VIDHYADEEP
UNIVERSITY

PROPOSED SYLLABUS

FOR

MASTER OF PHYSIOTHERAPY [MPT]

2022-2023

VIDHYADEEP INSTITUTE OF PHYSIOTHERAPY

Vidhyadeep University, Anita, kim, highway, Olpad, Gujarat 394110

...

MASTER OF PHYSIOTHERAPY [MPT]

FRAMEWORK

MPT-I	**MPT-II**
Exam Papers	
Paper- I: Applied Basic Sciences	Paper-V: Elective: Basics, Assessment and Evaluation
Paper-II: Physical and Functional Diagnosis	Paper- VI: Elective: Clinical Conditions & Physiotherapeutic Interventions
Paper- III: Applied Physiotherapeutics	Paper- VII : Dissertation
Paper-IV: Research Methodology and Biostatistics	****
Clinical Training	Clinical Training
Seminars, Case Discussions, Teaching, Field Works	Seminars, Journal Club, Case Discussions, Teaching, Field Works

PROGRAM TITLE: MASTER OF PHYSIOTHERAPY [MPT]

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**.**

Graduate Attributes:

Sr.no.	Attributes
1.	Physiotherapy Expert
2.	Communicator
3.	Researcher
4.	Facilitator of learning and Lifelong Learner
5.	Leader and team member
6.	Manager and Entrepreneur
7.	Professionalism, Employability and Accountability
8.	Social Responsibility

Program Outcomes:

No.	Programme Outcomes for MPT programme
PO 1	Knowledge and Skills
PO 2	Planning and Problem-Solving Abilities
PO 3	Communication
PO 4	Research Aptitude
PO 5	Professionalism and Ethics
PO 6	Leadership
PO 7	Societal Responsibilities
PO 8	Environment and Sustainability
PO 9	Lifelong Learner

Course Outline: The Masters Degree in Physiotherapy is a two-year Full-time program consisting of classroom teaching, self-academic activities, and clinical posting. In the first year, theoretical basis of physiotherapy is refreshed along with research methodology and biostatistics. The students are rotated in all areas of clinical expertise during this period. They are required to choose their study for the dissertation and submit a synopsis.

During the second year the students will be posted in their area of speciality. They are

required to complete and submit their dissertation. The learning program includes seminars, journal reviews, case presentations, case discussions and classroom teaching.

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 First year and Second Year respectively

A. REGULATIONS GOVERNING MPT DEGREE COURSE:

1. The name of the PG Degree program shall be **Master of Physiotherapy [MPT].**
2. This syllabus will be applicable from academic year 2022-23.

B. AIMS & OBJECTIVES OF MPT DEGREE COURSE:

1. Preparing the post graduate student towards professional autonomy with self regulating discipline.
2. Utilization of evidence based practice to consolidate the base of professional practice as per global standards.
3. Improving the concepts of physiotherapy management of various medical, surgical and other conditions.
4. Habituating the concept of research in order to validate techniques and technology in physiotherapy practice.
5. Enhancing multidisciplinary approach by maintaining professional relationship for complete patient care.
6. Inculcation of appropriate professional relationship in multidisciplinary set up, patient management and co partnership basis.
7. Practicing the concept of protection of rights of the community during referral as well as first contact practice.
8. Experience in clinical training and undergraduate teaching partly.
9. Preparation of the individual professional to provide expertise clinical services and education to the community

C. SPECIALITIES OFFERED

This course shall offer three specialties & the respective Degree shall be called as follows –

1. Master of Physiotherapy in Musculoskeletal Sciences

2. Master of Physiotherapy in Neurological Sciences
3. Master of Physiotherapy in Cardio-Pulmonary Sciences

D. ELIGIBILITY FOR ADMISSION

Every candidate for admission to the course for the degree of Master of Physiotherapy (specialty) should have passed the Bachelor degree in Physiotherapy full time program of the University or a degree of other University recognized as equivalent thereto with not less than 50% of marks in aggregate.

E. COMMENCEMENT OF COURSE

The course shall commence as per the notification of the University.

F. DURATION OF THE COURSE

The duration of Master of Physiotherapy course shall be extended over a period of 2 continuous years on a full time basis. Any break in the career, power of extension of the course & the fixation of the term shall be vested with the university.

Duration – This course is of total 80 weeks over a period of two academic years. It is conducted in two Parts i.e. - M.P.T part I & M.P.T. part II.

M.P.T. Part – I having duration of 40 weeks in one academic year & M.P.T. Part- II having 40 weeks in next academic year respectively. University examination shall be held at the end of Part – I & II respectively.

Total Transcript hours =3200 hours

Total 40 hours /week x 40 weeks = 1600 hours in M.P.T. part-I + 1600 hours in M.P.T. part–II including Dissertation

G. MEDIUM OF INSTRUCTION

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

H. METHODS OF TRAINING

The training of MPT students shall be on a full-time pattern with graded responsibilities in the management and treatment of patients entrusted to their care with ethical standards of

practice. They will be actively taking part in seminars, group discussions, case discussions, journal clubs, clinical rounds and other continuing education practices. They would be trained to perform research activities in their specialty.

They would be participating in teaching and training programs of undergraduate BPT students.

I. MONITORING THE PROGRESS OF STUDIES

1. Log book

Every student shall maintain a record of their learning progress using the log book duly signed and certified by the Head of the Departments during their various clinical training. The log book shall also contain presentations, seminars, case presentations done by the student if any.

2. A model checklist to monitor the progress of the student in various training and learning areas is given in the Appendix for reference**.**

3. Periodic tests

The college may conduct periodic tests including written, practical and oral/viva on the university examination pattern to give practice to students for examination.

J. ATTENDANCE REQUIREMENT FOR UNIVERSITY EXAMINATION

No student shall be admitted to appear for the examination unless they put on 75% of attendance during their period of study and training.

K. COURSE OF STUDY, SUBJECTS AND TEACHING SCHEDULE

Table 1 and Table 2 show the course of study, subjects and teaching schedule for MPT I & II.

TABLE - 1: MPT-I

PAPER	SUBECTS		TEACHING HRS		
			THEORY	PRACTICAL	TOTAL
I	Applied Basic Sciences				
	1.	Kinesiology and Biomechanics	150	****	150
	2.	Exercise Physiology	75	25	100
	3.	Ethics and administration; Physiotherapy education and Practice	50		50
II	Physical and Functional Diagnosis		100	100	200
III	Applied Physiotherapeutics		75	100	175
IV	Research Methodology & Biostatistics		75		75
	Clinical Training		****	750	750
	Seminars, Case Discussions, Teaching, Field Works			100	100
	Total Hrs				**1600**

TABLE - 2: MPT-II

PAPER	SUBECTS	TEACHING HRS		
		THEORY	**PRACTICAL**	**TOTAL**
V	**Elective:** Basics, Assessment and Evaluation	125	150	275
VI	**Elective:** Clinical Conditions & Physiotherapeutic Interventions	125	150	275
VII	Dissertation	****	200	200
	Clinical Training	****	750	750
	Seminars, Journal Clubs, Case Discussions, Teaching, Field Works		100	100
				1600

L. SCHEDULE OF ANNUAL AND SUPPLEMENTARY EXAMINATION

- The examination for MPT-I & II will be held at the end of the respective academic year.
- If any candidate fails in any number of papers in MPT-I, they shall appear in supplementary examination which will be held three (3) months after the publication of result and they shall be allowed to continue in the 2nd year programme.
- If the candidate fails again in the supplementary examination of MPT-I, the remaining papers can be taken along with MPT-II papers in the annual examination.
- Same procedure specified above for supplementary examination is applicable for MPT-II.
- If a candidate fails in theory and/or practical of MPT-I & II examination, he/she has to appear for the failed papers of each examination in both theory and practical respectively.
- If the candidates fail in the written/practical examination, but his/her dissertations approved, the approval of the dissertation shall be carried over to the subsequent Examinations.
- A candidate who fails in a MPT-I examination will be allowed to attend a course of the MPT-II, but the result of MPT-II will be with held till the candidate clears all the heads of failure papers of MPT-I & II.
- Total numbers of years to complete the prescribed post graduate degree programme shall not be more than 5 years.

