School of Health Sciences

CSJM University, Kanpur

Ordinance & Syllabus

for

Master of Physiotherapy (M.P.T)

Academic Programme

Specialization/Discipline:

Orthopaedics
Neurology
Cardiopulmonary Disorders

Ordinance according to

NEP-2020

Duration:

2 Years (04 Semesters)

M.P.T (Master of Physiotherapy)

ORDINANCE

Chapter

"A"

Preamble:
The Master of Physiotherapy course is a 2-year fulltime program with 4 semesters leading to the degree that equips the student with analytical, evidence based and Hands on learning skills. The program is generic in nature and has a component of additional learning of one area leading to an elective in that area. Psychosomatic aspects of training are a component through all the elective areas.

Title of the Programme: The programme shall be called "**Master of Physiotherapy"**

Objectives of the Programme:
At the completion of this course, the student should be –

- Able to execute all routine physiotherapeutic procedures with evidence based practice.
- Able to be a prominent member of the multidisciplinary physiotherapy team and treat all the conditions which need physiotherapeutic procedures.
- Able to provide adequate knowledge about the treatment procedures and its benefit.
- Able to transfer knowledge and skills to students as well young professionals.
- Able to perform independent physiotherapy assessment and treatment for patients.
- Able to undertake independent research in the field of physiotherapy.
- Learn multidisciplinary practice skills.
- Able to practice and assess patient independently.
- On successful completion of M.P.T programme, the Physiotherapist professional will be able to take up physiotherapy teaching assignments independently for undergraduate teaching programme. He / She will be able to prepare project proposal with selected research design and interpret the evaluated outcome measures (using sound data processing techniques and statistical methods). He/she will be able to practice in his / her specialty area with advanced knowledge and skills.

Program outcomes

1. Course work includes exercise physiology, principles of physiotherapy practice, electrophysiology and electives. The student will be skilled in treatment planning, management, administration of physiotherapy treatment and provision of patient support.
2. Acquire in-depth knowledge of structure and function of human body related to the respective branch of specialty.
3. Acquire the in-depth knowledge of movement dysfunction of human body, cause thereof principles underlying the use of physiotherapeutic interventions for restoring movement dysfunction towards normalcy.
4. Demonstrate skill in Physical & Functional diagnosis pertaining to patient under his/her care.
5. Demonstrate ability to critically appraise recent physiotherapeutic and related literature from journals & adopt diagnostic & therapeutic procedures based on it.
6. The student will also perform independent research within the department and help the department and the team for treatment planning of the patient.
7. PT post-graduate is encouraged to pursue further qualification to attain senior position in the professional field, also to keep abreast with the advance and new technology the professional should opt for continuous professional education credits offered by national and international institutes.
8. Employment opportunities can be found in hospitals in both private and public sectors as well as in independent physiotherapy clinics and as well as teaching institutes.
9. Demonstrate ability to make clinical decision (based on evaluation) regarding Physiotherapy strategy techniques and select appropriate outcome measures based on the comprehensive knowledge of specialty.
10. Demonstrate an expertise in evidence-based skill in the management disorders including movement dysfunction in concerned specialty.

Program Specific Outcomes

At the completion of this course, the student should be –

• Able to execute all routine physiotherapeutic procedures with evidence based practice.

• Able to be a prominent member of the multidisciplinary physiotherapy team and treat all the conditions which need physiotherapeutic procedures.

• Able to provide adequate knowledge about the treatment procedures and its benefit.

• Able to transfer knowledge and skills to students as well young professionals.

• Able to perform independent physiotherapy assessment and treatment for patients.

• Able to undertake independent research in the field of physiotherapy.

• Learn multidisciplinary practice skills.

• Able to practice and assess patient independently.

• On successful completion of M.P.T programme, the Physiotherapist professional will be able to take up physiotherapy teaching assignments independently for undergraduate teaching programme. He / She will be able to prepare project proposal with selected research design and interpret the evaluated outcome measures (using sound data processing techniques and statistical methods). He/she will be able to practice in his / her specialty area with advanced knowledge and skills.




1. M.P.T. degree will be under the faculty of Medicine of C.S.J.M. University, Kanpur in the department of physiotherapy

2. Duration of Course:

- MPT course will be a full-time course.
- Duration will be two years (Four Semesters).
  This course shall be divided into four semester examinations namely Master of Physiotherapy I & II Semester (First Academic Year) and III & IV Semester (Second Academic Year).

3. Specialization/Discipline

There shall be following specialization/discipline:

- **MPT in Orthopaedics**
- **MPT in Neurology**
- **MPT in Cardiopulmonary Disorders**

4. Seats:

Specialization/Discipline	No. of Seats
MPT in Orthopaedics	10 Seats
MPT in Neurology	10 Seats
MPT in Cardiopulmonary Disorders	

5. Admission.

Eligibility:

The students who have passed BPT (Bachelor of Physiotherapy) Course from any recognized Institutions/University with minimum of 55% marks (50% for SC/ST).

Mode of Admission:
As per the University Norms.

6. Medium of instruction:

English shall be the medium of instruction in the class and in the University examination.

7. Method of Teaching:

The method of teaching adopted shall be a combination of lectures, demonstrations and practicals by the full time faculty, visiting or part time or guest faculty.

8. Examination:

As per the University norms.

Duration of examination:

As per the University norms.

9. Attendance to appear in the end semester examination :

The permission to appear in end semester examination shall be granted to such candidate only who have fulfill the condition of 75% attendance in each subject separately in theory and practical as per the university rule.
Regarding attendance requirements students will have to fulfill the condition of 75% attendance. 15% relaxation in attendance, in exceptional circumstances can be made by the Vice Chancellor on the recommendation of the Director/Coordinator/Head of the Institute/Department.



Regulations : Scheme of Examination

M.P.T. Semester-I University Examination (Common to all specialization/ Discipline)

S. No.	Subjects	Subject code	THEORY MARKS			PRACTICAL MARKS			Total marks
			Theory Paper	Internal Assessment	Total	Practical	Internal Assessment	Total	
1.	Review of Basic Physiotherapeutics	MPT-101	75	25	100	-	-	-	100
2.	Advanced Physiotherapeutics-I	MPT-102	75	25	100	-	-	-	100
3.	Research Methodology	MPT-103	75	25	100	-	-	-	100
4.	Practical	MPT-104	-	-	-	75	25	100	100
								Grand Total	400

M.P.T. Semester-II, University Examination (Common to all specialization/ Discipline)

S. No.	Subjects	Subject code	THEORY MARKS			PRACTICAL MARKS			Total marks
			Theory Paper	Internal Assessment	Total	Practical	Internal Assessment	Total	
1.	Basics of Exercise Physiology and Nutrition	MPT-201	75	25	100	-	-	-	100
2.	Advanced Physiotherapeutics –II	MPT-202	75	25	100	-	-	-	100
3.	Biostatistics	MPT-203	75	25	100	-	-	-	100
4.	Practical	MPT-204	-	-	-	75	25	100	100
								Grand Total	400

M.P.T. Semester-III University Examination (Orthopaedics)

S. No.	Subjects	Subject code	THEORY MARKS			PRACTICAL MARKS			Total marks
			Theory Paper	Internal Assessment	Total	Practical	Internal Assessment	Total	
1	Pedagogy in Physiotherapy Education	MPT-301	75	25	100	-	-	-	100
2	Administration, Management & Ethical Issues	MPT-302	75	25	100	-	-	-	100
3	Orthopaedic Disorders & Management –I	MPT-303O	75	25	100	-	-	-	100
4.	Practical	MPT-304	-	-	-	75	25	100	100
								Grand Total	400

M.P.T. Semester-IV University Examination (Orthopaedics)

S. No.	Subjects	Subject code	THEORY MARKS			PRACTICAL MARKS			Total marks
			Theory Paper	Internal Assessment	Total	Practical	Internal Assessment	Total	
1	Applied Exercise Physiology	MPT-401	75	25	100				100
2	Orthopaedic Disorders & Management –II	MPT-402O	75	25	100	-	-	-	100
3.	Practical	MPT-403	-	-	-	75	25	100	100
4.	Dissertation	MPT-404	-	-	-	-	-	300	300
								Grand Total	600

M.P.T. Semester-III University Examination
(Neurology)

S. No.	Subjects	Subject code	THEORY MARKS			PRACTICAL MARKS			Total marks
			Theory Paper	Internal Assessment	Total	Practical	Internal Assessment	Total	
1	Pedagogy in Physiotherapy Education	MPT-301	75	25	100				100
2	Administration, Management & Ethical Issues	MPT-302	75	25	100	-	-	-	100
3	Neurological Disorders & Management –I	MPT-303N	75	25	100	-	-	-	100
4.	Practical	MPT-304	-	-	-	75	25	100	100
								Grand Total	400

M.P.T. Semester-IV University Examination
(Neurology)

S. No.	Subjects	Subject code	THEORY MARKS			PRACTICAL MARKS			Total marks
			Theory Paper	Internal Assessment	Total	Practical	Internal Assessment	Total	
1	Applied Exercise Physiology	MPT-401	75	25	100	-	-	-	100
2	Neurological Disorders & Management –II	MPT-402N	75	25	100	-	-	-	100
3.	Practical	MPT-403	-	-	-	75	25	100	100
4.	Dissertation	MPT-404	-	-	- -	-	-	300	300
								Grand Total	600

M.P.T. Semester-III University Examination
(Cardiopulmonary Disorders)

S. No.	Subjects	Subject code	THEORY MARKS			PRACTICAL MARKS			Total marks
			Theory Paper	Internal Assessment	Total	Practical	Internal Assessment	Total	
1	Pedagogy in Physiotherapy Education	MPT-301	75	25	100	-	-	-	100
2	Administration, Management & Ethical Issues	MPT-302	75	25	100	-	-	-	100
3	Cardiopulmonary Disorders & Management –I	MPT-303C	75	25	100	-	-	-	100
4.	Practical	MPT-304	-	-	-	75	25	100	100
								Grand Total	400

