

Master of Physiotherapy (MPT)

REGULATION & CURRICULUM 2020



Rajiv Gandhi University of Health Sciences, Karnataka 4th 'T' Block, Jayanagar,
Bangalore 560 041.

ORDINANCE GOVERNING MASTER OF PHYSIOTHERAPY (MPT) COURSE – 2020

Rs.

Copies may be obtained from:

The Director, Prasaranga,
Rajiv Gandhi University of Health Sciences,
4th T Block, Jayanagar, Bangalore 560 041

Rajiv Gandhi University of Health Sciences, Karnataka, Bangalore

The Emblem



The Emblem of the Rajiv Gandhi University of Health Sciences is a symbolic expression of the confluence of both Eastern and Western Health Sciences. A central wand with entwined snakes symbolises Greek and Roman Gods of Health called Hermis and Mercury is adapted as symbol of modern medical science. The pot above depicts Amrutha Kalasham of Dhanvanthri the father of all Health Sciences. The wings above it depicts Human Soul called Hamsa(Swan) in Indian philosophy. The rising Sun at the top symbolises knowledge and enlightenment. The two twigs of leaves in western philosophy symbolises Olive branches, which is an expression of Peace, Love and Harmony. In Hindu Philosophy it depicts the Vanaspathi (also called as Oushadi) held in the hands of Dhanvanthri, which are the source of all Medicines. The lamp at the bottom depicts human energy (kundalini). The script “DevahithamYadayahu” inside the lamp is taken from Upanishath Shanthi Manthram (BhadramKarnebhiShrunuyanadev...), which says **“May we live the full span of our lives allotted by God in perfect health”** which is the motto of the Rajiv Gandhi University of Health Sciences.

Rajiv Gandhi University of Health Sciences, Karnataka, Bangalore

Vision Statement

The Rajiv Gandhi University of Health Sciences, Karnataka, aims at bringing about a confluence of both Eastern and Western Health Sciences to enable the human kind - "Live the full span of our lives allotted by God in Perfect Health."

It would strive for achievement of academic excellence by Educating and Training Health Professionals who

- Shall recognize health needs of community,
- Carry out professional obligations ethically and equitably and in keeping with National Health Policy.

It would promote development of scientific temper and Health Sciences Research.

It would encourage inculcation of Social Accountability amongst students, teachers and institutions.

It would Support Quality Assurance for all its educational programmes.

Motto

"Right for Rightful Health Sciences Education"



ರಾಜೀವ್ ಗಾಂಧಿ ಆರೋಗ್ಯ ವಿಜ್ಞಾನಗಳ ವಿಶ್ವವಿದ್ಯಾಲಯ, ಕರ್ನಾಟಕ, ಬೆಂಗಳೂರು

RAJIV GANDHI UNIVERSITY OF HEALTH SCIENCES, KARNATAKA, BENGALURU
4th T Block, Jayanagar, Bengaluru – 560 041

Ref: ACA/DCD/MPT/379/2019-20

Date: 12/08/2020

NOTIFICATION

Sub: Revised Ordinance Governing Master of Physiotherapy Course (MPT),
2020.

- Ref:
- 1) Proceedings of 146th Syndicate meeting held on 30/11/2019
- Changeover of MPT to specialty degree program dated 20-12-2019
 - 2) Proceedings of BOS PG physiotherapy held on 19/03/2020
 - 3) Proceedings of Faculty meeting of Biomedical & Allied Health
Sciences held on 22/06/2020
 - 4) Proceedings of CAC meeting held on 4/07/2020
 - 5) Proceedings of 150th Syndicate meeting held on 10/07/2020

In exercise of the powers vested under Section 35(2) of RGUHS Act, 1994, the Revised Ordinance Governing Master of Physiotherapy Course (MPT), program is notified herewith as per Annexure.

The above Regulation shall be applicable to the students admitted to the said course from the academic year 2021-22 onwards.


REGISTRAR

To

The Principals of all colleges of MPT Course affiliated to RGUHS, Bangalore.

Copy to:

1. The Principal Secretary to Governor, Raj Bhavan, Bangalore - 560001
2. The Principal Secretary Medical Education, Health & Family Welfare Dept.,
M S Building, Dr.B.R. Ambedkar Veedhi, Bangalore – 01
3. PA to Vice – Chancellor/PA to Registrar/Registrar (Eva.)/Finance Officer,
Rajiv Gandhi University Health Sciences, Bangalore
4. All Officers of the University Examination Branch/ Academic Section.
5. Guard File / Office copy.

(Schedule annexed to University Notification No. ACA/DCD/MPT/379/2019-20)
**Revised Ordinance Governing Regulations and Curriculum of Master of
 Physiotherapy Course (2 Year)**

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REGULATIONS

**REVISED ORDINANCE GOVERNING
MASTER DEGREE PROGRAM IN PHYSIOTHERAPY (MPT), 2020**

(Under Section 35(2), Rajiv Gandhi University of Health Sciences Act, 1994)

PREAMBLE

It is expedient to regulate the Institution/ College running Master Degree Program in Physiotherapy (in short MPT), to set the standard in the said discipline, to enable autonomous practice as a specialist and to imbibe the required skill and professionalism in the student. Hence, this revised Ordinance.

PROGRAM TITLE

Title and Commencement:

(a) This revised Ordinance governing Master Degree Program in Physiotherapy, 2020.

Master degree program	Specialty	In Short
Master of Physiotherapy (MPT)	Musculo-skeletal Sciences	MPT-MSK
Master of Physiotherapy (MPT)	Sports Sciences	MPT-Sports
Master of Physiotherapy (MPT)	Cardio-vascular & Pulmonary Sciences	MPT-CVP
Master of Physiotherapy (MPT)	Pediatrics	MPT-Ped
Master of Physiotherapy (MPT)	Neurological Sciences	MPT-Neuro
Master of Physiotherapy (MPT)	Community Health	MPT-Com
Master of Physiotherapy (MPT)	Movement Science	MPT-MS

- (b) These Rules shall come into force, in all the Institution/ College running Master Degree Program in Physiotherapy (MPT), after the date of notification from the academic year 2021.
- (c) Institutions may opt for the specialties they desire to offer based on the infrastructure and facilities and available guide in the specialty. They must ensure to provide for the infrastructure and facilities as mentioned in this ordinance for the specialties opted for.

COURSE OUTLINE

The Master Degree in Physiotherapy is a two-year program consisting of classroom teaching, self-academic activities and clinical posting. In the first year, theoretical basis of specialty physiotherapy is refreshed along with research methodology and biostatistics. The students are posted in their areas of clinical expertise specialty during this period. They are required to choose their study for dissertation and submit a synopsis. During the second year the students will be posted in their area of specialty. They are required to complete and submit their dissertation. The learning program includes seminars, journal reviews, case presentations, case discussions and classroom teaching. Some of the clinical postings are provided at other reputed centers in the country in order to offer a wider spectrum of experience. The students are encouraged to attend conference, workshop to enhance their knowledge during the course of study. University examinations are held at the end of second year.

GOALS OF COURSE

1. Preparation of a post graduate student towards his/ her professional autonomy with self-regulating discipline at par with global standards.
2. Formation of base of the professional practice by referral as well as first contact mode using evidence-based practice.
3. Impartation of research basis in order to validate techniques & technology in practice to physiotherapy.
4. Acquainting a student with concept of quality care at the institutional as well as the community levels.
5. Inculcation of appropriate professional relationship in multidisciplinary set up, patient management and co partnership basis.
6. Preparation of students to address problems related to health education and community physiotherapy.
7. Practicing the concept of protection of rights of the community during referral as well as first contact practice.
8. Incorporation of concept of management in physiotherapy.
9. Experience in clinical training and undergraduate teaching partly.
10. Providing the honest, competent and accountable physiotherapy services to the community.

ELIGIBILITY

Eligibility to offer Master Degree Program in Physiotherapy (MPT)

Any Institution/ College running Graduate Degree Program in Physiotherapy (BPT) and on successful graduation of the first batch is eligible to seek affiliation to start/ commence Master Degree Program in Physiotherapy (MPT).

Eligibility for Admission

Candidates who have passed B.Sc. (PT) or BPT degree from institutions where the mode of study is a full time program, with minimum 3½ years / 4 ½ years duration from this university or any other university in India or abroad as equivalent with not less than 50% of marks in aggregate and have completed 6 months of compulsory rotating internship in Physiotherapy Colleges recognized by RGUHS - Karnataka are eligible. Candidates who have passed BPT through correspondence or Distance Education program are not eligible.

OR

Candidates who have passed BPT through Bridge Course or through Lateral Entry after completing their Diploma in Physiotherapy from institutions where the mode of study is a full time program from this university or any other university in India or abroad as equivalent with not less than 50% of marks in aggregate and have completed 6 months of compulsory rotating internship in Physiotherapy Colleges recognized by RGUHS - Karnataka are eligible. Candidates who have passed BPT through correspondence or Distance Education program are not eligible.

Obtaining Eligibility Certificate

No candidate shall be admitted for the postgraduate degree course unless the candidate has obtained and produced the eligibility certificate issued by Rajiv Gandhi University of Health Sciences, Karnataka. The candidate has to make the application to the university with the following documents along with the prescribed fee.

1. B.P.T. or B.Sc. (PT) provisional / degree certificate issued by the respective university.
2. Marks cards of all the university examinations passed.
3. Completion of internship certificate.
4. Proof of SC/ST or category-I as the case maybe.

Candidate should obtain the eligibility certificate before the last date for admission as notified by the university.

A candidate who has been admitted to postgraduate course should register his/her name in the University within a month of admission after paying the registration fee.

DURATION OF THE COURSE

The duration of master of physiotherapy course shall be extended over a period of two continuous Years' on a full-time basis. Any break in the career, power of extension of the course and the fixation of the term shall be vested with the University.

MEDIUM OF INSTRUCTION

English will be the medium of instruction for the subjects of study and for the examination of the MPT course.

INTAKE

The intake of students to the course shall be in accordance with the ordinance in this behalf. The guide student ration should be **1:3**

Intake to the Course:

- (a) An Institution while starting MPT for the first time, the fresh intake to the Master Degree Program in Physiotherapy (MPT) shall not exceed **THREE students/ speciality**.
- (b) The University may increase the intake subject to availability of Post Graduate guides and the Institution/College may apply for increase in intake, only after the first batch of students have successfully completed the above course.
- (c) The Post Graduate intake in the Institution/ College shall not exceed **SIX seats/ speciality**.
- (d) Existing institutions affiliated to RGUHS offering MPT, may continue their admission with their existing total intake capacity as approved by RGUHS and Government of Karnataka order.
- (e) Existing institutions affiliated to RGUHS offering MPT must decide the number of seats they would like to opt for in each specialty and offer them based on the availability of recognized guide for a particular specialty infrastructure and facilities available. However, The Post Graduate intake in the Institution/ College affiliated to RGUHS offering MPT shall not exceed **SIX seats/ speciality**.
- (f) Whereas, the University may increase the intake subject to availability of Post Graduate guides and the Institution/ College may apply for increase in intake in existing institutions affiliated to RGUHS offering MPT for not more than **SIX seats/ speciality**.

Intake of Students:

- a) The intake capacity of students to each specialty seats shall be

Specialty	Maximum Seats
MPT-MSK	SIX
MPT-Sports	SIX
MPT-CVP	SIX
MPT-Ped	SIX
MPT-Neuro	SIX
MPT-Com	SIX
MPT-MS	SIX

- b) However, the intake for fresh commencement in new colleges for the first time shall be THREE per specialty.
- c) The allotment of seats for any specialty shall be subject to availability of recognized guides by RGUHS in the area of specialty chosen.
- d) A new institution imparting a Master's degree in Physiotherapy can apply for seat enhancement only after the first batch of Master in Physiotherapy students have passed. No increase of intake shall exceed THREE seats per year and per specialty at a time.

GUIDE

Post Graduate Guide:

- (a) The teacher in a Physiotherapy College having 5 years of full-time teaching experience after obtaining Master Degree Program in Physiotherapy (MPT) and the teacher has been **recognized as guide by the Rajiv Gandhi University of Health Sciences**, Karnataka. The recognized teacher is eligible to guide the students of MPT program in their respective specialty.
- (b) Every recognized Post Graduate teacher can guide **THREE** students/year
- (c) Whereas, the existing MPT postgraduate guides in institutions affiliated to RGUHS may reapply for their recognition to guide specialty of their choice as per the specialty available in accordance to this ordinance.
- (d) This ordinance proposes to introduce a total of 7 specialties. This creates a need for guides in 2 additional areas in addition to the existing elective branches. A onetime measure is provided to PG guides to select the specialty branch they would guide. Once selected, the individual will be recognized as a guide for the specialty at RGUHS.

The academic qualification and teaching experience required for recognition by this university is as per the criteria for recognition of MPT teachers for guides.

Criteria for recognition of MPT teacher / guide

1. M.Sc. (PT) /MPT with five years teaching experience working on a full-time position at a Recognized institution.
2. The age of guide / teacher shall not exceed 63years.
3. The guide student ratio should be 1:3

Change of Guide

In the event of registered 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.

COURSE CONTENT & STRUCTURE

The course and structure are outlined under Subjects of Specialty as follows

SPECIALTY	Teaching & Learning Methods	Weekly Class hours	Total Hours
a) Principles of Physiotherapy Practice b) Research Methodology and Biostatistics c) Exercise Physiology d) Electrophysiology e) Applied Anatomy, Applied Physiology and Biomechanics in the area of specialty f) Physical and Functional Diagnosis relevant to specialty g) Treatment planning and Physiotherapy Management h) Recent Advances in the area specialty	Lectures	2	180
	Seminars	2	180
	Practical and Demonstrations	4	360
	Clinical Discussions	2	180
	Clinical Case presentations	2	180
	Journal Club	2	180
	Classroom Teaching / Pedagogy	1	90
	Self-directed learning/ Library	3	270
	Clinical Training	15	1350
Synopsis & Dissertation work		3	210
Community Camps, Field Visits, Participation in Workshops & Conferences			60
TOTAL HOURS		36	3240

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 the University Examinations. A candidate who does not satisfy the requirement of attendance even in one subject

or more will not be permitted to appear for University Examination. He / She will be required to make up the deficit in attendance to become eligible to take subsequent examination.

METHOD OF TRAINING

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

Clinical Facility:

Every Institution/College shall have provision for clinical facility for the specialties offered. This must be available in your own hospital or affiliated hospital.

Clinical Department required in the Hospital.

Every Institution/College shall have provision for clinical facility as specified in Schedule III of the BPT Ordinance 2016

The minimum number of beds required for Master degree program is 150. They may be distributed for the purposes of clinical teaching as specified in Schedule III of the BPT Ordinance 2016.

OPD – in campus requirement

Minimum number of outpatient flow shall be 20 per day in the College campus. This is in addition to the OPD at the attached hospital of the college.

OPD Unit: Mandatory 2000 sq. ft (minimum) to accommodate exercise and electro therapy units and make provision for mat area and a consultation room. An outpatient department at the tie up facility cannot be considered as an independent OPD Unit of the college. Staff Room of 200 Sq. ft. to be provided for staff in OPD unit.

Laboratories:

- (a) Every Institution/College running Master Degree Program in Physiotherapy (MPT) shall have adequate laboratory facilities as specified in the ordinance for Bachelor of Physiotherapy, BPT
- (b) The standard of such laboratory, space, equipment, supplies, and other facilities shall be in consonance with the ordinance for BPT

- i. Biomechanics / (Research Lab)
- ii. Electro therapy Lab
- iii. Exercise therapy Lab

Each lab shall have a minimum area of 800 sq. ft comprising of 5 treatment tables.

The Physiotherapy Labs must have the necessary equipment as prescribed the BPT Ordinance

Practical:

(a) The students shall carry out the practical learning under the guidance and supervision of a recognized guide.

(b) Every batch for practical learning shall consist of not more than SIX students.

(c) e – Learning shall be part and parcel of the Master Degree Program in Physiotherapy (MPT).

Laboratories:

(a) Every Institution/College running Bachelor Degree Program in Physiotherapy shall have adequate laboratory facilities specified in Schedule IV of the BPT Ordinance.

(b) The standard of such laboratory, space, equipment, supplies, and other facilities shall be in consonance with Schedule IV of the BPT Ordinance.

MPT course – Mandatory additional clinical section/ equipment/ Lab requirement.

The detailed list is provided in the curriculum under each Specialty area and the same is a part of this ordinance

(a) MPT –MSK

- i. Affiliation with a hospital having Orthopedic department must be established if offering this elective
- ii. The center MUST have the equipment and facilities mentioned in the curriculum for this specialty.

(b) MPT –Sports

- i. Affiliation with a Sports facility must be established if offering this elective.
- ii. A working MOU for utilizing the Lab facilities at the Affiliated Sports facility will be acceptable.
- iii. The center MUST have the equipment and facilities mentioned in the curriculum for this specialty.

iv.

(c) MPT –CVP

- i. Affiliation with a hospital having General Medicine, General Surgery, Pulmonary and Cardiac department, Medical and surgical ICU, Burns and Plastic surgery department must be established if offering this specialty.
- ii. The center MUST have the equipment and facilities mentioned in the

curriculum for this specialty.

(d) MPT –Ped

- i. Affiliation with a hospital having Pediatric department with PICU and NICU and other centers as specified under the specialty must be established if offering this elective
- ii. An additional Paediatric Physiotherapy department must be established if offering this elective. Paediatric Physiotherapy department may be established as an OPD unit of the college or the affiliated hospital must have an established Paediatric Physiotherapy OPD.
- iii. The center MUST have the equipment and facilities mentioned in the curriculum for this specialty.

(e) MPT –Neuro

- i. Affiliation with a hospital having Neurology department which includes Neuro – Medical and Neuro – surgical units must be established if offering this elective.
- ii. The center MUST have the equipment and facilities mentioned in the curriculum for this specialty.

(f) MPT –Com

- i. MOU with a nearby PHC and other centers as specified under the specialty must be established.
- ii. Infrastructure for Community Physiotherapy outpatient setting in the community
- iii. The center MUST have the equipment and facilities mentioned in the curriculum for this specialty.

(g) MPT –MS

- i. In addition to the existing BPT labs the institution offering Movement Science Specialty must establish an Advanced Biomechanics lab and Ergonomics lab.
- ii. The center MUST have the equipment and facilities mentioned in the curriculum for this specialty.

