shearing and bending stress, Torsion, Fatigue fracture, Aging of bone.

Biomechanical property of articular cartilage:
Viscoelasticity, Loading response, Creep, Stress relaxation, Tension, Shear on cartilage, Lubrication, Wear of cartilage.

Biomechanical property of muscles:
Force production, length- tension, load-velocity, the effect of pre stretching, Temperature, Fatigue.

Biomechanical property of ligament, tendon:
Loading response, Viscoelasticity behaviour, Ligament failure, Tendon injury mechanism Factors affecting properties of tendon & ligament.

Shoulder Complex:
Review anatomy, Kinetics and kinematics, Codman's paradox, Instantaneous center of rotation, Dynamics of shoulder complex, Static and Dynamic stabilization of glenohumeral joint, integrated function of shoulder complex.

Pathomechanics of paralytic shoulder:
Paralysis of Trapezius, Serratus anterior, Rhomboids, Deltoid, Supraspinatus Infraspinatus, Paralysis of the Subscapularis, Paralysis of Pectoralis major, Paralysis of Lattisimus dorsi.

Elbow complex:
Review anatomy, Coaptation of the articular surfaces, Kinetics and kinematics, Efficiency of flexor and extensor muscles, Dynamics of superior and inferior Radio-ulnar joint, Position of function and compensatory movements.

Pathomechanics of Elbow:
Paralysis of extensors, flexors, Tennis elbow, Golfer's elbow, Cubitus valgus and varus.

Wrist and hand:
Review anatomy, Kinetics and kinematics, Dynamics of the carpals, Lunate pillar, Scaphoid pillar, Scaphoid-Lunate couple, Functional pattern of wrist motion,
Architecture of the hand, Ligaments, Tunnels, Synovial sheaths of the flexor tendons. Mechanism of finger flexion, Extensor mechanism, influence on MCP, IP joints, Prehension-Power grip, Precision handling.

Pathokinetics of paralytic disabilities:
Paralysis of wrist Extensors & Flexors. Paralysis of finger extensors & flexors, Paralysis of interossei & lumbricals. Position of function and immobilization.

Hip:

Review anatomy, Architecture of femur, Muscular and bony factors affecting stability of hip. Kinetics and kinematics, Muscle function in unilateral and bilateral stance, Joint reaction, shear, compression force. Reduction of muscle force, Use of cane.

Pathomechanics of Hip joint:
Coxa valga, Coxa vara, Pathomechanics of the dysplasia of hip joint. Paralysis of hip Abductors, Adductors, Extensors and Flexors, Internal and External rotators. Paralytic dislocation.

Knee joint:
Review anatomy, Kinetics and kinematics, Transverse stability of the knee, Anterior-posterior stability of the knee, Mechanics of menisci and cruciate ligament. Muscle dynamics of the knee joint.

Pathomechanics of Knee joint:
Genu valgum – Static factors, Dynamic factors, Static Genu varum, Static Genu recurvatum, Mechanics of Tibial torsion.
Pathomechanics of the Paralytic knee: Extensor paralysis, Flexor paralysis of the knee.

Ankle and Foot:
Review anatomy, Kinetics and kinematics, Anterio-posterior stability of the ankle and factors limiting dorsiflexion and plantar flexion. Transverse stability of ankle, tibiofibular joints. Arches of foot-architecture of plantar vault, static and dynamic changes of arches of foot, Dynamic changes related to the medial and lateral rotation of the leg on the foot. Axis of the joint of the foot, Internal architecture of the foot, ligamentous reinforcements.

Pathomechanics of the foot and ankle:
Muscle paralysis and deformities of the Foot.
Pes cavus, Pes planus, Pronated foot, CTEV, Instability of subtalar joint, Hallux valgus, Hallux varus, Medial and lateral ligament injury, Talipes calcaneus, Talipes equinus.

Vertebral column:
Review of anatomy, Kinetics and Kinematics of Cervical, Thoracic, Lumbar and Sacro-iliac joints. Stability and Mobility of vertebral column. Normal and abnormal biomechanics of respiration.
Pathomechanics of Kyphosis, Scoliosis, Kyphoscoliosis.

Posture:
Postural control, Kinetics and Kinematics of posture, analysis of posture

Gait:
Normal gait cycle, Kinetics and Kinematics, Anatomical variation of normal gait.

3. P.T. Education Practice & Education Technology

Facility Planning
P.T. Department management-policies and procedure-recruitment, interview, orientation, probationary period, salary hours of work, leave facilities, retirement, referred policy, equipment maintenance records, statistics functioning, department planning design and construction, planning and innovation, growth and expansion type and size of hospital, services and activities space requirements, number of functional area elements,

occupancy time gymnasium, patient waiting areas, storage facilities, lighting floor surfaces.

