IEC UNIVERSITY

SYLLABUS

FOR

MASTER OF PHYSIOTHERAPY (NEUROLOGY)

(M.P.T) COURSE

ACADEMIC PROGRAMME

Duration: 2 year

COURSE-SCHEME

MPT (NEUROLOGY)
FIRST YEAR

S. No.	Sub Code	Subject	Contact Hr.	Credits
1.	MPT-101	Review of Human Sciences (Anatomy, Physiology, Pathology, pharmacology & Biochemistry)	**3**	**3**
2.	MPT-102	Review of Basic Therapeutics (Exercise Therapy, Electro Therapy, Biomechanics, & Bio. Engg.)	**3**	**3**
3.	MPT-103	Advanced Therapeutics & Diagnosis (Manual Therapy, MET, Myofascial Release, LASER, EMG, Micro Current, Radiology & Diagnostic Studies, Lab (Pathology)	**4**	**4**
4.	MPT-101 P	Review of Human Sciences (Anatomy, Physiology, Pathology, pharmacology & Biochemistry)	**2**	**2**
5.	MPT-102 P	Review of Basic Therapeutics (Exercise Therapy, Electro Therapy, Biomechanics, & Bio. Engg.)	**2**	**2**
Total			**14**	**14**

COURSE-SCHEME

MPT (NEUROLOGY)
SECOND YEAR

S. No.	Sub Code	Subject	Contact Hr	Credits
1.	MPT-N-201	Clinical aspects and recent advances in Neurology	**3**	**3**
2.	MPT-N-202	Advanced physical and functional diagnosis	**3**	**3**
3.	MPT-N-203	Advanced physiotherapeutic interventions	**4**	**4**
4.	MPT-N-204	Pedagogy & management	**4**	**4**
5.	MPT-N-205 P	Dissertation	**2**	**2**
6.	MPT-N-201 P	Clinical aspects and recent advances in Neurology	**2**	**2**
7.	MPT-N-202 P	Advanced physical and functional diagnosis	**2**	**2**
Total			**20**	**20**

MASTER OF PHYSIOTHERAPY (NEUROLOGY)

REGULATION OF THE UNIVERSITY

In exercise of the powers conferred by the Board of Management, IEC University, Baddi, Himachal Pradesh, hereby makes following regulations & syllabus for the Master of Physiotherapy Programme.

1. **SHORT TITLE AND COMMENCEMENT**: The regulation listed under this head is for M.P.T program offered by the colleges under IEC University. These regulations come into effect from the Academic Year 2020-21.

2. **TITLE OF THE COURSE:** It shall be called Master of Physiotherapy (MPT)

3. **ELIGIBILITY:** Candidates who have passed BPT degree from institutions where the mode of study is a full-time program, with minimum 4 ½ years duration with not less than 50% of marks in aggregate and have completed 6 months of compulsory rotating internship in Physiotherapy Colleges recognized by respective State Physiotherapy Council or Indian Association of Physiotherapists are eligible. **Candidates who have passed BPT through correspondence or distance education program is not eligible**

4. **DURATION OF THE ACADEMIC PROGRAMME**: The period of certified study for the M.P.T. course shall be two academic years in each Specialization

5. **INTAKE OF STUDENTS**: 10

6. **MEDIUM OF INSTRUCTIONS**: Medium of instruction will be English.

7. **ATTENDANCE:**
   The students admitted to this course shall attend regular classes. In order to be eligible for Appearing in the final examination at the end of an academic session, a candidate should Have minimum of 75% attendance in each of the subjects (Theory & Practical Separately) in An academic year. Failing to have this he/she will not be allowed to appear in the annual Examination.

8. **Examination System & Evaluation**:

   There shall be an Examination at the end of final academic year.

   - Each subject shall carry 100 marks out of which 30 marks will be of internal Assessment and 70 marks for the annual examination.

- The practical examination will be of 100 marks. The practical & viva – voce in each Subject will carry 30 marks as internal & 70 marks in final examination.

- The final examination will be of 70 marks. There will be 5 descriptive questions of 15 marks each, out of which a candidate shall be required to attempt any 3 (3X15=45 marks) & 8 short questions out of which, a student will have to attempt 5 questions each carrying 5 marks (5X5=25 marks).