M.P.T. Semester-IV University Examination
(Cardiopulmonary Disorders)

S. No.	Subjects	Subject code	THEORY MARKS			PRACTICAL MARKS			Total marks
			Theory Paper	Internal Assessment	Total	Practical	Internal Assessment	Total	
1	Applied Exercise Physiology	MPT-401	75	25	100	-	-	-	100
3	Cardiopulmonary Disorders & Management –II	MPT-402C	75	25	100	-	-	-	100
4.	Practical	MPT-403	-	-	-	75	25	100	100
5.	Dissertation	MPT-404	-	-	-	-	-	300	300
								Grand Total	600

SCHEME OF EXAMINATION

INTERNAL ASSESSMENT

- It will be for theory and practical both.
- It will be done through the whole semester.
- The candidate must obtain at least 40% marks in theory and practical separately in internal assessment to be eligible for the semester University examination.
- Internal assessment (Theory) will be done as follows:

a)	Mid-sem./Class Test	= 10 marks
b)	Assignments/Projects/Clinical Presentations	= 10 marks
c)	Attendance	= 05 marks
	Total	**= 25 marks**

Internal assessment (Practical) will be done as follows:

a)	Laboratory manual	= 10 marks
b)	Day to day performance	= 10 marks
c)	Attendance	= 05 marks
	Total	**= 25 marks**

CRITERIA FOR PASSING

- As per the University Norms.

Maximum duration for completion for course

- A candidate shall complete the course within four years from date of admission failing which the candidate will be discharged.

DIVISION:

- As per the University Norms.

DEGREE:

The degree of MPT course of the University shall be conferred according to specialization/discipline on the candidates who have pursued the prescribed course of study for not less than two academic years and have passed examinations as prescribed under the relevant scheme.

Monitoring Progress of Studies

It is essential to monitor the learning progress of each candidate through continuous appraisal and regular internal assessment. It also helps teachers to evaluate students, but also students to evaluate themselves. The monitoring is done by the faculty members of the department based on participation of students in various teaching / learning activities.

(a) Seminar

- Seminars /recent advance presentation will be held every week, however, its timings are subject to clinical schedule. Topics must be well researched and must include common knowledge, recent advances, analysis and references.
- PG students should present minimum of two seminars (One in general and one in elective area) and Internal Assessment marks will depend on better topic selection and presentation.

(b) Case Presentation

- PG students are expected to do at least one case presentation per month. They can choose the patient depending on the availability of cases. However, appropriateness should be confirmed with concern teacher.
- If the first presentation is unsatisfactory, students can do one more case presentation in the same posting for the improvement of the internal assessment.

(c) Clinical Practices

Post graduate students must know:

- Assessment, evaluation and diagnosis.
- Practice and application of physiotherapeutic system in hospital/institution.
- Application of advance physiotherapeutic maneuvers like manipulation and various neurological interventional concepts.
- Clinical reasoning, decision making, evidence based practice and recording system.

(d) Teaching Skills

Candidates should be encouraged to teach undergraduate students if any. This performance will be based on assessment by the faculty members of the department and from feedback from the undergraduate students.

(e) Journal Review Meeting (Journal Club):

The ability to do literature search, in depth study, presentation skills, and use of audio- visual aids are to be assessed. The assessment is made by faculty members and peers attending the meeting.

(f) Work diary / Log Book

Every student 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 practice, if any conducted by the candidate by the student.

(g) Mid Term Examination/Class Test/Assignments

There will be mid term examination of the students on every academic year. Various class tests may be taken by the department and assignments may be given to students on various topics. Marks of mid term examination will be included in internal assessment.

(h) Records

Records, log books and marks obtained in mid term exam/tests will be maintained by the Head of the Department and will be made available to the University.

Dissertation

Every candidate pursing MPT degree course is required to carry out research work on a selected research project under the guidance of a recognized postgraduate teacher. The results of such a work shall be submitted in the form of dissertation. Topic for dissertation shall be assigned by the guide.

If the subject of Thesis entails collaboration with other departments or specialties, the collaborative portion of the work will be supervised by Co-Guide, designated by the School of Health Sciences in consultation with the Guide. Where a Co-Guide is involved, the Thesis will be certified jointly by the Guide & Co-guide.

Every candidate shall submit synopsis to the University in the prescribed Performa 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 dissertation should be written under the following headings.

1. Introduction
2. Aims or objectives of study
3. Review of literature
4. Material and methods
5. Results
6. Discussion
7. Conclusion
8. References
9. Master and Chart & Table (If Applicable)
10. Annexure (If Applicable)

The written text of dissertation/ research project shall not be less than 50 pages and shall not exceed 120 pages excluding references, tables, questionnaires and other annexure. It should be neatly typed in double line spacing on one side of bond paper (A4 size, 8.27" x 11.69") and bound properly. Spiral binding should be avoided. A declaration by the candidate for having done the work himself should also be included, and the guide, head of the department and Director/Coordinator of the institute shall certify the dissertation/ research project.

Every candidates required to give power point presentation before final submission of dissertation. Four copies of Dissertation/research project shall be submitted to the university, through proper channel, along with a soft copy (CD), 6 months before the final examination. It shall be assessed by two examiners appointed by the university, one internal and one external. There will be a power point open presentation of the submitted dissertation as per the schedule given by the university. This presentation shall be jointly evaluated by external and internal examiner as per the criteria given below:

Objective(s) of the work done	50 Marks
Methodology adopted	100 Marks
Result and Discussion	100 Marks
Conclusion & outcome	50 Marks
Total	**300 Marks**

To pass in the dissertation a student must secure 150 marks.

If the student failed to secure the minimum passing marks he will resubmit the dissertation 01 month before the supplementary exam.

Guide:

I. Eligibility for guide for each specialty

(a) Full time faculty involved in teaching in the same department/institute.

(b) Minimum MPT with 3 years teaching experience in related subject as a full time faculty.

The Vice Chancellor of the University can appoint a person as a guide whom he/she considers suitable.

II. Age of Guide

The age of guide should not exceed 62 years or as per university norms.

III. Guide student ratio

1: 5

A recognized guide shall supervise dissertation work of not more than 5 students per academic year.

IV. Change of Guide

In the event of registered guide leaving the department/institute or in the event of death of guide, guide may be change with prior permission from the university.

COURSE OF STUDY

M.P.T. Semester-I (Common to all specialization/ Discipline)

S. No.	Subjects	Subject code	Total Teaching Hours	Credit
1.	Review of Basic Physiotherapeutics	MPT-101	80	04
2.	Advanced Physiotherapeutics-I	MPT-102	80	04
3.	Research Methodology	MPT-103	80	04
4.	Practical	MPT-104	160	08
5.	Dissertation	-	40	02
6.	Clinical Practices*	-	200	02
7.	Teaching Skills/ Seminars/Symposia/Journal Club etc.*	-	80	02
		Total Hours	720	26

*** Not included in University Exam**

M.P.T. Semester-II (Common to all specialization/ Discipline)

S. No.	Subjects	Subject code	Total Teaching Hours	Credit
1.	Basics of Exercise Physiology and Nutrition	MPT-201	80	04
2.	Advanced Physiotherapeutics-II	MPT-202	80	04
3.	Biostatistics	MPT-203	80	04
4.	Practical	MPT-204	160	08
5.	Dissertation	-	40	02
6.	Clinical Practices*	-	200	02
7.	Teaching Skills/ Seminars/Symposia/Journal Club etc.*	-	80	02
		Total Hours	720	26

*** Not included in University Exam**

M.P.T. Semester-III

(Orthopaedics)

S. No.	Subjects	Subject code	Total Teaching Hours	Credit
1.	Pedagogy in Physiotherapy Education	MPT-301	80	04
2.	Administration, Management & Ethical Issues	MPT-302	80	04
3.	Orthopaedic Disorders & Management –I	MPT-303O	120	06
4.	Practical	MPT-304	160	08
5.	Dissertation	-	80	02
6.	Clinical Practices*	-	200	02
7.	Teaching Skills/ Seminars/Symposia/ Journal Club etc.*	-	80	02
		Total Hours	800	28

*** Not included in University Exam**

M.P.T. Semester-IV
(Orthopaedics)

S. No.	Subjects	Subject code	Total Teaching Hours	Credit
1.	Applied Exercise Physiology	MPT-401	80	04
2.	Orthopaedic Disorders & Management –II	MPT-402O	120	06
3.	Practical	MPT-403	160	08
4.	Dissertation	MPT-404	120	06
5.	Clinical Practices*	-	200	02
6.	Teaching Skills/ Seminars/Symposia/Journal Club etc.*	-	80	02
		Total Hours	760	28

*** Not included in University Exam**

M.P.T. Semester-III
(Neurology)

S. No.	Subjects	Subject code	Total Teaching Hours	Credit
1.	Pedagogy in Physiotherapy Education	MPT-301	80	04
2.	Administration, Management & Ethical Issues	MPT-302	80	04
3.	Neurological Disorders & Management –I	MPT-303N	120	06
5.	Practical	MPT-304	160	08
6.	Dissertation		80	02
7.	Clinical Practices*	-	200	02
8.	Teaching Skills/ Seminars/Symposia/Journal Club etc.*	-	80	02
		Total Hours	800	28

*** Not included in University Exam**

M.P.T. Semester-IV
(Neurology)

S. No.	Subjects	Subject code	Total Teaching Hours	Credit
1.	Applied Exercise Physiology	MPT-401	80	04
2.	Neurological Disorders & Management –II	MPT-402N	120	06
3.	Practical	MPT-403	160	08
4.	Dissertation	MPT-404	120	06
5.	Clinical Practices*	-	200	02
6.	Teaching Skills/ Seminars/Symposia/Journal Club etc.*	-	80	02
		Total Hours	760	28

*** Not included in University Exam**

M.P.T. Semester-III
(Cardiopulmonary Disorders)

S. No.	Subjects	Subject code	Total Teaching Hours	Credit
1.	Pedagogy in Physiotherapy Education	MPT-301	80	04
2.	Administration, Management & Ethical Issues	MPT-302	80	04
3.	Cardiopulmonary Disorders & Management –I	MPT-303C	120	06
5.	Practical	MPT-304	160	08
6.	Dissertation	-	80	02
7.	Clinical Practices*	-	200	02
8.	Teaching Skills/ Seminars/Symposia/Journal Club etc.*	-	80	02
		Total Hours	800	28

M.P.T. Semester-IV
(Cardiopulmonary Disorders)

S. No.	Subjects	Subject code	Total Teaching Hours	Credit
1.	Applied Exercise Physiology	MPT-401	80	04
2.	Cardiopulmonary Disorders & Management –II	MPT-402C	120	06
3.	Practical	MPT-403	160	08
4.	Dissertation	MPT-404	120	06
5.	Clinical Practices*	-	200	02
6.	Teaching Skills/ Seminars/Symposia/Journal Club etc.*	-	80	02
		Total Hours	760	28

*** Not included in University Exam**

Master in Physiotherapy (MPT) Semester-I
Review of Basic Physiotherapeutics
Subject Code : MPT-101
Min. Hrs -: 80 Hrs.