Physical therapy and Law:

Medico logical aspects of physical therapy, liability, negligence, malpractice, licensure, workman's compensation.

P.T.Ethics:

Morals and ethics, Ethical analysis or moral problems, Ethical issue in physical therapy, Ethical rules, Aims and objectives of Physiotherapy.

P.T. Education

Aims, Philosophy and trends and issues in education including:

Educational aims, Agencies of education, Formal and informal education
Current issues and trends in education.

Concepts of teaching and learning:

Theories of teaching, Relationship between teaching and learning, Psychology of education, Dynamics of behaviour, Motivational process of learning, perception, individual differences, intelligence personality.

Curriculum:

Curriculum committee, Development of a curriculum for P.T, Types of curriculum, Formation of philosophy, objectives, course objectives, Placing, course placement, time allotment, Selection and organization of learning experience, Master plans of courses, Master rotational plan – individual rotational plan, Hospital and community areas for clinical instruction, Clinical assignments, Current trends and curriculum planning.

Principles and methods of teaching:

Strategies of teaching, Planning of teaching, Organization, writing lesson plans,
A. V. aids, Teaching methods-socialized teaching methods.

Measurement and Evaluation:

Nature of Measurement of education, meaning, process, personnel, standardized, non-standardized tests. Steps of constructing a test, measurement of cognitive domain, assessment techniques of affective, psychomotor domains, administering scanning and reporting.
Faculty development.

Section - B

Biostatistics and Research Methodology

Introduction -Uses of Statistical Methods in PT Research, Measurement scales, variables and their measurement.

Descriptive statistics:

Statistical data, Tabulation, Presentation of data in Diagrammatic and Graphic form.
Measures of Central Tendency and Dispersion. Variance and Standard deviation.

Inferential statistics:

Experimental research design:Parametric test-Related T, Unrelated T, One way anova for related, unrelated design. Non parametric test-McNemar test, Friedman test, Chi-squared.
Correlation design: Parametric test- Pearson test, Linear regression.

Non parametric test- Spearman test, Kendalls coefficient test

Research process and methods:

Scientific methods in PT research, Steps in research process, Review of literature,
Selection and statement of problem, Formulation of hypothesis and testing, Types of error in research study, Pilot study. Research design, principles and methods**.**

Sampling:

Population and samples, Methods of sampling.

Data Collection:

Data collection methods, scales and techniques of data collection. Reliability, Validity and criteria for assessing, Measuring the tools. Analysis and interpretation of research data. Role of computers in Research Process for Physiotherapist.

Research report:

Preparing the Research report, Mechanics/ Writing the report, Documentation, The Details of the study, Arrangement of report, Presentation of study for discussion.

Paper II- Physiotherapy Modalities

1.Electrotherapy

Short wave Diathermy (SWD):

Physics, biophysical and biochemical effects of SWD, therapeutic effects of SWD, indications, dangers, precautions, application of inductothermy.
Pulsed Shortwave Diathermy – Biological effects, Indications, Contraindications, Techniques of applications, Advantages and Disadvantages.

Microwave Diathermy (MWD):

Physics of microwave diathermy, Biophysical, Biochemical Therapeutic effects of MWD, Dosage, Indications, contraindications, techniques of MWD, Dangers, Precautions, Method of application advantages and disadvantages. Pulsed microwave diathermy.

Ultrasonic Therapy:

Medical frequencies of Ultrasound, Production of Ultrasound, Physical phenomena of Ultrasound, Pulsed Ultrasound, Physiological effects of Ultrasonic energy, Indications, Contraindications, Dangers, Coupling Media, Dosage, Methods of Application, Technique of application in contact method, Subacquatic method uses.

Ultraviolet Therapy:

Ultraviolet for medical use, Physiological effects, Therapeutic effects, Dosage-calculation of dosage, progression of dosage, Indications, PUVA regime, Contraindications, Applications, Using Air-cooled lamps, Kromayer lamp.Dangers.

Infrared Radiation:

Physics, Apparatus for infrared heating, Physiological effects, Indications, Contraindications, Technique of application, Advantages and disadvantages.

Iontophoresis:

Direct current, strength of solution, common drugs in usage today, Apparatus use, Indications, Contraindications, Dosage methods-In contact, subaquatic, Iontophoresis techniques-Treatment of Hyperhydrosis, calcific tendinits, allergic vasomotor rhinitis-side effects, contraindications and different techniques.

Faradic Stimulation:
Faradic type currents, Physiological effects, Indications, Contraindications, Faradic stimulation in weak pelvic floor muscles, Bell's palsy, Reeducation of limb oedema, disuse atrophy, reduction of muscles of foot.

High voltage Pulsed Galvanic Current:
Parameters, Types, Physiological & Therapeutic effects.