M. SCHEME OF EXAMINATIONS

MPT - I

PAPER	SUBJECT TITLE	THEORY	PRACTICAL	ORAL/VIVA	TOTAL
I	Applied Basic Sciences	100	*****	*****	100
	1. Kinesiology and Biomechanics				
	2. Exercise Physiology				
	3.Ethics and Administration; Pedagogy				
II	Physical and Functional Diagnosis	100	70	30	200
III	Applied Physiotherapeutics	100	70	30	200
IV	Research Methodology & Biostatistics	100	*****	*****	100
	Grand Total				**600**

MPT - II

PAPER	SUBJECT TITLE	THEORY	PRACTICAL	ORAL/VIVA	TOTAL
V	**Elective:** Basics, Assessment and Evaluation	100	100	50	250
VI	**Elective:** Clinical Conditions & Physiotherapeutic Interventions	100	100	50	250
VII	Dissertation	****	****	Dissertation : 25 marks for written work, 25 marks for Micro Teaching, 25 marks for presentation, and 25 marks for orals	100
	Grand Total				**600**

*** Recent advances and Evidence Based Practice in Physiotherapy may be asked in all the papers.**

1. Master of Physiotherapy in Musculoskeletal Sciences

PAPER	SUBJECT TITLE	THEORY	PRACTICAL	ORAL/VIVA	TOTAL
V	Musculoskeletal Conditions : Basics, Assessment and Evaluation	100	100	50	250
VI	Physiotherapeutic Intervention in Clinical Musculoskeletal Conditions	100	100	50	250
VII	Dissertation	****	****	Dissertation : 25 marks for written work, 25 marks for Micro Teaching, 25 marks for presentation, and 25 marks for orals	100
	Grand Total				**600**

2. Master of Physiotherapy in Neurological Sciences

PAPER	SUBJECT TITLE	THEORY	PRACTICAL	ORAL/VIVA	TOTAL
V	Neurological Conditions : Basics, Assessment and Evaluation	100	100	50	250
VI	Physiotherapeutic Interventions in Clinical Neurological Conditions	100	100	50	250
VII	Dissertation	****	****	Dissertation: 25 marks for written work, 25 marks for Micro Teaching, 25 marks for presentation, and 25 marks for orals	100
	Grand Total				**600**

3. Master of Physiotherapy in Cardio-Pulmonary Sciences

PAPER	SUBJECT TITLE	THEORY	PRACTICAL	ORAL/VIVA	TOTAL
V	Cardio-Pulmonary Conditions - Basics, Assessment and Evaluation	100	100	50	250
VI	Physiotherapeutic Interventions in Clinical Cardio-Pulmonary Conditions	100	100	50	250
VII	Dissertation	****	****	Dissertation : 25 marks for written work, 25 marks for Micro Teaching, 25 marks for presentation, and 25 marks for orals	100
	Grand Total				**600**

QUESTION PAPER PATTERN FOR MPT EXAMINATION

THEORY

Papers having Maximum: 100 Marks.		
Type of question	Number of Questions	Marks for Each Question
Section – I: 50 Marks		
Long Essay	One	20
Short Essay	Two	2x10=20
Very Short Answer	Two	2x5=10

Type of question	Number of Questions	Marks for Each Question
Section – II: 50 Marks		
Long Essay	One	20
Short Essay	Two	2x10=20
Very Short Answer	Two	2x5=10

B) Practical examination

MPT -I, Total - 100 marks

1. Long case (1) - 1x45 = 45 marks

2. Short cases (1) - 1x25 = 25 marks

3. Oral/Viva - 30 marks

MPT –II, Total - 150 marks

1. Long case (1) - 1x50 = 50 marks

2. Short cases (2) – 2 x 25= 50

3. Oral/Viva - 50 marks

*** Dissertation-** 100 marks [Dissertation 25 marks for written work, 25 marks for Micro Teaching, 25 marks for presentation, and 25 marks for orals.]

N. EXAMINERS

There shall be two (2) examiners. One of them shall be the external examiner from outside the university and the other shall be the internal examiner preferably from the same college or as decided by the university.

An external examiner must be a faculty of physiotherapy having at least 5 years of teaching experience as a PG Teacher.

O. CRITERIA FOR DECLARING AS PASS IN THE EXAMINATION

50% of marks in theory of University examinations and 50% marks in practical and oral or viva examinations and 50% aggregate of all the three put together.

P. DECLARATION OF CLASS

- A candidate having appeared in all the PAPERS in the same examination and passed that examination in the first attempt and secures 75% of marks or more of grand total marks prescribed will be declared to have passed the examination in **First Class with Distinction.**

- A candidate having appeared in all PAPERS in the same examination and passed that examination in the first attempt and secures 60% of marks or more but less than 75% of grand total marks prescribed will be declared to have passed the examination in **First Class.**

- A candidate having appeared in all the PAPERS in the same examination and passed that examination in the first attempt and secures 50% of marks or more but less than 60% of grand total marks prescribed will be declared to have passed the examination in **Second Class.**

- A candidate passing the university examination in more than one attempt shall be placed in **Pass class** irrespective of the percentage of marks secured by him/her in the examination.

Q. DISSERTATION

Student will select a topic in his/her area of interest, in consultation with a Supervisor/Guide, qualified for the purpose as recommended by the University for and carries out an independent 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 Performa a research proposal [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.

Format of the Research Proposal

- Title
- Introduction with its relevance
- Gist of review of the related literature along with research gaps
- Rationales of the study/justifications for selection of the problem
- Research questions, objectives, hypothesis (if any)
- Limitations/scope of the study
- Definitions of keywords (only operational definitions)
- Methodology (Action plan)
    - o Research method with justifications
    - o Populations along with its size (structure wise if any)
    - o Sample size, sample selection procedure, sampling techniques
    - o Tools for data collection:
        - ➢ Selection of tool – details and justification
        - ➢ Tool construction: Detail plan for its construction, quality measures, finalization
    - o Mode of data collection and cross-validation procedure
    - o Methods for data analysis

• Time-Schedule

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 is not responsible for the outcome and results.

The dissertation should be written under the following headings.

- Introduction
- Aims or objectives of the study
- Review of literature
- Materials and methodology
- Results
- Observation
- Discussion
- Conclusion
- Summary
- References
- Tables
- Annexure

Minimum requirements for dissertation:

The written text of dissertation shall not be less than 50 pages and shall not exceed 100 pages excluding references, tables, questionnaires, Master chart and other annexure. It should be neatly typed in Times New Roman, font size 12, double line spacing on one side of paper (A4 size, 8.27" x 11.69") and bound properly. Spiral binding should be avoided. The guide, head of the department and head of the institution shall certify the dissertation.

Four copies of dissertation thus prepared shall be submitted, three months before final examination on or before the dates notified by the university.

Soft copies of all Dissertations in PDF format have to be submitted in a CD with proper

Disclosures:
1. Name of college
2. College Code
3. Subject code

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.

If the dissertation is not approved or rejected by the appointed examiners, the result shall be withheld till the resubmitted dissertation is approved.

R. GUIDE

Guide: - The academic qualification and teaching experience required for recognition as a guide are:

1. M.Sc. (PT) /MPT with five years teaching experience as Lecturer working on a full time position at a recognized institution.

2. Notwithstanding above, in view of acute shortage of teachers the teachers having three years teaching experience after MPT and working on a full time basis should be considered as guide for MPT course

3. The guide student ratio should be 1:3.

S. CHANGE OF GUIDE:

In the event of a recognized guide leaving the college for any reason or in any circumstances beyond the control guide may be changed with prior permission from the University and candidates of that guide will be allotted proportionately to other existing guides irrespective of their specialty.