- The duration of final examination shall be 3 hrs.

- The marks of the internal assessment will be given by the teacher in charge / HOD On the basis of the performance of the candidate throughout the year, MST & Attendance, Projects any other Assessment like seminars.

- The distribution of 30 marks of Internal Examination will be as follows: 20 marks will be given from MST in each year.
- A maximum weightage of 5 marks will be given for attendance in all theory and practical in the University Final Exam.
- 5 Marks will be given for Projects & Seminars
- A student shall have a minimum of 75% attendance in a course to be eligible to appear in the Final Examination.
- 5 marks for attendance shall be calculated as follow
- 75-79% - 1
- 80-84% - 2
- 85-89% - 3
- 90-94% - 4
- 95% and above -5

- However, the Dean is authorized to condone the shortage of attendance up to a maximum of 10% due to genuine reason on the recommendation of course teacher

The minimum number of marks to pass the examination shall be 50% in theory including internal assessment and 50% in practical including internal assessment in each subject

10. **Supplementary Exam:** Any candidate who fails in two or less than two courses can appear in the supplementary examination conducted by the University within six months of declaration of result. Practical for this purpose will be considered as a separate paper.
    Any candidate failing in more than two papers would be considered as a failed shall have to reappear in the next Annual Examination as Ex. – Student.

11. DISSERTATION (PROJECT WORK)

Dissertation shall be of 100 marks there will be no sessional in this subject. The dissertations shall be of 5000 words (Minimum). Consisting of result of his own study / work bases upon his/her Clinical Duties under the Guidance of a Teacher/Guide.
The degree of Master of Physiotherapy will be awarded to the candidate only after he / she has completed the following:-
1. The COE publish the result of the examination, as soon as possible after the

2. He/ she passed all the academic examination successfully (included dissertation).

12. GUIDE

The academic qualification ad teaching experience required for recognition by this university for a

postgraduate teacher for guiding MPT candidates shall be.

1. M.Sc. (PT) / MPT with three years teaching experience working on a full time position at any esteemed institution.
2. The age of teacher / guide shall not exceed 65 years.
3. The guide student ratio shall be 1:3

13. **Examiners**

MPT degree with minimum 2 years of teaching experience shall be appointed as examiners.

14. Paper Setters

MPT degree with minimum 2 years of teaching experience shall be appointed as paper setters.

15. Criteria for Declaring as Pass in University Examination.

A candidate shall be declared to have passed the examination if he/she secures 50% of the marks in the university written examination including internal assessment & 50 % in practical including internal assessment in each subject.

COURSE STRUCTURE
M.P.T. NEUROLOGY FIRST YEAR
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S. No.	Subjects	Code	Theory			Practical			Grand Total	Credit	
			Marks	Int. Assessment	Total	Marks	Internal Assessment	Total		Theory	Practical
1.	Review of Human Sciences (Anatomy, Physiology, Pathology, pharmacology & Biochemistry)	MPT-101	70	30	100	70	30	100	200	3	2
2.	Review of Basic Therapeutics (Exercise Therapy, Electro Therapy, Biomechanics, & Bio. Engg.)	MPT - 102	70	30	100	70	30	100	200	3	2
3.	Advanced Therapeutics & Diagnosis (Manual Therapy, MET, Myofascial Release, LASER, EMG, Micro Current, Radiology & Diagnostic Studies, Lab (Pathology)	MPT-103	70	30	100	-	-	-	100	4	-
								Total=	**500**		
Note: Supervised rotatory clinical training (at least 2 hrs./day in Physiotherapy clinic/OPD)											

REVIEW OF HUMAN SCIENCES

M.P.T. – 1st year

Code – MPT - 101

Course objective:

1. Applied anatomy for supportive specialization.
2. Normal functional anatomy for Analysis between normal & abnormal.
3. Subject support: Medical professional supportive purpose / action reaction of the medical related to different specialization.
4. Pathology : Basic condition knowledge, their pathological changes & their relevant conditions to support the specialization.
5. Biochemistry : For nutritional & diet chart of different conditions.