Functional Electrical Stimulation:
Parameters, Physiological & Therapeutic effects.

Didynamic Currents:
Physiological effects, Indications, Contraindications, Methods of Application , Dosage.

Interferential therapy (IFT):
Interferential currents, Principles of Interferential Therapy, Physiological effects, Uses.

Transcutaneous Electrical Nerve Stimulations (TENS):
Principles, 'pain gate' theory, physiological effects, Therapeutic effects, Obstetrical Tens, Cancer pain and Tens, Electrode placement, Post operative pain relief by TENS, TENS for non-healing fracture.

Laser Therapy:
Cold laser production, Physical Characteristics, Physiological Effects, Dosage, Pain control, Indications, Contraindications, Trigger Points.

Cryotherapy:
Cold Packs, Ice Massage, Ice Towels, compressive cryotherapy, vapocoolant sprays-Therapeutic effects, uses in sports medicine, Cryokinetics, Cryostretch, Spasticity management, Therapeutic uses.

Paraffin Wax Bath:
Methods of Application-Immersion, Brushing, Equipment required, Physiological and Therapeutic effects, Uses and Precautions.

Fluidotherapy:
Equipment required, Methods of Application, Physiological Effects, Therapeutic Uses and Benefits of the Therapy.

Hydrotherapy:
Physical laws of water, Physiological Effects of water, Equipment, Environments, Hygiene, Treatment time and temperatures, Safety considerations, Advantages and disadvantages, Aquatic therapy, Bad ragaz technique.

Hot packs:
Hydrocollator Packs, Temperature maintenance, Physiological effects, Methods of application, Uses, Advantages and disadvantages.

Contrast Bath:
Equipment used, Method of application, Indications, Contraindications, Physiological effects, Therapeutic uses.

Traction:
Types of Spinal traction – Continous, Intermittent, Manual, Auto traction, Gravity Lumbar traction, Indications for Spinal Traction, Contraindications, Effects of traction, Mechanical Lumbar traction, technique, Cervical traction technique.

Mechanical External Compression:
Causes of oedema, Pathophysiology of oedema, Types of oedema, Methods of external compression, Intermittent compression, Elastic support bandaging, Gradient support, Massage, Exercise, Physiological Effects, Therapeutic Uses, Patient Education.
Spasticity: Mechanism, Muscle Spindle, and Methods of Management.
Pain: Types, Pathway, Current theories, Assessment.
Clinical decision making in Electrotherapy.

2. Electromyography and Nerve Conduction Studies

Instrumentation-Apparatus, Surface electrodes, Needle electrodes-Types, Amplifier, Stimulator, Digital processing, Electrical safety.
EMG Examination Muscle at rest, Insertional activity, Spontaneous activity, Voluntary activity. Normal motor unit action Potentials, Abnormal motor Unit. Quantitative methods in EMG, Action potential measurements in motor unit population.
EMG Biofeedback:
Biophysical principle, Technique, Clinical application for various conditions.
Motor and Sensory Nerve Conduction study:
Physiology of nerve conduction, General factors affecting nerve conduction, Nerve stimulation-latency, Amplitude, Nerve conduction velocity, Special conduction techniques-H wave and F wave in proximal conduction studies.
Standard motor conduction techniques-long thoracic nerve, radial nerve, ulnar nerve median nerve, femoral nerve, sciatic nerve, peroneal nerve, tibial nerve.
Standard sensory conduction techniques, radial nerve, ulnar nerve, median nerve, lateral cutaneous nerve of thigh, saphenous nerve, peroneal nerve, tibial nerve, sural nerve.
Somatosensory evoked potentials- General principles, Electrode placement, Polarity methodology for upper extremity studies, Methodology for lower extremity studies, use of Sep's in Thoracic outlet Syndrome, Brachial plexopathy, use in intra operative monitoring, use of Sep's for determining prognosis & Diagnosis.

3. Mobilization and Manipulations.

Evaluation, Principle concepts and Techniques of following Mobilization methods:
McKenzie, Mulligan, Maitland, Kaltenborn, Myofacial release, Muscle energy techniques, Neuro mobilization.

4.Physical Assessment Detail physiotherapeutic assessment procedure for musculoskeletal, neurological, cardiorespiratory, pediatrics, geriatrics, obstetrics & gyneacology and sports.

5. Recent advance: recent advance in the above mention field.

Second year MPT
Paper III- Advance PT Management -A

1. Physiotherapy in Orthopeadics

Embryology and Anatomy of Musculoskeletal system.
Regional Assessment of Spinal and Peripheral joints.