T: MASTER OF PHYSIOTHERAPY – TRANSCRIPT

Serial No.	Subject / Paper	Total Hours
MPT-I		
1.	**Applied Basic Sciences**	
	Kinesiology & Biomechanics	150
	Exercise Physiology	100
	Ethics and administration; Physiotherapy Education and Practice	50
2.	Physical and Functional Diagnosis*	200
3.	Research Methodology and Biostatistics	75
4.	Applied Physiotherapeutics*	175
5.	Clinical Training	750
6.	Seminars, Case Discussions, Teaching, Field Works	100
	Total Hours	**1600**
MPT-II		
1.	**Elective**: Basics, Assessment and Evaluation*	275
2.	**Elective**: Clinical Conditions & Physiotherapeutic Intervention*	275
3.	Clinical Training	750
4.	Seminars, Journal Club, Case Discussions, Teaching, Field Works	100
5.	Dissertation*	200
	Total Hours	**1600 Hours**
	Grand Total	**3200 hours**

*** Subjects having practical exam.**


MPT-I
Master of
Physiotherapy

Paper I – Applied Basic Sciences

Total hours: Theory:	300 300
Kinesiology and Biomechanics	150
Exercise Physiology	100
Ethics and administration; Physiotherapy Education and Practice	50

Objective: On completion of the subject, students will have had the opportunity to develop the following generic skills:

A. An appreciation of the team approach to learning in complex areas.
B. The ability to critically evaluate research literature in the area of anatomy/applied anatomy, and apply this information towards understanding the mechanisms operating in conditions resulting from injury or disease.
C. An appreciation of the importance of, and development of, good written and presentation skills to aid group learning.
D. Sound knowledge of the anatomy of the relevant system in the body.

Section-I

Kinesiology

Objectives- At the end of the course, the candidate will –

A. Acquire the updated knowledge of the Patho-mechanics of the Human Movement
B. Be able to apply the principles of Biomechanics in functional analysis of movement, Ergonomic Analysis / advice and Prostheses / Orthotics
C. Be able to prescribe, check out & train in the application of lower limb prostheses, and Spinal / lower extremity Orthosis used as mobility aids
D. Be able to prescribe the Ergonomic alterations at the Work Place and Industry.
E. Be able to fabricate, temporary hand splints & functional splints for Gait training.
F. Acquire skill in disability evaluation & will be able to CERTIFY the same.
G. Be able to impart knowledge & train the students in this subject at the undergraduate level.

1. **Kinematics:**
   a. Types of motion (accessory and joint play of axial and peripheral skeletal)
   b. Location of motion (instantaneous axis of movement, shifting axis of movement)
   c. Magnitude of motion (factors determining it)

d. Direction of motion
e. Angular motion and its various parameters
f. Linear motion and its various parameters
g. Projectile motions

2. Kinetics:

a. Definition of forces
b. Force vectors (composition, resolution, magnitude)
c. Naming of Force (gravity and anti-gravity force, JRF)
d. Force of gravity and COG
e. Stability
f. Reaction forces
g. Equilibrium & Balance
h. Linear forces system
i. Friction and its various parameters
j. Parallel force systems
k. Concurrent force systems
l. Work power and energy
m. Moment arms of force & its application
n. Force components
o. Equilibrium of force

3. Mechanical energy, work and power

a. Definitions
b. Positive and Negative work of muscles
c. Muscle mechanical power
d. Causes of inefficient movement
e. Co-contractions
f. Isometric contraction against gravity jerky movement
g. Energy generation at one joint and absorption at another
h. Energy flow and Energy system used by the body
i. Energy storage

Biomechanics

1. Biomechanics of: Bone and soft tissues, including muscles, ligaments, tendon and nerves.
2. Biomechanics of Joints: Classification, structure and function including kinematics and kinetics of joints.
3. Spine: Structure and function including kinematics and kinetics of Various Vertebral joints.
4. Changes in physical and mechanical properties because of aging, exercise, Immobilization and position
5. Mechanoreceptors: its types, distribution with respect to joint, structure and function and Clinical applications

(a) Gait:

a. Normal Gait and its determinants
b. Gait parameter including temporal and spatial
c. Kinematic and Kinetic of normal human gait
d. Pathological gait
e. Running
f. Stair climbing

(b) Gait Analysis.

a. Overview of normal gait analysis : kinetic and kinematic analysis; Description of some of the most commonly used types of observational gait analysis; Advantages and disadvantages of kinematic qualitative and kinematic quantitative gait analyses.

b. Gait Training, Pre ambulation programme, assistive devices and gait patterns, Recent advances in analysis of Gait

2. Posture Control, Optimal Posture and their deviations in different planes.
3. Ergonomics and its application in working environments

Recommended books:

1. Clinical Kinesiology for the Physical therapist Assistants - Lippert L, Jaypee.
2. Brunnstrom's Clinical Kinesiology - Letimkuni W, Jaypee.
3. Clinical Kinesiology - Laura Weiss, Jaypee.
4. Joint Structure & Function - Levangie P, Norkin C, Jaypee.
5. Basic Biomechanics of the musculoskeletal system - Nordin M, Lippincot Williams.

6. Biomechanical Basis of Movement - Hamill J & Krutzen K M, Lippincot Williams.
7. Measurements of Joint Motion - Norkin C, F. A. Davis.
8. Principles of Mechanics & Biomechanics - Bell, Frank, Stanley Thornes Pvt. Ltd.
9. Basic Biomechanics - Hall, Susan J, McGraw hill.
10. Kinesiology - Oatis, Carol A, Lippincot Williams.
11. Applied Kinesiology - Robert Frost, North Atlantic Books.
12. Biomechanics of Spine - White and Punjabi, Lippincot Williams

Section-II

Exercise Physiology

Objectives- At the end of the course, the candidate will –

A. Acquire updated knowledge of Physiology of Physical Exercise and will be able to interpret the Physiological effects of the vital parameters of simple laboratory tests such as "Stress Test"

B. Acquire the skill of using Bicycle- Ergometry & Treadmill for the purpose of General Fitness & Exercise tolerance for Healthy persons.

C. Be able to prescribe & train for general fitness and health promotion for children, pregnant and lactating females, obese and elderly subjects.

D. Be able to impart knowledge for training the undergraduate students

1. Sources of Energy, Energy Transfer and Energy Expenditure at rest and various physical activities.
2. Nutrition, Body consumption, caloric balance, food for the athlete, regulation of food intake, ideal body weight, optional supply of Nutrients.
3. Metabolic consideration — VO2, Lactate threshold, RQ, energy expenditure in terms of calorimetry.
4. Acute effects of exercise on — Cardiovascular, Respiratory, Metabolic (aerobic & anaerobic), Thermo-regulatory, Buffer (pH), Neuro-musculoskeletal, Endocrine, Immune systems.
5. Conditioning effects (adaptations) of exercise on — Cardiovascular, Respiratory, Metabolic (Aerobic & anaerobic), Thermo regulatory, Buffer (pH), Neuro-Musculoskeletal (strength, power, endurance, speed, flexibility, agility, skill), Endocrine, Immune systems.
6. Body composition
7. Exercise at different altitudes.
8. Exercise at various climatic conditions.
9. Special aids to performance and conditioning.
10. Exercise prescription for health and fitness with special emphasis to cardiovascular

disease, Obesity and Diabetes.

11. Principles of health promotion for Growing Children, Healthy Adults, Pregnant /Lactating females, Elderly, Sports person
12. Aerobic and Anaerobic Exercise Training
13. Fatigue assessment, Types, and Relevance with Exercise Tolerance tests & Training and management
13. Fitness Testing for:
    a. Aerobic power
    b. anaerobic power and capacity
    c. Muscular strength and power, flexibility.
14. Obesity –exercises for weight reduction
15. Exercise and aging
16. Clinical exercise physiology

Recommended books for reference:

1. Exercise Physiology, energy, nutrition and human performance - McArdle, Katch & Katch, Lippincot Williams.
2. Illustrated principles of exercise physiology - Axen. K, Kathleen. V, Prentice Hall.
3. Essentials of Exercise Physiology - Shaver Larry. G, Surjeet Publications.
4. Physiology of Sports and Exercise - Majumdar. P, New Central Book.
5. Exercise and the Heart - Froliecher, Victor. F, Elsevier.
6. Textbook of Work Physiology - Astrand and Rodahl, McGraw Hill.
7. Kinanthropometry and Exercise Physiology Laboratory manual tests, procedures and data- Erston, Reilly, F & FN Spon.

Section-III

Ethics and administration; Physiotherapy Education and Practice

Objective: At the end of the course, the candidate will acquire the knowledge of:

A. Ethical Codes of Physiotherapy practice, Moral and Legal aspects of Physiotherapy practice

B. Constitution and Function of Indian Association of Physiotherapists (IAP).

C. Role of World Health Organization (WHO) and World Confederation of Physiotherapists (WCPT)

D. Acquire the managerial & Management skills in Planning, implementation and administration in clinical practice [service / self employment] & academic activities including the skill of documentation and use of information technology in professional practice.