**MONITORING PROCESS OF STUDENTS
(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 is 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 checklist are given in the table 1 to 7 (APPENDIX) which may be copied and used

Portfolio: Every candidate shall maintain a work diary and record his/her participation in the training programmes 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 Head of the Institution and presented in the university examination.

Periodic tests: The College may conduct periodic tests. The test may include 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 Department and sent to the University, when called for.

DISSERTATION

Every candidate pursuing MPT degree course is required to carry out work on a selected research Project under the guidance of a recognized postgraduate teacher. This may include qualitative research, systematic review or empirical research.

The results of such a 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, and comparison of results and drawing conclusions.

Every candidate shall submit to the Registrar of 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. Guide will be only a facilitator, advisor of the concept and hold responsible in correctly directing the candidate in the methodology and not responsible for the outcome and results.

The written text of dissertation shall not be less than 50 pages and shall not exceed 200 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.

Dissertation thus prepared shall be submitted to the Registrar (Evaluation) as per the format notified by the University, 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. The dissertation shall be valued by the evaluator (Examiners) apart from the guide out of which one is external outside the university and one internal from other college of the same university. Any one-evaluator acceptance other than the guide will be considered as a precondition for eligibility to take the examination.

Dissertation once defended need not be defended at successive examination attempts.

SCHEDULE OF EXAMINATION

The University shall conduct examination for MPT course at the end of 2nd year. The Examinations shall be known as MPT Final Examination. A student shall register for all the papers when he/she appears for the first time.

If a student fails in theory and/or practical of MPT Final Examination, he/she has to reappear for all the papers of examination in both theory and practical respectively.

SCHEME OF EXAMINATION

Component	PAPER	Written	Practical	Viva	Total
Theory & Practical	Paper I	100	-	-	100
	Paper II	100	-	-	100
	Paper III	100	100	50	250
	Paper IV	100	100	50	250
TOTAL		400	200	100	700

PAPER I IS COMMON FOR ALL THE SPECIALTIES

PARTICULARS OF THEORY QUESTION PAPERS AND DISTRIBUTION OF MARKS

A written examination consisting of 4 question papers each of three hours duration & each paper carrying 100 marks. Particulars of Theory question paper & distribution of marks are shown below

PAPER	MARKS ALLOTTED	TOTAL
Paper I	10 Questions x 10 Marks each	100 Marks
Paper II	10 Questions x 10 Marks each	100 Marks
Paper III	10 Questions x 10 Marks each	100 Marks
Paper IV	10 Questions x 10 Marks each	100 Marks

PATTERN OF MODEL QUESTION PAPER FOR MPT EXAMINATION**MPT – Theory: Maximum Marks: 100 (No choice)**

Duration: 3 Hours

Long Essay (10 Questions) – 10 x 10 = 100Marks

MPT Practical / Clinical – 150Marks*Note: All cases for clinical examination should be on patients & not on model*

Practical-I + Viva-voce = 1x100= 100 Marks Viva Voce = 50 Marks

Practical-II+ Viva Voce = 1x100= 100 Marks Viva Voce = 50 Marks

[Marks Entry: Practical/Clinical=100Marks Viva-voce = 50Marks]

PARTICULARS OF PRACTICAL AND VIVA-VOCE

Clinical Examination will be aimed at examination of clinical skills and competence of the candidates for undertaking independent work as a specialist.

PRACTICAL / VIVA-VOCE	DESCRIPTION	MARKS ALLOTTED
Practical I	Long case from Specialty area to assess investigative, diagnostic skills and patient management skills	100
Viva-voce	5 Spotters and viva from the specialty area	50
Practical II	Major Elective long case aimed at examining clinical skills and competency of the candidate for undertaking independent work as specialist	100
Viva-voce	Viva on dissertation/ Specialty.	50

PARTICULARS OF VIVA VOCE

Viva- Voce examination shall aim at assessing depth of knowledge, logical reasoning, confidence & oral communication skills and spotters. Special emphasis shall be given to dissertation work during the MPT Part examination. (The Student need not defend their dissertation at successive attempts). The marks of Viva-Voce examination shall be included in the clinical examination to calculate the percentage and declaration of results.

EXAMINERS

Practical- I - There shall be 2 examiners. One of them shall be external outside the zone from the same specialty and the other shall be internal from the same specialty from the same college.

Practical – II - There shall be 2 examiners. One of them shall be external outside the University from the same specialty and the other will be guide assigned to the student from the same college.

CRITERIA FOR DECLARING PASS IN THE UNIVERSITY EXAMINATION

A candidate shall be declared pass if he / she secures a 50% of marks in theory aggregate and secures a 50% of marks in Practical / Clinical and Viva-Voce aggregate.

DECLARATION OF CLASS

First class with distinction – 75% & above in aggregate provided the candidate passes the examination in 1st attempt. First class – 60% & above in aggregate provided the candidate pass the examination in 1st attempt.

Pass – 50% of maximum marks in theory aggregate and 50% of maximum marks in clinical and Viva-Voce aggregate.

DESCRIPTIVE COURSE CONTENT

Paper – I

Fundamentals in Physiotherapy Practice, Pedagogy and Research

1. **Principles of Physiotherapy Practice**
 - a. Definition of Physiotherapy, Scope of Practice
 - b. General and Professional competencies
 - c. Physiotherapy Knowledge, Skill and Education Framework
 - d. Principles of Evidence Based Practice in Physiotherapy
 - a. History taking, assessment tests, Patient Communication, documentation of findings, treatment planning and organization.
 - b. Documentation of rehabilitation assessment and management using International Classification of Functioning Disability and Health (ICF).
 - c. Use of Standardized scales and tests in various assessments. Psychometric properties and its Interpretation in Physiotherapy practice.

2. **Core Professional Values in Physiotherapy including Professional and Research Ethics**
 - a. Introduction to World Physiotherapy Standards of Physical Therapy Practice Guideline
 - b. Core Professional Values across Different Countries and Regions
 - c. ICMR Ethical Guidelines
 - d. Ethical issues in practice of physiotherapy.

3. **Research Methodology and Biostatistics**
 - a. **Designing Clinical Research: Basic Ingredients**
 - i. Getting Started: The Anatomy and Physiology of Clinical Research
 - ii. Fundamentals of Literature Search and Review
 - iii. Conceiving the Research Question and Developing the Study Plan
 - iv. Choosing the Study Subjects: Specification, Sampling, and Recruitment
 - v. Planning the Measurements: Precision, Accuracy, and Validity
 - vi. Hypotheses and Underlying Principles to Estimating Sample Size and Power

 - b. **Designing Clinical Research: Study Designs**
 - i. Designing Cross-Sectional, Case–Control and Cohort Studies

- ii. Enhancing Causal Inference in Observational Studies
- iii. Designing a Randomized Blinded Trial, Alternative Clinical Trial Designs and their Implementation Issues
- iv. Designing Studies of Diagnostic Tests
- v. Research Using Existing Data
- vi. Fundamentals of Qualitative Research Methods
- vii. Fundamentals of Systematic Reviews and Meta-analysis
- viii. Designing a systematic review protocol

c. Implementation of Clinical Research

- i. Designing Questionnaires, Interviews, and Online Surveys
- ii. Implementing the Study and Quality Control
- iii. Data Management
- iv. Designing qualitative studies

d. Biostatistics

- i. Basic Fundamentals of Biostatistics
- ii. Probability and Normal Distribution
- iii. Descriptive Statistics: Measures of Central Tendency and Spread
- iv. Hypothesis Testing: One-Sample Inference, Two-Sample Inference, Multi-sample Inference,
- v. Hypothesis Testing: Nonparametric Methods, Categorical Data
- vi. Regression, Correlation Methods and Diagnostic Tests
- vii. Data synthesis in qualitative design

e. Consuming and Disseminating Research

- i. Strategies for following Emerging Evidence, Clinical Practice Guidelines and Clinical pathways
- ii. Best Practices in Research Dissemination
- iii. Writing a Manuscript for Publication

4. Exercise Physiology

- a. Fundamentals of Human Energy Transfer
- b. Source of Nutrition and Energy, Macro and Micro Nutrients, Food Energy and Optimum Nutrition for Exercise
- c. Energy Expenditure During Rest and Physical Activity
- d. Measuring and Evaluating Human Energy-Generating Capacities During Rest and Exercise
- e. Responses and Adaptations of Pulmonary, Cardiovascular, Neuromuscular, Musculoskeletal, Endocrine System to Different Types of Exercise and Training
- f. Body Composition, Its Evaluation, Obesity and Weight Control
- g. Training the Anaerobic and Aerobic Energy Systems
- h. Training Muscles to Become Stronger
- i. Factors Affecting Physiological Function: The Environment and

Special Aids to Performance

- j. Influence of Age and Gender in Exercise and Training.

5. Electrophysiology

- a. Anatomy and physiology of peripheral nerve, muscle and neuromuscular junction.
- b. Electrical properties of muscle and nerve.
- c. Instrumentation for neuromuscular electrical stimulation.
- d. Muscles plasticity in response to electrical stimulation.
- e. Electrical stimulation and its effects on various systems.

6. Pedagogy in Physiotherapy Education

- a. Competency Based Education in Physiotherapy
- b. Basics of Adult Learning Theories including Learning Styles and Motivation
- c. Formulating Intended Learning Outcomes Including Tyler's principles, Bloom's Taxonomy, Miller's Pyramid, Clinical Competence, and Dreyfus' Model of Skill Acquisition
- d. Instructional Design and Individual Assessment such as Multiple-choice Question Writing, Skill assessment, Oral Presentation, and Rubrics and Standardization
- e. Instructional Techniques: Knowledge Transfer
- f. Instructional Techniques: Skill Development
- g. Instructional Techniques: Attitudes
- h. Instructional Techniques: Teaching with Technology
- i. Academic Planning and Organisation

7. Management, Entrepreneurship and Leadership in Physiotherapy Practice

- a. Introduction to Management in Physiotherapy: Definition, Principles, Functions and Evolution of Management Thought
- b. Management Process: Planning, Organizing, Directing, Controlling. Decision making.
- c. Responsibilities of the Physiotherapy Manager: Staffing Responsibilities; Responsibility for Patient Care; Fiscal Responsibilities; Responsibility for Risk Management; Legal and Ethical Responsibilities; Communication Responsibilities
- d. Entrepreneurship in Physiotherapy Practice: Need, Advantages and Opportunities, Challenges and Barriers
- e. Leadership: Need, Relevance, Competencies and Characteristics

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2. World Physiotherapy (2011) Physical Therapist Professional Entry Level Education Guideline. (Available from: <https://world.physio/sites/default/files/2020-07/G-2011-Entry-level-education.pdf>)
3. CSP (2011) Physiotherapy Framework: Putting physiotherapy Behaviours, Values, Knowledge & Skills into Practice [updated May 2020](Available from: <https://www.csp.org.uk/professional-clinical/cpd-education/professional-development/professional-frameworks>)
4. Expected Minimum Competencies for an Entry Level Physiotherapist in the Europe Region World Physiotherapy Guidance Document (Available from: https://www.erwcpt.eu/education/expected_minimum_competencies_for_entry_level)
5. Evidence-Based Medicine: How to Practice and Teach EBM, 2nd Edition: By David L. Sackett, Sharon E. Straus, W. Scott Richardson, William Rosenberg, and R. Brian Haynes, Churchill Livingstone, 2000
6. Rob Herbert, Gro Jamtvedt, Kåre Birger Hagen, Judy Mead. Practical Evidence-Based Physiotherapy (Second Edition), Churchill Livingstone,
7. 2011, ISBN 9780702042706,
8. World Physiotherapy (2011) Standards of Physical Therapy Practice Guideline(Available from: <https://world.physio/sites/default/files/2020-06/G-2011-Standards-practice.pdf>)
9. 2017 ICMR National Ethical Guidelines for Biomedical and Health Research involving Human Participant
- 10.2020 ICMR Policy on Research Integrity and Publication Ethics (RIPE)
- 11.Designing Clinical Research 4th Edition. Stephen B. Hulley et al. Published By: Lippincott Williams & Wilkins. ISBN-13: 9781469840543
- 12.Medical Biostatistics (Chapman & Hall/CRC Biostatistics Series). 4th Edition 2017. Abhaya Indrayan, Rajeev Kumar Malhotra. Chapman and Hall/CRC. ISBN 9781498799539
- 13.Exercise Physiology Nutrition, Energy, and Human Performance. 8th Edition. William D. McArdle PhD, Frank I. Katch , Victor L. Katch. Lippincott Williams & Wilkins. ISBN/ISSN: 9781451191554
- 14.Principles of Medical Education. 4th Edition. Tejinder Singh, Piyush Gupta, Daljit Singh. 2013. Jaypee Publishers.
- 15.Management in Physical Therapy Practices, 2nd Edition. Catherine G. Page PT, MPH, PhD. ISBN-13: 978-0-8036-4033-7
- 16.Heather A. Current thinking on Leadership and Physiotherapy Practice. 2016. Report Prepared for AGILE Professional Network of the Chartered Society of Physiotherapy (Available from: https://agile.csp.org.uk/system/files/current_leadership_thinking_and_physiotherapy_practice.pdf)

**Master of Physiotherapy
Musculo-skeletal Sciences
MPT-MSK**

OBJECTIVES

On Completion of the course, the post graduate will be able to

1. Exercise professional autonomy based on sound knowledge, skills and discipline at par with global standards in the Musculoskeletal Specialty area
2. Practice within the professional code of ethics and conduct, and the standards of practice within legal boundaries.
3. Identify and analyze musculoskeletal dysfunction within the boundaries of physiotherapy practice and arrive at an appropriate hypothesis based on sound clinical reasoning
4. Work with integrity and autonomy in an interdisciplinary team
5. Involve in undergraduate and post graduate teaching with competence
6. Conduct research activities and utilize findings for professional development and lifelong learning

SCOPE OF PRACTICE

A musculoskeletal specialist physiotherapist will be competent to evaluate, assess and arrive at reasoning-based hypothesis in patients with musculoskeletal dysfunction, trauma or disease. Musculoskeletal Physiotherapists work based on the ICF framework to develop, maintain, restore and optimize health and function. They will be competent to use current evidence to treat and manage musculoskeletal deficits or dysfunctions in children, adults and elders. They will be competent to act as a team leader of a multidisciplinary rehabilitation team and contribute to interdisciplinary care planning and implementation of musculoskeletal rehabilitation methods. They will be competent to take up academic and research positions in their area of expertise. They will be competent to be autonomous clinical practitioners.

PAPER II**FUNDAMENTAL PRINCIPLES OF MUSCULOSKELETAL PHYSIOTHERAPY****1. Basic Concepts of Musculoskeletal System:**

- a. Anatomy and Physiology of Musculoskeletal system.
- b. The Skeletal System
- c. The Articular System
- d. The Neuro-muscular System

2. Basic Concepts of Anthropometry:

- a. Definition of Anthropometry
- b. Tools for Measurement
- c. Body Size
- d. Determination of Body Shape
- e. Tissues Composing the Body
- f. Human Variation
- g. Methods in Body composition analysis

3. Basic Concepts of Biomechanics:

- a. Kinetics, Kinematics, space and time
- b. Force, Vectors, Motion
- c. Degrees of freedom, Moment of force, Equilibrium
- d. Concept of Energetics (Energy/Power/Efficiency of movement/ metabolic energy consumption)

4. Biomechanics of movement across Life Span:

- a. Growth and development of the musculoskeletal system
- b. Maturation of mobility and gait
- c. Biomechanics of Gait
- d. Gait development in Children
- e. Gait changes in older adults
- f. Biomechanics and aging

5. Physiological Basis of Human Movement:

- a. Basic concepts of Exercise metabolism
- b. Measurement of Exercise capacity
- c. Oxygen supply during exercise
- d. Energy cost of activity
- e. Applications of Exercise Physiology and adaptations to different systems.
- f. Physiology of Movement and its application in musculoskeletal disease, Injury and Dysfunction.

6. Mechanics and Pathomechanics of Joints:

- a. Upper Extremity Joints
- b. Lower Extremity Joints
- c. Spinal Joints
- d. Temporomandibular Joint
- e. Skeletal tissue
- f. Soft tissues

7. Posture:

- a. Normal and Abnormal Posture
- b. Control of Posture
- c. Analysis of Posture
- d. Postural Deformities

8. Gait and function:

- a. Gait cycle
- b. Biomechanical analysis of Gait
- c. Normal and Pathological Gaits.
- d. Energy Expenditure and Gait
- e. Kinetic and Kinematic analysis of Various functional activities

9. Pain:

- a. Definition, Pain pathways, Physiology and Pathophysiology of Pain
- b. Acute Pain & Chronic Pain
- c. Assessment of Pain in different populations
- d. Theories and Models of Pain
- e. Specific musculoskeletal Pain states and Syndromes
- f. Tools for assessment of Pain
- g. Evidence based advances in Pain assessment.