Upper limb fractures and Dislocations:

Describe in detail the fracture humerus, forearm bones, colle's fracture, hand bones and their conservative, surgical and P.T. Management and their complications. Total shoulder replacement and P.T. Management, Anterior dislocation of shoulder and reconstructive procedures-Putti Platt, Bankart repair, Magnusan, Stalk, Bristow and its P.T. Management.

Sprains and Muscle Strains:

Rotator cuff injuries, Bicipital tendinits, Supraspinatus tendinitis, Tennis Elbow, Trigger Finger, Periarthritis shoulder-P.T. Management.
Thoracic-outlet Syndrome, shoulder hand syndrome, Carpal tunnel syndrome and their P.T. Management.

Lower Limb fractures and Dislocations:

Describe in detail about the fracture neck of femur and their complication, Fracture trochanter and their classifications, sub trochanteric fracture, Fracture shaft of femur, Supracondylar fracture and Intercondylar fracture of femur and its surgical and P.T. management.
Describe in detail the Patella fracture, Patellectomy, Intercondylar fracture of shaft of tibia, Pott's fracture, Calcaneal fracture, Metatarsal fracture and its surgical and P.T. management.
The following operative procedure and its P.T. management should be studied, Total hip replacement, Bipolar endoprosthesis, Hemiarthroplasty, Richard's compression plate technique, Jewett Nail Fixation, Total knee replacement, ACL reconstruction, Menisectomy.

Following conditions and its P.T. Management:

Congenital dislocation of hip, Slipped capital femoral epiphysis, Avascular necrosis of femoral head, Coxa vara, Coxa valga, Anterior retroversion, Posterior and Anterior dislocation of hip, Perthe's disease, Chondromalasia patellae, Recurrent dislocation of patella, Forefoot valgus, Forefoot varus, Tarsal tunnel syndrome and its surgical and elaborate PT management.

Spinal fractures and Dislocations:

Clinical features, following fracture of vertebrae, its conservative management and surgical management such as steffi plate fixation, Harrington's rod instrumentation. Describe the P.T. management following fracture spine.

Arthritis:
Affections of cervical spine and its P.T. management, Anatomy of articular cartilage, Osteoarthritis- Its clinical features and its P.T. Management, Tibial Osteotomy, Total knee replacement and its P.T. management. Rheumatoid arthritis- its clinical features and its P.T. Management.

Deformities of the spine:
Scoliosis, Kyphosis, Lordosis- Type, Measurement, Braces, Operative correction and its P.T. Management.

Brachial plexus injuries:
Its surgical management, nerve graft and its P.T. management, Tendon transfers, re-education, EMG- Biofeedback, splinting and P.T. management

Affection of the Vertebral column:
Spondylolysthesis- Pathology, Surgical and P.T.management.
IVDP- Pathology, Traction, Surgery, P.T.management, Back care. Lumbar spondylosis- Pathology, X ray findings, P.T.management. Pott's paraplegia- Taylor's brace, Decompression surgery.

Amputation:
Principles of Amputation, Levels of amputation, Immediate post surgical prosthetic fitting, P.T. aim and treatment, Stump management, Types of prosthesis, Prosthetic training, Gait deviations, Check-outs.

2.Geriatric Rehabilitation.

Physiological changes of various system in ageing, Principles of Geriatric Rehabilitation, Role of Physical Therapist in Geriatric Rehabilitation, Diabetic and Geriatric Patient, Rheumatoid arthritis and Osteoarthritis in elderly, Fracture in elderly, Pathological Fracture, Osteoporosis, Vertebral Fracture, Geriatric amputee, Lumbar canal stenosis, Pagets disease, Stroke management, Prevention of cardio pulmonary deconditioning, Alzheimer's disease, Dementia.

3. Obstetrics and Gynaecology

Basic Anatomy and Physiology of Pelvis and Reproductive organs. Endocrine physiology related to Reproductive Medicine. Physiological changes during Pregnancy.
Musculo-skeletal changes during pregnancy and adaptation of the mother, Importance of Prenatal exercise, Stages of Labour, Breathing exercise during Labour.
Changes after delivery, Weak pelvic floor muscles, its significance and exercises
Urinary incontinence, assessment, Management
Pain- Musculo-skeletal pain during Pregnancy. Pain during delivery and pain relief.
Post-natal exercise, Conditioning exercises.
Maintenance of Posture during Pregnancy and Breast-feeding.
Psychological and emotional changes and coping with the demands of newborn.
Exercises in non-pregnant state.

Paper IV- Advanced P.T Management – B

1. Physiotherapy in Neurology

Anatomy of Cerebrum, Cerebellum and Spinal cord, Disorders of motor system, Reflexes, Ageing of Nervous system, Physiology of CSF, Circulation, Absorption, Hydrocephalus-Treatment, Ventriculi peritoneal shunt, Ventriculi arterial shunt-P.T.management.