E. Be able to impart the knowledge to the undergraduate students.

1. Communication skills, Client interest and Satisfaction.
2. Inter Disciplinary Relation, Co-partnership, Mutual Respect, Confidence and

Communication, Responsibilities of the Physiotherapists, Status of Physiotherapist in Health Care.

3. Role of Professional in Socio Personal and Socio Economical context.
4. Need of Council Act for regulation of Professional Practice.
5. Self- Regulatory role of Professional Association.
6. Rules of Professional Conduct.
7. Role of WCPT, Various branches and special interest group of WCPT.
8. Indian association of physiotherapists: rules, regulations, framework, aims, and objectives. Physiotherapy and law. Medico legal aspects of physiotherapy, liability, negligence, malpractice, licensure, workman's compensation.
9. Administration & Marketing – personal Policies –Communication & Contract. Administration principles based on Goal & Function at large Hospital / Domiciliary ser up / Private Clinic / Academic Institution.
10. Methods of maintaining records – Budget planning
11. Performance analysis – Physical structure, reporting system, Man P Status, Functions, Quality & Quantity of Services, Turn over – Cost benefit, Contribution.
12. Aims of physiotherapy education
13. Concepts of teaching and learning; Theories of teaching.
14. Principles and methods of teaching;
    a. Strategies of teaching
    b. Planning of teaching
    c. Organization
    d. Writing lesson plans
    e. Audio visual aids
    f. teaching methods
15. Guidance and counseling; principles and concepts, guidance and counseling services of students and faculty
16. Practical
    a. Design a curriculum for a basic physiotherapy programme
    b. Prepare a lesson plan and conduct classes
    c. Construct a written objective type test for the lessons you have taken
    d. Prepare a plan for evaluating students
    e. Internal assessment tests in all topics
    f. Lectures and seminars.
17. Hospital as an organization - Functions and types of hospitals
18. Roles of Physical therapist, Physical therapy Director, Physiotherapy Supervisor, Physiotherapy assistant, Physiotherapy aide.
19. Confidentially of the Patient's status
20. Legal responsibility
21. Consumer protection law, health law, MCI.

22. Standards of practice for physiotherapists
23. Liability and obligations in the case of medical legal action
24. Law of disability & discrimination

Recommended books:

1. Communication Skills in Clinical Practice - Sethuraman K. R.
2. Handbook of Educational Technology - Elington Henry, Kogan Page.
3. Physical Therapy Administration & Management - Hickok, Robert J, Williams & Wilkins.
4. Clinical Decision making in Rehabilitation - Basmajian, John V, Churchill Livingstone.
5. Handbook of Clinical Teaching - Watts Nancy, Churchill Livingstone.
6. Physical Therapy Ethics by Gabard and Martin (Sep 2, 2010)
7. Management in Physical Therapy Practices by Catherine G. Page (Sep 23, 2009)
8. Physical Rehabilitation: Evidence-Based Examination, Evaluation, and Intervention by Michelle H. Cameron and Linda Monroe (Apr 5, 2007)
9. Physical Therapy Management by Ronald W. Scott and Christopher L Petrosino (Sep 1, 2007)

Paper II – Physical and Functional Diagnosis

Total hours:	200
Theory:	100
Practical/Oral:	100

Objectives: On completion of the subject, students will have had the opportunity to develop the following generic skills-

A. Make clinical decision and plan for effective treatment.
B. Evaluate and analyses the physiological aspects of physical rehabilitation.
C. Identify and recognize the importance of monitoring vital signs.
D. Plan strategies for management of various musculoskeletal, neurological, cardio pulmonary problems and in various medical and surgical conditions.

E. Learn operation and clinical applications of Electro-diagnostic instruments.
   a. Be able to interpret the E.M.G. and Nerve Conduction Studies with

appropriate clinical reasoning.

b. Acquire the sound knowledge of use of E.M. G. machine for the simple Electrodiagnostic studies of motor unit and methodology of Sensory and Motor Conduction and Reflex Study.
c. Expertise in the skill of using various electrical currents for the purpose of Electrodiagnostic & be able to interpret the same with appropriate clinical reasoning.
d. Be able to train the undergraduate students at Preclinical & Clinical level.

Section-I

1. Clinical Decision Making - Planning Effective Treatment. Clinical decision making models, Team approach, Foundation for clinical decision making.

2. Vital Signs. Identification of reasons for monitoring vital signs; importance of monitoring vital signs; common techniques of monitoring vital signs; identification and analysis of normal values with that of abnormal values.

3. Principles and application of investigative and imaging techniques in Physiotherapy
    a. Blood test
    b. Arterial Blood Gas (ABG) analysis
    c. Pulmonary Function Test (PFT)
    d. Radiological examination
    e. Computerized Tomography (CT)
    f. Magnetic Resonance Imaging (MRI)
    g. Ultrasonography (US)
    h. Electrocardiography (ECG)
    i. Dope testing

4.Evaluation assessment and treatment planning strategies for musculoskeletal, neurological, cardiopulmonary, sports specific and other physiotherapy conditions: Principles of evaluation, clinical manifestations, general and specific clinical examination.

A. Physiotherapy assessment of the following:
    a. Range of motion (ROM)
    b. Tone
    c. Muscular strength and endurance
    d. Flexibility
    e. Coordination
        - Non equilibrium test

- Equilibrium test

f. Sports specific skills

g. Cardiac efficiency

h. Sensory evaluation

i. Functional Evaluation

- Various scoring methods in functional assessment
- Validity and reliability

j. Fitness evaluation

- Aerobic
- Anaerobic

B. Assessment of cognitive, perceptual dysfunctions and vestibular dysfunction.

5. Electro-Diagnosis:
    1. Characteristics and components of Electro therapeutic stimulation systems and Electro physiological assessment devices.
    2. Instrumentation for neuromuscular electrical stimulation.
    3. Electrical properties of muscle and nerve.
    4. Neurobiology of afferent pain transmission and central nervous system mechanisms of pain modulation.
    5. Electrical stimulation and circulation.
    6. Clinical Electro physiological testing: Instruments, Techniques and Interpretations of
        a. Nerve conduction velocity including Repetitive Nerve Stimulation (RNS)
        b. Electromyography
        c. Bio-feedback technique.
        d. Late responses
    7. Concepts of electro physiological studies in neuro muscular diseases as a diagnostic and therapeutic tool.
    8. Evoked potentials – VEP, SSEP, MEP, BAEP

Recommended books:

1. Manual of nerve conduction velocity techniques - De Lisa, Raven Press.
2. Electro-diagnosis in disease of nerve and muscle - Kimura J, F.A. Davis
3. Clinical Electromyography and Nerve Conduction Studies - Shin J.OH, Williams & Wilkins.
4. Clinical Neurophysiology - Nerve conduction, Electromyography and Evoked Potentials – Mishra & Kalita, Churchill Livingstone.
5. A Practical Treatise On Electro-Diagnosis in Diseases of the Nervous System by Alexander Hughes Bennet (Jan 10, 2010)
6. Introduction to Surface Electromyography, Second Edition by Jeffrey R. Cram (Mar 16, 2010)

Section-II

1. Psychological aspects of rehabilitation in disability: Psychological tests.
2. Developmental Screening

    (a) Factors Motor control assessment
    (b) Motor control theories/mechanism
    (c) Patterns of normal development
    (d) specific procedures and tests used to assess motor control defects

3. Anthropometry

    a. Body measurements
        - Height
        - Weight
        - Circumference
    b. Body Proportion
        - Body Mass Index (BMI)
        - Waist Hip Ratio (WHR)
    c. Body Composition
        - Somatotyping
        - Methods of measurement
            • Water displacement
            • Skin fold measurement
            • Under water weighing
            • Bioelectric Impedance Analysis (BIA)

5. Differential diagnosis in Physiotherapy

6. Functional evaluation.

    a. The concepts of health status impairment; functional limitations; disability and handicap; definition of functional activity and the purposes and components of the functional assessment; selection of activity and roles for an individual based on his or her capabilities and functional limitations.

    b. Various forms of functional tests; physical function test and multi dimensional functional assessment instrument, identification of instrument for testing function.

    c. Various scoring methods used in functional assessment;

d. Reliability and validity of various functional assessments.