Unit I: Human Anatomy

Outline of general anatomy Introduction to upper limb & lower limb

a) Bones & Joints
b) Muscles
c) Pectoral, Axilla, Scapula, Arm, Forearm, Cubital fossa, Hand
d) Thigh, Gluteal region, popliteal fossa.
e) Leg, foot

Introduction of thoracic bones & Joints.

Introduction of vertebral column

I. Cervical, thoracic, lumbar, sacral spine.
II. Anatomy of spinal cord.

Introduction of head & neck

I. Neck: Side of neck Back of neck
II. Temporomandibular joint

a) Meninges, CSF
b) Blood supply of brain & Spinal cord
c) Outline of brain stem.
d) Anatomy of spinal cord

Unit II: Human Physiology Cardiovascular system

a) Structure & Properties of heart
b) Cardiac Cycle
c) Cardiac output
d) The Physiology of vascular

system. Respiratory system

a) Functional anatomy
b) Ventilation & control of ventilation
c) Alveolar air
d) Regulation of the breathing
e) Pulmonary function test.

Muscular system:

a) Types of muscles & the properties
b) Physiology and Muscular contraction
c) Neuromuscular

Nervous system

a) Elementary Neuroanatomy
b) Neurons & Neuroglia
c) Properties of nerve fibres, synapse
d) Spinal cord
e) Cerebral cortex
f) Pyramidal & extrapyramidal system
g) Cerebrospinal fluid
h) Cranial nerves.

Unit III : Pharmacology

- Discussion in detail of the following groups of drug. Their effects, uses, side effects and dosage.

1. Drugs used in pain
2. Local anesthetics
3. Steroids
4. Muscle relaxants
5. Drug acting upon central nervous systems & autonomic nervous system.

Unit IV : Pathology

a) General Pathology (Cell Injury, Inflammation, repair, immune system)

b) Musculoskeletal system

a) Bones :

b) Joints:

-Degenerative joint diseases

-Bursitis

c) Skeletal muscles

(Muscle atrophy, myositis, muscular dystrophy, myasthenia gravis)

d) Nervous system

a) Infection (meningitis, encephalitis)

b) Vascular disease (cerebral infarction, intracranial hemorrhage)
c) Degenerative disease (Alzheimer diseases, Parkinsonism, Motor neuron disease)
d) Demyelinating disease (Multiple sclerosis)
e) The peripheral nervous system (diabetic neuropathy)

Unit V : Biochemistry: Diet its nutritional and calorific value of various foods balance diet, energy requirements of various individuals.

REVIEW OF BASIC THERAPEUTICS

M.P.T. – 1ST Year

Code – MPT – 102

Unit I: Exercise Therapy

Review of the following techniques.

- Assessment techniques like MMT & Goniometry.
- Stretching and mobilization.
- Re- education and strengthening
- Gait analysis and training (both normal & pathological gait)
- Relaxation & soft tissue manipulation (Massage).
- Posture.
- PNF
- Traction
- Hydrotherapy

Unit II: Electrotherapy

- Gen. Review of low, medium & currents and their modifications like di-dynamic and Russian currents.
- Ultrasound.
- UVT and IRR
- Cryotherapy
- Other thermal modalities.
- I.F.T., LASER, MWD, SWD, TENS, EMG, BIOFEEDBACK, MUSCLE STIMULATOR

Unit III : Biomechanics

- Evaluation and assessment of joint motion.
- Evaluation and assessment of locomotion.
- Evaluation and assessment of posture.

Unit IV : Bio-Engineering

- Various types of orthosis & its uses(limbs & spines).
- Various types of prosthesis, patients preparation and application.

ADVANCED THERAPEUTICS AND DIAGNOSIS

M.P.T – 1ST Year

Code– MPT 103

Unit I: Manual Therapy: Introduction, History, Basic

Classification, Assessment for manipulation, discussion in brief about the concepts of mobilization like Maitland & Mullighan in mobilization of joints nerves, Methodology in general with examples of few joints / nerves (Manipulation studies & work according to their specialization).

Unit II:Muscle Energy technique and positional stretch: The basic concept and application of these techniques.

Unit III: Myofascial Release: Concept & brief discussion of its application techniques.

Unit IV:LASER : Production, types, effects, applications, indications & contraindications.