Intracranial Neoplasm:

Gliomas, Meningiomas, Neuromas, Angiomas, Craniopharyngiomas, Pituatary-Adenomas, Surgical management & P.T. management.

Pyogenic infections of CNS:

Bacterial meningitis, Brain abscess, Tuberculosis Meningitis, Neurosyphilis- Clinical features, Pathophysiology, Medical Management, Surgical & P.T. management.

Viral infections of CNS:

Poliomyelitis, Viral encephalitis, subacute sclerosing encephalitis, AIDS- clinical features Pathophysiology, Medical Management, Surgical & P.T. Management.

Cerebro-vascular Diseases:

Stroke syndrome, Ischaemic stroke, Infarction, Thromboembolic stroke, Haemorrhagic stroke, Transient Ischaemic attacks- Clinical features, Pathophysiology, Medical Management, Surgical, Carotid endartectomy & P.T. management.

CT Scan, MRI, carotid angiography, SPECT Intra-cranial haemorrhage, Arterio-venous malformations of the brain, Clinical features and PT management.

Metabolic Disorders of Brain:

Hypoxic encephalopathy, Hypoglycaemic encephalopathy, Hepatic encephalopathy-Clinical features, Pathophysiology, Medical Management and PT management.

Degenerative Disease of Nervous System:

Parkinson's Disease- Clinical manifestations, Pathophysiology, Medical Management, Surgical treatment, PT management. Motor neuron disease, Amyotrophic lateral sclerosis, Progressive bulbar palsy, Progressive muscular atrophy- Clinical picture, Pathophysiology, Medical Management, and PT management.

Cerebral Palsy:

Causes, Classification, Types, Reflex, Activity at different levels, Assessment of developmental milestones from birth, Deformities.

Management: Lifting, Carrying, Positioning, Orthopeadics surgeries in CP child, Equipments used for CP child.

Treatment Techniques: NDT (Bobbath), Roods approach, Vojta techniques, Home programme.

Spinabifida:

Incidence, Assessment of Neonate Spinabifida occulta, Types of lesion, Deformity, Bladder management. Surgical and P.T.Management.

Polyneuropathy:
Post-infective Polyradiculo Neuropathy, Aetiology, Pathology, Signs & Symptoms, Prognosis, Medical Management and PT management.

Diabetic Polyneuropathy
Aetiology, Symptoms, Signs, Diagnosis, Prognosis and PT management.

Hereditary sensory motor neuropathy:
Types, Medical Management and PT management.

Disorders of spinal cord:
Compression of the spinal cord- Neoplasm of the vertebral column, IVDP, Extradural or epidural abscess-Signs & Symptoms, Myelography, CT scan, surgical treatment, PT management and Rehabilitation.

Syringomyelia:
Aetiology, Pathology, Clinical manifestation, surgical treatment, Decompression, Laminectomy, ventriculiatrial shunt, PT management, Spasticity management, Orthoses, pressure-sore management, education.

Disorders of Muscle:
Myasthenia gravis- Aetiology, Classification, Signs & Symptoms, Prognosis, EMG picture, Thymectomy, Medical Management, PT management.
Eaton-Lambert syndrome.
Dermatomyositis- Clinical features, Enzymes level, Muscle biopsy, Medical Management and PT management.

Myotonic disorders:
Myotonia congenital, Dystrophia myotonic, Paramyotonia congenita- Clinical features, Pathology, Medical Management & PT management.

Progressive muscular dystrophy:
Classification, Etiology.
Duchenne Muscular Dystrophy- Clinical presentation, Pathology, Enzymes level, Muscle biopsy, EMG picture, Orthotic management, PT management.
Becker muscular dystrophy: Clinical presentation, deformities and PT management.
Limb-girdle muscular dystrophy- Clinical features, Muscle biopsy, EMG, PT management.
Facio-Scapulohumeral-muscular dystrophy: Clinical presentation, Incidence and P.T management.

Multiple sclerosis:
Pathology, Aetiology, Predisposing factors, Motor, Sensory symptoms, Prognosis, Diagnosis, MRI, CT scan, Evoked potential tests, CSF examination, PT management in minimal disabled, Moderate disabled & severely disabled.

EMG, Motor Units Potential in various conditions
Motor neuron disease, Hereditary motor neuron diseases, Poliomyelitis, Muscular dystrophies, Inflammatory myopathies, Congenital myopathies, Metabolic myopathies.

Peripheral Neuropathies:
Nerve conduction changes in peripheral neuropathy, EMG changes in peripheral neuropathies. Hereditary neuropathies, Toxic neuropathies, Idiopathic neuropathies, Guillain-Barre Syndrome, Chronic Polyneuropathy.