COURSE OBJECTIVES:

a) To have a thorough understanding of Exercise therapy, electrotherapy, kinematics and kinetics in motion.
b) To have an understanding of structure and function of biological tissues involve in the human motion.
c) To evaluate movement and estimate force on human structure during exercise.
d) To understand the functioning operating physiological mechanism and uses of biomechanical instruments.

COURSE OUTCOMES:

a) Students will be able to understand and apply concepts and terminology with in the area of Exercise therapy, electrotherapy and biomechanics.
b) Students will be able to describe how biomechanical factors influence motion in exercise.
c) Demonstrate and understanding of statics, kinematics and kinetics in human motion.
d) Apply a broad and coherent knowledge of the underlying principles and concepts of biomechanics particularly in the field of kinematics and kinetics as applied to human and projectile motion.
e) Safely and effectively use biomechanics instrumentation and equipment to record and asses human and object motion.
f) Record, extract and analyze key information about human and object.

THEORY

EXERCISE THERAPY

- General Exercise therapy and principles
- Assessment Methods & Techniques (like MMT, Anthropometry& Goniometry etc.).
- Functional diagnosis measures: Functional activity specific assessment-FIM, ADL Scales, Assessment of health wellness: SF-36.
- Reponses and adaptations of various systems to exercise and training.
- Physiology of movements
- Strengthening exercise
- Stretching and soft tissue mobilization and manipulation
- Relaxation, traction
- Hydro therapy, Balance and co-ordination.
- Recent advances in exercise therapy

ELECTROTHERAPY

- General electrotherapy and principles.
- Low, medium and high frequency current and modalities
- Di-dynamic, Russian and High volt currents
- Cryotherapy
- Electro Physiological assessment devices.
- Muscle plasticity in response to electrical stimulation
- Electrical stimulation and its effect on various systems.
- Recent advances in electrotherapy

BIOMECHANICS, KINESIOLOGY AND PATHO-MECHANICS

- General Biomechanics, Kinesiology and principles.
- Bone, Joint, articular cartilage, various soft tissue and nerve.
- Biomechanics and pathomechanics
- Biomechanics, kinesiology and pathomechanics and all joints and muscles.
- Evaluation and assessment of postures, abnormal postures, gait and abnormal gaits.
- Evaluation and assessment of joint motions and muscle function.

REHABILITATION

- General Principles of rehabilitation
- Types and uses (orthotics and prosthetics)
- Application related to various disorders.

Master in Physiotherapy (MPT) Semester-I
Advanced Physiotherapeutics-I
Subject Code : MPT-102
Min. Hrs -: 80 Hrs.

COURSE OBJECTIVES:

a) To have a thorough understanding of Advance manual therapy approaches.
b) To have an understanding of structure and function of biological tissues involve in the human motion.
c) To evaluate movement and estimate force on human structure during exercise.
d) To understand the functioning operating physiological mechanism and uses of biomechanical instruments.

COURSE OUTCOMES:

a) Students will be able to understand and apply concepts and terminology with in the area of manual therapy.
b) Students will be able to describe how manual therapy.
c) Apply a broad and coherent knowledge of the underlying principles and concepts of biomechanics particularly in the field of kinematics and kinetics as applied to human and projectile motion.
d) Safely and effectively use biomechanics instrumentation and equipment to record and asses human and object motion.
e) Record, extract and analyze key information about human and object.

MANUAL THERAPY

Part-I: Foundational concepts in Manual therapy Unit

1. History of manual therapy
2. Biomechanical principles in manual therapy
• Concave-Convex rule
• Close pack and Loose pack Positions
• Resting positions
• Joint status
• Barrier concepts
• Fryette's Laws
• Articular neurology
4. Pain

Part-II: Joints Mobilization Techniques

(Terminology, Principles, Indications, Contra-indications, Assessment and method of application of the following techniques)

1. Kalten born
2. Maitland
3. Mulligan
4. McKenzie
5. Cyriax
6. Butler neural mobilization

Nerve Conduction studies, EMG and Biofeed Back

Theory

- Physiology and nerve conduction
- Electrical activities of muscles
- Different type of EMG recording in normal and abnormal muscles.
- MNCV, SNCV, 'H' reflex, F, wave & blink reflex.
- Procedure and recording methods mechanisms
- Physiology and mechanisms bio feed, procedure and application of various disorders.

Master in Physiotherapy (MPT) Semester-I
Research Methodology
Subject Code : MPT-103
Min. Hrs -: 80 Hrs.

COURSE OBJECTIVE:

a) To have a thorough understanding of presenting supporting evidences and how to conduct research.
b) To have an understanding of model of research and biostatistics.
c) To evaluate every procedure on the basis of evidences.
d) To understand the data analysis procedure and their significance in research.

COURSE OUTCOMES:

a) Students will be able to understand and apply concepts and terminology with in the area of Research.
b) Students will be able to describe research design and application of different methods to analyze the data collected to conduct and complete the research.

RESEARCH METHODOLOGY

1. Research in physiotherapy

- Introduction
- Research for Physiotherapist: Why? How? And When?
- Research – Definition, concept, purpose, approaches
- Internet sites for Physiotherapist

2. Research Fundamentals

- Define measurement
- Measurement framework
- Scales of measurement
- Pilot Study
- Types of variables
- Reliability & Validity
- Drawing Tables, graphs, master chart etc

3. Writing a Research Proposal, Critiquing a research article

- Defining a problem
- Review of Literature
- Formulating a question, Operational Definition
- Inclusion & Exclusion criteria
- Forming groups
- Data collection & analysis
- Results, Interpretation, conclusion, discussion
- Informed Consent
- Limitations

4. Research Design

- Principle of Designing
- Design, instrumentation & analysis for qualitative research
- Design, instrumentation & analysis for quantitative research
- Design, instrumentation & analysis for quasi-experimental research
- Design models utilized in Physiotherapy

5. Research Ethics

- Importance of Ethics in Research
- Main ethical issues in human subjects' research
- Main ethical principles that govern research with human subjects
- Components of an ethically valid informed consent for research

Master in Physiotherapy (MPT) Semester-I
Practical
Subject Code : MPT-104
Min. Hrs -: 160 Hrs.

1. Assessment, evaluation and diagnosis
2. Practice and application of physiotherapeutic system in hospital/centre/ institution.
3. Application of advance physiotherapeutic maneuvers like manipulation (maitland, cyriax, mulligan etc.) and various neurological interventional concepts (bobath, NDT etc.).
4. Clinical reasoning, decision making, evidence based practice and recording system.
5. Short case from area of elective to assess investigative and diagnostic skills
6. Short case from area of elective to assess patient management skills

Master in Physiotherapy (MPT) Semester-II
Basics of Exercise Physiology & Nutrition
Subject Code : MPT-201
Min. Hrs -: 80 Hrs.

Course Objectives: On completion of the subject, students will have the opportunity to develop the skills of intellect decision making. It also provides an extension of their communication skills to articulate the evidence based acquaintance and clinical knowledge for assessment and diagnosis of patients. It is a prospect to the students for the application of the research and professional information to novel situations.

Course Outcome: On completion of this subject students should have the opportunity to:

a) Strengthen the basic fundamental basis of assessment and diagnosis and postulate this knowledge in clinical practice.

b) Analyses critical evaluate the patient conditions and formulation of accurate diagnosis.

c) Acquire a thorough understanding of basic exercise physiology which can be applied in clinical practice.

I. Bioenergetics of exercise :

- **a)** High energy phosphates,
- **b)** Anaerobic and aerobic ATP synthesis,
- **c)** Bioenergetics Control, exercise intensity & substrate utilization, Protecting CHO stores,
- **d)** Muscle adaptation to endurance training, processes that potentially limit the rate of fat oxidation,
- **e)** Regulation of substrate utilization, training - induced increase in FFA oxidization: Basal metabolic and resting metabolic rates and factors affecting them,
- **f)** Classification of Physical Activities by energy expenditure,. Concept of MET , measurement of energy cost of exercise

II. Nutrition

- **a)** Metabolism of Carbohydrate , fats and proteins , vitamin, mineral and water

III. Nutrition in exercise

- **a)** Optimum nutrition for exercise
- **b)** Nutrition for physical performance
- **c)** Pre-game meal
- **d)** Carbohydrate loading
- **e)** Food for various athletic events
- **f)** Fluid and energy replacement in prolonged exercise

I. Respiratory responses to exercise

- **a)** Ventilation at Rest and during Exercise.
- **b)** Ventilation and the Anaerobic Threshold, static and dynamic lung volume.
- **c)** Gas diffusion
- **d)** Oxygen and carbon dioxide transport, second wind
- **e)** Control of pulmonary ventilation during exercise
- **f)** Adaptive changes in the respiratory systems due to regular physical activities.