10. Electro Physics:

- a. Basic concepts of Electrotherapy
- b. Alterations in skeletal muscle performance
- c. Soft tissue repair and healing
- d. Biophysical effects of heat and cold
- e. Clinical decision making in selecting Electro modalities.
- f. Alternative modalities for pain and Tissue healing

PAPER III**PHYSICAL AND FUNCTIONAL DIAGNOSIS IN MUSCULOSKELETAL DISORDERS**

1.
 - a. Introduction to assessment
 - b. Basic assessment methods
 - c. Physical assessment as a screening tool

2.
 - a. Screening the Head, Neck, and Back
 - b. Screening the Shoulder and Upper Extremity
 - c. Screening the Sacrum, Sacroiliac, and Pelvis
 - d. Screening the Lower Quadrant: Buttock, Hip, Groin, Thigh, and Leg
 - e. Screening the Chest and Ribs

3.
 - a. Direct access and self-referral
 - b. Primary care
 - c. Autonomous Practice
 - d. Decision making Process

4.
 - a. Physiotherapy diagnosis in Musculoskeletal system
 - b. Special tests used in Musculoskeletal examination
 - c. Medical screening for potential referred pain – Red flags
 - d. Investigation methods/Diagnostic Imaging used in musculoskeletal disease, injury and Dysfunction
 - e. Electrophysiological testing/Electro diagnosis in musculoskeletal disease, injury and Dysfunction
 - f. Exercise testing in musculoskeletal disease, injury and Dysfunction

5.
 - a. Assessment of fractures, includes (Pre-operative and post-operative assessments)
 - b. Prescription of orthotic devices/splints in musculoskeletal disease, injury and Dysfunction
 - c. Assessment of Hand Injuries, Soft tissue repairs.
 - d. Assessment of Amputations.
 - e. Assessment of Degenerative Conditions and orthopedic diseases
 - f. Assessment methods in pediatric orthopedic disorders

6.
 - a. Functional Assessment
 - b. Functional Assessment scales used in Trauma and Musculoskeletal dysfunction
 - c. Critical decision making in selection of outcome measures used in Trauma and Musculoskeletal dysfunction
 - d. Ergonomics Risk assessment in Musculoskeletal disorders
 - e. Use of ICF in Musculoskeletal diagnosis

7.
 - a. Fitness evaluation specific to age, gender and disorders- standard methods with norm referencing for India
 - b. Clinical reasoning in Manual therapy.
 - c. Evaluation of work capacity and return to work

PAPER IV**PHYSIOTHERAPY INTERVENTIONS IN MUSCULOSKELETAL DISORDERS**

- 1. Interventions for Physiologic Impairments during Rehabilitation**
 - a. Impaired Muscle Performance
 - b. Impaired Endurance
 - c. Impaired Mobility
 - d. Impaired Neuromuscular control

- 2. Management of Pain**
 - a. Pharmacological management of Pain (Opioids, Non – Opioids, Adjuvants, Analgesics and Local anesthetics)
 - b. Electrotherapy in managing pain
 - c. Educational and behavioral strategies in managing pain.
 - d. Adjuvant therapies in managing pain

- 3. Methods of Musculoskeletal Rehabilitation**
 - a. Biomechanical concepts
 - b. Functional concepts
 - c. Postural stability and Balance
 - d. Core stability in Rehabilitation
 - e. Functional Training& Physical activity promotion
 - f. Education and behavioral methods

- 4. Advanced techniques in Musculoskeletal Rehabilitation**
 - a. Manual Therapy and Myofascial concepts and methods (Different schools of Thought)
 - b. Neurological Concepts and functional methods in musculoskeletal dysfunctions
 - c. External applications
 - d. Cognitive behavioral methods
 - e. Adjuvant methods

- 5. Electro modalities in Musculoskeletal Rehabilitation**
 - a. Physical agents in Rehabilitation
 - b. Electric currents for Tissue healing
 - c. Evidence based electrotherapy management in Musculoskeletal disorders
 - d. Electromagnetic agents in Rehabilitation
 - e. Alternative modalities for Tissue healing

- 6. Ergonomics**
 - a. Ergonomic Interventions for Work related Musculoskeletal disorders
 - b. Work hardening and conditioning

- c. Role of Assistive devices in Work Place
- d. Current designs in Assistive technology

7. Trauma Rehabilitation

- a. Evidence based approach in management of Fractures and Post-operative conditions
- b. Rehabilitation of Neoplastic conditions, Tendon transfers, Soft tissue injuries and surgeries, Degenerative and Orthopedic conditions.

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BOOKS

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4. Magee DJ. Orthopedic Physical Assessment. Elsevier Health Sciences; 2014.
5. Donatelli RA, Wooden MJ. Orthopaedic Physical Therapy. Elsevier health sciences; 2009.
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8. McKinnis LN. Fundamentals of musculoskeletal imaging. FA Davis; 2013.
9. Greenspan A, Beltran J. Orthopaedic Imaging: A practical approach. Lippincott Williams & Wilkins; 2020.
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12. American College of Sports Medicine. ACSM's resource manual for guidelines for exercise testing and prescription. Lippincott Williams & Wilkins; 2012.
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15. Hertling D, Kessler RM. Management of common musculoskeletal disorders: physical therapy principles and methods. Lippincott Williams & Wilkins; 2006.
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21. Cooper C. Fundamentals of Hand Therapy: Clinical Reasoning and Treatment Guidelines for Common Diagnoses of the Upper Extremity. Elsevier Health Sciences; 2014.
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25. McKenzie R. The cervical and thoracic spine: mechanical diagnosis and therapy. Orthopedic Physical Therapy; 1990.
26. Butler DS, Jones MA. Mobilisation of the nervous system. Elsevier health sciences; 1991.
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31. Travell JG, Simons DG. Myofascial pain and dysfunction: the trigger point manual. Lippincott Williams & Wilkins; 1983.
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35. Maitland GD, Hengeveld E, Banks K, English K. Maitland's vertebral manipulation: Elsevier Butterworth; 2005.
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38. Twomey LT. Grieve's modern manual therapy. Boyling JD, Jull GA, editors. London: Churchill Livingstone; 2004.
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41. Gatterman MI. Foundations of chiropractic: subluxation. Elsevier Health Sciences; 2005 Mar 15.
42. Haldeman S. Principles and practice of chiropractic. McGraw-Hill Medical; 2004 Sep 24.
43. Ward RC, Jerome JA. Foundations of Osteopathic Medicine. 1997. Williams and Wilkins, Baltimore, MD.
44. DiGiovanna EL, Schiowitz S, Dowling DJ, editors. An osteopathic approach to diagnosis and treatment. Lippincott Williams & Wilkins; 2005.

JOURNALS

1. Journal of Orthopedic and Sports Physical Therapy
2. Journal of Physiotherapy-Official Journal of the Australian Physiotherapy Association
3. Archives of Physical Medicine and Rehabilitation.
4. Physiotherapy.
5. Physical Therapy by APTA.
6. International Journal of Physiotherapy.
7. Physiotherapy Practice.
8. Musculoskeletal Science and Practice.

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9. International Biomechanics
 10. Journal of Strength and Conditioning Research
 11. Chiropractic and Manual Therapies
 12. Journal of Hand Therapy
 13. Musculoskeletal Care
 14. Strength and Conditioning Journal
 15. Shoulder and Elbow
 16. Journal of Back and Musculoskeletal Rehabilitation
 17. Journal of Manual and Manipulative Therapy
 18. Manual Therapy.
 19. Journal of Manual Medicine
 20. Journal of Orthopedics, Trauma and Rehabilitation.
 21. Gait and Posture
 22. Physiotherapy - The Journal of Indian Association of Physiotherapists.

FACULTY & INFRASTRUCTURE REQUIREMENTS

1. **Minimum Faculty Position for MPT- MSK program**
 - a. Professor/ Associate Professor – ONE
 - b. Assistant Professor – ONE
 - c. Faculty must be recognized from the area of Musculoskeletal specialty
 - d. Faculty position is inclusive from the minimum faculty position for BPT program

2. **Minimum Infrastructure requirement**
 - a. Affiliation with a hospital having Orthopedic department must be established if offering this elective
 - b. The center **MUST** have ALL the equipment and facilities mentioned under the METHODS OF TRAINING in this ordinance for this specialty in consonance with Schedule IV of the BPT Ordinance.

**Master of Physiotherapy
Sports Sciences
MPT-Sports**

OBJECTIVES

On Completion of the course, the post graduate will be able to

1. Exercise professional autonomy based on sound knowledge, skills and discipline at par with global standards in sports injury, prevention, management and rehabilitation.
2. Practice within the professional code of ethics and conduct, and the standards of practice within legal boundaries.
3. Identify and analyze sports specific risk, dysfunction and injury within the boundaries of physiotherapy practice and arrive at an appropriate hypothesis based on sound clinical reasoning on the field and in an institution
4. Work with integrity and autonomy with an interdisciplinary sports team
5. Involve with competence in academic sports specific areas
6. Conduct research activities and utilize findings for professional development and lifelong learning

SCOPE OF PRACTICE

A Sports Science Specialist physiotherapist will be competent to evaluate assess and arrive at reasoning-based hypothesis in individuals engaged in various sporting activities. Sports Physiotherapists work based on the ICF framework to develop, maintain, restore and optimize, function and performance. They will be competent to use current evidence to identify risks, plan and implement preventive strategies, evaluate and assess an acute injury, manage them effectively on field and undertake rehabilitation program specific to individual sports. They will be competent to use current evidence to evaluate, identify and manage sports specific deficits, dysfunctions and injuries in children, adults, elderly and differently abled. They will be competent to act as a team leader of a multidisciplinary sports rehabilitation team and contribute to interdisciplinary care planning and implementation of sports related programs. They will be capable to take up academic and research positions in their area of expertise and competent to be autonomous sports physiotherapy practitioners.

PAPER II**BASIC MEDICAL SCIENCES FOR SPORTS PHYSIOTHERAPY**

1. **Applied and Functional Anatomy**
 - a. Growth & maturation of systems involved in performance.
 - b. Human movement control
2. **Applied Physiology**
 - a. Cardio-Vascular system and Respiratory system
 - b. Endocrine system
 - c. Musculoskeletal system – Normal Physiology and Pathophysiology of muscle, tendon and ligament injuries.
 - d. Neurophysiology of balance, coordination and reaction.
 - e. Bio-Energetics / Energy transfer
 - f. Exercise and sports Physiology
3. **Applied biomechanics and patho-mechanics of bones, joints & soft tissues.**
4. **Principles of Biomechanics and kinesiology for sports.**
5. **Principles of motor learning and control.**
6. **Pain neuroscience education**
7. **Sports psychology:**
 - a. Psychological aspects of sport injury
 - b. Athletes reaction to injury-athletes response to injury
 - c. Psychological aspects of Pain, Anxiety, Stress, Motivation
 - d. Psychological aspects of exercise.
 - e. Pre-competitive anxiety, aggression in sports, eating disorders,
 - f. Psychological training techniques
 - g. Psychological aspect of doping
 - h. Psychological preparation of elite athletes
 - i. Neurophysiology of Emotion
8. **Sports Nutrition:**
 - a. Well-balanced diet,
 - b. Pre-event nutrition,
 - c. Increasing and decreasing weight in wrestlers,
 - d. Carbohydrate – loading diet,
 - e. Sugar before and after competition
9. **Sports pharmacology**
10. **Anti-doping:**

- a. (NADA,WADA)
 - b. Promotion of fair play.
11. **Role of a Sports physiotherapist as an administrator and team collaborator**
 12. **Principles of Training and exercise conditioning**
 13. **Thermoregulation**
 14. **Altitude, body fluids**
 15. **Body composition**
 16. **Medical conditions:**
 - a. Diabetes
 - b. HT
 - c. COPD
 - d. NCDs
 17. **Ergogenic aids**

PAPER III**SPORTS ASSESSMENT, INJURY EVALUATION (SPORTS TRAUMATOLOGY) AND EXERCISE PHYSIOLOGY**

1. **Assessment &Evaluation:**
 - a. Methods of evaluation: Interview, Clinical Examination,
 - b. Reliability & Validity of the tests,
 - c. Investigative Procedures,
 - d. Field Tests and Laboratory tests
 - e. Evaluation of motor skills (fundamental and sports specific skills)
2. **Clinical Bio-psychosocial approach to sports injury evaluation.**
3. **Evaluation of Physical Fitness:** Health and skill related fitness tests.
4. **Functional assessment.**
5. **Musculoskeletal screening**
6. **Investigation methods/Diagnostic Imaging used**
7. **On and Off-field assessment, pre-participation evaluation.**
8. **Sports specific assessment of lower limb complex:**
9. **Sports specific assessment of upper limb complex:**
10. **Sports specific assessment of spinal column**
11. **Sports specific assessment of Gait deviations**
12. **Criteria for return to sports**
13. **Advanced evaluation methods:**
 - a. Isokinetic, Myometers, Force plates & 3D analysis
 - b. Sports movement analysis
 - c. Fatigue assessment: lactate analyser
 - d. Kinesiological EMG
 - e. Kin anthropometric evaluation

PAPER IV**SPORTS INJURIES, PREVENTION, MANAGEMENT AND REHABILITATION**

1. **Principles of Prevention of Sports Injuries:**
 - a. Protective devices
 - b. Technique
 - c. Play area and play surface
 - d. Shoes
2. **Common sports injuries, mechanisms (causation), prevention and management:**
 - a. Soft tissue:
 - i. Ligament
 - ii. Muscle
 - iii. Tendon
 - b. Hard tissue:
 - i. Bone
 - ii. Articular cartilage
3. **Sports emergency and first aid management.**
4. **Sports specific Injuries in different sports categories**
 - a. Individual Sports
 - b. Partner Sports
 - c. Team Sports
 - d. Extreme Sports
5. **Advanced Physiotherapy Intervention Techniques used in the Management of Sports Specific Injuries: Techniques**
6. **Sports injury prevention and management for special population:**
 - i. Children
 - ii. Women
 - iii. Elderly
 - iv. Differently abled
7. **Guidelines and protocols for Return to sports following injury, conservative and surgical management**
8. **SPECIAL TOPICS**
 - a. **Medico legal issues in sports**
 - b. **Fitness and exercise prescription for special population and differently abled**

- c. **Effects of exercise on various hormones in the body.**
- d. **Exercise and Menstrual cycle.**
- e. **Female athlete triad**
- f. **Exercises for mood enhancement and anxiety.**
- g. **Sports and fitness in pediatrics.**
- h. **CPR and shock management during off and on field.**
- i. **Sports specific fitness training**
- j. **Ergonomics for sport**
- k. **Fitness programming for healthy adults and special population**

REFERENCES

Recommended Books

1. Essentials of Exercise Physiology, Frank Katch, Vic Katch, and William D McArdle
2. Exercise Physiology, William D McArdle
3. ACSM's Guidelines for Exercise Testing and Prescription
4. Clinical Exercise Physiology, Jonathan Ehrman, Paul Gordon, Paul Visich, Steven Keteyian
5. Gaits analysis – Perry J., Black Thorofare, New Jersey, 1992
6. Kinesiology of the human body, Steindler
7. Kinesiology: The Mechanics and Pathomechanics of Human Movement, Carol A. Oatis
8. Kinesiology of the Musculoskeletal System: Foundations for Rehabilitation 2nd Edition by Donald A. Neumann
9. Musculoskeletal Examination, Jeffrey M. Gross
10. Clinical Reasoning in Musculoskeletal Practice, Darren A. Rivett and Mark A. Jones
11. Clinical Orthopaedic Rehabilitation Brotzman SB, Wilk KE 2003
12. Clinical Sports Medicine Brukner P, Khan K 2002
13. Sports Physiotherapy, Maria Zuluaga, Christopher Briggs, John Carlisle.
14. Sports Injury Assessment and Management, David C Reid.
15. Sports injuries diagnosis and management, Christopher N. Norris:
16. Orthopedic and sports physical therapy, Terry R. Maccone Mosby
17. Sports injuries prevention and their treatment, Lass Peterson
18. Proprioception and neuromuscular control in joint stability LEPHARTS COTTM. Fu Freddie H. - human kinetics
19. Orthopaedic taping, wrapping, bracing & padding - BEAM JOEL W. JAYPEE
20. Taping techniques principles and practice - MACDONALD ROSE - BUTTERWORTH H HEINEMANN
21. Rehabilitation techniques for sports medicine and athletic training - Willian E Prentice
22. Mobilization of the extremity joints – Kaltenbore, Harper and Row, Philadelphia.
23. Orthopaedic physical therapy- Donatteli, London Churchill Livingstone, 1994.
24. Sports and physical therapy – Bernhardt Donna, Churchill, Livingstone
25. Orthopaedic Sports Medicine, DeleeDrez Miller, 3rd edition: 2009, Saunders Elsevier
26. Post-surgical orthopedic sports rehabilitation knee and shoulder, Robert C. Sports medicine problem and practical management, Eugene sherry

RECOMMENDED JOURNALS

1. American Journal of Sports Medicine
2. BMJ Open Sport and Exercise Medicine Open Access
3. British Journal of Sports Medicine
4. Clinical Journal of Sport Medicine

5. Clinics in Sports Medicine
6. Exercise and Sport Sciences Reviews
7. International Journal of Performance Analysis in Sport
8. International Journal of Sports Medicine
9. International Journal of Sports Physiology and Performance
10. Journal of Exercise Rehabilitation
11. Journal of Exercise Science and Fitness Open Access
12. Journal of Orthopedic and Sports Physical Therapy
13. Journal of Sport Management
14. Journal of Sport Rehabilitation
15. Journal of Sports Medicine and Physical Fitness
16. Journal of Sports Sciences
17. Physical Therapy in Sport
18. Physiotherapy
19. Sport, Exercise, and Performance Psychology
20. Sports Biomechanics
21. Sports Health
22. Sports Medicine - Open Open Access
23. Strength and Conditioning Journal

FACULTY & INFRASTRUCTURE REQUIREMENTS

1. **Minimum Faculty Position for MPT- Sportsprogram**
 - a. Professor/ Associate Professor – ONE
 - b. Assistant Professor – ONE
 - c. Faculty must be recognized from the area of Musculoskeletal / Sports specialty
 - d. Faculty position is inclusive from the minimum faculty position for BPT program

2. **Minimum Infrastructure requirement**
 - a. Affiliation with a hospital having Orthopedic and Sports department must be established if offering this elective
 - b. The center MUST have ALL the equipment and facilities mentioned under the METHODS OF TRAINING in this ordinance for this specialty in consonance with Schedule IV of the BPT Ordinance.
 - c. In addition to the existing labs for BPT, the institution must have an established Sports lab (minimum 1200 sqft) and a full body biomechanics lab (minimum 1400 sqft) with fitness assessment equipments and equipments for biomechanical analysis and lab facilities for analysis of blood gas, blood lactate and biomarkers and VO2 max

Or
 - d. A working MOU with a recognized sports organization facility which is at par with the Central/ State Sports Authority

**Master of Physiotherapy
Cardio-vascular and Pulmonary Science
MPT-CVP**

OBJECTIVES

On Completion of the course, the post graduate will be able to

1. Exercise professional autonomy based on sound knowledge, skills and discipline at par with global standards in prevention, management and rehabilitation of subjects with general medical, surgical, cardiovascular, pulmonary conditions
2. Practice within the professional code of ethics and conduct, and the standards of practice within legal boundaries.
3. Identify and analyze specific risks and dysfunction related to general medical, surgical, cardiovascular, pulmonary conditions within the boundaries of physiotherapy practice and arrive at an appropriate hypothesis based on sound clinical reasoning
4. Work with integrity and autonomy in an interdisciplinary team
5. Involve in undergraduate and postgraduate teaching with competence
6. Conduct research activities and utilize findings for professional development and lifelong learning

SCOPE OF PRACTICE

A Cardiovascular & Pulmonary specialist physiotherapist will be competent to evaluate, assess and arrive at reasoning-based hypothesis in patients with general medical, surgical, cardiovascular and pulmonary trauma or disease. Cardiovascular & Pulmonary Physiotherapists work based on the ICF framework to develop, maintain, restore and optimize health and function. They will be competent to use current evidence to treat and manage medical, surgical, cardiovascular and pulmonary dysfunctions in children, adults and elders. They will be competent to act as a team leader of a multidisciplinary rehabilitation team and contribute to interdisciplinary care planning and implementation of cardiovascular and pulmonary rehabilitation methods. They will be competent to take up academic and research positions in their area of expertise. They will be competent to be autonomous clinical practitioners.