Nerve Trauma and compression Syndromes:
Nature and effects of nerve injury- Course and Prognosis, EMG, NCV changes- Brachial plexus lesions, Entrapment neuropathies- Median nerve (Carpal Tunnel Syndrome), Ulnar nerve (Cubital Tunnel Syndrome), Radial nerve, Meralgia Parasthetica, Tarsal Tunnel Syndrome, Facial nerve-Electrical stimulation, Blink reflex.

2. Physiotherapy in Cardio-Respiratory Disorders

Cardio-Respiratory assessment-Inspection, Palpation, Percussion & Auscultation, chest movement, Chest expansion, Breathing pattern.
Chest X- rays, Acute respiratory failure-Minute, Hypoxemia, Respiratory failure, Respiratory abnormalities (management), Endotracheal Intubation, Tracheostomy, Mechanical ventilation, Oxygen toxicity, PEEP, Bronchial hygiene, Breathing exercises, Physical physiotherapy, oxygen therapy.
Neonates with respiratory diseases:
Anatomical & Physiological differences in neonates, Pulmonary problems secondary to immaturity, Neonatal distress, Asphyxia management, Broncho-pulmonary dysplasia, Nikity- Wilson syndrome, Bronchial stenosis, Chest physical therapy, Positioning manual percussion & vibration, Airway suctioning, Bronchial Drainage at home, Suctioning at home.
Children's with respiratory dysfunction:
Developing lung, developmental delay, COPD, Asthma, Cystic fibrosis, Immunological deficiencies, Bone marrow transplantation, Pediatric AIDS, Pertussis, functional & developmental assessment, Bronchial drainage, Percussion, Vibration and shaking, coughing techniques, forced expiratory techniques (FET), Autogenic drainage (AD) techniques, Expiratory pressure therapy, Postural exercise, Treatment precautions, Home care, Mechanical Percussor & Vibrators, Role of physiotherapy in pediatric OP clinic, Exercise testing, Exercise prescription.
Respiratory muscles:
Respiratory muscle mechanics, Respiratory muscle blood flow, Determinants of respiratory muscle fatigue, Respiratory muscle function in disease, Effects of training programme on pulmonary function.
Mobilization:
Effects of immobilization, Methods of patient mobilization, Standing, Ambulating, Equipment used for mobilization.
Adjuncts to chest physiotherapy:
Humidification, Nebulization, Mechanical Nebulizer, Ultrasonic Nebulizer, IPPB Aerosol delivery, (Installations and Complications).
Bronchodilators, Mucolytic / Aerosols, Blow bottles, Incentive Spirometry.
Peripheral vascular disorders (PVD):
Physiology, Flow controls, Arterial pathological conditions, Nervous pathological conditions, Lymphatic pathological conditions. (Risk factors of all the Pathological conditions mentioned under PVD).
Evaluation–Arterial evaluations, Venous evaluation, Lymphatic evaluation-Doppler study

Treatment - Arterial treatment, Winsor & Weyman Scale, Burger's exercises, Hyperbaric oxygen, Cold laser. Venous treatment - Electrical Stimulation. Lymphatic treatment-intermittent compression.

Chronic Obstructive pulmonary disease:

Emphysema, Chronic bronchitis, Bronchiectasis, Asthma, Cystic fibrosis, Pathophysiology of COPD, Exercise testing, Airway clearance, O_2 therapy, Pursed lip breathing-exercises.

Suctioning & coughing:

Cough mechanism, Methods of cough stimulation, Tracheal suctioning complications, lavage, and bagging.

Atherosclerosis:

Coronary artery supply, Risk factors & development of coronary diseases, heamodyanamics of coronary artery flow in normal and diseased states.

Cardiac rehabilitation:

Following Myocardial Infarction, Exercise protocol, Ambulation, Training program, Coronary artery Bypass graft (CABG), Metabolic equivalents, Coronary Angioplasty, hazards, Prognosis and Percutaneous Coronary angioplasty.

Congenital heart diseases (CHD):

Tetralogy of fallot, Atrial septal defect, Ventricular septal defect, Patent ductus arteriosus, Total anomalous pulmonary venous connection, Partial anamolaus pulmonary venous connection, Single atrium, Atrial atresia, Pulmonary atresia, Tricuspid atresia, Coarctation of aorta, Double outlet right ventricle, Transposition of great vessels, Transposition of heart- (Clinical features of all conditions in CHD), X-ray finding, ECG, Cardiac catheterization, Surgical management, Prosthetic cardiac values, Balloon Mitral valvotomy, valve replacement, Open valvotomy- (PT management of all the conditions in CHD).

Diseases of the myocardium:

Hypertrophic cardiomyopathy, Contractile Cardiomyopathy- Clinical features, Pathology, ECG, Endomyocardial biopsy, Cardiac transplantation and their PT management.