II. Cardiovascular responses to exercise

- **a)** Cardiovascular system and exercise, acute vascular effects of exercise.
- **b)** Circulatory responses to various types of exercise regulation of cardiovascular system during exercise.
- **c)** Pattern of redistribution of blood flow during exercise.
- **d)** Adaptive responses of cardiovascular system to aerobic and anaerobic training.
- **e)** Athlete heart

III. Exercise and Acid Base Balance

a) Acid and Bases
b) Buffers
c) pH
d) Respiratory Regulation of pH
e) Alkali Reserve
f) The kidneys and Acid base balance
g) Alkalosis and Acidosis
h) Acid base balance following heavy exercise.

IV. Hormonal responses to exercise with respect to

a) Growth Hormone (GH),
b) Thyroid and Parathyroid Hormones.
c) Anti-diuretic Hormone (ADH) and Aldosterone,
d) Insulin and Glucagon,
e) The catecholamine; epinephrine and norepinephrine.
f) The sex hormones.
g) The glucocorticoids (Cortisol) and Adrenocorticotrophic Hormones (ACTH).
h) Prostaglandins and Endorphins:

Books suggested

1. Essentials of Exercise Physiology: McArdle, WD, Katch, FI, and Katch, VL. 2nd edn, Lippincott Williams and Wilkins (2000)·
2. Fundamentals of Exercise Physiology: For Fitness Performance and Health, Robergs RA, and Roberts, S.O. McGraw Hill (2000)
3. Exercise Physiology: Powers, SK and Howley ET. 4th edn; Mc Graw Hill (2001)
4. Physiology of Sport and Exercise: Wilmore, JH and Costil, DL. Human Kinetics (1994)
5. Exercise Physiology- Human Bioenergetics and its Application: Brooks, GA, Fahey, TD, White, TP. Mayfield Publishing Company (1996)
6. Komi, P. (Ed.) (1992) Strength and power in sport. Blackwell Scientific Publications.
7. Levick, J.R. (1998) An introduction to Cardiovascular Physiology. 2nd ed. Butterworth Heinemann
8. McArdle, WD, Katch, FI & Katch, VL (2001) Exercise Physiology. 5th ed. Lippincott, Williams & Wilkins.
9. Shephard and Astrand (1996) Endurance in sport. Blackwell Scientific Publications.
10. Willmore, JH & Costill, DL (1999) Physiology of Sport and Exercise. 2nd ed. Human Kinetics.
11. Guyton, A.C. Textbook of Medical Physiology (7th Ed.). Philadelphia: Saunders, 1986, pp. 382-386, 472-476.
12. Perspectives in Nutrition (6th ed.) by Wardlaw
13. Nutrition for sport and exercise (2nd ed.) by Berning and Steen

Master in Physiotherapy (MPT) Second Semester
Advanced Physiotherapeutics-II
Subject Code : MPT-202
Min. Hrs -: 80 Hrs.

COURSE OBJECTIVE: On completion of the subject, students will have the opportunity to develop the skills of intellect decision making. It also provides an extension of their communication skills to articulate the evidence based acquaintance and clinical knowledge for assessment and diagnosis of patients. It is a prospect to the students for the application of the research and professional information to novel situations.

COURSE OUTCOME: On completion of this subject students should have the opportunity to:

1. Strengthen the basic fundamental basis of assessment and diagnosis and postulate this knowledge in clinical practice.
2. Analyses critical evaluate the patient conditions and formulation of accurate diagnosis.

Acquire a thorough understanding of advance concepts of Physiotherapy including Manual therapy and electrotherapy which can be applied in clinical practice.

1. Soft Tissue Techniques and Recent Advances in Manual therapy
(Terminology, Principles, Indications, Contra indications, Assessment and method of Application of the following techniques)

Unit

1. Myofascial release techniques
2. Muscle energy techniques
3. Trigger point release
4. High velocity thrust techniques
5. Positional release techniques
6. Lymphatic manipulations
7. Kinesio Taping

2. Ergonomics

1. History of ergonomics
2. Worker care spectrum
3. Postural examination
4. Job analysis
5. Work hardening programme
6. Exit assessment
7. Pre-employment screening
   - Job analysis
   - Job task analysis
   - Job site analysis
8. Work capacity analysis
9. Role of Physiotherapy in industrial set up
10. Workers functional capacity assessment
11. Industrial therapy
12. Adult education
13. Injury prevention and ergonomics

3. Radiology, Pathology and Diagnostic Studies

- General studies
- Principle of reading radiological reports
- X-Ray, CT Scan and MRI scan in relation with various disorders/diseases
- Routine examination of sputum, and analysis of the report.
- Clinical co-relation with various disorders.
- EEG, evoke potential etc.

Master in Physiotherapy (MPT) Second Semester
Biostatistics
Subject Code : MPT-203
Min. Hrs -: 80 Hrs.

COURSE OBJECTIVES:

a) To have a thorough understanding of presenting supporting evidences and how to conduct statistical analysis.
b) To have an understanding of model of biostatistics.
c) To evaluate every procedure on the basis of evidences.
d) To understand the data analysis procedure and their significance in research.

COURSE OUTCOMES:

a) Students will be able to understand and apply concepts and terminology with in the area of biostatistics.
b) Students will be able to describe research design and application of different methods to analyze the data collected to conduct and complete the research. .
c) Record, extract and analyze key information about human and object.

BIOSTATISTICS

1. Biostatistics
- Introduction
- Definition
- Types
- Application in Physiotherapy

2. Data
- Definition
- Types
- Presentation
- Collection methods

3. Measures of central value
- Arithmetic mean, median, mode. Relationship between them
- Partitioned values- Quartiles, Deciles, Percentiles
- Graphical determination

4. Measures of Dispersion
- Range
- Mean Deviation
- Standard Deviation

5. Normal Distribution Curve
- Properties of normal distribution
- Standard normal distribution
- Transformation of normal random variables.
- Inverse transformation
- Normal approximation of Bioaxial distribution.

6. Correlation analysis
- Bivariate distribution:
- Scatter Diagram
- Coefficient of correlation
- Calculation & interpretation of correlational coefficient
- T-test, Z-test, P-value

7. Regression analysis
- Lines of regression
- Calculation of Regression coefficient
- Sampling distribution
- Standard error
- Types I & II error

9. Probability (in Brief)

10. Hypothesis Testing
- Null Hypothesis
- Alternative hypothesis
- Acceptance & rejection of null Hypothesis
- Level of significance

11. Parametric & non parametric tests
- Chi square test
- Mann-Whitney U test
- Wilcoxon Signed test
- Kruskal-Wallis test
- Friednam test
- T-test/student T test
- Analysis of variance

Master in Physiotherapy (MPT) Semester-II
Practical
Subject Code : MPT-204
Min. Hrs -: 160 Hrs.

1. Assessment, evaluation and diagnosis
2. Practice and application of physiotherapeutic system in hospital/centre/ institution.
3. Application of advance physiotherapeutic maneuvers like manipulation (maitland, cyriax, mulligan etc.) and various neurological interventional concepts (bobath, NDT etc.).
4. Clinical reasoning, decision making, evidence based practice and recording system.
5. Short case from area of elective to assess investigative and diagnostic skills
6. Short case from area of elective to assess patient management skills

Master in Physiotherapy (MPT) Semester-I & II
Clinical Practices
(Common to all specialization/discipline)
Min. Hrs -: 200 Hrs. (Sem-I) + 200 Hrs. (Sem.-II)

Post graduate students must know:

- Assessment, evaluation and diagnosis.
- Practice and application of physiotherapeutic system in hospital/ institution.
- Application of advance physiotherapeutic maneuvers like manipulation and various neurological interventional concepts.
- Clinical reasoning, decision making, evidence based practice and recording system.

Master in Physiotherapy (MPT) Semester-I & II
Teaching Skills/ Seminars/Symposia/Journal Club etc.*
(Common to all specialization/discipline)
Min. Hrs -: 80 Hrs. (Sem-I) + 80 Hrs. (Sem.-II)

(a) Teaching Skills

Candidates should be encouraged to teach undergraduate students if any. This performance will be based on assessment by the faculty members of the department and from feedback from the undergraduate students.

(b) Seminar/Symposia

- Seminars /recent advance presentation will be held every week, however, its timings are subject to clinical schedule. Topics must be well researched and must include common knowledge, recent advances, analysis and references.
- PG students should present minimum of two seminars (One in general and one in elective area) and Internal Assessment marks with depend on better topic selection and presentation.

(c) Journal Review Meeting (Journal Club):

The ability to do literature search, in depth study, presentation skills, and use of audio- visual aids are to be assessed. The assessment is made by faculty members and peers attending the meeting.

(d) Work diary / Log Book

Every student 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 practice, if any conducted by the candidate by the student.

Master in Physiotherapy (MPT) Semester-III
Pedagogy in Physiotherapy Education
(Common to all specialization/discipline)
Subject Code : MPT-301
Min. Hrs -: 80 Hrs.

COURSE OBJECTIVES: On completion of the study of this subject the student should be able to understand the dynamics of teaching & learning. Plan effective teaching sessions in Physiotherapy

COURSE OUTCOMES: On completion of this subject students should have the opportunity to:

a) Strengthen the basic fundamental basis of assessment and diagnosis and postulate this knowledge in clinical practice.
b) Analyses critical evaluate the patient conditions and formulation of accurate diagnosis.

Acquire a thorough understanding of management and educational methodology in physiotherapy which can be applied in clinical practice.