Unit V : Nerve conduction studies and EMG : Normal & abnormal action potentials, its recording protocols, analysis & apparatus.

Unit VI: Microcurrents : Concepts, Indications, Contraindications & Application.

Unit VII: Biofeedback: Principle, effects, uses and contraindications.

FOLLOWING ARE ONLY FOR PRACTICAL KNOWLEDGE: NOT FOR THEORY EXAM)

Unit VIII: Radiology & Diagnostic studies: Reading and analysis of 1. X – Ray. 2. C.T. Scan 3. M.R.I. Scan

Their clinical relation with various muscular skeletal disorders and nervous disorders

Unit IX: Lab (Pathology) Investigations: Methodology of routine examination of blood, urine only.

Analysis of various laboratory Examination reports and their clinical Co- relation with various muscular skeletal disorders and nervous disorders

MPT II[nd] YEAR

MPT IN NEUROLOGY

S. no.	Subjects	Code	Theory			Practical			Grand total
			Marks	Int. Assess	Total	Marks	Int. Assess	Total	
1	Clinical aspects and recent advances in Neurology	MPT-N-201	70	30	100	70	30	100	200
2	Advanced physical and functional diagnosis	MPT-N-202	70	30	100	70	30	100	200
3	Advanced physiotherapeutic interventions	MPT-N-203	70	30	100	-	-	-	100
4	Pedagogy & management	MPT-N-204	70	30	100	-	-	-	100
5	Dissertation	MPT-N-205				70	30	100	100
			Total=						700
Note: Supervised rotatory clinical training (at least 2 hrs./day in Physiotherapy clinic/OPD)									

1. **CLINICAL ASPECTS & RECENT ADVANCES IN NEUROLOGY (MPT-N-201)**

COURSE CONTENT

1) **NEURO ANATOMY** - • Basic units of nervous system • Central nervous system covering of CNS. Cerebral Hemisphere, Cerebral Cortex, Cerebellum, Thalamus, Basal ganglia, Hypothalamus, Limbic system, Ventricular system, CSF, Blood Brain Barrier, Blood Supply and Venous drainage of CNS. Brain Stem and Spinal Cord • Peripheral Nervous System- Spinal Nerves Cranial Nuclei and Cranial Nerves, Blood Supply, Plexus, Individual Nerves – Dermatomes, Myotomes and Sclerotomes and & NMJ • Autonomic Nerves system • Tracts: Pyramidal, Extra Pyramidal and Ascending Tracts • Development of Nervous system.It is mandatory to see and comprehend the dissected parts of the nervous system.

2) **NEURO PHYSIOLOGY** – Functions of all the organs mentioned below • Cerebral hemisphere, Cerebral cortex, Cerebellum, Thalamus, Basal ganglia, Hypothalamus, Limbic system, Brain stem and spinal cord, PNS & ANS •Membrane Potential Action potential, Neuro Muscular Transmission, Physiology of Hyper Sensitivity, Receptors and Effectors, Neural Circuits. Somato Sensory System, Micturition Reflex, Bowel Activity, Neurogenic shock, Nervous Regulation of Circulation, Perception, Pain Physiology of Pain, Articular Neurology, Neural Development- degeneration and regeneration, Myelination, Nerve Immunology and Aging of Nervous System.

3) **NEUROSCIENCE**- • Nature of movement, Motor control, Theories of Motor Control, Postural Control, Development of Postural Control, Development of Locomotion, Neural Control of Human Locomotion, Theories of Neural Control of Reach and Grasp and Plasticity.

4) **PATHOMECHANICS** - • The student should get well acquainted with the Pathomechanics of individual joints, gait and posture related to neurological diseases.

5) **CLINICAL CONDITIONS** - • Definitions, Causes, Clinical Features, pathophysiology, general investigation, Medical and surgical management of the the below mentioned conditions: Pyogenic infections of CNS • Viral Infections of CNS • Polyneuropathy • Disorders of Spinal Cord • Peripheral Nerve and plexus lesions • Cerebellar lesions • Myopathies • Cerebro-Vascular Diseases
• Degenerative diseases of the nervous system • UMN syndrome •Motor neuron diseases •Congenital Myopathies •Coma • Dementia • Extra pyramidal syndrome • Encephalitis

Autonomic disorder •Movement disorders •Peripheral nerve lesions, Paediatric neurology – CP, spinal bifida • Craniovertebral junction anomalies – Hydrocephalus • Toxic Nerve disorders – Alcohol, drug abuse, asphyxia, Cancer chemotherapy, oral contraceptive and epidural & spinal anesthesia.