PAPER II

BASICS OF CARDIOVASCULAR AND PULMONARY SCIENCES

1. **Applied Anatomy, Physiology, and Biomechanics of Respiratory System**
 - a. Applied Anatomy, developmental anatomy and physiology of the respiratory system in health and its application in various respiratory dysfunctions across lifespan.
 - b. Regulation of respiration
 - c. Biomechanics of respiration
 - d. Bronchial circulation.
 - e. Pathomechanics in respiratory dysfunction and thorax throughout lifespan.
 - f. Effect of Body positioning on pulmonary functions.
 - g. Pathology, Pathophysiology of various acute and chronic diseases affecting the respiratory systems.

2. **Applied Anatomy and Physiology of Cardiovascular System**
 - a. Applied Anatomy, developmental anatomy and physiology of the cardiovascular dysfunction across lifespan
 - b. Effect of Body positioning on Cardiovascular system
 - c. Cardiovascular Control Mechanism
 - d. Pathology, Pathophysiology of various acute and chronic diseases affecting the cardio vascular systems.

3. **Applied Anatomy and Physiology of Integumentary System**
 - a. Applied Anatomy,
 - b. Developmental anatomy,
 - c. Physiology of Integumentary system

4. **Exercise Physiology**
 - a. Optimal nutrition for exercise and essentials of good nutrition in health and disease.
 - b. Body composition determination and impact of body composition on resting metabolic rate and sub maximal exercise oxygen consumption
 - c. Physiology of Energy transfer in body during exercise.
 - d. Energy expenditure at rest, physical activity and disease.
 - e. Energy consumption and MET value of various physical activity and exercise.
 - f. Physiological variations, responses and adaptations (age/gender) of cardiovascular and respiratory system to different types of exercise and training.
 - g. Environmental influence on exercise performance including impact of pollution on exercise training

5. **Pain**

- a. Definition and types of pain.
- b. Physiology of pain and modulation of pain (acute and chronic)

6. Health Promotion & Fitness

- a. Principles and concepts of training in fitness and wellness.
- b. Application of training with principles of weight control.
- c. Aerobic metabolism and responses during exercise
- d. Anaerobic metabolism and responses during exercise

7. Exercise Physiology in Health and Disease across lifespan

- a. Exercise physiology and exercise intolerance in cardiopulmonary, vascular and metabolic disease.
- b. Biochemical primers in exercise and exercise intolerance and Genetic and metabolic on exercise and exercise intolerance.
- c. Exercise intolerance in health (across lifespan) and various non-communicable diseases

PAPER III**PHYSICAL ASSESSMENT AND FUNCTIONAL DIAGNOSIS OF CARDIOVASCULAR AND PULMONARY SCIENCES**

1. **Assessment, Monitoring and Outcome measures in Critical Care Rehabilitation**
 - a) Evaluation in the critically ill patient
 - b) Weaning Criteria
 - c) Documentation
 - d) ICU Equipment & Monitoring
 - e) Critical care complications
 - f) Outcome measures used in critical care

2. **Critical care investigations and its implications for physiotherapy**
 - a) Investigations like ECG, Arterial blood gas, Electrolytes, Biochemical markers,
 - b) Hematological and biochemical values and interpretations
 - c) Chest radiographs, ultra sonography and echocardiography
 - d) Early intervention priorities based on physical examination and investigations

3. **Respiratory System**
 - a. Physical examination of Respiratory system
 - b. Pulmonary function Test (PFT)
 - c. ABG, Echo, Radiology (X-ray and CT scan & MRI)
 - d. Evaluation of Respiratory muscle strength & endurance in chronic respiratory disorders.
 - e. POMR – problem oriented medical records and documentation methods
 - f. Outcome measures used in Respiratory disorders.

4. **Cardiovascular System**
 - a. Physical examination of Cardiac System
 - b. Clinical evaluations – Auscultation, ECG, Holter Monitoring, Echo, Doppler, X ray, /Angiogram/IABP, ECMO
 - c. POMR – problem oriented medical records and documentation methods
 - d. Outcome measures used in Cardiac dysfunction.
 - e. Cardiopulmonary and metabolic system – Cardiopulmonary exercise testing (CPET) /Stress testing in various cardiovascular disorders.

5. **ANS Dysfunction and Testing**

6. **Assessment of Renal Dysfunction**

7. **Cardiopulmonary Rehabilitation (OPD Setting)**

- a. Health related fitness assessment (endurance, strength, flexibility and body composition) through various methods in various cardiovascular and pulmonary disease
- b. Risk Stratification
- c. Exercise Tolerance Test- (Advanced and traditional methods)
- d. Monitoring Systems: Basic (Manual Measurements), Advanced (Technology)
- e. Evaluating physical activity (subjective and objective) through appropriate outcome measures

8. **Peripheral Vascular Disorders**

Assessment and special tests of

- a) Arterial, Venous and Lymphatic systems
- b) Assessment of wound and Ulcer
- c) Assessment of edema

9. **Integumentary System**

- a. Screening, evaluation and Assessment of skin conditions
- b. Screening, evaluation and Assessment of burns
- c. Assessment of Wound healing

10. **Oncology**

- a. Physical examination and screening of different types of cancer
- b. Special emphasize on cancer affecting head and neck, thorax and abdomen
- c. Cancer evaluation methods, outcome measures, functional evaluation

11. **Pain Assessment & Evaluation**

- a. Evaluation of Pain in general medical, surgical, Cardio-vascular & respiratory conditions and cancer

12. **Exercise Testing in Different population (including metabolic syndromes, renal failure, obesity)**

- a. Methods to analyze body composition
- b. Exercise testing (aerobic, strength, flexibility)
- c. Definition of physical activity, its importance in health and disease
- d. Assessment of physical activity (subjective and objective) through appropriate outcome measures

13. **Evaluation and Diagnostic tool/ Equipment's used to assess fatigue**

PAPER IV

PHYSIOTHERAPY INTERVENTIONS IN CARDIOVASCULAR AND PULMONARY SCIENCES

1. **Cardio-pulmonary resuscitation, CPR- BLS Training**
2. **Acute and Critical Care Settings - Comprehensive management of adults**
 - a. Acute care setting – environment, equipment and monitoring
 - b. Body Mechanics and Positioning
 - c. Care of the patient with artificial Airway
 - d. Management of ventilated conscious, ventilated unconscious, and patient not on ventilator
 - e. Weaning of Ventilation
 - f. Preventive Measures and Evidence based Practice
3. **Intensive Care Management of Individuals with Primary Cardiovascular and Pulmonary dysfunction**

Principles and physical therapy management for:

 - a. COPD and RLD
 - b. Status Asthmaticus
 - c. Coronary artery disease and Open-Heart Surgery
 - d. Respiratory failure and Heart failure
4. **Intensive Care Management of Individuals with Secondary Cardiovascular and Pulmonary dysfunction**

Principles and physical therapy management for:

 - a. Obesity
 - b. Neuromuscular conditions
 - c. Musculoskeletal trauma
 - d. Head Injury
 - e. Spinal Cord Injury
 - f. Organ Transplantation
5. **Intensive Care Management of Medical and Surgical Complications(special emphasis on management of patients with burns, upper abdominal surgery, minimally invasive abdominal surgery)**
6. **Critical care management of Neonates, Infants and Pediatric Patients**
 - a. General Management of the critically ill Neonate: Bronchial Hygiene Therapy, Neonatal Resuscitation, Airway Management
 - b. Medical and physiotherapy techniques in critically ill neonates, Infants and Pediatric patients
 - c. Physiotherapy interventions in the management of neonates, infants and

Pediatric patients with Primary and Secondary Cardiopulmonary, Musculoskeletal and Neurological dysfunctions in Critical Care unit

7. Cardiovascular and Pulmonary Physical Therapy in stable and chronic conditions

Principles of physical therapy management for:

- a. Acute Medical Conditions
- b. Surgical Conditions & Chronic primary and Secondary cardiovascular and pulmonary dysfunction

8. Cardio respiratory Physiotherapy Skills & Therapeutics

- a. Lung expansion therapy –methods and techniques to improve lung volumes and capacities
- b. Bronchial Hygiene therapy – methods and techniques to clear secretions
- c. Methods and techniques to decrease work of breathing
- d. Endurance promotion activities
- e. Energy conservation techniques
- f. Oxygen therapy and hyperbaric oxygen therapy
- g. Methods to increase exercise capacity

9. Pharmacotherapy

- a. Airway Pharmacology
- b. Impact of Pharmacotherapeutics in Cardiovascular and Respiratory conditions and its relevance in exercise prescription and rehabilitation.

10. Cardio Pulmonary Rehabilitation

- a. Elements of International standards for a Cardiac/ Pulmonary rehabilitation Program: historic perspective, Definition and Goals, Physical reconditioning, scientific basis, Benefits and potential hazards, Patients evaluation and selection criteria and Recent Advances.
- b. Smoking cessation and other risk factor modifications

11. Prevention of Cardiovascular, Endocrine, Metabolic and Pulmonary Diseases

- a. Primary prevention of various Cardiovascular, Endocrine, Metabolic and Pulmonary diseases
- b. Public health programs for cardiovascular and pulmonary diseases globally and in India.

12. Diseases of Peripheral Vascular and Lymphatic system

- a. Evidence based management of patients with Arterial, Venous and Lymphatic diseases.
- b. Ulcer and wound management.

13. Pain

- a. Pain management in post-surgical conditions.
- b. Therapeutic modalities in pain management

14. Exercise Prescription for The People With Primary Cardiovascular And Pulmonary And Endocrine Conditions

- a. Exercise prescription and evidence-based strategies for promoting and maintaining health, physical activity and exercise in above conditions.

Exercise Prescription for the People with Non Primary Cardiovascular And Pulmonary and Endocrine Conditions

- a. Neuromuscular conditions
- b. Collagen/Connective tissue conditions
- c. Chronic renal insufficiency
- d. Overweight and Obesity

15. Oncology

- a. Physiotherapy management of different types of tumors
- b. special emphasize on head, neck, lung and mediastinal tumors
- c. Cancer rehabilitation and palliative care

16. Physiotherapy Management of Integumentary System

- a. Prevention and management of skin conditions
- b. Use of Therapeutic agents to facilitate wound repair
- c. Prevention of ulcers in patients with desensitized skin
- d. Appropriate exercises during different phases of Burn care
- e. Scar Management and Outpatient rehabilitation for Burns

17. Preventive and Long-Term Care

- a. Patient education and Caregiver education
- b. Health promotion and risk minimization strategies

REFERENCES

Recommended Books

1. Walter T.ACSMs Clinical Exercise Physiology by Walter R Thompson, 10th ed .Lippincott Williams & Wilkins;2013
2. Kenney, W. Larry, Wilmore, Jack, Costill, David. Physiology of sports and exercise by Jack H .Willmore, Costill& Kenney,6th ed. .Human Kinetics; 2015
3. William D. McArdle, Frank I. Katch, Victor L. Katch .Exercise Physiology by Mac Ardle , Katch&Katch, 8th ed. Lippincott Williams & Wilkins;2015
4. ML Pollock. Pollock Heart Disease and rehabilitation by Pollock ML .Wiley–Blackwell.1979
5. James Watkins. Fundamental biomechanics of sport and exercise by James Watkins .Taylor& Francis.2014
6. Richards J.The Comprehensive Text Book of Clinical biomechanics by Jim Richards. 2nded. Elsevier;2018
7. A Pressler, NiebauerJ.Text book of sports and exercise cardiology by Axel Pressler and Josef Niebauer. 1st ed. Springer International Publishing.2020
8. Durstine L, Moore GE, MJ La Monte ,BA Franklin. Pollocks Textbook of Cardiovascular Disease and Rehabilitation by Larry Durstine, GE Moore .Human Kinetics; 2008.
9. Frost R. Applied Kinesiology by Robert Frost Applied Revised Edition: A Training Manual and Reference Book of Basic Principles and Practices. North Atlantic Books;2013
- 10.Pierce NB. Guide to mechanical ventilation and Intensive respiratory care.Saunders;1995
- 11.J Cairo .Mechanical Ventilation-Susan Pilbeam.7th ed.Mosby Elsevier ;2019
- 12.Hillegass E, SadowskyS.Essentials of Cardiopulmonary Physical Therapy- Steven Sadowsky. 2nd ed. Saunders ;2010
- 13.Kacmarek RM, Stoller KJ, Heuer A .Egans Fundamentals of Respiratory Care,11th ed. Mosby Elsevier;2016
- 14.Goldberger A. Clinical Electrocardiography.8th ed. Elsevier;2012
- 15.Cifu DX. Braddoms Physical Medicine and Rehabilitation.5th ed. Elsevier Health Sciences;2015
- 16.William D. McArdle, Frank I. Katch, Victor L. Katch. Essentials of Exercise Physiology .Lippincott Williams & Wilkins; 2006
- 17.Sundar TS .Blood Gases by T Shyam Sundar.4th ed.Paras Medical Publisher;2020
- 18.Hall J. Guyton and Hall, Textbook of Medical Physiology.13th ed. Saunders; 2015
- 19.Pryor JA, Prasad A. Physiotherapy for Respiratory and Cardiac Problems: Adults and Paediatrics4th ed.Elsevier;2008
- 20.Smith M, Ball V. Cardiovascular / Respiratory physiotherapy by Mandy Smith. Elsevier;1998
- 21.Frownfelter DL, Dean E.Principles and practice of cardiopulmonary physical therapy Donna I. Frownfelter , Elizabeth dean. Mosby Elsevier;1996
- 22.Downie AP, Cash JE .Cash’s Textbook of Chest, Heart, and Vascular disorders for physiotherapists.4th ed.Mosby Elsevier;1987
- 23.FroelicherV, Myers J .Exercise and the Heart (Cardiovascular Clinics s),5th ed.Elsevier;2006

- 24.Sullivan OB .Physical rehabilitation by Susan OB Sullivan. 6th ed. F.A Davis Company;2013
- 25.Myres SR. Saunders, Manual of Physical Therapy Practice. Saunders;1995

Recommended Journals

1. American Journal of Respiratory and Critical Care Medicine (Am J Respir Crit Care Med)
2. Chest (Chest)
3. Critical Care (Crit Care)
4. Diabetes Therapy
5. Experimental Diabetes Research
6. Indian Journal of Chest Diseases and Allied Sciences (Indian J Chest Dis Allied Sci)
7. Journal of Cardiopulmonary Rehabilitation and Prevention
8. Journal of Chronic Obstructive Pulmonary Disease
9. Journal of Exercise Physiology Online (J Exerc Physiol Online)
10. Lung India (Lung India)
11. Primary Care Diabetes
12. Primary care Respiratory Journal
13. Respiratory Research (Res.)
14. The Open Respiratory Medicine Journal
15. International Journal of Diabetes in Developing Countries
16. Clinics in Chest Medicine
17. Diabetes Research and Clinical Practice
18. British Journal of Diabetes and Vascular Disease
19. International Journal of Chronic Obstructive Pulmonary Disease (Int J Chron Obstruct Pulmon Dis)
20. Cardiopulmonary Physical Therapy Journal
21. Journal of Cardiac and Pulmonary Rehabilitation
22. Circulation
23. American Heart Journal
24. Journal of American Heart Association (JAHA)
25. International Journal of Cancer (IJC)
26. Journal of Cancer
27. British Journal of Cancer
28. CANCER
29. Cancer Journal
30. Supportive Care in Cancer
31. Asia Pacific Journal of Cancer Prevention

Related scientific publications including position statements, guidelines, landmark trials, systematic reviews and meta-analysis and recent trials:

1. Lobelo F et al. Routine Assessment and Promotion of Physical Activity in Healthcare Settings: A Scientific Statement From the American Heart Association. Circulation. 2018;137(18):e495-e522
2. Starth SJ et al. Guide to the assessment of physical activity: Clinical and research applications: a scientific statement from the American Heart Association. Circulation. 2013;128(20):2259-79

3. Lavie CJ, et al. Exercise and the cardiovascular system: clinical science and cardiovascular outcomes. *Circ Res.* 2015;117(2):207-19.
4. Spruit M et al. An official American Thoracic Society /European Respiratory Society statement: key concepts and advances in pulmonary rehabilitation. *Am J Respir Crit Care Med.* 2013;188(8): e13-6

FACULTY & INFRASTRUCTURE REQUIREMENTS

1. **Minimum Faculty Position for MPT- CVP program**
 - a. Professor/ Associate Professor – ONE
 - b. Assistant Professor – ONE
 - c. Faculty must be recognized from the area of Cardio-vascular and Pulmonary Specialty
 - d. Faculty position is inclusive from the minimum faculty position for BPT program

2. **Minimum Infrastructure requirement**
 - a. Affiliation with a hospital having Medical, Surgical, Cardio-Thoracic and Pulmonology department must be established if offering this elective
 - b. The center **MUST** have ALL the equipment and facilities mentioned under the METHODS OF TRAINING in this ordinance for this specialty in consonance with Schedule IV of the BPT Ordinance.