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

1. **Education**
   - Introduction
   - Educational Philosophy- Idealism Naturalism, Pragmatism
   - Aims of Education
   - Functions of Education
   - Formal, informal and non-formal Education
   - Agencies of Education
   - Current issues and Trends in Higher Education
   - Issue of quality in Higher Education
   - Autonomy and Accountability
   - Privatization of Education

2. Concept of Teaching and Learning
   - Meaning and scope of Educational Psychology
   - Meaning and Relationship between teaching and learning
   - Learning Theories
   - Dynamics of behavior
   - Individual differences

3. Curriculum
   - Meaning and concept
   - Basis of curriculum formulation
   - Framing objectives for curriculum
   - Process of curriculum development and factors involved.
   - Evaluation of curriculum

4. Method and techniques of teaching
   - Lecture
   - Demonstration
   - Discussion
   - Seminar
   - Assignment
   - Project
   - Case Study

5. Planning for teaching
   - Bloom's taxonomy of instructional objectives
   - Writing instructional objectives in behavioural terms
   - Unit planning
   - Lesson planning

6. Teaching aids
   - Types of teaching aids
   - Principles of selection, preparation and use of audio-visual aides

7. Measurement and Evaluation
   - Nature of educational measurement: meaning, process, types of tests
   - Construction of an achievement test and its analysis
   - Standardized test
   - Introduction of some standardized tools, important tests of intelligence,
   - aptitude, and personality.
   - Continuous and comprehensive evaluation

8. Guidance and counseling
   - Meaning & concepts of guidance and counseling
   - Principles of guidance and counseling

9. Awareness PROGRAMME
   - Awareness and guidance to the common people about health and disease

Master in Physiotherapy (MPT) Semester-III
Administration Management & Ethical Issues
(Common to all specialization/discipline)
Subject Code : MPT-302
Min. Hrs -: 80 Hrs.

COURSE OBJECTIVE: On completion of the study of this subject the student should be able to understand the basic issues of Management & Administration. Practice as an informed professional on Legal & ethical issues

COURSE OUTCOMES: On completion of this subject students should have the opportunity to:

a) Strengthen the basic fundamental basis of management and administration and legal and ethical issues.
b) Acquire a thorough understanding of management and educational methodology in physiotherapy which can be applied in clinical practice.

SECTION-I

Management:

- Introduction
- Evolution of management
- Functions of management
- Management process – planning, organization, direction, controlling
- Decision-making.

Personnel management:

- Staffing
- Recruitment selection
- Performance appraisal
- Collective bargaining
- Job satisfaction

Marketing:

- Market segmentation
- Channels of distribution
- Promotion
- Consumer behavior

Total Quality Management:

- Basics of quality management
- Quality control
- Quality assurance PROGRAMME in hospitals & medical audit
- International quality system.

SECTION II

Administration, Legal Ethical Issues

- Hospital as an organization - Functions and types of hospitals
- Roles of Physical therapist, Physical therapy Director, Physiotherapy supervisor, Physiotherapy
- assistant, Physiotherapy aide, Home health aide, Volunteer.
- Rules of Professional Conduct.
- Legal responsibility
- Code of ethics
- Functions of Physiotherapy associations
- Role of the International Health Agencies
- Standards of practice for physiotherapists
- Liability and obligations in the case of medical legal action
- Law of disability & discrimination
- Confidentially of the Patient's status
- Consumer protection law, health law, MCI, DC

Master in Physiotherapy (MPT) Semester-III
Orthopaedic Disorders and Management-I
Subject Code : MPT-303O
Min. Hrs -: 120 Hrs.

COURSE OBJECTIVE: On completion of the subject, students will have the opportunity to develop the skills of intellect decision making. It also provides an extension of their communication skills to articulate the evidence based acquaintance and clinical knowledge for assessment and diagnosis of patients. It is a prospect to the students for the application of the research and professional information to novel situations. Correlate the clinical manifestations to the organ of dysfunction of the musculoskeletal system. To understand the Conservative & Surgical management of the musculoskeletal conditions as relevant to physiotherapy.

COURSE OUTCOMESS: On completion of this subject students should have the opportunity to:

1. Strengthen the basic fundamental basis of assessment and diagnosis and postulate this knowledge in clinical practice.
2. Analyses critical evaluate the patient conditions and formulation of accurate diagnosis.

Acquire a thorough understanding of cardiopulmonary conditions which can be applied in clinical practice.

Musculoskeletal disorders

- Introduction, epidemiology of disease pattern, Path physiology, Clinical
- presentation, conservative management & complications of the following clinical conditions:

General Musculoskeletal Disorders

1. Congenital Malformation

- **Upper Limb**- Sprangel's shoulder, Radio ulnar synostosis, Madelung's deformity, Radial club hand, Contracted fingers, syndactyly, Polydactyly, Ectrodactyly.
- **Lower Limb**- Congenital dislocation CDH, Congenital Coxa vara, Congenital short femur, Congenital talipes equino varus, Congenital flat foot
- **Spine and Trunk** –Torticollis, Cervical rib, Scoliosis, Klipel-Feil Syndrome, Spina bifida

2. Rheumatic disorders

- Rheumatoid arthritis
- Ankylosis Spondylosis
- Reiter’s disease
- Polymyalgia rheumatica
- Psoriasis

3. Infections of musculoskeletal system

- Acute
- Chronic

4. Metabolic and endocrine disorders

- Calcium metabolism
- Osteoporosis
- Osteomalacia and ricket

5. Tumors of the musculoskeletal system

- Classification
- Benign
- Malignant

6. Neuromuscular disorders

- Poliomyelitis.
- Cerebral palsy
- Arthrogryposis multiplex Congenita
- Muscular dystrophy

7. Osteoarthritis

- Hip & Knee

8. crystal deposition diseases

- Gout, Calcium pyrophosphate deposition disease (CPPD)

Musculoskeletal Disorders
Orientation and General principles of Orthopaedic surgery-
1. Arthrodesis
2. Osteotomy
3. Arthroplasty
4. Bone grafting
5. Internal and external fixations
6. Distraction and limb reconstruction
7. Correction of bone deformities and joint contractures.
8. Tendon transfers
9. Nerve suturing and grafting.

PHYSIOTHERAPY ASSESSMENT
1. Review of General assessment – patients history, observation, palpation, examination
2. Pain assessment and scales for evaluation in acute and chronic pain
3. Sensory assessment
4. Motor assessment
5. Balance assessment and scales for assessment. Balance Outcome measures and there administration.
6. Assessment of Tone, flexibility, tightness of musculoskeletal tissues
7. Muscle Length Testing and special tests for the same
8. Reflex testing
9. Limb length measurement recent methods for assessment and its clinical applications
10. Postural assessment methods and common deviations from the normal
11. Examination of movements, Range of Motion
12. Clinical Gait assessment (observational methods and EMG gait analysis)
13. Functional assessment
14. X-Ray, MRI, CT report reading and analysis
15. Physical Disability evaluation in detail .ICF classification

PHYSIOTHERAPY MANAGEMENT
Review of Basic Techniques:
1. Stretching (principals and methods)
2. Strengthening (principals and methods)
3. Passive movements testing and end feel assessment
4. Active exercise training , its benefits and various methods
5. Assisted resisted exercise training
6. Resisted exercise training. Its uses and disadvantages in comparison with other forms of exercise training
7. Postural Re-education (methods and techniques)
8. Electrotherapy Modalities(principal off application and properties along with various indications and contraindications)

Advanced Physiotherapy Treatment approaches:
1. Mobilization techniques like Mc Kenzie.
2. Pain management with emphasis on pain of peripheral origin and central origin
3. Gait Training
4. Biofeedback
5. Hydrotherapy
6. Patient & family education
7. Role of splints in Physiotherapy
8. Relaxation Techniques
9. Massage therapy
10. Wheel chair skills-basic

Master in Physiotherapy (MPT) Semester-III
Practical (Common to all specialization/discipline)
Subject Code : MPT-304
Min. Hrs -: 160 Hrs.

Practical - Clinical Examination

It should be aimed for assessing competence and skills of physiotherapeutic intervention and procedures as well as testing students ability to make relevant and valid observations, diagnostic & prognostic interpretations and inference, clinical, laboratory or experimental work relating to this her subject.

1. Assessment, evaluation and diagnosis
2. Practice and application of physiotherapeutic system in hospital/centre/ institution.
3. Application of advance physiotherapeutic maneuvers like manipulation (maitland, cyriax, mulligan etc.) and various neurological interventional concepts (bobath, NDT etc.).
4. Clinical reasoning, decision making, evidence based practice and recording system.
5. Major Elective long case aimed at examining clinical skills and competency of the candidate for undertaking independent work as specialist
6. Short case from area of Elective to assess patient management skills.

Master in Physiotherapy (MPT) Semester-IV
Applied Exercise Physiology
Subject Code : MPT-401
(Common to all specialization/discipline)
Min. Hrs -: 80 Hrs.

COURSE OBJECTIVE: On completion of the subject, students will have the opportunity to develop the skills of intellect decision making. It also provides an extension of their communication skills to articulate the evidence based acquaintance and clinical knowledge for assessment and diagnosis of patients. It is a prospect to the students for the application of the research and professional information to novel situations.

COURSE OUTCOMES: On completion of this subject students should have the opportunity to:

a) Strengthen the basic fundamental basis of assessment and diagnosis and postulate this knowledge in clinical practice.
b) Analyses critical evaluate the patient conditions and formulation of accurate diagnosis.
c) Acquire a thorough understanding of applied exercise physiology which can be applied in clinical practice.