ADVANCED PHYSICAL AND FUNCTIONAL DIAGNOSIS (MPT-N-202)

COURSE CONTENT

Principle of Assessment - • Assessment of motor system • Assessment of sensory system • Assessment of Perception • Assessment of Posture • Assessment of Balance •Assessment of Pain •Assessment of Incoordination •Assessment of Higher centre •Assessment of Voluntary control • Gait analysis • Writing SOAP notes •Analysis of Functional Mobility • Assessment procedures in children & elderly • Environinental Analysis •Use of investigation measures in assessment (CT. MRI. PET etc) • Types of Impairment • Conceptual Models of Disability • Self-assessment & Self efficacy scale • Tools used in Neuro assessment (scales, grades etc) • NCV & EMG • Disability Evaluation.

Measures of cognitive impairment and disability - • Glasgow coma scale, & Children's coma scale.

Measures of motor impairment - • Motor club assessment, River mead motor assessment, Motricity index, Trunk control test, Motor assessment scale, Modified Ashworth scale for spasticity, isomeric muscle strength & Dynamometry.

Measures of focal disability - • Standing balance, Functional ambulation categories, timed walking test, River
mead mobility index, nine hole peg test, Action research arm test.

Activities of daily living and extended ADL test- •Barthel ADL index, Katz ADL index, River mead ADL scale, Kenny self Care evaluation, Nottingham extended ADL index & Global Measures of disability, Functional independence measure, PULSES profile, Measures of Handicap and quality of life, WHO handicap scale, Glasgow outcome scale, Quality of life – a measure, Environmental assessment–non- standard.

Multiple Sclerosis - • Kurtzke Multiple sclerosis rating scale, an illness severity scores for multiple

sclerosis. Stroke scales- • National institute of health stroke scale, hemispheric stroke scale,

Clinical classification of
stroke [Branford] & Allen score for prognosis of stroke.

Spinal cord injury- • Frankel's scale, Motor index and sensory indices & American spinal cord in injury association assessment chart.

Pain assessment and evaluation.

Assessment of Posture, gait, co-ordination & Voluntary control.

Investigation Techniques - • CT scans, MRI, X-Ray, Nuclear imaging, EEG, NCV, EMG: Evoked potentials, Basic procedure, principles and interpretation of results and neurological conditions.

ADVANCED PHYSIOTHERAPEUTIC INTERVENTIONS
(MPT-N-203)

COURSE CONTENT

1) General Principles of Treatment.

2) Theoretical basis of treatment concepts.

3) Different types of Approaches in Neuro rehabilitation.

4) Latest advancement in Therapeutic approaches.

5) Techniques to optimize and Restoration of Functional Performance.

6) Musculoskeletal Treatment concepts applied to Neurology.

7) Hypothesis Oriented Clinical Practice.

8) Evidence based Neurological Physiotherapy.

9) Strategies to improve Motor control.

10) Physiotherapeutic intervention for patients with – Perceptual dysfunction, Balance dysfunction, mobility controls disorders, postural control disorders & Incoordination problems.

11) Role of sensory system in performance with sensory reeducation & desensitizing techniques.

12) Abnormal gait & Gait training.

13) Pain Relieving Measures.

14) Motor Learning – Theories & Stages of learning skills, Motor relearning programme.

15) Feed Back, Models of Practice & Biofeed back in clinics.

16) Plasticity.

17) Adjuncts used in Neuro rehabilitation (Swiss ball, mat etc.)

18) Splinting & Orthotic appliances in Neurological disorders.

19) Environmental Modifications& Ergonomics.

20) Clinical Psychology in Neurological rehabilitation.

21) Multi-disciplinary Team (MDT) in Neuro Rehabilitation.

22) Sensory biofeedback.