**Master of Physiotherapy
Pediatrics
MPT-Ped**

OBJECTIVES

On Completion of the course, the post graduate will be able to

1. Exercise professional autonomy based on sound knowledge, skills and discipline at par with global standards in the area of pediatric physiotherapy
2. Practice within the professional code of ethics and conduct, and the standards of practice within legal boundaries.
3. Identify, analyze pediatric disorders/ dysfunctions within the boundaries of physiotherapy practice and arrive at an appropriate hypothesis based on sound clinical reasoning
4. Work with integrity and autonomy in an interdisciplinary team
5. Involve in undergraduate and post graduate teaching with competence in pediatric physiotherapy
6. Conduct research activities and utilize findings for professional development and lifelong learning

SCOPE OF PRACTICE

A Pediatric specialist physiotherapist will be competent to evaluate, assess and arrive at reasoning-based hypothesis in pediatric disorders. Pediatric Physiotherapists work based on the ICF framework to develop, maintain, restore and optimize health and function within the pediatric age group. They will be competent to use current evidence to treat and manage a range of cardiopulmonary, orthopedic, neurological and other disorders in children. They will be competent to act as a team leader of a multidisciplinary rehabilitation team and contribute to interdisciplinary care planning and implementation of pediatric habilitation methods. They will be competent to take up research and academic positions in their area of expertise. They will be competent to be autonomous clinical practitioners.

PAPER – II**APPLIED ANATOMY, PHYSIOLOGY AND BIOMECHANICS IN PAEDIATRICS****1. General Paediatrics**

- a. Neonatal and Paediatric Advanced Life Support (NALS and PALS).
- b. Basics of Genetics and Applied Genetics in Paediatrics.
- c. Exercise physiology in paediatrics- Adaptive response (acute and chronic) on various systems
- d. Nutritional requirements & Immunization schedule in paediatric population.
- e. Neurophysiology of movement.
- f. Theories of pain and its application in paediatrics.

2. Developmental Paediatrics

- a. Embryological Development and Applied embryology- General, Cardiovascular system, Neurological, Musculoskeletal System, Respiratory system and other systems of human body
- b. Normal and Applied Growth and Development/Maturation - Anthropometric changes across paediatric life span, Cardiovascular system, Nervous System, Musculoskeletal System, Respiratory system and other systems of human body
- c. Development - Theories of Development; Typical and Atypical development; Sensory system development; Reflex maturation and Reactions

3. System Based Applied Paediatrics

- a. Theories of Motor Control and Motor Learning and its application.
- b. Development and applied aspects of Bowel and Bladder function.
- c. Development and applied aspects of Gastrointestinal function.
- d. Development and applied aspects of Balance, Coordination and Gait.
- e. Development of Posture and applied Postural deviations.
- f. Cardio-respiratory physiology in pediatrics

PAPER- III**PHYSICAL AND FUNCTIONAL DIAGNOSIS IN PEDIATRICS****1. Assessment in General Paediatrics**

- a. Prenatal screening and assessment of movement
- b. Clinical identification of possible genetic abnormalities
- c. Interpretation of assessments based on International Classification of Functioning, Disability and Health (ICF) guidelines in Paediatric conditions.
- d. Assessment of motor control and motor learning.
- e. Evaluation and interpretation of sensory disorders (autism and autism related disorders) including perceptual and behavioural disorders.
- f. Assessment, physical and functional diagnosis of gait using various scales and use, interpretation of laboratory-based gait assessment.
- g. Assessment, physical and functional diagnosis of balance and coordination using various scales and use, interpretation of laboratory- based assessment
- h. Ergonomic assessment of Children in Integrated Schools.
- i. Motor Control Assessment - Voluntary control assessment and Selective Motor Control.
- j. Assessment of Paediatric disorders using standardised test /scales at all levels of dysfunction in various condition of paediatric population with their psychometric properties

2. Assessment in Developmental Paediatrics

- a. Growth assessment.
- b. Developmental screening and assessment (Norm referenced, Criterion referenced, Functional and other scales for screening and assessment of various disorders in paediatric population).
- c. Assessment of nutrition and obesity in paediatrics.
- d. Assessment of High-risk Neonates/Children.
- e. Assessment principles in specific genetic disorders with motor system involvement- Down syndrome, bleeding disorders

3. Assessment in System based Paediatrics

- a. Assessment of children in Intensive Care Unit.
- b. Physical and Functional assessment, Differential diagnosis and Investigations including Laboratory, Electrophysiological, radiological investigations in Neurological, Cardio-respiratory, Metabolic, Musculoskeletal and various conditions of the paediatric population.
- c. Physical activity and Fitness assessment (including Exercise Tolerance Testing)
- d. Assessment, physical and functional diagnosis in paediatrics Oncology.
- e. Assessment, physical and functional diagnosis in paediatrics Burns.

- f. Pre and post- surgical assessment in Paediatric conditions.
- g. Assessment of Integumentary System.
- h. Assessment, physical and functional diagnosis of Adolescent Health Disorders and paediatric Mental Health.
- i. Pain assessment in Neonates and Children.
- j. Assessment of Movement dysfunction in Paediatrics.
- k. Assessment of DCD, LD and ADHD.

PAPER- IV**PAEDIATRIC PHYSIOTHERAPY / PHYSIOTHERAPEUTICS IN PAEDIATRICS****1. Management in General Paediatrics**

- a. Goal setting and treatment guidelines based on International Classification of Functional Disability and Health (ICF) in Paediatric conditions.
- b. Early Intervention in neuro developmental disorders and orthopedic disorders
- c. Management of Sensory Disorders including Perceptual and Behavioural Disorders.
- d. Management of motor system disorders
- e. Promotion of Physical activity and Fitness in Typical and Atypical Paediatric population.
- f. Management of disorders of function, posture and gait
- g. Prescription and Application of Orthosis, Prosthesis, Assistive and Adaptive devices, seating systems and mobility devices
- h. Technology based intervention in Paediatric Physiotherapy.
- i. Role of Paediatric Physiotherapist in Mainstream, Integrated and Special Schools.
- j. Recovery process in Nervous System and Neural plasticity.
- k. Role of Paediatric Physiotherapy in Community.
- l. Exercise prescription in adolescents

2. Management in Developmental Paediatrics:

- a. Management of Growth disorders.
- b. Management of Developmental disorders and genetic disorders specifically bleeding disorders, down syndrome, inborn errors of metabolism and muscular dystrophies

3. Management in System Based Paediatrics

- a. Management in Neonatal Intensive Care Unit (NICU), Paediatric Intensive Care Unit (PICU) and High-risk babies.
- b. Management of Neuro-paediatric, Cardio-respiratory, Metabolic and Musculoskeletal conditions
- c. Management of Paediatric Conditions – Oncology, Burns, Non-communicable diseases, Integumentary systems, amputations
- d. Management of Pain in Neonates and Children using various modalities.
- e. Management of Motor dysfunction in Paediatrics.
- f. Management of Oromotor and Orosensory dysfunctions.
- g. Management of Myopathic and Neuropathic conditions.
- h. Management in neurodevelopment disorders -LD, ADHD, DCD.
- i. Application of yoga in paediatric population

REFERENCES

Recommended Books

1. Gallahue, D. L., Ozmun, J. C., & Goodway, J. (2006). Understanding motor development: Infants, children, adolescents, adults, 4/e. Mcgraw-hill.
2. Stamer, M. H. (2015). Posture and movement of the child with cerebral palsy. PRO-ED, Incorporated.
3. Rennie, J. M., & Kendall, G. (2013). A Manual of Neonatal Intensive Care, 5/e. CRC Press.
4. Illingworth, R. S. (2002). The normal child: some problems of the early years and their treatment, 10/e. WB Saunders Company.
5. Illingworth, R. S. (2013). The development of the infant and young child: Normal and abnormal, 10/e. Churchill Livingstone.
6. Fanaroff, J. M., & Fanaroff, A. A. (2012). Klaus and Fanaroff's Care of the High-Risk Neonate, 6/e. Elsevier Health Sciences.
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8. Effgen, S. K. (2012). Meeting the physical therapy needs of children. FA Davis.
9. Armstrong, N., & Van Mechelen, W. (Eds.). (2008). Paediatric exercise science and medicine. Oxford University Press.
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11. Fenichel, G. M. (2009). Clinical paediatric neurology: a signs and symptoms approach, 5/e. Elsevier Health Sciences.
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24. Bly, L. (1999). Baby treatment based on NDT principles. Therapy Skill

Builders.

25. Dubowitz, V. (1980). *The floppy infant*, 2/e. Cambridge University Press.
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30. Shumway-Cook, A., & Woollacott, M. H. (2007). *Motor control: translating research into clinical practice*, 2/e. Lippincott Williams & Wilkins.
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33. Latash, M. L. (2008). *Neurophysiological basis of movement. Human Kinetics*.
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47. Polin, R. A., Fox, W. W., & Abman, S. H. (2011). *Fetal and Neonatal Physiology: Expert Consult-Online and Print, Vol. 1*. Elsevier Health

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48. Jaeger, L. (1987). Home program instruction sheets for infants and young children. Therapy Skill Builders.
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52. Umphred, Darcy Ann, Rolando T. Lazaro, Margaret Roller, and Gordon Burton, eds. (2013). Neurological rehabilitation, 6/e. Elsevier Health Sciences.
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55. Herdman, S. J., & Clendaniel, R. (2014). Vestibular rehabilitation, 2/e. FA Davis.
56. Patten, J. (1996). Neurological differential diagnosis, 2/e. Springer Science & Business Media.
57. Shacklock, M. (2005). Clinical neurodynamics: a new system of neuromusculoskeletal treatment. Elsevier Health Sciences.
58. Gillen, G. (2008). Cognitive and perceptual rehabilitation: Optimizing function. Elsevier Health Sciences.
59. Christa Einspieler (Author), Heinz R. F. Prechtel (2008) Prechtel's Method on the Qualitative Assessment of General Movements in Preterm, Term and Young Infants (Clinics in Developmental Medicine) Mac Keith Press
60. Karen Marc Dante MD (Editor), Robert M. Kliegman MD. Nelson Essentials of Pediatrics: Elsevier India

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2. socialjustice.nic.in
3. <http://www.icf-elearning.com>
4. wcd.nic.in
5. mohfw.gov.in

Recommended Journals

1. Paediatric Physical Therapy – Publisher: Lippincott, Williams & Wilkins.
2. Developmental Medicines & child neurology – Publisher: Wiley-Blackwell
3. Physical and Occupational Therapy in Paediatrics – Publisher: Informa
4. Disability and rehabilitation - Publisher: Taylor & Francis.
5. Clinical rehabilitation- Publisher: Sage
6. International journal of developmental disabilities - Publisher: Maney
7. Physical medicine and rehabilitation – Publisher: Austin

FACULTY & INFRASTRUCTURE REQUIREMENTS
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1. Minimum Faculty Position for MPT- Ped program

- a. Professor/ Associate Professor – ONE
- b. Assistant Professor – ONE
- c. Faculty must be recognized from the area of Pediatric Specialty
- d. Faculty position is inclusive from the minimum faculty position for BPT program

2. Minimum Infrastructure requirement

- a. Affiliation with a hospital having Pediatric department (with both in-patient and out-patient facility) with NICU, a high risk follow up clinic and early intervention program must be established if offering this specialty
- b. The center MUST have ALL the equipment and facilities mentioned under the METHODS OF TRAINING in this ordinance for this specialty in consonance with Schedule IV of the BPT Ordinance.
- c. Institution must be attached to one special school
- d. A pediatric physiotherapy unit must be established/ available in the institution/ affiliated hospital with the facilities and equipment required to assess and treat children referred for pediatric physiotherapy.
- e. Separate Lab or Shared lab area space of 1000 sq.ft area with Walkway and Community ambulation Training path 10 metres
- f. Own or in attached facility [Neuroimaging, Electro diagnostic and Biochemical investigation facility]
- g. The Pediatric-physiotherapy unit MUST have all facilities and equipment for Pediatric-rehabilitation viz Cognition assessment, Perception assessment, Sensory assessment, Muscle Strength assessment, Motor assessment, Balance, Gait assessment, Grip and Grasp assessment, Functional Assessment, Physical Activity Measurement, Assistive devices, Mobility devices

**Master of Physiotherapy
Neurological Science
MPT-Neuro**

OBJECTIVES

On Completion of the course, the post graduate will be able to

1. Exercise professional autonomy based on sound knowledge, skills and discipline at par with global standards in prevention, management and rehabilitation of patients with neuro-medical and neuro-surgical conditions
2. Practice within the professional code of ethics and conduct, and the standards of practice within legal boundaries.
3. Identify and analyse specific risks and dysfunction related to neurological conditions within the boundaries of physiotherapy practice and arrive at an appropriate hypothesis based on sound clinical reasoning
4. Work with integrity and autonomy in an interdisciplinary team
5. Involve in undergraduate and postgraduate teaching with competence
6. Conduct research activities and utilize findings for professional development and lifelong learning.

SCOPE OF PRACTICE

A Neurology specialist physiotherapist will be competent to evaluate, assess and arrive at reasoning-based hypothesis in patients with neuro-medical or neuro-surgical trauma or disease. Neurology Physiotherapists work based on the ICF framework to develop, maintain, restore and optimize health and function. They will be competent to use current evidence to treat and manage Neurological dysfunctions in children, adults and elders. They will be competent to act as a team leader of a multidisciplinary rehabilitation team and contribute to interdisciplinary care planning and implementation of Neuro-rehabilitation methods. They will be competent to take up academic and research positions in their area of expertise. They are competent to be autonomous clinical practitioners.

PAPER II

BASIC SCIENCES FOR NEUROLOGICAL PHYSIOTHERAPY

1. **Anatomy and Physiology of nervous system**
 - a. Central nervous system,
 - b. Peripheral nervous system and
 - c. Autonomic Nervous system

2. **Pathology and clinical features of nervous system disorders**
 - a. Pathological changes and clinical features in progressive and non-progressive disorders of Central and peripheral nervous system causing movement dysfunction.

3. **Motor control**
 - a. Physiology of Motor control [Movement organization at a cortical level, contributory role of cerebellum, basal ganglia and other subcortical structures]
 - b. Theories of Motor Control [Reflex Theory, Hierarchical Theory, Systems Theory, Dynamical systems theory, Equilibrium point theory, Ecological Theory, Uncontrolled Manifold Theory]
 - c. Kinematic and Kinetic Motor Control variables

4. **Motor Development**
 - a. Motor development [Reflex, Gross Motor, Fine Motor]
 - b. Sensory development
 - c. Cognitive development
 - d. Social development

5. **Motor behavior of basic tasks**
 [Walking, Postural control and Object interaction with hands]
 - a. Goal and description of motor tasks
 - b. Development and variation of motor tasks across different age groups
 - c. Neural control of motor tasks
 - d. Biomechanics of motor tasks
 - e. Role of environment variables in task performance across different stages of development

6. **Motor learning and principles of promoting neuroplasticity**
 - a. Physiology of Motor learning
 - b. Stages of Learning
 - c. Classification of Motor Tasks
 - d. Practice and feedback for motor tasks
 - e. Measurement of Motor Learning

7. Exercise promotion and disease prevention

- a. Concept of Health, disease, disability and neuro-rehabilitation care delivery within the Indian context incorporating caregiver education and training.
- b. Need for motivation in neurological patients
- c. Defining and describing health behavior
- d. Causes of positive and negative health behaviors
- e. Theories of behavior and behavior change for exercise health behavior
- f. Measurement of behavior and behavior change supported by modern technology.
- g. Application of basic Behavior change
- h. Techniques for promoting positive healthy lifestyle behavior.

8. Reorganization and recovery

- a. Neural Plasticity
- b. Adaptation across musculoskeletal system in nervous system disorders
- c. Genetic and metabolic influences on neural plasticity
- d. Effect of Neuropharmacology on exercise, recovery and reorganization

PAPER III**NEUROPHYSIOTHERAPY ASSESSMENT****1. Body Structure and Function Assessment in neurological disorders**

- a. Assessment of Cerebral Cortical function [Such as Consciousness, Higher Functions, Sensory functions, Perception, Motor functions, Synergy, Speech, Vision etc]
- b. Assessment of cerebral cortical dysfunction in Progressive and Non-progressive disorders of Central Nervous System
- c. Assessment of Basal Ganglia functions [Motor planning, Movement initiation and control, Muscle Tone]
- d. Assessment of dysfunction in movement disorders
- e. Assessment of Cerebellar functions [Such as Motor coordination, Sensory integration of visual, vestibular and proprioceptive systems]
- f. Assessment of movement dysfunction in cerebellar disorders
- g. Assessment of Spinal Cord & Brainstem functions [Such as Muscle functions, Sensory functions, Reflexes and Autonomic functions]
- h. Assessment of movement dysfunction in Progressive and Non-progressive disorders of spinal cord
- i. Assessment of Peripheral nervous system including Muscle and Neuromuscular junction functions [Such as Motor, sensory and peripheral autonomic functions]
- j. Assessment of sensory, motor and autonomic dysfunction in peripheral nerve injuries, polyneuropathies, neuromuscular junction and muscle disorders
- k. Screening and Assessment for Primary prevention and Risk reduction of secondary impairments in all neurological disorders. [Such as musculoskeletal, cardiopulmonary, integumentary and vascular system functions]
- l. Assessment for primary prevention and Risk reduction such as Falls in conditions such as senility, prolonged inactivity, dementia, depression, polypharmacy, vestibular pathology, Fall history etc.