7. Evaluation of aging

Recommended books:

1. X-rays, their origin, dosage as practical application - Sehall, W.E, John Wright & Sons.
2. Diagnostic Radiography - Bryan G. J, Churchill Livingstone.
3. Cross Section Anatomy & Atlas of Computerized Tomography - Ledley, Robert Steven & Huang H. K, Lea & Febiger, Philadelphia.
4. Helical Spiral CT – A practical Approach - Zeman, Robert K, McGraw Hill.
5. Digital Radiography – A Focus on clinical utility - Price Ronald R, Rollo F David, Grune & Stration.
6. Fundamentals of Musculoskeletal Imaging - Mckinnis Lynn N, F. A. Davis.
7. Diagnostic Imaging for Physiotherapists - Swain James Bush, Reed Elsiever.
8. The Neural Basis of Motor ControL - Black I, Churchill Livingstone.
9. Gait Analysis - Perry J. Black Thorofare, Newjersy.
10. Kinanthropometry - Singh and Malhotra, Lunar Publications.
11. Sports Anthropometry - A Kinanthropometric approach - H. S. Sodhi, Anova Publications.
12. Perspectives in Kinanthropometry - James A.P.Day, Human Kinetics.
13. Writing SOAP notes - Kettenbach Ginge, F. A. Davis.
14. Clinical Decision making in Rehabilitation - Basmajian, John V, Churchill Livingstone

Paper-III Applied Physiotherapeutics

Total hours:	175
Theory:	75
Practical/Oral:	100

OBJECTIVES: At the end of the course the candidate will-

A. Acquire the knowledge and skill of various approaches of Manual therapy for joints of the limbs/spine.

B. Be able to integrate the manual therapies to rehabilitate the Mechanical Neuro.Muscular problems.

C. Be able to impart knowledge and train the undergraduate in Manual therapy.

D. Acquire the updated knowledge of therapeutics effects (at the cellular levels) of various electrical currents, Thermal agents, ultra sound & electro – magnetic forces & potential risk factors on prolonged exposure.

E. Acquire the knowledge about various Pharmacotherapeutic agents to be used in combination with various electro – therapeutic modes, with appropriate clinical decision & reasoning in the management of pain / tissue healing / Wound care & skin condition conditions.

Section -I

1. Pain: Neurobiology, Various theories, Modulation and Physiotherapy Management including
   electromagnetic radiations, ultrasound, Electro acupuncture etc.
2. Maternal and child care in general physiotherapy.
3. Applied neuro- anatomy and neuro-physiotherapy.
4. Inhibition and facilitation techniques.
5. Theories of motor learning.
6. Therapeutic bio feedback & psychosomatic training.
7. Combination therapy, shock wave therapy, long wave therapy.
8. Functional training – Respiratory exercises, Training for feeding, bladder and

bowel training, coughing and compression

9. Artificial respiration, inhalation therapy & intensive care unit procedures.
10. Yogasanas & Pranayama
    a. Physiological & therapeutic principles of yoga
    b. Yogasanas for physical culture, relaxation and meditation.
    c. Application of Yogasanas in physical fitness, flexibility, cardiac rehabilitation and neuromotor learning.
    d. Pranayama and respiratory physiology.
    e. Kriyas and their physiological significance. Therapeutic application of yoga.
    f. Yoga – a holistic approach.
11. Acupuncture: definition, principles, techniques, physiological effects, indications, contra- indications, dangers & integration of acupuncture with physiotherapy.
12. Magneto therapy.
    a. Physiological & therapeutic principles of yoga
    b. Yogasanas for physical culture, relaxation and meditation.
    c. Application of Yogasanas in physical fitness, flexibility, cardiac rehabilitation and neuromotor learning.
    d. Pranayama and respiratory physiology.
    e. Kriyas and their physiological significance. Therapeutic application of yoga.
    f. Yoga – a holistic approach.
13. Acupuncture: definition, principles, techniques, physiological effects, indications, contra- indications, dangers & integration of acupuncture with physiotherapy.
14. Magneto therapy.
15. Naturopathy.
16. History of manual therapy, overview of manual therapy approaches for all the joints
17. Clinical Reasoning and differential clinical diagnosis and practical application of different approaches such as – Maitland, Kaltenborne, Cyriax, Mulligan and Mackenzie.
18. Soft tissue approaches: myofascial techniques, neural tissue mobilization, Muscle Energy Techniques (MET) along with practical application.
19. Massage, mobilization and manipulations.
20. Ergonomics

Section-II

A. ADVANCED PHYSIOTHERAPEUTICS (Medical)

1. Physiotherapy in common conditions of skin
2. Physiotherapy in common vascular diseases.
3. Physiotherapy in nutritional deficiency diseases.
4. Physiotherapy in respiratory disorders.
5. Physiotherapy Management of ischemic heart diseases.
6. Exercise planning and prescriptions.
7. Physiotherapy in psychiatry.
8. Management of pain in neurological and Musculo-skeletal disorders.
9. Physiotherapy management in arthritis and allied conditions.

B. ADVANCED PHYSIOTHERAPEUTICS (SURGICAL)

1. Monitoring systems, defibrillator and Artificial respirators.
2. Physiotherapy in post operative management of metabolic, hormonal, neoplastic and infective conditions of bones and joints.
3. Pre and post operative physiotherapy in tendon transfer.
4. Physiotherapy management following head injuries, in intensive care and neurosurgical procedures.
5. Physiotherapy following general surgery.
6. Physiotherapy following uro-surgery.
7. Physiotherapy following plastic surgery.
8. Physiotherapy management following selective and common cases of oncologic surgeries.
9. Physiotherapy following obstetric and gynecological disorders.

C. Recent advances and Evidence based Practice in all physiotherapeutic condition

Recommended books:

1. Rehabilitation Specialist Hand Book - Rothstein, Hales M, F. A. Davis Company.
2. Clinical Electrotherapy - Nelson &Currier, Appleton & Lange.
3. Electrotherapy Explained - Low J & Ann Reed, Butterworth Heinemann.
4. Electrotherapy - Kitchen. S, Churchill Livingstone.

5. Maitland's Vertebral Manipulation - Maitland. G. D, Butterworth Heinemann.

6. Maitland's Peripheral Manipulation - Maitland. G. D, Butterworth Heinemann.

7. Principles of Manual Therapy - Sebastian. D.

8. Rehabilitation of movement: Theoretical Basis of Clinical Practice - Pitt Brooke. J, Harcourt-brace.

9. Manipulation & Mobilization: Extremity & Spinal Techniques - Edmond. S, Mosby.

10. Hydrotherapy in Pediatrics - Campion. C. R, William Heinemann.

11. PNF in Practice - Adler. S & Becker D, Springer.

12. Facilitated Stretching - 3rd Edition by Robert McAtee and Jeff Charland (Feb 21, 2007)

13. Clinical Electrophysiology: Electrotherapy and Electrophysiologic Testing by Andrew J. Robinson and Lynn Snyder-Mackler (Sep 28, 2007)

Paper-IV: Research Methodology and Biostatistics

Total hours:	75
Theory:	75

Section-I: RESEARCH METHODOLOGY

Objectives: At the end of the course, the candidate will acquire the knowledge of:

A. To become familiar with the Types and Criteria of Research in physiotherapy
B. To understand the concepts, Design problems & sampling techniques of research
C. To develop the skill needed to read publish research critically
D. To develop the skills of planning to conduct research
E. To develop the skills to write research reports
F. Acquire skills of reviewing literature, formulating a hypothesis, collect data, writing research proposal etc
G. Describe the importance & use of biostatistics for research work

1. Research in Physiotherapy
   a. Introduction
   b. Research for Physiotherapist: Why? How? And When?
   c. Research – Definition, concept, purpose, approaches
   d. Internet sites for Physiotherapist
2. Research Fundamentals
   a. Types of variables
   b. Reliability & Validity
   c. Drawing Tables, graphs, master chart etc
3. Writing a Research Proposal
   a. Defining a problem
   b. Hypothesis: function of hypothesis in quantitative research
   c. Types of hypothesis, characteristics of testable hypothesis, wording of the hypothesis
   d. Review of Literature
   e. Formulating a question, Operational Definition
   f. Inclusion & Exclusion criteria
   g. Forming groups
   h. Data collection & analysis
   i. Results, Interpretation, conclusion, discussion
   j. Informed Consent
   k. Limitation