1. **Training and conditioning:** Physiological basis of physical training, training principles, interval training, continues running concept of anaerobic threshold and vo2 max, physiological effects of various physical training methods, aerobic and anaerobic training, strength training factors influencing training effects: intensity, frequency, duration, detraining, process of recovery, post exercise oxygen consumption factors affecting recovery process, overtraining .
   a) **Body temperature regulation during exercise:** Mechanism of regulation of body temperature, Body temperature responses during exercise, Physiological responses to exercise in the heat, Acclimatization to exercise in the heat, Effects of age and gender on body temperature regulation during exercise, Physical activity and heat illness [heat exhaustion, dehydration exhaustion heat cramps & heat stroke], Prevention of Heat Disorders.
   b) **Exercise in the Cold:** Effects of exposure to cold and severe cold, Wind chill, Temperature receptors. Role of hypothalamus, shivering, Frost Bite and other problems, Clothing and Environment.
2. **Exercise at Altitude**: Exercise at altitude immediate physiological responses at high altitude, physiological basis of altitude training, phases of altitude training and specific training effects, altitude acclimatization, oxygen dissociation curve at altitude, disorders associated with altitude training.
3. **Exercise and body fluids**: Measurement and regulation of body fluids, Body fluid responses and adaptations to exercise, Effects of dehydration and fluid replenishment on physiological responses to exercise and performance Fluid/carbohydrate replacement beverages.
4. **Physical activity, body composition, energy balance and weight control:** Significance and measurement of body composition, Body composition during growth and aging, Body composition and physical performance, Effect of diet and exercise on body composition, Physical activity, energy balance, nutrient balance and weight control, Physical activity, fat distribution and the metabolic syndrome , Healthy weight loss, Ways and methods of weight reduction , fluid maintenance, disordered eating, nutritional ergogenic aids, diet supplements in athletes and others involved in physical activity.
5. **Exercise and Diabetes Mellitus:** Exercise in insulin, requiring diabetes and non-insulin dependent diabetes mellitus, Effect of physical training on glucose tolerance and insulin sensitivity, Management of diabetes by diet and insulin

Books suggested

1. Essentials of Exercise Physiology: McArdle, WD, Katch, FI, and Katch, VL. 2nd edn, Lippincott Williams and Wilkins (2000)·
2. Fundamentals of Exercise Physiology: For Fitness Performance and Health, Robergs RA, and Roberts, S.O. McGraw Hill (2000)
3. Exercise Physiology: Powers, SK and Howley ET. 4th edn; Mc Graw Hill (2001)
4. Physiology of Sport and Exercise: Wilmore, JH and Costil, DL. Human Kinetics (1994)
5. Exercise Physiology- Human Bioenergetics and its Application: Brooks, GA, Fahey, TD, White, TP. Mayfield Publishing Company (1996)
6. Komi, P. (Ed.) (1992) Strength and power in sport. Blackwell Scientific Publications.

Master in Physiotherapy (MPT) Semester-IV
Orthopaedic Disorder & Management-II
Subject Code : MPT-402O
Min. Hrs -: 120 Hrs.

COURSE OBJECTIVE: On completion of the subject, students will have the opportunity to develop the skills of intellect decision making. It also provides an extension of their communication skills to articulate the evidence based acquaintance and clinical knowledge for assessment and diagnosis of patients. It is a prospect to the students for the application of the research and professional information to novel situations.

COURSE OUTCOMES: On completion of this subject students should have the opportunity to:

1. Strengthen the basic fundamental basis of assessment and diagnosis and postulate this knowledge in clinical practice.
2. Analyses critical evaluate the patient conditions and formulation of accurate diagnosis.
3. Acquire a thorough understanding of advance concepts of Physiotherapy including Manual therapy and electrotherapy which can be applied in clinical practice.

MUSCULOSKELETAL DISORDERS

Introduction, epidemiology of disease pattern, Path physiology, Clinical presentation, complication and physiotherapy management of the following clinical
conditions:

Regional Orthopeadics

1. The shoulder
- Rotator cuff lesions
- Instability
- Rheumatoid disease of shoulder.
- Tuberculosis

2. The Elbow
- Tennis elbow
- Golfer's elbow
- Myositis ossificans

3. The Wrist
- Carpal tunnel syndrome
- Ganglion
- Wrist instabilities and special tests

4. The Hand
- Peripheral nerve injuries
- Tendon lesions and transfer surgeries
- Deformity in rheumatoid arthritis, peripheral nerve injuries, Hemiplegia
- SCI and leprosy

5. Cervical Spine
- Discogenic pain
- Whiplash injuries
- Thoracic outlet syndrome
- Brachial plexus injury and plexopathies
- Torticollis and wry neck in pathologies of cervical spine

6. Back
- Inervertebral disc.
- Discogenic pain
- Spondylolysis & listhesis
- Scoliosis & kyphosis
- Tuberculosis
- Musculoskeletal causes of low back pain

7. The Hip
- A vascular necrosis of femoral head.
- Osteoarthritis
- Principles of Total Hip Replacement (THR)

8. Knee
- Osteoarthritis
- Meniscal / ligament injuries
- Genu valgum / varum
- Principles of Total Knee Replacement (TKR)

9. Ankle and foot

- Metatarsalgia
- Flat foot
- Carsus foot
- Hallax valgus
- CTEV
- Ankle sprains

10. Fractures and joint injuries

- Principles of acute fracture care
- Conservative management of the following:
- Pediatric fractures
- Injuries of shoulder, upper arm and elbow
- Injuries of forearm and wrist
- Neurosurgery
- Injuries of Spine
- Injuries of Pelvis
- Injuries of Hip and Femur
- Injuries of Knee.
- Leg Injuries
- Injuries of ankle and foot

MUSCULOSKELETAL SURGERIES

General Principal and Orientation –

1. Operations on joints
2. Menisectomy, laminectomy, patellectomy, total knee and hip replacement
3. Malformations of spine & spinal cord
4. Surgeries for disc disorders
5. Amputations for upper and lower extremities.
6. Surgical management of fractures & other injuries
7. Orthopaedic implants- designs, materials, indications, post-operative assessment

PHYSIOTHERAPY ASSESSMENT

Review of General assessment – patients history, observation, palpation, examination

- Pain assessment
- Sensory and motor assessment
- Balance assessment
- Assessment of tone, flexibility and tightness
- Muscle Length Testing
- Reflex testing
- Limb length measurement
- Postural assessment
- Examination of movements, Range of Motion
- Clinical Gait assessment
- Functional assessment and outcome scales and questionnaires
- X-Ray, MRI, CT report reading & analysis
- Physical Disability evaluation and ICF classification. (in brief)
- Clinical Orthopaedic testing

Advanced physiotherapy Treatment approaches

- Mobilization techniques: Mulligan Cyriax, Maitland
- Combined movement therapy
- Muscle energy techniques and its applications
- Positional release techniques
- Myofasical release
- Trigger point therapy
- Group exercises
- Physiotherapy in home setting and use of assistive aids
- External aids, appliances, and adaptive self-help devices:
- Prescription, biomechanics, checkout and training.
- Community based rehabilitation in musculoskeletal disorders.
- Wheelchair prescription and advanced skills
- Transfer techniques.

Master in Physiotherapy (MPT) Semester-IV
Practical
Subject Code : MPT-403
(Common to all specialization/discipline)
Min. Hrs -: 160 Hrs.

Practical - Clinical Examination

It should be aimed for assessing competence and skills of physiotherapeutic intervention and procedures as well as testing students ability to make relevant and valid observations, diagnostic & prognostic interpretations and inference, clinical, laboratory or experimental work relating to this her subject.

1. Assessment, evaluation and diagnosis
2. Practice and application of physiotherapeutic system in hospital/centre/ institution.
3. Application of advance physiotherapeutic maneuvers like manipulation (maitland, cyriax, mulligan etc.) and various neurological interventional concepts (bobath, NDT etc.).
4. Clinical reasoning, decision making, evidence based practice and recording system.
5. Major Elective long case aimed at examining clinical skills and competency of the candidate for undertaking independent work as specialist
6. Short case from area of Elective to assess patient management skills.

Master in Physiotherapy (MPT) Semester-IV
Dissertation
Subject Code : MPT-404
(Common to all specialization/discipline)
Min. Hrs -: 120 Hrs.

Every candidate pursing MPT degree course is required to carry out research work on a selected research project under the guidance of a recognized postgraduate teacher. The results of such a work shall be submitted in the form of dissertation. Topic for dissertation shall be assigned by the guide.
Fulltime recognized PG Teacher/Guide from other institute can act only as a co-guide, If the subject of Thesis entails collaboration with other departments or specialties, the collaborative portion of the work will be supervised by Co-Guide, designated by the School of Health Sciences in consultation with the Guide. Where a Co-Guide is involved, the Thesis will be certified jointly by the Guide & Co-guide.
Every candidate shall submit synopsis to the University in the prescribed Performa 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 dissertation should be written under the following headings.

1. Introduction
2. Aims or objectives of study
3. Review of literature
4. Material and methods
5. Results
6. Discussion
7. Conclusion
8. References
9. Master and Chart & Table (If Applicable)
10. Annexure (If Applicable)

The written text of dissertation/ research project shall not be less than 50 pages and shall not exceed 120 pages excluding references, tables, questionnaires and other annexure. It should be neatly typed in double line spacing on one side of bond paper (A4 size, 8.27" x 11.69") and bound properly. Spiral binding should be avoided. A declaration by the candidate for having done the work himself should also be included, and the guide, head of the department and Director/Coordinator of the institute shall certify the dissertation/ research project.

Every candidate is required to give power point presentation before final submission of dissertation. Four copies of Dissertation/research project shall be submitted to the university, through proper channel, along with a soft copy (CD), 6 months before the final examination. It shall be assessed by two examiners appointed by the university, one internal and one external. There will be a power point open presentation of the submitted dissertation as per the schedule given by the university. This presentation shall be jointly evaluated by external and internal examiner as per the criteria given below:

Objective(s) of the work done	50 Marks
Methodology adopted	100 Marks
Result and Discussion	100 Marks
Conclusion & outcome	50 Marks
Total	**300 Marks**

To pass in the dissertation a student must secure 150 marks.
If the student failed to secure the minimum passing marks he will resubmit the dissertation 01 month before the supplementary exam.