2. Neurological investigations

- a. Electrophysiological investigations [EMG, SD curve and FG Test, Nerve conduction studies and Evoked Potentials]
- b. Neuroimaging [Ultrasound, CT, MRI, FMRI, PET, TMS, EEG]
- c. Biochemical [CSF, Muscle and Nerve Biopsy]

3. Motor Behavior Assessment

- a. Motor Control and Motor Behavior Assessment in clinical and natural environment
 - i. Postural control assessment
 - ii. Gait assessment and Other Gross movement assessment
 - iii. Reach, Grasp and manipulation Assessment
 - iv. Motor control and Motor Learning Assessment of motor tasks and

- functional activities utilizing performance measures and energetics
 - v. Kinematic and kinetic analysis of motor tasks and functional activities and retention measures
 - b. Physical assessment of functions in clinical and natural environment
 - i. Assessment of Activities and Instrumental activities of daily function
 - ii. Assessment of Health Behaviors and Exercise adherence
 - iii. Assessment of Environmental Barriers and Facilitators
 - iv. Assessment of Personal Barriers and Facilitators
- 4. Activity limitation and Participation Restriction assessment using Functional Outcome Measures**
- a. Generic outcome measures
 - i. Activities of Daily Living
 - ii. Instrumental Activities of Daily Living
 - iii. International Classification of Functioning Outcome measure
 - iv. Participation Level Measure
 - v. Quality of Life Measures
 - b. Disease Specific Measures relevant to Activity and Participation
 - i. CNS Disorder including Movement Disorders and Cerebellar Disorders
 - ii. Spinal Disorders
 - iii. Peripheral Nerve and Muscle Disorders
 - c. Goal setting in progressive and non-progressive neurological disorders across ICF domain outcomes based on rate of prognosis.
 - d. Assessment for assistive technological interventions

PAPER IV

NEUROPHYSIOTHERAPY TREATMENT

1. **Treatment of Body structure and Function impairments in neurological disorders.**
 - a. Treatment of cerebral cortical dysfunction impairments affecting movement in Progressive and Non-progressive disorders of Central Nervous System.
 - i. Assisting and leading exercise, teaching, enhancing and developing skills of functions of the brain including Global and Specific mental functions.
 - ii. Practice Training of caregivers for Practical and Emotional support with mental functions
 - iii. Training motor planning and control.
 - iv. Assisting and leading exercise for movement functions. Supporting or guiding exercise focusing on functions of motor reflex, involuntary movement reaction, control of voluntary movement, gait pattern functions and sensations related to muscles and movement functions
 - b. Treatment of movement dysfunction and in movement disorders and cerebellar disorders
 - i. Assisting, Training and development of exercises for inhibiting involuntary movement dysfunction and incoordination.
 - ii. Supporting or guiding exercise focused on functions of unintentional, non- or semi - purposive involuntary movements
 - iii. Supporting or guiding exercise focused on initiating and controlling functions of voluntary movements such as cueing
 - c. Treatment of sensory, motor and autonomic dysfunction in Progressive and Non-progressive disorders of spinal cord, peripheral nerves, muscles and neuromuscular junction.
 - i. Training for touch, temperature and other stimuli
 - ii. Teaching, enhancing or developing skills - of sensory functions of sensing surfaces and their texture or quality, sensing temperature, vibration, pressure and noxious stimulus through practice.
 - iii. Education and advice about touch functions, Stimulation of touch functions.
 - iv. Training for Proprioceptive functions
 - v. Teaching, enhancing or developing skills - of sensory functions of sensing the relative position of body parts - through practice
 - vi. Assisting and leading exercise for Proprioceptive functions
 - vii. Training muscle functions
 - viii. Training, Supporting or guiding exercise-focusing functions related to muscle power, muscle tone and muscle endurance
 - ix. Electrical stimulation of muscle functions
 - x. Training Autonomic functions

- xi. Training control of central and peripheral sympathetic and parasympathetic functions through exercises and biofeedback
 - d. Treatment for Risk reduction of secondary impairments in all neurological disorders. Such as musculoskeletal, cardiopulmonary, integumentary and vascular system functions
 - i. Supporting, Guiding, Educating and Training for the following exercises: Functional Strength Training, Stretching Exercise, Aerobic exercise Planning and prescription, Wound management, Managing DVT, Relaxation Training.
 - e. Treatment for Risk reduction such as Falls in conditions such as senility, prolonged inactivity, dementia, depression, polypharmacy, vestibular pathology, Fall history etc.
- 2. Neurological Approaches and Technology enabled treatment techniques in retraining CNS and PNS disorders.**
- a. Understanding of Classical Approaches such as Rood, Bobath, NDT, Brunnstrom, PNF, Sensory Integration and their merits and demerits.
 - b. Retraining with Technology Based Interventions:
 - i. Virtual Reality,
 - ii. Robotic Therapy,
 - iii. Functional Electrical Stimulation,
 - iv. Brain and Spinal cord Stimulation,
 - v. Brain computer interface training
 - vi. Neuro biofeedback therapy
 - vii. Assistive technology
- 3. Functional Interventions for Promoting Neuroplasticity for improving Motor Behavior in various clinical disorders**
- a. Principles of Neuroplasticity and Motor learning
 - b. Motor Relearning Program
 - c. Systems Model of retraining postural control, locomotion and upper limb activities.
 - d. Task oriented and Functional Training for carrying out General tasks such as lifting and carrying objects, Mobility, self-care, domestic life, and Major life activities.
 - e. Action Observation training and Mirror Therapy
- 4. Interventions for activity promotion and Participation Facilitation in various neurological disorders**
- a. Behavior Change Techniques for promoting positive health behavior
 - i. Training to influence health behaviours and exercise adherence
 - ii. Education to influence health behaviours and exercise adherence.
 - iii. Advocacy, Advising, counselling and emotional support for health behaviours
 - b. Environmental Enrichment

- i. Prescription, Education, Advice, Training in and deconditioning from the use of products and technology those adapted or specially designed to assist functioning such as orthotic and assistive devices and technology.
 - ii. Capacity building interventions targeting aspects of natural environment and human-made changes to environment such as environmental remodeling in their home environment.
- c. Social Environment Enrichment
 - i. Providing education and advice about practical, physical or emotional support provided by people, to encourage a change of functioning, environment, attitude or behavior in relation to health (or risks)

REFERENCES

Recommended Books

Neuro Anatomy:

1. Bhuiyan PS, Rajgopal L, Shyamkishore K. Inderbir Singh's Textbook of Human Neuroanatomy: (Fundamental & Clinical). 10th Edition. JP Medical Ltd; 2018. ISBN-13 : 978-9352701483

Neurophysiology:

2. Hudspeth, A.J; Jessell, Thomas M.; Kandel, Eric R.; Schwartz, James H.; Siegelbaum, Steven A. Principles of neural science. 5th Edition. McGraw-Hill Medical, editors. New York: McGraw-hill; 2013. ISBN 13: 9780071390118

Pathophysiology:

3. Christopher M Fredericks; Lisa K Saladin Philadelphia. Pathophysiology of the motor systems: Principles and Clinical presentations. F.A. Davis, 1996. ISBN-13 : 978-0803600935

Motor Control:

4. Mark L. Latash. Neurophysiological Basis of Movement: 2nd Edition. Human Kinetics Publishers. 2008. ISBN-10: 0736063676 ISBN-13 : 978-0736063678
5. James J. Gibson. The Ecological Approach to Visual Perception: Classic Edition. Psychology Press & Routledge. 2014. ISBN-13: 978-1848725782

Motor Development:

6. Kathleen Haywood, Nancy Getchell. Life Span Motor Development 7th edition Human Kinetics Publishers 2019. ISBN: 9781492566908.
7. Smith, L. B., & Thelen E. *Bradford Books series in cognitive psychology. A dynamic systems approach to development: Applications. MIT Press* 1994. ISBN-10 : 0262519445

Motor Behavior:

8. Anne Shumway-Cook, Marjorie H. Woollacott. Translating Research into Clinical Practice. 5th Edition. Wolters Kluwer. 2017. ISBN: 9781496302632, 14963026

Motor Learning:

9. Richard A. Magill, David I. Anderson. Motor learning and control: Concepts and Applications, 11th Edition. Mcgraw-hill Education. 2017. ISBN 978-1-259-82399-2.
10. Richard A. Schmidt, Tim Lee, Carolee Winstein, Gabriele Wulf, Howard N. Zelaznik. Motor Control and Learning A Behavioral Emphasis. 6th Edition. Human Kinetics Publishers ISBN-13: 978-1492547754

Behavior change:

11. American College of Sports Medicine. ACSM's Behavioral Aspects of Physical Activity and Exercise. Publisher: Lippincott Williams and Wilkins. 2013. ISBN-13: 978-1451132113.
12. Susan Michie, Lou Atkins, Robert West. The Behaviour Change Wheel: A Guide To Designing Interventions. Silverback Publishing. ISBN-10 : 1912141000 ISBN-13 : 978-1912141005

Reorganization and recovery:

13. Krakauer JW, Carmichael ST. Broken movement: The Neurobiology of Motor Recovery after Stroke. MIT Press; 2017. ISBN-13 : 978-0262037228
14. Charles D. Ciccone. Pharmacology in Rehabilitation : Contemporary

Perspectives in Rehabilitation. 5th Edition. F.A. Davis Company. 2015
ISBN-10 : 0803640293 ISBN-13 : 978-0803640290

Basic Principles of assessment

15. Thomas B. Newman, Michael A. Kohn, Evidence-Based Diagnosis, Cambridge University Press, 2009. ISBN:9781139476850, 1139476858.
16. Rothstein JM, Echternach JL, Riddle DL. The Hypothesis-Oriented Algorithm for Clinicians II (HOAC II): a guide for patient management. Physical Therapy. 2003 May 1;83(5):455-70.
17. Anne Shumway-Cook, Marjorie H. Woollacott. Translating Research into Clinical Practice. 5th Edition. Wolters Kluwer. 2017. ISBN: 9781496302632, 14963026
18. World Health Organization. How to use the ICF: A practical manual for using the International Classification of Functioning, Disability and Health (ICF). Exposure draft for comment. October 2013. Geneva: WHO

Assessment of Body structure and Function:

19. Kameshwar Prasad , Ravi Yadav , John Spillane. Bickerstaff's Neurological Examination in Clinical Practice. 7th adapted edition. Wiley India Pvt Ltd: 2013. ISBN-10: 8126538988 ISBN-13 : 978-8126538980
20. Geraint Fuller. Neurological Examination Made Easy. 6th Edition. Elsevier. 2019 ISBN-10 : 0702076279 ISBN-13 : 978-0702076275
21. World Health Organization. How to use the ICF: A practical manual for using the International Classification of Functioning, Disability and Health (ICF). Exposure draft for comment. October 2013. Geneva: WHO

Investigation:

22. Jun Kimura. Electrodiagnosis in Diseases of Nerve and Muscle: Principles and Practice. 4th Edition. OUP USA: 2014. ISBN-10: 0199738688 ISBN-13 : 978-0199738687
23. U.K. Misra , J Kalita . Clinical Neurophysiology: Nerve Conduction, Electromyography, Evoked Potentials. 4th Edition. Elsevier India: 2019. ISBN-10 : 8131258157 ISBN-13 : 978-8131258156
24. Allan Ropper , Martin Samuels, Joshua Klein, Sashank Prasad. Adams and Victor's Principles of Neurology. 11th Edition. McGraw-Hill Education / Medical: 2019. ISBN-10: 0071842616 ISBN-13: 978-0071842617

Motor and Physical activity Behaviour:

25. Anne Shumway-Cook, Marjorie H. Woollacott. Translating Research into Clinical Practice. 5th Edition. Wolters Kluwer. 2017. ISBN: 9781496302632, 14963026
26. Susan Michie, Lou Atkins, Robert West. The Behaviour Change Wheel: A Guide To Designing Interventions. Silverback Publishing. ISBN-10 : 1912141000 ISBN-13 : 978-1912141005

Outcome measures:

27. Robert Herndon. Handbook of Neurologic Rating Scales. 2nd Edition. Demos Medical Publishing 2005 ISBN-13 : 978-1888799927
28. Elspeth Finch. Physical Rehabilitation Outcome Measures: A Guide to Enhanced Clinical Decision Making. 2nd Edition Springer Publishing Company 2002 ISBN:9780781742412
29. Measurement in Neurological Rehabilitation. By Derick T. Wade. 1992.

Retraining Body Function

30. Susan B.O'Sullivan, Thomas J. Schmitz, George D. Fulk. Physical Rehabilitation. 7th Edition. F.A. Davis Company: 2019. ISBN-10: 0803661622 ISBN-13: 978-0803661622
31. Rolando T. Lazaro .Umphred's Neurological Rehabilitation. 7th Edition.

- Mosby: 2020. ISBN-10: 0323611176 ISBN-13: 978-0323611176
32. Jacqueline Montgomery. Physical Therapy for Traumatic Brain Injury: Clinics in Physical Therapy. Churchill Livingstone: 1994. ISBN-10: 0443089086 ISBN-13:978-0443089084
33. Meg E. Morris, Robert Iansek. Rehabilitation in Movement Disorders. Cambridge University Press 2013 ISBN: 9781107014008, 110701400X
- Neurological Approaches and Rehabilitation Technology**
34. Raj Samuel Glady. Physiotherapy in Neuroconditons. Jaypee Brothers Medical Publishers. ISBN: 9788180616310, 9788180616310
35. David J. Reinkensmeyer, Volker Dietz, Neurorehabilitation Technology 2nd Edition. Springer International Publishing. 2016. ISBN: 9783319286037, 331928603X
- Motor Behavior Retraining**
36. Joel Stein, Richard L. Harvey, Richard D. Zorowitz , Carolee J. Winstein, George E. Wittenberg. Stroke Recovery and Rehabilitation. 2nd Edition. Demos Medical Publishing: 2014. ISBN-10:1620700069 ISBN-13: 978-1620700068
37. Janet H. Carr, Roberta B. Shepherd. Neurological Rehabilitation: Optimizing motor performance. 2nd Edition. Churchill Livingstone: 2010. ISBN-10: 0702040517. ISBN-13: 978-0702040511
38. Anne Shumway-Cook, Marjorie H. Woollacott. Motor Control Translating Research into Clinical Practice. 5th Edition. Wolters Kluwer. 2017. ISBN: 9781496302632, 149630263X
- Activity promotion**
39. Susan Michie, Lou Atkins, Robert West. The Behaviour Change Wheel: A Guide To Designing Interventions. Silverback Publishing. ISBN-10 : 1912141000 ISBN-13 : 978-1912141005

URL

<https://www.who.int/classifications/icf/en/>

Recommended Journals

1. Journal of Neurologic Physical Therapy
2. Journal of Motor Behavior
3. Stroke
4. The Journal of Spinal cord Medicine
5. Journal of Parkinson's Disease
6. Human Movement Science
7. Gait and Posture
8. Motor Control
9. Neural plasticity
10. Neurorehabilitation
11. Neurorehabilitation and Neural repair
12. Journal of neuroengineering and rehabilitation
13. Disability and Rehabilitation
14. African journal of disability
15. International Journal of Behavioral Nutrition and Physical activity
16. International journal of Stroke
17. Movement Disorders
18. Parkinsonism and related disorders

19. Journal of Head Trauma Rehabilitation
20. Topics in spinal cord Injury Rehabilitation
21. Neuromuscular disorders
22. Neurology Asia
23. Neurology India

FACULTY & INFRASTRUCTURE REQUIREMENTS
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1. Minimum Faculty Position for MPT- Neuro program

- a. Professor/ Associate Professor – ONE
- b. Assistant Professor – ONE
- c. Faculty must be recognized from the area of Neurological sciences Specialty
- d. Faculty position is inclusive from the minimum faculty position for BPT program

2. Minimum Infrastructure requirement

- a. Affiliation with a hospital having Neurology department (with both in-patient and out-patient facility) must be established if offering this elective
- b. The center MUST have ALL the equipment and facilities mentioned under the METHODS OF TRAINING in this ordinance for this specialty in consonance with Schedule IV of the BPT Ordinance.
- c. A Neuro physiotherapy unit must be established/ available in the institution/ affiliated hospital with the facilities and equipment required to assess and treat Neurological disorders/ dysfunctions.
- d. Separate Lab or Shared with Movement Science of 1000 sq.ft area Walkway and Community ambulation Training path 10 metres
- e. Own or in attached facility [Neuroimaging, Electro diagnostic and Biochemical investigation facility]
- f. The Neuro-physiotherapy unit MUST have all facilities and equipment for Neuro-rehabilitation viz Cognition assessment, Perception assessment, Sensory assessment, Muscle Strength assessment, Motor assessment, Balance, Gait assessment, Grip and Grasp assessment, Functional Assessment, Physical Activity Measurement, Assistive devices, Mobility devices

**Master of Physiotherapy
Community Health
MPT-Com**

OBJECTIVES

The objective of the course is to develop a cadre of dynamic, progressive postgraduate physiotherapist, who upon completion of the course will be

1. Competent to use the physiotherapy knowledge and skills framework to work with people at both individual and population level to promote inclusive health, prevent disease, and identify and treat health conditions; with a goal to maximize their functioning, independence in activities and participation
2. Able to effectively use their knowledge and leadership skills to integrate all resources and strategies, as described in the course content, to deliver high quality innovative services that are affordable, accessible, effective and efficient.
3. Competent to teach and mentor undergraduate and postgraduate students; undertake independent research; strengthen existing and develop new clinical care pathways
4. Able to efficiently advocate for maximizing access to physiotherapy service provisions within the healthcare delivery framework.

SCOPE OF PRACTICE

The postgraduate specialist physiotherapist in community health will be competent as autonomous clinical practitioners to promote health, prevent disease, restore health, maximize body functioning and independence in activities and participation of individuals, families and communities. They will use their subject and domain expertise as described in the course content to deliver need and context-based care.

They would be competent to work in various settings such as independent practitioners in the community, primary, urban and community health centers, health and wellness clinics, general and targeted population clinics, hospitals, teaching institutions, research institutions, non-governmental organizations, various central and state government health programs viz National Program for Health care for Elderly, National Leprosy Eradication Program, Government institutions, international health organizations, industrial and office settings, schools, specialized care institutions such as assisted living facilities, geriatric homes, child care institutions.