Tumours of the heart:

Primary Cardiac tumours, Metastatic cardiac tumours, Pathology, Clinical presentation and its summarized surgical treatment.

Trauma to the chest:

Pneumothorax, Haemothorax, Fracture ribs, Lung contusion, Injury to great vessels, Clinical presentation, Management and PT management.

Describe PT management of Lung segmental resection, Lobectomy, Pneumonectomy, Open lung biopsy, Bilobectomy & Tracheostomy

Describe Conservative & PT management of the following:

Bronchiectasis, Lung abscess, Bronchopneumonia, Destroyed lung carcinoma of the lung, Pulmonary embolism, Pneumoconiosis, Asbestosis & Interstitial lung disease, pre-operative & post-operative management.

Describe underwater seal intercostal drainage, Rib resection Decortication, Window operation and Omentoplexy- (PT management for the same).

Cardio-pulmonary resuscitation:

Cardiac arrest, Ventricular fibrillation, Resuscitation, Closed & Open Cardiac management, Artificial respiration, Emergency medications.

Investigations:
Pulmonary function tests, ECG, Echocardiography, Cardiac Catheterization, Stress testing, coronary angiography, Acid base gases, lipid profile, Chest x-ray and Exercise tolerance test, CT Scan, MRI.

Paper V- Elective

Sports Physiotherapy

Physiological background:
Skeletal muscle – Type I and Type II fibers. General Conditioning principles, Strength, Power, Muscular endurance, Flexibility, Aerobic and Anaerobic metabolism, Sports diving, Scuba diving, Second wind, Athletic lung, Stress hormone in exercises and Runner's high.

Biomechanics in sports:
Throwing, Swimming, Rowing, Walking, Running, Jumping and landing mechanics.

Prevention of Atheletic Injuries:
Warm-up schedule, Stretching, Partner stretching using the Proprioceptive Neuromuscular Facilitation technique. Protective equipments, Supportive devices, Motion limiting devices.

Treatment of Atheletic injuries*:*
Tapping and Wrapping techniques.
Cryotherapy, Massage, Manipulation for sports injuries, Sauna bath, Spa therapy and Kinesiological EMG in sports.

Emergency care and Atheletic First Aid:
Cardiopulmonary emergencies, Heimlich maneuver, Shock Injuries- Internal and External Injuries, Head and Neck Injuries, Fractures, Dislocations. Stretcher use, RICE Therapy and Gait instruction.

Injury Rehabilitation:
Goals of Rehabilitation, Types of exercises – Isometric exercise, Isotonic exercise, Isokinetic exercise, Plyometrics, Manual resistance, Proprioceptive Neuromuscular Facilitation, Surgical tubing. Circuit training, Sport specific skills.

Epiphyseal Injuries:
Prevention, Classification, Treatment, Complications and Prognosis of Epiphyseal injuries, Osgood Schlatters disease, Traction epiphysitis, Patellar Tendinits, Complete avulsion of the epiphysis of the Tibial tubercle.

Shoulder Injuries:
Acute and overuse injuries of the shoulder its immediate management, and PT management in detail.

Elbow Joint Injuries:
Olecranon bursitis-Prevention, Treatment, Elbow problems resulting from Throwing – Medial lesions, Lateral lesions & Posterior lesions- Treatment.

Wrist and Hand Injuries:
Acute and overuse injuries of the wrist, hand its immediate management, and PT management in detail.

Thigh Injuries:
Contusion to the Quadriceps – Signs and Symptoms, Treatment, Complications, Prognosis, Strain of the Quadriceps muscle- Mechanism of injury, Signs and Symptoms, Treatment. Acute Strain of the Hamstring group – Signs and Symptoms, Treatment. Complete rupture of the Patellar tendon – Signs and Symptoms, Treatment.

Knee Injuries:
Prevention of the injuries, Mechanisms of knee ligament injuries, First degree sprain, Second degree sprain, Third degree sprain –Signs and Symptoms, Treatment. Anterior and Posterior Cruciate tears, Anterio-medial, Anterio-lateral instability – Symptoms, Pathology, Treatment, Rehabilitation, Exercise for Meniscal lesions. Types of tears, Aetiology, Signs and symptoms, Treatment. Injuries of the patella-. Osteochondritis Dissecans – types, Signs and treatment. Jumper's knee – Aetiology, symptoms, treatment. Rehabilitation of the knee and Patellofemoral joints Post Menisectomy- Rehabilitation program.

Leg, ankle and foot Injuries:
Rupture of the Gastrocnemius (Tennis leg), Total rupture of the Achilles tendon, Partial rupture of the Achilles tendon - Mechanism of injury, Signs and Symptoms, Treatment, Rehabilitation. Prevention of the Ankle injures, Mechanism for Ankle sprains, Evaluation of injured ankle. Ankle and Foot rehabilitation, Stress fracture of the metatarsal, Morton's Neuroma.