Describe problem list, assessment & physiotherapeutic treatment for following conditions.

1) UMN Syndrome.
2) Polyneuropathy.
3) Peripheral Neuropathy.
4) Motor neuron disease.
5) Myopathies.
6) Disorders of Spinal cord.
7) Cerebellar Ataxia.
8) Extra pyramidal Syndrome.
9) Movement Disorders.
10) Cerebral Palsy & Spina bifida.
11) Cerebro- Vascular Diseases.
12) Peripheral Nerve and plexus lesions.
13) Traumatic Brain injury.
14) Poliomyelitis.
15) Irreversible neurological damage beyond relearning.

B.REFERENCE

1) Barbara : Muscles , nerves and movement kinesiology in daily living.
2) Barbra : Disease of the nervous system.
3) Richard : Neurological rehabilitation.
4) Susan , neurological physiotherapy
5) Omer : management of peripheral nerve problems.
6) Darcy : Neurological rehabilitation.
7) Charles : the Neuroscience of human movement
8) Janet : a motor relearning programme for stroke .
9) Snell Richards clinical Neuro Anatomy for medical students .
10) Pediatric physical therapy- Shepard

11) John pattern : neurological differential diagnosis

12) Fredericks : Pathophysiology of motor system

PEDAGOGY IN PHYSIOTHERAPY EDUCATION INCLUDING MANAGEMENT AND ADMINISTRATION

(MPT-N-204)

Following are the topics to be included but not limited to:

1. **Education**

a) Introduction
b) Educational Philosophy- Idealism, naturalism, pragmatism
c) Aims of education
d) Functions of education
e) Formal, informal & Non-formal education
f) Agencies of education
g) Current issues & trends in higher education
h) Issue of quality in higher education
i) Autonomy & accountability
j) Privatization of education

2. **Concept of teaching & learning**

a) Meaning & scope of educational psychology
b) Meaning & relationship between teaching & learning
c) Learning theories
d) Dynamics of behavior
e) Individual differences
f) Curriculum
g) Meaning & concept
h) Basis of curriculum formulation
i) Framing objectives for curriculum
j) Process of curriculum development & factors involved
k) Evaluation of curriculum

3. **Method & techniques of teaching**

a) Lecture
b) Demonstration
c) Discussion
d) Seminar
e) Assignment
f) Project
g) Case study

4. **Planning for teaching**

a) Bloom's taxonomy of instructional objectives
b) Writing instructional objectives, behavioral terms
c) Unit planning
d) Lesson planning

e) Teaching Aids
f) Types of teaching aids
g) Principles of selection, preparation & use of audio-visual aids

5. Measurement & evaluation

a) Nature of educational measurement: meaning, process, types of tests
b) Construction of an achievement test & its analysis
c) Standardized test
d) Introduction of some standardized tools, important tests of intelligence, aptitude & personality
e) Continuous & comprehensive evaluation

6. Guidance & counseling

a) Meaning & concepts of guidance & counseling
b) Principles of guidance & counseling

7. Awareness of programme

a) Awareness of guidance to the common people about health & disease

Administration, Management & Ethics

UNIT I- Management

1. Financial & corporate management
2. Marketing & management
3. International relations & business
4. Organizational behavior & culture
5. Basic economics

UNIT II- Administration

1. Functions of management
2. Fundamentals of hospital administration
3. Management process- Planning, Organization, Direction, Controlling, Decision making
4. Personnel management- staffing, recruitment, selection, performance appraisal, collective bargaining, job satisfaction
5. Total quality management- basics, quality control, quality assurance, hospitals & medical audit, international quality system, six sigma approach
6. Just in time approach

UNIT III- Ethics & Legal Issues

1. Rules of professional conduct
2. Legal responsibility
3. Code of ethics
4. Functions of Physiotherapy associations
5. Role of international health agencies

6. Standards of practice for phyhsiotherapists
7. Liability & obligations in the case of medical legal action
8. Law of disability & discrimination
9. Confidentiality of the patient's status
10. Consumer protection law, health law.

REFERENCE:-

1. Pedagogy in Physiotherapy Education: C.S. Ram
2. A Text book of Curriculum, pedagogy & Evaluation: Dr S.K. Bhatia