PAPER II**APPLIED THEORIES, PHILOSOPHIES & GLOBAL PERSPECTIVES FOR PHYSIOTHERAPY IN COMMUNITY HEALTH**

1. **Medical Anthropology & Global Health**
 - a. Introduction to Medical Anthropology and Global Health
 - b. Cultural Anthropology and Its Relevance to Healthcare
 - c. Introduction to Ethno medicine
 - d. Anthropology of Women's Health
 - e. Anthropology and Child Development
 - f. Anthropology of Aging and Care
 - g. Anthropology of Disability

2. **Introduction to Behavioral Medicine**
 - a. Biopsychosocial approach to Health and Illness
 - b. Behavioral Influence on Health
 - c. Behavior Change Theories in Healthcare
 - d. Health Professionals' Behavior and Healthcare Delivery
 - e. Application of Behavioral Medicine in Health Promotion & Disease Prevention
 - f. Role of Behavior Medicine in Healthcare Delivery for Chronic Neuromuscular, Musculoskeletal and Non-Communicable Diseases

3. **Health Education**
 - a. Principles of and Rationale for Health Education
 - b. Communication Skills and Strategies in Health Education
 - c. Principles and Guidelines for Development of Health Information Education and Communication Strategies

4. **Community Health**
 - a. Definition and Scope of Community Health
 - b. Consequences of Neglecting Community Health
 - c. Relevance of Community Health to Sustainable Development Goals
 - d. Principles of Community Health
 - e. Strategies for Promoting Community Health

5. **Health Care Delivery System**
 - a. Evolution of Health Care Delivery Systems
 - b. Components of Healthcare Delivery System
 - c. Healthcare Delivery Systems in low- and High-Income Economies
 - d. Health Care Delivery System in India
 - e. Healthcare Access Disparities
 - f. Overview of Access to Physiotherapy Services

- g. National Health Programs
 - h. Significance of Clinical care Pathways in Healthcare Access and Delivery
- 6. Technology in Healthcare Delivery**
- a. Role of Technology in Improving Access to Healthcare
 - b. Introduction to Health Informatics
 - c. Introduction to Telehealth
 - d. Remote Monitoring and Access to Healthcare
- 7. Disability & Health**
- a. Models of Disability
 - b. ICF Framework
 - c. Prevalence and Burden of Disability
 - d. Implications of Disability on Health and Wellbeing
 - e. Disability and Sustainable Development Goals
- 8. Disability Laws, Policies and Advocacy**
- a. Disability Rights Movement
 - b. Legislating for Disability Rights
 - c. International Conventions and Laws on Disability
 - d. National and State Laws, Rules and Regulations for Disability
- 9. Rehabilitation**
- a. Definition, Models, & Components
 - b. Rehabilitation as a Key Strategy for Health in 21st Century
 - c. Rehabilitation in Health Systems
 - d. Strengthening Health Systems to Improve Access to Rehabilitation Services
 - e. Access to Rehabilitation in Primary Health Care
 - f. Community Based Rehabilitation
 - g. Rehabilitation in Emergencies: Minimum Technical Standards and Recommendations for Rehabilitation
- 10. Principles & Biomechanics of Assistive Technology and Products**
- a. Principles of Assistive Technology
 - b. Concept of Universal Design
 - c. Biomechanical considerations of mobility devices
 - d. Biomechanical Principles of Prosthetics and Orthotics
- 11. Occupational Biomechanics and Ergonomics**
- a. Common Physical Principles in Occupational Biomechanics and Ergonomics
 - b. Biomechanical Principles of Load Analysis
 - c. Biomechanics of Human Posture
 - d. Factors influencing Load Bearing Abilities of Human Body

- e. Biomechanics of Lifting and Material Handling
- f. Biomechanics of Overexertion injuries

12. Gerontology

- a. Aging and Population Health
- b. Population Demographics with Aging
- c. Aging and Disability
- d. Theories of Aging
- e. Physiological, Functional and Behavioral Changes with Aging

13. Health and gender

- a. Gender Influence of Health Behavior and Outcomes
- b. Anatomical and Physiological Changes Across the Life Span and their Implications for Health and Functioning
- c. Biomechanics during Pregnancy
- d. Biomechanics of Pelvic Floor in aging and specific conditions including surgical interventions
- e. Health and the third gender
- f. Body Image and Health Behaviors

14. Oncology

- a. Overview of Cancer and its Primary Therapies
- b. Health Behaviors during and after a Cancer Diagnosis
- c. Impact of Cancer Diagnosis and its Therapies on Body Functioning, Activity and participation
- d. Lifestyle Medicine and Cancer Survivorship

PAPER – III**ASSESSMENT FRAMEWORK FOR PHYSIOTHERAPY SERVICE PROVISIONS IN COMMUNITY HEALTH**

- 1. International Classification systems of disease and health**
 - a. Relationship and Difference between ICD and ICF
 - b. ICF as a Universal Tool for Measuring Functioning in Society
 - c. ICF Applications: Service Provision, Policy Development, Economic Analysis, Research Use

- 2. Outcome Measures for Physiotherapy in Community Health**
 - a. Outcome Measures for Assessment of Body structure & Functioning
 - b. Outcome Measures for Assessment of Activity and Participation
 - c. Assessment of contextual factors and quality of life in various contexts

- 3. Assessment of Health Behavior Relevant to Physiotherapy Service Provision**
 - a. Approaches to Health Behavior Assessment
 - b. Components of Health Behavior Assessment
 - c. Tools for Health Behavior Assessment

- 4. Health Education Assessment**
 - a. Assessment for Health Literacy
 - b. Tools for Health Education Assessment
 - c. Patient Education Needs Assessment
 - d. Need Assessment for the Development of IEC Material

- 5. Assessment of Health Systems and Pathways**
 - a. Overview of WHO Framework for Health System Performance Assessment
 - b. Clinical Pathways as a Healthcare Tool
 - c. Assessment of Clinical Care Pathways

- 6. Community Health Assessment Relevant to Physiotherapy Service Provision**
 - a. Principles of Community Health Assessment
 - b. Community Health Assessment & Planning Models, Frameworks & Tools
 - c. Common Elements of Assessment and Planning Frameworks
 - d. Application of Community Health Assessment Strategies in Different Settings (Urban and Rural Communities, Special Population Communities, Institutions, Industries, Schools)

- 7. Physical Fitness Assessment**

- a. Relationship between Physical Fitness and Health
 - b. Components of Health-related Fitness
 - c. Factor influencing Physical Fitness Assessment
 - d. Methods and Tools for Health-related Fitness Assessment
 - e. Fitness Assessment in Special Population including individuals with Disabilities
 - f. Fitness Assessment in Resource-limited Settings
- 8. Disability and Rehabilitation**
- a. Assessment of disability Across Lifespan (Childhood Disability to Disability in the Elderly)
 - b. Methods of Disability Assessment
 - c. Rehabilitation Need Assessment of individuals and societies
- 9. Assistive Technology & Products**
- a. Assistive Technology Need Assessment Across Lifespan
 - b. Seating, assessment
 - c. Wheelchair prescription and Skills Assessment
 - d. Assessment for Orthotic Prescription
 - e. Assessment for Prosthetic Prescription
 - f. Assistive Technology Need Assessment for Inclusive Education
 - g. Assistive Technology Need Assessment for Physical Activity and Sports
 - h. Assessment for environment, adaptations and home access
- 10. Industrial Health and Ergonomics**
- a. Assessment of Occupational Hazards (Physical hazards/ Biological Hazards/ Chemical hazards/Mechanical hazards/ Psychological hazards)
 - b. Common Ergonomic Assessment Tools
 - c. Technology-enabled Ergonomic Assessment
 - d. Evaluation of Workplace Physical Demand
 - e. Return to Work Evaluation
- 11. Geriatrics**
- a. Health Behavior in Elderly
 - b. Multisystem Assessment
 - c. Assessment of Chronic Pain and Disability in Elderly
 - d. Assessment of Fall Risk and Frailty
- 12. Health and gender**
- a. Adolescent Health
 - b. Assessment of Pelvic Floor Integrity and Function
 - c. Antenatal & Postnatal Assessment
 - d. Assessment of infant care - participatory techniques
 - e. Aging and pelvic Health (incontinence, constipation, sexual function)
- 13. Oncology and Palliative Care**

- a. Health Behavior Change Assessment
- b. Assessment for Pre-habilitation
- c. Assessment for Cancer Related Fatigue and Pain
- d. Evaluation of Complication of Cancer Therapies
- e. Palliative Care Need Assessment

14. Accessibility Audit

- a. Principles of Accessibility Audit
- b. Guidelines for Accessibility Audit in Built Environment, Public Spaces & Access to Technologies
- c. Components of Accessibility Audit

PAPER – IV
PLANNING AND MANAGEMENT FRAMEWORK FOR PHYSIOTHERAPY SERVICE
PROVISIONS IN COMMUNITY HEALTH

1. **Improving Physiotherapy Service Provisions within Healthcare Delivery Pathways**
 - a. Strategies for Developing Clinical Care Pathways
 - b. Strategies for Educating Healthcare Team Members on Service Provisions and Delivery
 - c. Strategies for Communicating Evidence and Advocacy for Physiotherapy Service provisions with Stakeholders (Government, Institutions, Professional Organizations, Funding Bodies, Healthcare Providers, Patients & caregivers, and General population).
 - d. Translating Research Evidence to Practice within Healthcare Delivery Pathways (National, State, Community & Institutional Care Pathways)

2. **Health Promotion**
 - a. Components of Health Promotion Interventions
 - b. Strategies for Health Promotion Interventions
 - c. Implementation and Monitoring of Health Promotion Interventions in different settings (School, Workplace, Industries, Urban and Rural Communities)

3. **Health Education**
 - a. Design and Development of IEC Resources
 - b. Planning for IEC Interventions
 - c. Implementation and Monitoring of Health Education Interventions
 - d. Strategies for Effective Implementation of Health Education Interventions
 - e. Facilitators and Barriers to Implementation of Health Education Interventions
 - f. Training of Healthcare Providers, Caregivers and Community Workers and Volunteers in Health Education Delivery

4. **Behavioral and Community Health Approaches to Management of Chronic Neuromuscular, Musculoskeletal and Non-Communicable Diseases**
 - a. Facilitators and Barriers to Behavior Change Intervention
 - b. Principles & Strategies for Behavior Change Interventions
 - c. Guidelines for Behavior Change Initiation and Adherence Enhancing Strategies
 - d. Implementation and Monitoring of Behavior Change Intervention
 - e. Community-based Approaches towards Management and Care of Chronic Health Impairments

5. **Planning and Implementation of Rehabilitation Interventions**

- a. Sustainable Development Goals and Rehabilitation
- b. WHO Recommendations on Rehabilitation in Health Systems
- c. Rehabilitation in Health Systems-WHO Guide for Action
- d. Delivery of Effective Rehabilitation Interventions Across Lifespan
- e. Best Practices in Implementation of Rehabilitation Interventions

6. Community Based Approach to Healthcare

- a. Community participations a Fundamental Component of Primary Health Care
- b. Strategies for Community Engagement in Healthcare Delivery
- c. Implementing Health Promotion through Community Participation
- d. Evidence-based Strategies for Community Mobilization and Participation
- e. Community-Based Rehabilitation as a Strategy within Community Development for People with Disabilities
- f. Understanding and Implementing WHO CBR Guidelines
- g. Planning and Management of CBR Programs

7. Assistive Technology and Products

- a. Use of Assistive Technology across Lifespan
- b. Integrating Universal Design Assistive Technology Products
- c. Adapting WHO's Eight-Step Wheelchair Service Provision for Assistive Technology Prescription
- d. WHO Priority Assistive Products List and National List of Essential Assistive Products
- e. Guidelines for Prescription & Training of Orthosis and Prosthesis
- f. Guidelines for adapted seating systems
- g. Guidelines for Wheelchair Prescription & Training
- h. Usability and aesthetics of Assistive Technologies

8. Industrial Health and Ergonomics

- a. Workstation Modifications to Prevent Occupational Hazards
- b. Ergonomic Interventions as a Treatment and Preventative Tool for Work-Related Musculoskeletal Disorders
- c. Principles of Work-hardening and Conditioning Programs
- d. Return-to-Work Health and Fitness Programs
- e. Education and Training of Employers & Employees in Ergonomic Solutions

9. Geriatrics

- a. Implementation of Healthy Aging Programs
- b. Components of Geriatric Care and Rehabilitation
- c. Developing a Multi-component Geriatric Rehabilitation
- d. Improving Geriatric Rehabilitation Service Provisions in Healthcare Delivery
- e. Implementing Geriatric Rehabilitation Programs across Settings (In-patient, out-patient, specialized institutions, communities)

10. Gender and Health

- a. Health Promotion in Adolescents
- b. Screening and Education Programs for lifestyle diseases
- c. Pelvic Floor Dysfunction and Management Across Lifespan
- d. Exercise Programs for Improvement of ante natal, Post-Natal Health and Fitness
- e. Management of Urinary& bowel Incontinence and other dysfunctions
- f. Exercise Interventions for Health and Fitness specific to gender concerns (men, women and third gender)

11. Oncology and Palliative care

- a. Evidence Summary of Benefits of Physiotherapy Interventions in Cancer care
- b. Integrating Physical Activity and Exercise as an Intervention Strategy across the Spectrum of Cancer Care
- c. Implementing Evidence-based Physiotherapy Interventions in Cancer Rehabilitation
- d. Physiotherapy Service Provisions in Palliative Care (Health Education, Improving Self-efficacy, Pain management, Prescription of assistive technologies, Maintenance of ADL and Functional Independence, Training of Caregivers)

12. Research and Innovation in Community Health and Rehabilitation

- a. Principles of community participation research including action research methodologies
- b. Evidence summaries of Assessment and Intervention Strategies in Community Health and Rehabilitation
- c. Best Practice Guidelines in Community Health and Rehabilitation
- d. Opportunities for Innovation in Community Health and Rehabilitation

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Recommended Journal

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2. Disability and Rehabilitation. <https://www.tandfonline.com/loi/idre20>
3. American Journal of Health Promotion.
<https://journals.sagepub.com/home/ahp>
4. Clinical Rehabilitation. <https://journals.sagepub.com/home/cre>
5. Archives of Physical Medicine and Rehabilitation.
<https://www.sciencedirect.com/journal/archives-of-physical-medicine-and-rehabilitation>
6. Disability and Rehabilitation: Assistive Technology
<https://www.tandfonline.com/loi/iidt20>
7. Disability, CBR & Inclusive Development. <https://dcidj.org/>
8. Bulletin of the World Health Organization.
<https://www.who.int/publications/journals/bulletin>
9. Journal of Geriatric Physical Therapy.
<https://journals.lww.com/jgpt/pages/default.aspx>
10. PTJ: Physical Therapy & Rehabilitation Journal.
<https://academic.oup.com/ptj>
11. Physiotherapy journal.
<https://www.journals.elsevier.com/physiotherapy>
12. Journal of Rehabilitation Research & Development.
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15. Supportive Care in Cancer. <https://www.springer.com/journal/520>
16. Indian Journal of Palliative Care. <https://www.jpalliativecare.com>

FACULTY & INFRASTRUCTURE REQUIREMENTS
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1. Minimum Faculty Position for MPT- Com program

- a. Professor/ Associate Professor – ONE
- b. Assistant Professor – ONE
- c. Faculty must be recognized from the area of Community Health Specialty
- d. Faculty position is inclusive from the minimum faculty position for BPT program

2. Minimum Infrastructure requirement

- a. Affiliation with a Primary Health Center/ Community Health Center must be established if offering this Specialty
- b. The center MUST have ALL the equipment and facilities mentioned under the METHODS OF TRAINING in this ordinance for this specialty in consonance with Schedule IV of the BPT Ordinance.
- c. Community Outreach Facilities or Working MoU's for Community Outreach Programs viz
 - i. Geriatric Homes
 - ii. Special Schools
 - iii. Regular Schools (for implementation of School Health Programs)
 - iv. Outreach Programs in Community Centers
 - v. Adoption of Rural Communities for Implementation of Community Health Programs
 - vi. Liaison and MoU with Primary/Community Health Centers
 - vii. MoU with Engineering/Technology Institutions for Research and Innovation in Assistive Technology
 - viii. Tie up with minimum of two employers who have various types of employments including manual material handling, assembly line and sedentary jobs
 - ix. Transport Provisions for Field Visits and Outreach Activities

**Master of Physiotherapy
Movement Science
MPT- MS**

OBJECTIVES

On Completion of the course, the post graduate will be able to

1. Use expertise in biological movement in analyzing, interpreting and prescribing movement related information and exercise prescription in health and wellness excluding professional athletes and sports
2. Be competent researchers in fundamental areas of physiotherapy practice. E.g. India specific functions, client preferences.
3. Be able to demonstrate the following competencies.
 - a. Decision making:
 - i. Choose a course of action from various alternatives using a reasoned process to achieve intended goals.
 - ii. Make Decisions in a complex setting to achieve intended goals using a structured process and multiple sources of available information.
 - b. Communication:
 - i. Convey and exchange thoughts, ideas and information [clients, Colleagues etc] effectively through various mediums and approaches.
 - ii. Articulate and discuss ideas and persuade others to achieve common outcomes.
 - c. Skills: have current skills to undertake the necessary job responsibilities and update them as required.
 - d. Safety: consider the safety of the patient/client, themselves and other stakeholders at all times.
 - e. Ethics: adhere to ethical guidelines of interaction at all times in all situations.

SCOPE OF PRACTICE

Movement Specialist will be able to use expertise in biological movement in analyzing, interpreting and prescribing movement related information and exercise prescription in health and wellness excluding professional athletes and sports. This may include disabled population who are not currently ill. The Movement therapist will be competent in research related to the fundamental areas of physiotherapy practice such as functions specific to Indian population and Indian work settings and preferences of clients.

Movement Specialists have a scope of working as diagnosticians, researchers, academicians, as adjunct members of health promotion teams, fitness experts in public health (school, offices), Biomechanists, and Exercise physiologist (under sports authority of India). Using their leadership qualities and knowledge in kinesiology and movement functions, movement therapists have a major role as academicians and clinical experts in physiotherapy colleges; Working in interdisciplinary areas that deal with human movement and its applications e.g. assistive technology divisions, ergonomic product manufacturers, as a consultant is also in the scope of practice. The therapists will be well versed in research and recent advances in the fields of kinesiology, movement dysfunction, ergonomics, etc. Since the expertise lies in the field of movement, the workings of the Gait and biomechanical laboratories is understood best by movement specialists.

PAPER – II
FUNDAMENTAL PRINCIPLES OF MOVEMENT AND ITS DYSFUNCTION

1. **Anatomical and physiological basis of movement**
 - a. Growth and development of all systems
 - b. Anatomy – embryology, gross anatomy
 - c. Functional anatomy and physiology related to nerve, cardio vascular, respiratory, gastro intestinal, renal, endocrine, CNS, motor system
 - d. Energy systems.
 - e. Biochemical processes involving energy systems, nutrition and its role in health, oxygen transport, aerobic and anaerobic systems.
 - f. Physical and anatomical parameters of movement during function and physical activity.

2. **Motor control and its influence on movement**
 - a. Motor control and development, and degeneration in health and disease
 - b. Nature and control of movement- theories.
 - c. Physiological basis of motor learning and function.
 - d. Postural control.
 - e. Control of mobility.
 - f. Reach, grasp and manipulation.
 - g. Movement within the framework of motor control theories and their application to function, learning, occupations and physical activity.
 - h. Motor control theories as applied to movement dysfunction and remediation in function, physical activity and occupation.