Master in Physiotherapy (MPT) Semester-IV
Clinical Practices
(Common to all specialization/discipline)
Min. Hrs -: 200 Hrs.

Post graduate students must know :

- Assessment, evaluation and diagnosis.
- Practice and application of physiotherapeutic system in hospital/ institution.
- Application of advance physiotherapeutic maneuvers like manipulation and various neurological interventional concepts.
- Clinical reasoning, decision making, evidence based practice and recording system.

Master in Physiotherapy (MPT) Semester-IV
Teaching Skills/ Seminars/Symposia/Journal Club etc.
(Common to all specialization/discipline)
Min. Hrs -: 80 Hrs.

(a) Teaching Skills

Candidates should be encouraged to teach undergraduate students if any. This performance will be based on assessment by the faculty members of the department and from feedback from the undergraduate students.

(b) Seminar/Symposia

- Seminars /recent advance presentation will be held every week, however, its timings are subject to clinical schedule. Topics must be well researched and must include common knowledge, recent advances, analysis and references.
- PG students should present minimum of two seminars (One in general and one in elective area) and Internal Assessment marks with depend on better topic selection and presentation.

(c) Journal Review Meeting (Journal Club):

The ability to do literature search, in depth study, presentation skills, and use of audio- visual aids are to be assessed. The assessment is made by faculty members and peers attending the meeting.

(d) Work diary / Log Book

Every student 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 practice, if any conducted by the candidate by the student.

Master in Physiotherapy (MPT) Semester-III
Neurological Disorders & Management-I
Subject Code : MPT-303N
Min. Hrs -: 120 Hrs.

COURSE OBJECTIVE: On completion of the subject, students will have the opportunity to develop the skills of intellect decision making. It also provides an extension of their communication skills to articulate the evidence based acquaintance and clinical knowledge for assessment and diagnosis of patients. It is a prospect to the students for the application of the research and professional information to novel situations.

COURSE OUTCOMES: On completion of this subject students should have the opportunity to:

a) Strengthen the basic fundamental basis of assessment and diagnosis and postulate this knowledge in clinical practice.
b) Analyses critical evaluate the patient conditions and formulation of accurate diagnosis.
c) Acquire a thorough understanding of factors influencing learning including the learner and the environment, and how these factors can be applied in clinical practice.

NEUROLOGICAL DISORDERS

Introduction, etiology, Path physiology, Clinical presentation, conservative management & complications of the following clinical conditions:

- Congenital & hereditary Disorders
- Disorders of cerebral circulation
- Head Injury
- Spinal Cord Injury
- Disorders of Peripheral nerves
- Disorders of cranial nerves
- Disorders of muscles

Investigations

Orientation and Introduction, Physical basis, normal result & common abnormal responses, (in brief)

- Skull X ray
- Computerized Tomography
- Magnetic Resonance Imaging
- Intracranial Pressure monitoring
- Evoked Potentials
- EMG/ NCV
- Lumbar puncture
- Common Laboratory tests in Neurological disorders

NEUROSURGICAL DISORDERS

1. General Principles of neurosurgery
2. Disorders of CSF Fluid & circulation
3. Cerebral malformations
4. Spasticity management
5. Surgical repair of peripheral Nerves
6. Muscle lengthening/ Release
7. Management of an unconscious Patient
8. ICU management of a neurologically ill patient

PHYSIOTHERAPY ASSESSMENT

Perform thorough Physiotherapy assessment & list deficiencies

- Design individualized goals for the patient
- Rationalize the outcome of the assessment
- Document systematic, meaningful, accurate written records of the patient

1. Review of General assessment
2. Assessment of Higher mental functions
3. Neurodevelopment assessment
4. Pain assessment
5. Sensory assessment
6. Assessment of Tone, flexibility, tightness
7. Motor Control assessment
8. Muscle Length Testing
9. Postural assessment
10. Limb length measurement
11. Range of Motion
12. Balance assessment
13. Coordination assessment
14. Reflex Testing
15. Cranial nerve testing
16. Nerve Tension testing
17. EMG/ NCV report reading & analysis
18. Clinical Gait assessment
19. Functional assessment
20. Physical disability evaluation (in brief)

PHYSIOTHERAPY MANAGEMENT

Review of Basic Techniques:

1. Stretching
2. Strengthening
3. Passive movements
4. Active exercise training
5. Assisted Resisted Exercise training
6. Resisted exercise training
7. Postural Re-education
8. Electrotherapy Modalities

Advanced Physiotherapy Treatment approaches:

1. Neurodevelopment technique
2. Bobath
3. Vojta
4. Brunnstrom
5. PNF
6. Rood's Approach
7. Pain management
8. Gait Training
9. Wheelchair Prescription
10. Biofeedback
11. Hydrotherapy
12. Relaxation technique
13. Pediatric Neurophysiotherapy
14. Geriatric Neurophysiotherapy
15. Assistive Technologies and its role in Neurorehabilitation
16. Prosthetics and Orthotics in Neurorehabilitation
17. Wheelchair skills- Basic

Master in Physiotherapy (MPT) Semester-IV
Neurological Disorders & Management-II
Subject Code : MPT-402N
Min. Hrs -: 120 Hrs.

COURSE OBJECTIVE: On completion of the subject, students will have the opportunity to develop the skills of intellect decision making. It also provides an extension of their communication skills to articulate the evidence based acquaintance and clinical knowledge for assessment and diagnosis of patients. It is a prospect to the students for the application of the research and professional information to novel situations.

COURSE OUTCOMES: On completion of this subject students should have the opportunity to:

a) Strengthen the basic fundamental basis of assessment and diagnosis and postulate this knowledge in clinical practice.
b) Analyses critical evaluate the patient conditions and formulation of accurate diagnosis.

Acquire a thorough understanding neurological disorders related to Central Nervous system can be applied in clinical practice situations. To understand the conservative & surgical management of the Neurological conditions as relevant to physiotherapy.

NEUROLOGICAL DISORDERS

Introduction, epidemiology of disease pattern, Path physiology, Clinical presentation, conservative management & complications of the following clinical conditions:

1. Degenerative disorders
2. Movement disorders
3. Autoimmune disorders
4. Infectious disorders of nervous system
5. Balance disorders
6. Disorders of spine & spinal cord
7. Metabolic & Nutritional disorders
8. Disorders of nervous system due to drugs & chemical agents
9. Tumors
10. Epilepsy
11. RSD
12. Brief outline on Psychiatric disorders

NEUROSURGICAL DISORDERS

Orientation and General principles of Neuro surgery

1. Intracranial abscess
2. Malformations of spine & spinal cord
3. Surgeries for disc disorders
4. Decompression surgeries for tumors
5. Stereotactic surgery
6. Image guided frameless stereotaxy
7. Psychosurgery

PHYSIOTHERAPY ASSESSMENT

1. Review of General assessment
2. Pain assessment
3. Sensory and motor assessment
4. Assessment of Tone, flexibility, tightness
5. Muscle Length Testing
6. Postural assessment
7. Limb length measurement
8. Range of Motion
9. Balance assessment
10. Coordination assessment
11. Reflex Testing
12. Cranial nerve testing
13. Nerve Tension testing
14. EMG/ NCV report reading & analysis
15. Clinical Gait assessment
16. Functional assessment
17. Environmental assessment

PHYSIOTHERAPY MANAGEMENT

Advanced Treatment approaches

- Neural mobilization technique
- Balance & Coordination training
- Vestibular training
- Cognitive and Perceptual disorders
- Environmental modifications
- Muscle energy techniques
- Group exercises
- Wheelchair skills- Advance

Master in Physiotherapy (MPT) Semester-III
Cardiopulmonary Disorders & Management-1
Subject Code: MPT-303C
Min. Hrs -: 120 Hrs.

COURSE OBJECTIVE: On completion of the subject, students will have the opportunity to develop the skills of intellect decision making. It also provides an extension of their communication skills to articulate the evidence based acquaintance and clinical knowledge for assessment and diagnosis of patients. It is a prospect to the students for the application of the research and professional information to novel situations.

COURSE OUTCOMES: On completion of this subject students should have the opportunity to:
1. Strengthen the basic fundamental basis of assessment and diagnosis and postulate this knowledge in clinical practice.
2. Analyses critical evaluate the patient conditions and formulation of accurate diagnosis.

Acquire a thorough understanding of cardiopulmonary conditions and their management, cardiopulmonary Pharmacology which can be applied in clinical practice.

CARDIOLOGY

Epidemiology, Pathomechanics, clinical presentation, relevant diagnostic test (ECG, Echo cardiography, cardiac catheterization, Radionuclide scanning, stress testing, ABG, Labs etc.) and medical management of disorders of the cardiac system.

1. Assessment of symptoms of heart disease
2. Disorder of cardiac rate, Rhythm and condition
3. Cardiac Arrest
4. Cardiac failure
5. Shock
6. Rheumatic fever
7. Congenital heart disease
8. Disease of the heart valve
9. Infective Endocarditis
10. Ischemic heart disease
11. Hypertension
12. Orthostatic hypotension
13. CPR
14. Pericarditis
15. Heart disease in pregnancy
16. Degenerative arterial disease
17. Inflammatory arterial disease
18. Raynaud's disease
19. Venous thrombosis
20. Peripheral Vascular disease
21. Cardio myopathy
22. Disease of the pericardium

PHYSIOTHERAPY ASSESSMENT & MANAGEMENT

This course provide student with the principal of physiotherapy management in disorder of the cardiopulmonary system and the application of these principal in specific disorders. Through lecture, case conferences, journal discussion and class discussions students will be able to set up a treatment programme tailored to the patient's needs.