4. Research Design

a. Qualitative and Quantitative research designs

- Difference between qualitative and quantitative designs

b. Experimental design

Quasi experimental research; advantages and disadvantages of quasi experiments Non experimental design

- Controlled trials
  - -Parallel or concurrent controls
    - Randomized
    - Non randomized
  - Sequential controls
    - Self controlled
    - Cross over

- External controls
- Studies with no controls

c. Observational Study design

- Descriptive or case series
- Case control studies (retrospective)
- Cross sectional studies, surveys
- Cohort studies (prospective)
- -Historical Cohort studies

d. Meta analyses

5. Population and sample

a. Definition of population and sample
b. Types of sampling
c. Sample size determination and calculation
d. Sample rationale
e. Non-probability sampling ; convenience sampling , quota sampling, purposive sampling, advantages and disadvantages of non probability sampling
f. Probability sampling; Simple random sampling, stratified random sampling,
g. Cluster sampling, systematic sampling, advantages and disadvantages of probability sampling

6. Data collection methods

a. scales and techniques of psychological measures

b. Research reliability, validity and criteria for assessing, measuring the tools,
c. Presentation of data
d. Analysis and interpretation of research data
e. Role of computers
f. Pilot study

7. Interpretation of statistical results

a. Interpreting significant and non significant results
b. Discussion and conclusion of obtained results
c. Guidelines to interpret and critique research results

8. Writing research for publication

a. Guidelines to publish a research paper and its contents

9. Presenting a research report

a. Writing the report
b. Documentation
c. Details of the study
d. Arrangement of report
e. Practice - Presentation of study for discussion
f. Method of teaching - lecture and discussion- Seminars and practices.

10. Research Ethics

a. Importance of Ethics in Research, Ethical issues in human subjects research, Ethical principles that govern research with human subjects
b. Components of an ethically valid informed consent for research

Section-II: BIOSTATISTICS

Objectives: At the end of the course, the candidate will acquire the knowledge of:

A. Distinguish between quantitative and qualitative variables
B. Know how to summarize information using mean, median, standard deviation, quartiles and inter-quartile range
C. Understand the key concept of probability
D. Know when and how to use the binomial distribution
E. Understand the central limit theorem
F. Know when and how to use the t7 distribution
G. Calculate and interpret the confidence intervals

H. Understanding the meaning of P7 values in significance testing
I. Learn the use of Chi- Square test
J. Calculating and interpreting a correlation coefficient
K. Understand the concept of regression

1. Biostatistics
   a. Introduction
   b. Definition
   c. Types
   d. Application in Physiotherapy
2. Data
   a. Definition
   b. Types
   c. Presentation
   d. Collection methods
   e. Various types of graphs, obtaining graphs using statistical software's like excel

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

4. Measures of Dispersion
   a. Range
   b. Mean Deviation
   c. Standard Deviation

5. Normal Distribution Curve
   a. Properties of normal distribution
   b. Standard normal distribution
   c. Transformation of normal random variables.
   d. Inverse transformation
   e. Normal approximation of Binomial distribution.

6. Correlation analysis
   a. Bivariate distribution
   b. Scatter Diagram
   c. Coefficient of correlation
   d. Calculation & interpretation of correlation coefficient
   e. T-test, Z-test, P-value

7. Regression analysis
    a. Lines of regression
    b. Calculation of Regression coefficient

8. Sampling
    a. Methods of Sampling
    b. Sampling distribution
    c. Standard error
    d. Types I & II error

9. Probability (in Brief)
    a. Probability and sampling
    b. Probability as a mathematical system
    c. Population and samples
    d. Sampling distribution
    e. Sampling methods
    f. Point and interval estimation for proportion mean
    g. Hypothesis testing, simple test of significance
    h. Inferential technique: normal

10. Hypothesis Testing
    a. Null Hypothesis
    b. Alternative hypothesis
    c. Acceptance & rejection of null Hypothesis
    d. Level of significance

11. Parametric & Non parametric tests
    a. Chi square test
    b. Mann-Whitney U test
    c. Wilcoxon Signed test
    d. Kruskal-Wallis test
    e. Friedman test
    f. T-test/student T test
    g. Analysis of variance
    h. Standard errors of differences

12. Learn SPSS software application and Graph Software application. [Not for Exam].

Reference books:

1. Methods in Biostatistics - Mahajan B. K, Jaypee.
2. Research Methodology - Kothari C. R, Vishwa prakashan.
3. How to Write a Thesis - Teitalbaum.
4. Statistical Methods for Professional Education courses - Gupta S. P, Sultan Chand.
5. Rehabilitation Research: Principles & Applications - Domholdt, Elizabeth.
6. Writing Case Reports – How to manual for Clinicians - Mc Ewen Irene, APTA.
7. The Researching Therapist: A Practical Guide to Planning, Performing and Communicating Research by Sue Jenkins, Connie J. Price and Leon Straker (Nov 17, 1997)
8. Research Methods for Clinical Therapists - Hicks Carolyn, Churchill Livingstone.
9. Elements of Research in Physical therapy - Currier D, Williams and Wilkins.
10. Qualitative Research for Occupational and Physical Therapists: A Practical Guide by Christine Carpenter and Melinda Suto (Feb 12, 2008)
11. First Steps in Research: A Pocketbook for Healthcare Students (Physiotherapy Pocketbooks) by Stuart B. Porter (May 30, 2008)
12. Barbara; statistical methods for health care research
13. Research Methods: A Framework for Evidence-Based Clinical Practice by Wendy L. Hurley, Craig R. Denegar and Jay Hertel (Oct 25, 2010)


MPT-II
Master of
Physiotherapy

MPT-II: Elective Papers

Master of Physiotherapy in Musculoskeletal Sciences

Total hours:	275
Theory:	125
Practical/Oral:	150

Paper-V Elective:
Musculoskeletal Conditions: Basics, Assessment and Evaluation

Objectives:

This course shall enable the candidate to establish first contact physiotherapy for the management of Musculoskeletal disorders and pain, expertise in the skills of manual medicine, advanced electro-diagnostic/ therapeutic skills, and ability to function as a consultant in the team of health professionals concerned with sports sciences, hand rehabilitation, women's health as well as geriatric health and industrial set up. The sub headings are :

A. Advances in manual medicine and pain management
B. Rehabilitation of hand
C. Sports sciences
D. Industrial health and ergonomics
E. Women's health and geriatric health
F. Applied bio-mechanics and bio-engineering

Section-I: Musculoskeletal Conditions - Basics

ANATOMY, PHYSIOLOGY AND BIOMECHANICS

1. Embryological development of musculoskeletal system.
2. Osteology; structure of bone, ossification of bones, skull bones, facial bones, bones of upper extremity,, lower extremity, pelvis, vertebral column, ribs.
3. Myology; Structure of muscles , type of muscle, muscle fibers, origin , insertion,, nerve supply of muscles of upper extremity, lower extremity, Trunk.
4. Structure of joints, types of joints, detailed structure and formation of all the joints, detailed structure and formation of al the joints, neurobiology of joint
5. Neurology: peripheral nerves, dermatomes and myotomes,
6. Physiology: Joint physiology (movements), muscle physiology
7. Biomechanics of normal joints and Pathomechanics of fractures, deformed joints.

Section-II: Musculoskeletal Conditions- Assessment and Evaluation

Introduction, principles and concepts of Patient history, observation, Examination, Principles, scanning examination, examination of specific joints, functional assessment, specific tests, reflexes, cutaneous distribution, joint play movements, palpation and diagnostic imaging.

1. Head and Face:

Patient history, observation Examination, examination of the head, examination of the face, examination of the eye, examination of the nose, examination of the teeth, examination of the ear, special tests, reflexes and cutaneous distribution, joint play movements, palpation, diagnostic imaging.

2. Cervical Spine:

Patient history, observation Examination, active movements, passive movements, resisted isometric movements, peripheral joint scanning examination, myotomes, functional assessment, special tests, reflexes and cutaneous distribution, joint play movements , palpation, diagnostic imaging.

3. Temporomandibular Joint:

Patient history, observation Examination, active movements, passive movements, resisted isometric movements, functional assessment, specific tests, reflexes and cutaneous distribution, joint play movements , palpation, diagnostic imaging.