3. **Growth development and degeneration of movement**
 - a. Aging and its effect on all systems and the impact on movement and physical activity and exercise.
 - b. Theories and application of motor control and learning lifespan perspective in order to identify normal maturation and aging versus dysfunction.
 - c. Movement development based on environmental influences and growth and development.
 - d. Movement adaptations with aging and anthropometry and environmental influences including work.

4. **Exercise physiology, Electrophysiology**
 - a. Nutrition and energy transfer mechanism
 - b. Physiological processes during exercise/ physical activity in
 - c. Pulmonary system
 - d. Cardiovascular system
 - e. Neuromuscular system
 - f. Endocrine system

PAPER – III**MEASUREMENT AND ASSESSMENT IN MOVEMENT**

1. **Exercise testing, prescription, determinants and reasoning.**
 - a. Exercise training and adaptations in functional capacity
 - b. Factors affecting function, performance- evaluation and analysis using laboratory tests and field tests, interpretation based on age, gender, race and other factors
 - c. Reasoning for relevant tests and methods
 - d. Understanding of potential safety concerns and precautions

2. **Biomechanics and kinesiology**
 - a. Biomechanics of tissues and musculoskeletal structures
 - b. Biomechanics of joints
 - c. Posture, balance and gait
 - d. Biomechanical adaptations to exercise/ aging
 - e. Testing and analysis of kinetic, spatial, temporal and kinematic parameters and energetics using instrumented methods, scales. Reasoning for choice of tests and methods of tests
 - f. Analysis of fundamental movement skills

3. **Application in complex functions**
 - a. Analysis of posture,
 - b. Gait,
 - c. Balance,
 - d. Higher motor activities using instrumented and self reported measures- choice and interpretations of methods and tests
 - e. Ergonomic evaluation

PAPER – IV

MOVEMENT REMEDIATION

1. **Psycho-social aspects of exercise and movement – culture, preferences, societal barriers**
 - a. Ecological adaptations and maladaptation: influences of beliefs, culture, life roles and societal influences
 - b. Health culture and practices specific to physical activity with relevance to various parts of India
 - c. Cultural and historical conditions shaping practices with respect to various social groups in India (geography/ gender/ ability/ age) factors driving nutrition, health, activity beliefs
 - d. Commercialization of health: changing beliefs, attitudes towards health and activity
 - e. Counselling methods of psycho social aspects of movement and exercise

2. **Occupational biomechanics**
 - a. Epidemiology of occupational disorders- various groups of disorders – manual material handling, sedentary work, prolonged postures

 - b. Occupational biomechanical modelling- using existing models that predict low back pain, neck pain, and other work-related musculoskeletal disorders
 - i. Planar Static Biomechanical Models: - Single-Body-Segment Static Model, Two-Body-Segment Static Model, Static Planar Model of Nonparallel Forces, Planar Static Analysis of Internal Forces and Multiple-link Coplanar Static Modelling.
 - ii. Three-dimensional Modelling of Static Strength.
 - iii. Dynamic Biomechanical Models: -Single-Segment Dynamic Biomechanical Model, Multiple-Segment Biodynamic Model of Load Lifting and Coplanar Biomechanical Models of Foot Slip Potential While Pushing a Cart.
 - iv. Special-purpose Biomechanical Models of Occupational Task: -Low-Back Biomechanical Models, Biomechanical Models of the Wrist and Hand and Modelling Muscle Strength.

 - c. Methods of evaluating work capacity including instrumented and self-reported methods
 - i. Introduction.
 - ii. Joint Motion: Methods and Data, Methods of Measuring Joint Motion, Normal Ranges of Joint Motion and Factors Affecting Range-of-Motion Data.
 - iii. Muscle Strength Evaluation: Definition of Muscular Strength, Static and Dynamic Strength-Testing Methods, Population Muscle Strength Values and Personal Factors Affecting Strength.
 - iv. Limitations of Mechanical Work-Capacity Data.

- d. Anthropometry and its role in work- assessment of anthropometry and matching person to job description methods- instrumentation
Measurement of Physical Properties of Body Segments:
- i. Body-Segment Link Length Measurement Methods.
 - ii. Body-Segment Volume and Weight.
 - iii. Body-Segment Locations of Center of Mass.
 - iv. Body-Segment Inertial Property Measurement Methods.
- Anthropometric Data for Biomechanical Studies in Industry:
- i. Segment Link Length Data.
 - ii. Segment Weight Data.
 - iii. Segment Mass-Center Location Data.
 - iv. Segment Moment-of-inertia and Radius-of-Gyration Data.
- e. Bioinstrumentation in occupation with relevance to manual material handling, sedentary and prolonged postures
- i. Introduction.
 - ii. Human Motion Analysis Systems: Basis for Measuring Human Motion.
 - iii. Muscle Activity Measurement: Applied Electromyography, Mechanomyography and Intra Muscular Pressure.
 - iv. Muscle Strength Measurement Systems: Localized Static Strength Measurement Systems, Whole-body Static Strength Measurement System and Whole-body Dynamic Strength Measurement System.
 - v. Intradiscal Pressure Measurement: Measurement Concept, Intradiscal Pressure Measurement System and Applications and Limitations in Occupational Biomechanics.
 - vi. Intra-abdominal (Intragastric) Measurements: - Measurement Development, Measurement System, Applications and Limitations in Occupational Biomechanics.
 - vii. Seat Pressure Measurement Systems
 - viii. Stature Measurement System.
 - ix. Force Platform System.
 - x. Foot and Hand Force Measurement Systems.
 - xi. Measurement of Vibration in Humans.
- f. Workplace design- principles of occupational and cognitive ergonomics
- i. Introduction.
 - ii. Localized Musculoskeletal Injury in Industry.
 - iii. Practical Guidelines for Workplace and Machine Control Layout.- Structure-Function Characteristics of the Shoulder Mechanism, Shoulder-Dependent Overhead Reach Limitations, Shoulder-and Arm-Dependent Forward Reach Limits., Neck/Head Posture Work Limitations, torso Postural Considerations in Workbench Height Limitations and Biomechanical Considerations in the Design of Computer Workstations.
- g. Hand tool design- design principles for user comfort and efficiency
- i. The Need for Biomechanical Concepts in Design.
 - ii. Shape and Size Considerations- Shape for Avoiding Wrist Deviation, Shape for Avoiding Shoulder Abduction, Shape to Assist Grip, Size of Tool Handle to Facilitate Grip, Finger Clearance Considerations and Gloves.

- iii. Hand-Tool Weight and Use Considerations.
 - iv. Force Reaction Considerations in Powered Hand-tool Design.
 - v. Keyboard Design Considerations - Posture Stress and Keying Exertion Force Repetition.
 - h. Product design: ergonomics principles of user comfort
 - i. Personal protective equipment, training and selection of workers- principles and reasoning parameters to prevent injury and increase efficiency.
3. **Movement remediation methods in disease and dysfunction**
- a. Health beliefs and participatory methods of movement remediation
 - b. Cognitive behavioral therapy in movement dysfunction
 - c. Physical activity promotion methods to remediate movement dysfunction
 - d. Methods of integrating fundamental movement skills

REFERENCES

Recommended Books

1. Anthropology and public health: bridging differences in culture and society. Hahn & Inhorn, 2nd ed. Oxford University press, 2009.
2. Essential ultrasound anatomy. Loukas & Burns. Wolters Kluver 2019.
3. Performance psychology: a practitioner's guide. Richards & Abbot. Churchill Livingstone 2011.
4. Comparative Quantification of Health Risks Global and Regional Burden of Disease Attributable to Selected Major Risk Factors Volume 1 Edited by Majid Ezzati, Alan D. Lopez, Anthony Rodgers and Christopher J.L. Murray. WHO 2004.
5. Biochemistry primer for exercise science. Houston. Human Kinetics 2006.
6. Motor control: translating research into clinical practice. Shumway-Cook & Woollacott. 5th ed. Lippincott Williams & Wilkins. 2016.
7. Exercise physiology nutrition energy and human performance. McArdle. 8^{ed}, Lippincott Williams & Wilkins. 2015.
8. Methods for Community-Based Participatory Research for Health. Israel, Eng, Schulz, Parker, editors; 2nd Ed. Jossey-Bass 2012.
9. Qualitative Methods in Public Health: A Field Guide for Applied Research. Tolley, Ulin, Mack, Robinson, Succop. 2nd Ed. Jossey-Bass. 2016.
10. Biomechanical analysis of fundamental human movements. Chapman. Human Kinetics 2008.
11. Principles of Biomechanics & Motion Analysis. Griffiths. Lippincott Williams & Wilkins 2005.
12. Joint Structure and Function: A Comprehensive Analysis. Pamela K. Levangie Cynthia C. Norkin. 6th edition ;
13. Burnstrom's Clinical Kinesiology .Peggy A. Houglum and Dolores B. Bertoti ;6th edition ;2011
14. Basic Biomechanics of the Musculoskeletal System. Margareta Nordin, Victor H. Frankel. Wolters Kluwer; 4th edition .2012
15. Kinesiology-The Mechanics And Pathomechanics Of Human Movement" Carol.A.Oatis, Lippincott Williams and Wilkins; 3rd edition edition 2016
16. Biomechanics and Motor Control of Human Movement. David A. Winter ; John Wiley & Sons; 4th edition ; 2009
17. Motor Control and Learning: A Behavioral Emphasis. Richard A. Schmidt, Tim Lee, Carolee Winstein, Gabriele Wulf, Howard N. Zelaznik ; 6th Edition
18. Clinical Exercise Physiology .Jonathan K Ehrman, Paul M. Gordon,
19. Exercise Physiology: Theory and Application to Fitness and Performance: Edward T. Howley Scott K. Powers
20. Exercise Physiology: Nutrition, Energy, and Human Performance . McArdle PhD, William D., Katch, Frank I., Katch, Victor L.
21. Exercise Physiology for Health Fitness and Performance. Sharon Plowman and Denise Smith
22. Physiology of Sport and Exercise + Web Study Guide . W. Larry Kenney, Jack Wilmore, et
23. Advanced Fitness Assessment and Exercise Prescription. Ann L. Gibson, Dale R. Wagner, Vivian H. Heyward, Eighth Edition
24. ACSM's Guidelines for Exercise Testing and Prescription by American College of Sports Medicine

25. Principles of Exercise Testing and Interpretation: Including Pathophysiology and Clinical Applications by Karlman Wasserman MD PhD, James E. Hansen MD, et al.
26. Exercise Testing and Interpretation: A Practical Approach . Christopher B. Cooper and Thomas W. Storer
27. Occupational Biomechanics .Don B. Chaffin , Gunnar B. J. Andersson, et al.
28. Tissue Mechanics ; Stephen C. Cowin and Stephen B. Doty
29. Biomechanics in Ergonomics .Shrawan Kumar
30. Ergonomics: How to Design for Ease and Efficiency. K.H.E. Kroemer , H.B. Kroemer, et al
31. Working Postures and Movements: Tools for Evaluation and Engineering (Ergonomics and Human Factors) . Nico J. Delleman, Christine M. Haslegrave, et al.
32. Introduction to Ergonomics- R.S. Bridger CRC press

URL

1. <https://www.acsm.org/>
2. <https://www.bcpe.org/>

Recommended Journals

1. The ergonomist
2. Journal of Occupational Health
3. Motor Control
4. Journal of ergonomic Research
5. Clinical Biomechanics
6. Clinical electrophysiology
7. Nutrition and health.
8. Journal of Biomechanics.
9. The journal of exercise physiology

FACULTY & INFRASTRUCTURE REQUIREMENTS
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1. Minimum Faculty Position for MPT- Com program

- a. Professor/ Associate Professor – ONE
- b. Assistant Professor – ONE
- c. Faculty must be recognized from the area of Musculoskeletal Science, Sports, Neurophysiotherapy or Community Health
- d. Faculty position is inclusive from the minimum faculty position for BPT program

2. Minimum Infrastructure requirement

- a. The center MUST have ALL the equipment and facilities mentioned under the METHODS OF TRAINING in this ordinance for this specialty in consonance with Schedule IV of the BPT Ordinance.
- b. In addition to the existing BPT labs we require the following,
 - i. 1200sqft for advanced biomechanics
 - ii. 1200 Sqft for Ergonomic
- c. Equipment:
 - i. Advanced Biomechanics Lab viz Force plates to differentially analyse right and left; Basic high speed camera for kinematics analysis- 2; Infrared sensors; Accelerometer and Gyrometer- 2; Dynamic EMG; Testing Treadmill; Oxygen analyser; Hand Held Dynamometer.
 - ii. Ergonomic Lab: Furniture to simulate various job including load carrying, sedentary work and loading at different heights
- d. The infrastructure is for Minimum of one and maximum of 10 students.
- e. A working MOU's for Lab facilities above will be acceptable for First Five Years.
 - i. Tie up with minimum of 2 employers who have various types of employments including manual material handling, assembly line and sedentary jobs
 - ii. Facility for Ultrasound guided anatomy (institution/lab/standalone)

APPENDIX

GRADED RESPONSIBILITY IN CARE OF PATIENTS AND OPERATIVE WORK
(Structured Training Schedule of clinical & specialty subjects only)

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- Observer

A- Assisted a more senior Physiotherapist

PA – Performed procedure under the direct supervision of a senior specialist

PI- Performed Independently

- Teaching Activities – UG Teaching
- Learning Activities: Self Learning, Use of computers & library
- Participation in departmental activities;

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 cases in two years
e.	Inter departmental meetings	Minimum 5 cases in two years
f.	Community work, camps/ field visits	Minimum four case in two years
g.	Clinical rounds	Minimum 250 in two years
h.	Dissertation work	Minimum 200 hours in 2 years
i.	Participation in conferences/presentation of paper	Minimum 2 in two years
j.	Any other – Specify (eg.CME)	

TABLE - 1

MODEL CHECK-LIST FOR EVALUATION OF JOURNAL REVIEW PRESENTATIONS

Name of the Student :

Name of Faculty / Observer :

Date :

Sl.No	Items for observation during presentation	Poor (0)	Below Average (1)	Average (2)	Good (3)	Very Good (4)
1.	Article chosen was					
2.	Extent of understanding the scope & objectives of the paper by the candidate					
3.	Whether cross references have been consulted					
4.	Whether other relevant publications consulted					
5.	Ability to respond to questions on the paper / subject					
6.	Audio – Visual aids used					
7.	Ability to defend the paper					
8.	Clarity of presentation					
9.	Any other observation					
Total Score						

TABLE - 2

MODEL CHECK-LIST FOR EVALUATION OF SEMINAR PRESENTATIONS

Name of the Student :

Name of Faculty / Observer :

Date :

Sl.No	Items for observation during presentation	Poor (0)	Below Average (1)	Average (2)	Good (3)	Very Good (4)
1.	Whether other relevant publications consulted					
2.	Whether cross references have been consulted					
3.	Completeness of preparation					
4.	Clarity of presentation					
5.	Understanding of subject					
6.	Ability of answer questions					
7.	Time scheduling					
8.	Appropriate use of Audio – Visual aids					
9.	Overall performance					
10.	Any other observations					
	Total Score					

TABLE - 3

MODEL CHECK-LIST FOR EVALUATION OF CLINICAL WORK

Name of the Student :

Name of Faculty / Observer :

Date :

Sl.No	Items for observation during presentation	Poor (0)	Below Average (1)	Average (2)	Good (3)	Very Good (4)
1.	Regularity of attendance					
2.	Punctuality					
3.	Interaction with colleagues and supportive staff					
4.	Maintenance of case records					
5.	Presentation of cases during rounds					
6.	Investigations of work up					
7.	Beside manners					
8.	Rapport with patients					
9.	Treatment approaches & techniques					
10.	Overall quality of ward work					
	Total Score					

TABLE - 4

EVALUATION FOR CLINICAL PRESENTATION

Name of the Student :

Name of Faculty / Observer :

Date :

Sl.No	Points to be considered	Poor (0)	Below Average (1)	Average (2)	Good (3)	Very Good (4)
1.	Completeness of History					
2.	Whether all relevant points elicited					
3.	Clarity of presentation					
4.	Logical order					
5.	Mentioned all positive and negative points of importance					
6.	Accuracy of general physical examination					
7.	Whether all physical signs missed or misinterpreted					
8.	Whether any major signs missed or misinterpreted					
9.	Diagnosis – Whether it follows logically from history & findings					
10.	Investigations required Special investigation					
11.	AIMS					
12.	MEANS					
13.	Treatment Techniques					
14.	Others					
	Grand Total					

TABLE - 5

MODEL CHECK-LIST FOR EVALUATION OF TEACHING SKILL PRACTICE

Name of the Student :

Name of Faculty / Observer :

Date :

Sl.No.	Details	Strong Point	Weak Point
1.	Communication of the purpose of the talk		
2.	Evokes audience interest in the subject		
3.	The introduction		
4.	The sequence of ideas		
5.	The use of practical examples & / or illustrations		
6.	Speaking style (enjoyable, monotonous, etc., -Specify)		
7.	Attempts audience participation		
8.	Summary of the main points at the end		
9.	Asks questions		
10.	Answer questions asked by the audience		
11.	Rapport of speaker with his audience		
12.	Effectiveness of the talk		
13.	Uses Audio visual aids appropriately		

TABLE - 6

MODEL CHECK LIST FOR DISSERTATION PRESENTATION

Name of the Student :

Name of Faculty / Observer :

Date :

Sl.No	Points to be considered	Poor (0)	Below Average (1)	Average (2)	Good (3)	Very Good (4)
1.	Interest shown in selecting a topic					
2.	Appropriate review of literature					
3.	Discussion with guide & other faculty					
4.	Quality of protocol					
5.	Preparation of proforma					
	Grand Total					

TABLE - 7

CONTINUOUS EVALUATION OF DISSERTATION WORK BY GUIDE

Name of the Student :

Name of Faculty / Observer :

Date :

Sl.No	Items for observation during presentation	Poor (0)	Below Average (1)	Average (2)	Good (3)	Very Good (4)
1.	Periodic consultation with guide					
2.	Regular collection of case material					
3.	Depth of analysis / discussion					
4.	Departmental presentation of findings					
5.	Quality of final output					
6.	Others					
	Total Score					

Source: Regulations and Curricula for Postgraduate Degree and diploma courses in Medical Sciences, RGUHS, Karnataka.