GENERAL PRINCIPAL

1. P.T. Assessment
2. Mobilization and Exercises (Strengthening conditioning and endurance)
3. Body positioning
4. Airway Clearance Techniques
5. Postural Drainage
6. Forced Expiratory technique
7. Breathing Exercise
8. Percussion and vibration
9. Exercise training and Exercise testing
10. Bio feed back
11. Respiratory Muscle training
12. Ventilator
13. Humidification and Aerosol therapy
14. Applying and Evaluating Bronchial Hygiene therapy
15. outcomes of pulmonary Rehabilitation
16. Functional Adaptations
17. Prevention of Morbidity and Mortality with the use of physical aids
18. PT in ICU
19. Techniques for facilitating ventilatory pattern
20. Respiratory therapy equipment and adjuncts to Cardiopulmonary therapy
21. Principal and prescription of cardiac Rehabilitation
22. Principal and prescription of pulmonary Rehabilitation
23. PT in neonatal ICU
24. Diabetes and Exercise

Master in Physiotherapy (MPT) Semester-IV
Cardiopulmonary Disorders & Management-II
Subject Code : MPT-402C
Min. Hrs -: 120 Hrs.

COURSE OBJECTIVE: On completion of the subject, students will have the opportunity to develop the skills of intellect decision making. It also provides an extension of their communication skills to articulate the evidence based acquaintance and clinical knowledge for assessment and diagnosis of patients. It is a prospect to the students for the application of the research and professional information to novel situations.

COURSE OUTCOMES: On completion of this subject students should have the opportunity to:

1. Strengthen the basic fundamental basis of assessment and diagnosis and postulate this knowledge in clinical practice.
2. Analyses critical evaluate the patient conditions and formulation of accurate diagnosis.

Acquire a thorough understanding of surgical cardiopulmonary conditions and physiotherapy management which can be applied in clinical practice.

PULMONOLOGY

Epidemiology, pathomechanics, clinical presentation, relevant diagnostic tests (PFT, Labs etc.) and medical management of disorders of the pulmonary system.

1. Obstructive pulmonary disease
2. Infection of the Respiratory system
3. Interstitial and infiltrative pulmonary disorders
4. Pulmonary disorders due to exposure to Organic and inorganic pollutants.
5. Pulmonary disorders due to systemic inflammatory disease
6. Pulmonary vascular disease
7. Disease of pleura
8. Respiratory failure
9. Supplemental Oxygen and Oxygen delivery devices in Chronic Respiratory Disease.
10. Neuromuscular and Skeletal disorders leading to Global Alveolar Hypoventilation
    - Myopathies
    - Spinal muscular Artophies
    - Poliomyelitis
    - Motor Neuron Disease
    - HSMN
    - Kyphoscoliosis
    - Pectus Carinatum
    - Pectus Excavatum
11. Pathophysiology of paralytic – Restrictive pulmonary syndromes
12. Conventional Approaches to managing n-M-Ventilatory failure
13. Mechanical ventilation: Concept, Physiological effect and complications

CARDIOTHORACIC SURGERY

Surgical management of the above conditions, indication, contraindications for surgery, precautions after surgery. Also included:

1. Close v/s open heart surgery
2. Incisions
3. Preoperative Assessment of Patient
4. Pre and post op blood gas exchange
5. Haemodynamic performance of CTVS Patients
6. Emergencies in CTVS
7. A-V Shunt
8. Heart Transplant
9. Left Ventricular Assistive devices
10. Procedure on Sternum, Chest wall, diaphragm, mediastinum, oesophagus
11. Cardiopulmonary Bypass
12. Maintaining and Removing Artificial Airways

PHYSIOTHERAPY ASSESSMENT & MANAGEMENT

This course provide student with the principal of physiotherapy management in disorder of the cardiopulmonary system and the application of these principal in specific disorders. Through lecture, case conferences, journal discussion and class discussions students will be able to set up a treatment programme tailored to the patient's needs.

GENERAL PRINCIPAL

1. P.T. Assessment
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7. Breathing Exercise
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9. Exercise training and Exercise testing
10. Bio feed back
11. Respiratory Muscle training
12. Ventilator
13. Humidification and Aerosol therapy
14. Applying and Evaluating Bronchial Hygiene therapy
15. outcomes of pulmonary Rehabilitation
16. Functional Adaptations
17. Prevention of Morbidity and Mortality with the use of physical aids
18. PT in ICU
19. Techniques for facilitating ventilatory pattern
20. Respiratory therapy equipment and adjuncts to Cardiopulmonary therapy
21. Principal and prescription of cardiac Rehabilitation
22. Principal and prescription of pulmonary Rehabilitation
23. PT in neonatal ICU
24. Diabetes and Exercise

RECOMMENDED BOOKS

1. Scientific basis of human movement – Gowitzke, Willams and Wilkins, Baltimore, 1988 3rdedition.
2. Clinical biomechanics of spine – White A,A and Panjabi-J.B Lippincot, Philadelphia 1978.
3. Kinesiology – Brunnstrom Singe, F.A. Davis- Philadelphia – 1966
4. Text book of work physiotherapy – Guyton, Prim Books Bangalore-1991 8th edition
5. Hand book of physiology in Aging- Masoro, C.R.C Press, 1981
6. Research for physiotherapists- Hicks C., Churchhill Living stone, Edingburgh 1995 Ed.$
7. Introduction to Research in Health Sciences-Polgar S, Churchhill Livingstone, London, 1988.
8. Elements of Research in physical Therapy- Currier D.P, Willams & Wilkins, Baltimore, 1990Ed.3
9. Hand book of Research Method – Sproull, Screcrow Press, 1998.
10. Physical therapy Research- Domholdt, W.B Saunders, Philadelphia. 1993
11. Public power & Administration – Wilenski, Hale & Iremonger, 1998.
12. Public Therapy administration & Management – Hickik Robert J.
13. Management Principles for physiotherapists – Nosse Lorry J.
14. Human neuroanatomy – Carpenter M.B, Williams & Wilkins, Baltimore, 1983
15. Physical management of Multiple Handicapped – Freser, William & Wilkins, Baltimore.
16. Physiotherapy in pediatrics – Shepherd R. Heinmann, London, 1980 2nd edition
17. Orthotics in neurological rehabilitation – Aisen, Demos Publication, New York 1992
    Manual of nerve condition velocity techniques – De Lisa, Raven press, New York, 1982
18. Electrodiagnosis in diseases of nerve and muscle – Kimura J, F.A Davis, Philadelphia.
19. Mobilization of the extremity joints – Kaltenbore, Harper and Row, Philadelphia.1980
20. Chest physiotherapy in Intensive care unit – Makezie, Willams & Wilkins, Baltimore.
21. Cardiopulmonary symptoms in physiotherapy –Cohen M, Churchil, Livingstone, London-1988.
22. Physical rehabilitation: assessment and treatment – O'Sullivan, F.A Davis, Philadelphia 1994.
23. Neuro-rehabilitation – Farber, W.B Saunders, Philadelphia 1982
24. Orthopaedic physical therapy- Donatteli, London Churchill Livingstone, 1994.
25. Gaits analysis – Perry J., Black Thorofare, New Jersy, 1992
26. Bio – feedback- A practitioners guide - Kerb D, Guiford press.
27. The neural basis of motor control – Black I, Churchill Livingstone, London-1987
28. Physical therapy management of Parkinson's disease – Turnbull Gerode , Churchill, Livingstone, London-1994
29. Abnormal postural reflex activity caused by Brain lesions – Bobath b. Aspen publications,Rockville, 1897.
30. Disorders of voluntary muscle- Eagel, Churchill, Livingstone, Edingburgh 1988.
31. A Clinician's view of neuro muscle disorder – Brook M.H Williams and Wilkins, Baltimore1986.
32. Proprioception, neuro muscular facilitation techniques – Knot M. and Voss, Harper and Row,New York 1972 2nd edition.
33. Stroke rehabilitation – Laidler, Capman and Hall, London 1994.
34. Motor relearning programme for stroke – Carr, Aspen publication, Rock ville, 1987.
35. Adult hemiplegia: evaluation and treatment – Bobath B, Heinmann, London 1988.
36. Paraplegia and tetraplegia – Brombley, Churchill, Livingstone, Edingburgh 1991
37. Child with spina Bifida – Anderson E.M. and Spain B., Methun, London 1977.
38. A manual of neonatal intensive care – Robert N.R.C, Edward Arnold, London 1986
39. Measurement in physical therapy – Churchill, Livingstone, London 1988.
40. Soft tissue pain and disability – Cailliet Rene, Jaypee Brothers, New Delhi 1992
41. Myofascial pain and dysfunction – Travell, Willams & wilkins, Baltimore 1983
42. Physical therapy of the low back – Twomey, Churchill, Livingstone, London 1983
43. Sport injuries of the shoulder – Souza Thomas A., Churchill, Livingstone, London 1994
44. Vertebral manipulation – Matiland G.D, Boston, Butterworth & Co. Boston, 1997.
45. Peripheral manipulation - Matiland G.D, Boston, Butterworth & Co. Boston, 1997.
46. Sports and physical therapy – Bernhardt Donna, Churchill, Livingstone, London 1995
47. Hand rehabilitation – Christine- Churchill, Livingstone, London 1995
48. Cardiopulmonary symptoms in physiotherapy practice – Cohen M., Churchill, Livingstone,London 1988
49. Clinical application of ventilatory support – Kinby Churchill, Livingstone, New York 1990
50. Cardiopulmonary Physiotherapy – Irwin, C.V., Mosby, St. Louis 1990.
51. Pulmonary rehabilitation: guidelines to success – Hoidkins, Butterworth, Boston, 1984.
52. Cardiac rehabilitation – Amundsen l.R, Churchill, Livingstone, London 1988
53. Obstetrics and gynaecologic physical therapy – Wilder Elnine, Churchill, Livingstone, NewYork 1994
54. Physiotherapy in obstetrics and gynaecology – Polden & Mantle, Jaypee Brothers, New Delhi1994
55. Physical therapy of the cancer patient – McGaryex charles Churchill, Livingstone, New York1989.
56. Industrial therapy – Key G.L, Mosby, St. Louis 19887.