4. Shoulder:
Patient history, observation Examination, active movements, passive movements, resisted isometric movements, functional assessment, specific tests, reflexes and cutaneous distribution, joint play movements , palpation, diagnostic imaging.
.
5. Elbow:

Patient history, observation Examination, active movements, passive movements, resisted isometric movements, functional assessment, specific tests, reflexes and cutaneous distribution, joint play movements , palpation, diagnostic imaging.

6. Forearm, Wrist and Hand:

Patient history, Observation – common hand and finger deformities, other physical findings Examination, active movements, passive movements, resisted isometric movements, functional assessment, specific tests, reflexes and cutaneous distribution, joint play
movements , palpation, diagnostic imaging.

7. Thoracic (dorsal) Spine:

Patient history, observation Kyphosis, scoliosis, breathing chest deformities. Examination- active movements, passive movements, resisted isometric movements, functional assessment, specific tests, reflexes and cutaneous distribution, joint play movements , palpation, diagnostic imaging.

8. Lumbar Spine:

Patient history, observation Examination, active movements, passive movements, resisted isometric movements, functional assessment, specific tests, reflexes and cutaneous distribution, joint play movements , palpation, diagnostic imaging.

9. Pelvis:

Patient history, observation Examination, active movements, passive movements, resisted isometric movements, functional assessment, specific tests, reflexes and cutaneous distribution, joint play movements , palpation, diagnostic imaging.

10. Hip:

Patient history, observation Examination, active movements, passive movements, resisted isometric movements, functional assessment, specific tests, reflexes and cutaneous distribution, joint play movements , palpation, diagnostic imaging.

11. Knee:

Patient history, observation Examination, active movements, passive movements, resisted isometric movements, functional assessment, specific tests, reflexes and cutaneous distribution, joint play movements , palpation, diagnostic imaging.

12. Lower leg, Ankle and Foot:

Patient history, observation Examination, active movements, passive movements, resisted

isometric movements, functional assessment, specific tests, reflexes and cutaneous distribution, joint play movements , palpation, diagnostic imaging.

13. Assessment of Gait:

a) Normal patterns of gait, stance phase, swing phase , joint motion during normal gait Normal parameters of gait, base width, step length, stride length, lateral pelvic shift, vertical pelvic shift, pelvic rotation centre of gravity, normal cadence. Overview and patient history, Observation – foot wear Examination, locomotion score, compensatory mechanisms.

b) Abnormal gait, antalgic (painful) gait, arthrogenic gait (stiff hip or knee), ataxic gait,contracture gait, equines gait, gluteus maximus gait, gluteus medius (Trendelenburg's) , hemiplegic or hemiparetic gait, parkinsonian gait, plantar flexor gait, psoatic limp, quadriceps gait, scissors gait, short leg gait, steppage or drop foot gait.

14. Assessment of Posture:

a) Postural development, factors affecting posture, causes of posture Common spinal deformities, Lordosis, kyphosis, scoliosis Patient history, Observation – standing, forward flexion, sitting, supine lying prone lying Examination

15. Assessment after acute injury of bone, ligament, and tendon

a. Mechanism of injury
b. History
c. Observation
d. Examination
e. Special tests
f. Palpation and diagnostic imaging

16. Assessment of the Amputee:

a. Levels of amputation
b. Patient history, observation
c. Examination- measurements related to amputation active movements, passive movements, resisted isometric movements, functional assessment, sensation testing, psychological testing , palpation, diagnostic imaging.

17. Pre operative and post operative assessment in orthopaedic surgeries

18. Assessment and evaluation of pain Apart from the above; the student is expected to learn assessment and evaluation in the following clinical conditions (pre operative and post operative)

Recommended books:

1. Treatment of Fractures in Practice - Page. C, Henry Frowle.
2. Outline of Fractures - Adams. J, Churchill Livingstone.
3. Joint and Soft Tissue Injuries - Pfizer.
4. Outline of Orthopedics - Adams, Hamblen, Churchill Livingstone.
5. Apley's system of Orthopedics and Fracture - Solomon. A, ARN.
6. Physical signs in Orthopedics - Walsh, Henry. J, Jaypee.
7. Management of common musculoskeletal disorders - Hertliny. K, Lippincott.
8. Clinical Orthopedic Diagnosis - Pandey. S, Pandey. A, Jaypee.
9. Clinical Assessment and Examination in Orthopedics - Rex.
10. Orthopedic Physical Assessment - Magee, Jaypee.
11. Clinical Orthopedic Examination - Mcrae. R, Churchill Livingstone.
12. Campbell's Operative Orthopedics - Speed. J.S, Mosby.
13. Orthopedic Rehabilitation Assessment - David. I. P, Springer.
14. Illustrated Orthopedic Physical Assessment - Evans. R, Mosby

Paper-VI Elective:

Physiotherapeutic Intervention in Clinical Musculoskeletal Conditions

Section-I: CLINICAL MUSCULOSKELETAL CONDITIONS

1. General Musculoskeletal disorders:

a. Degenerative disorders of joints
b. Infections of bones and joints
c. Arthropathies
d. Tumors of the bone
e. Congenital deformities
f. Spinal deformities
g. Developmental disorders of bone
h. Metabolic and endocrine disorders
i. Conditions related to upper extremity, lower extremity and spine
j. Soft tissue: overuse injuries
k. Musculoskeletal problems in neuromuscular disorders

2. Traumatic Orthopedics:

a. Classification of fractures
b. Dislocation of various joints
c. Fractures and dislocation of upper extremity
d. Fractures and dislocation of lower extremity
e. Fractures and dislocation of spine and pelvis
f. Fractures of skull, face bones and ribs
g. Soft tissue: acute traumatic injuries

3. Orthopedic surgeries:

a. Amputation
b. Joint replacement surgeries
c. Osteotomy and Arthrodesis
d. Surgery for correction of bone deformities and contractures
e. Surgical procedures for fracture, dislocation
f. Tendon transfer principles and procedures
g. Bone grafting
h. Nerve suturing and grafting
i. Implants in Orthopedics

Section-II: PHYSIOTHERAPY INTERVENTIONS IN MUSCULOSKELATAL CONDITIONS

1. Physiotherapy management procedures in general musculoskeletal disorders:

   a. Degenerative disorders of joints
   b. Infections of bones and joints
   c. Arthropathies
   d. Tumors of the bone
   e. Congenital deformities
   f. Spinal deformities
   g. Developmental disorders of bone
   h. Soft tissue: overuse injuries
   i. Neuromuscular disorders
   j. Conditions related to upper extremity, lower extremity and spine
   k. Metabolic and endocrine disorders
   l. soft tissue acute traumatic injuries

2. Physiotherapy management procedures in Traumatic Orthopedics:

   a. Fractures and dislocation of upper extremity
   b. Fractures and dislocation of lower extremity
   c. Fractures and dislocation of spine
   d. Fractures of sternum and ribs

3. Physiotherapy management procedures in orthopedic surgeries:

   a. Amputation
   b. Joint replacement surgeries
   c. Osteotomy and arthrodesis
   d. Surgery for correction of bone deformities and contractures
   e. Surgical procedures for fracture, dislocation
   f. Tendon transfers
   g. Bone grafting
   h. Nerve suturing and grafting

4. Orthosis, Prostheses and mobility aids in musculoskeletal problems:

   a. Principles of Orthosis and prostheses
   b. Biomechanical compatibility, materials and designs of mobility aids

c. Different types of Orthosis and Prostheses used in musculoskeletal problems
d. Functional training with Orthosis and Prostheses

5. Physiotherapeutic approaches in musculoskeletal conditions:

a. Manual therapy approaches for specific joints of upper extremity, lower extremity and spine
b. Therapeutic exercises commonly used in musculoskeletal conditions including correction exercises and home exercises
c. Pilates and core stability exercises
d. Proprioceptive Neuromuscular Facilitation (PNF)
e. Hydrotherapy in common musculoskeletal conditions
f. Swiss ball exercises
g. Taping, Wrapping and Bracing techniques.