Injuries to the Running Athletics:
Common running induced injuries to the hip-ilio-tibial tract pain, Trochanteric bursitis, Stress fracture of femoral neck. Common running related injuries to the knee: -Medial patellar pain, Pes anserine bursitis, Patellar tendinits and Biceps femoral tendinits. Common running related injuries to the lower leg-Tibial stress reaction, stress fracture and Medial Tibial stress syndrome. Compartment syndrome – Anterior, Posterior, Lateral. Fibular stress reaction and Stress fracture – Aetiology, Signs and Symptoms, Management. Retrocalcaneal bursitis-Signs and Symptoms, Treatment. Plantar fascitis – Etiology, Signs and Symptoms, Treatment.

Swimming Injuries:
Swimmer's shoulder- Signs and symptoms, Treatment, Prevention of injury. Breaststroker's knee- mechanism of Injury, Signs and symptoms, Treatment, Prevention.
Swimmer's ear- Signs and Symptoms, Treatment, Prevention.

Tennis Injuries. Throwing injuries- prevention, management.

Psychological perspective of sports:
Scope, Rate of sports psychology in performance, Will to Win, self-talk, Effect of stress, motivation on performance, Stress management.

Nutrition and athlete:
Well balanced diet, Pre event nutrition, Role of nutrition in sports.

Female athlete:
Common injuries, Sports amenohrea, Hormonal changes during sports.

Ethical aspects in Sports:
Legal aspects, Drug Abuse and Drug dependency.
Latest advancement in the field of Sports Physiotherapy

Paper V- Elective

Physical Therapy in Neurological Disorder

Development and growth of Central Nervous system.
Developmental stages-Gross motor, fine motor, Cognitive development, Social development, Language development, Adaptive/ self help.

Motor Learning: Phases, Theories, Strategies to improve motor learning.
Motor relearning programme (MRP).
Motor control: Phases, Theories, Strategies to improve motor control.

Neuro facilitation techniques:
Proprioceptive Neuro muscular facilitation (PNF), Principles, Basic procedures of facilitation, Techniques, Developmental sequence.
Neurodevelopmental therapy (NDT), Principles, Inhibition, Facilitation, Key points, RIP
Sensory system in Motor performance, Proprioceptors, Exteroceptors, Vestibular stimulation, Auditory stimulation, Visual stimulation, Gustatory stimulation, Autonomic nervous system.

Basal ganglia, Cerebellum, Physiology, Disorders, Assessment, Medical Management
Movement disorders- Perceptual disorders, Simple perception, Complex perception, Apraxia, Agnosia.
Assessment and intervention strategies for cognitive and perceptual dysfunction.

Neural Control of bladder, its dysfunction, Bladder training Programmes.

Golgi tendon organ, Muscle spindle, Spasticity, Assessment, Steps to reduce Spasticity.

Balance- Mechanism of normal balance, Visual, Vestibular, Somatosensory, Assessment, Strategies to improve balance.

Reflexes, Superficial, Deep tendon reflex, Developmental reflexes.

Vestibular Rehabilitation, Vestibular system, Anatomy, Physiology, Assessment, Intervention.

High-risk infant, Evaluation, Concept of intervention, Complication.

Head injury, Classification, Medical Management, P.T. Management
Latest advancement in the field of Neurological Physiotherapy

Specialization in Orthopaedics physiotherapy

1. Embryology and anatomy musculoskeletal system
2. Applied anatomy with emphasis on Bio-mechanics, Kinesiology, work physiology and locomotor functions.
3. Clinical assessment and rationale of laboratory investigations along with differential diagnosis.
4. Clinical symptomatology, pathophysioology and pathomechanics of musculoskeletal conditions.
5. Assessment of functions, locomotor impairment disabilities and disability evaluation.
6. Physiotherapy management of locomotor disorder and their principles of treatment.
7. Arthrokinematic and oskeokineomatics of musculo skeletal systems, weight transfer mecnahisms during gait and other functional activities.
8. Orthopaedics implants-designs, materials, indications, post-operative assessment and training.
9. External aids, applicances, adaptive, self-help devices, prescriptions biomechanical compatibility, checkout and training.
10. Manual therapy; soft tissue manipulation and mobilization, neural mobilization, acupressure.
11. Joint manipulation-peripheral joints and vertebral joints.
12. Neurological complications of locomotor disorder, conservative electro diagnostic procedure.
13. Community based rehabilitation in musculoskeletal disorder.
14. Latest advancement in the field of Orthopaedics Physiotherapy.