6. Ergonomic principles and its application
7. Recent advances in Orthopedic Physiotherapy.
8. Community based rehabilitation in musculoskeletal conditions
9. Evidence based physiotherapy management for different musculoskeletal conditions

Recommended books:

1. Musculoskeletal intervention Techniques for Therapeutic Exercise - Voight. M, McGraw Hill.
2. Rehabilitation for the Post surgical Orthopedics - Maxey. L, Mosby.
3. Clinical Orthopedic Physical Therapy - Richardson. J, W. B. Saunders.
4. Orthopedic Rehabilitation Science - Loudon, Kalte, Butterworth.
5. Therapy for Amputees - Engstorm. B, Churchill Livingstone.
6. Musculoskeletal Physiotherapy: Clinical Science and Evidence Based Practice - Refschugae. K, Butterworth Heinnemann.
7. Orthopedic Examination, Evaluation and Intervention - Dutton. M, McGraw Hill.
8. Inpatient Physiotherapy management of Orthopedic Surgery - Chipchase, Butterworth Heinemann.
9. Physiotherapy in Orthopedics: A Problem solving Approach - Atkinson, Elsevier.
10. Handbook of Orthopedic Rehabilitation - Brotzman. B, Mosby.
11. Orthopedic Physiotherapy - Tidswell. M, Mosby.

12. Treatment and Rehabilitation of Fractures - Hoppenfeld, Lippincott Williams.

13. Orthopedic Physical Assessment by David J. Magee (Dec 10, 2007)

14. Orthopedic Manual Therapy: An Evidence-Based Approach by Chad Cook (Aug 18, 2006)

15. Pocketbook of Taping Techniques by Rose Macdonald BA FCSP (Aug 27, 2009)

16. Principles of Neuromusculoskeletal Treatment and Management: A Guide for Therapists by Nicola J. Petty (Oct 2, 2004)

17. Differential Diagnosis for the Orthopedic Physical Therapist by James Meadows (Jan 1, 1999)

18. Orthopaedic Examination, Evaluation, and Intervention, 2nd Edition (Book & DVD) by Mark Dutton (Feb 19, 2008)

19. A System of Orthopaedic Medicine by Ludwig Ombregt (Dec 23, 2002).

20. Hand and Upper Extremity Splinting: Principles and Methods by Elaine Ewing Fess, Karan Gettle, Cynthia Philips and Robin Janson (Aug 4, 2004)

21. Principles of Assessment and Outcome Measurement for Occupational Therapists and Physiotherapists: Theory, Skills and Application by Alison J. Laver Fawcett (May 8, 2007)

22. Pocket Guide to Musculoskeletal Assessment by Richard Baxter (Jul 3, 2003)

23. Critical Pathways in Therapeutic Intervention: Extremities and Spine by David C. Saidoff BS PT and Andrew L. McDonough EdD PT (Jan 15, 2002)

24. Rehabilitation of the Spine: A Practitioner's Manual by Craig Liebenson (Mar 3, 2006)

25. Clinical Orthopaedic Rehabilitation by S. Brent Brotzman MD and Kevin E. Wilk PT DPT (Jan 24, 2003)

26. Macnab's Backache by David A. Wong and Ensor Transfeldt (Oct 30, 2006)

27. Orthopaedic Physical Therapy by Robert A. Donatelli PhD PT OCS and Michael J. Wooden MS PT OCS (Jul 27, 2009)

28. The Swiss Ball: Theory, Basic Exercises and Clinical Applications by Beate Carrière, V. Janda and R. Tanzberger (Nov 28, 2000)

29. Orthopaedic Medicine: a practical approach by Monica Kesson MSc Grad Dip Phys MCSP Cert Ed Cert FE and Elaine Atkins DProf MA MCSP Cert FE (Oct 8, 2005)

30. Neck Pain: Medical Diagnosis and Comprehensive Management by David G. Borenstein MD, Sam W. Wiesel MD and Scott D. Boden MD (Aug 15, 1996)

Master of Physiotherapy in Neurological Sciences

Total hours:	275
Theory:	125
Practical/Oral:	150

Paper-V Elective:
Neurological Conditions - Basics, Assessment and Evaluation

Objectives:

The course shall enable the candidate to expertise in early intervention acquisition and application of neuromotor and sensory integration skills on adults and paediatric neurological conditions as a first contact practitioner. Such candidate shall also attain an ability to acquire a position as consultant in the team of health care professionals involved in electro-diagnosis, disability evaluation, as well work in the management of patients at the intensive care area and
\or in the rehabilitation neurologically affected adults and children/neonates. The sub-specialities are:

a. Adult neurological and psychosomatic conditions and applied neurophysiology.
b. Developmental and paediatric Neuro pathological conditions.
c. Applied bio-mechanics and bio-engineering
d. Geriatrics
e. Electro-diagnosis
f. Intensive care

Section-I: Neurological Conditions - Basics

NEUROANATOMY

1. Embryological development, growth & maturation of nervous system.
2. Normal Sequential behavior and physiological changes throughout the developmental arc.
3. Introduction and organization of nervous system, normal development of brain and spinal cord.
4. Neuro biology of neurons and Neuroglia
5. Coverings of the nervous system
4. Nerve fibres
5. Dermatomes and myotomes

6. Cerebrum and cerebral hemispheres, Cerebral cortex
7. Cerebellum and its connections
8. Brain stem, Midbrain, Pons, Medulla
9. Thalamus, hypothalamus and their connections
10. Limbic system, reticular formation
11. Internal capsule, corpus straitum
12. Basal ganglia and its connections
13. Ventricular system and CSF
14. Blood brain barrier
15. Spinal cord, tracts ascending & descending
16. Blood supply of CNS and peripheral nervous system, venous drainage of CNS
17. Peripheral nervous system
18. Autonomic nervous system
19. Cranial nerves and their nuclei

* It is mandatory to see/ comprehend the dissected parts of the nervous system.

NEUROPHYSIOLOGY

Functions of all the organs including:

1. Nerve fibers & Coverings of the nervous system
2. Dermatomes and myotomes
3. Cerebrum and cerebral hemispheres, Cerebral cortex
4. Cerebellum and its connections
5. Brain stem, Midbrain, Pons & medulla
6. Thalamus, hypothalamus, connections
7. Limbic system, reticular formation
8. Special senses
9. Internal capsule, corpus striatum
10. Basal ganglia and its connections
11. Ventricular system and CSF
12. Blood brain barrier
13. Spinal cord tracts, ascending & descending
14. Peripheral nervous system
15. Autonomic nervous system
16. Neurophysiology of balance, co-ordination & locomotion
17. cranial nerves and their nuclei
18. Motor control
19. Neural development of posture and gait
20. Physiology of pain

21. Physiology of reflexes – normal and abnormal
22. Physiological basis of motor learning and recovery of functional motor control

PATHOMECHANICS

The student should get well acquainted with the pathomechanics of individual joints and Posture related to neurological diseases.

Section-II: Neurological Conditions – Assessment and Evaluation

a) Measurement and assessment; what and why?
b) Classification of impairment, disability and handicap
c) How to choose a measure?
d) Measurement in practice
e) General neurological examination
f) Measures for use in neurological disability

1. Measures of cognitive impairment and disability;
    a. Glasgow coma scales
    b. Children's coma scales
    c. Edinburgh – 2 coma scale
    d. Blessed dementia rating scales; information7 concentration – memory test; dementia scale

2. Measure of motor impairment;
    a. Motor club assessment
    b. Rivermead motor assessment
    c. Motricity index
    d. Trunk control test
    e. Motor assessment scale
    f. Modified ashworth scale for spasticity
    g. Isometric muscle strength
    h. Motor neuron disease/ amyotrophic lateral sclerosis
    i. Dynamometer

3. Measures of focal disability;

a. Standing balance
    b. Functional ambulation categories

c. Hauser ambulation index
d. Timed walking test
e. Rivermead mobility index
f. Nine hole peg test
g. Action research arm test
h. Franchay arm test

4. Activities of daily living and extended ADL tests;
   a. Barthel ADL index
   b. Katz ADL index
   c. Nottingham ten point ADL index
   d. Rivermaid ADL scale
   e. Northwick park index of independence in ADL
   f. Kenny self care evaluation
   g. Nottingham extended ADL index
   h. Frenchay activity index

5. Global measures of disability;
   a. OPCS disability scale: severity categories
   b. functional independence measure
   c. PULSES profile

6. Measures of handicap and quality of life;
   a. WHO handicap scale
   b. Rankin scale
   c. Glasgow outcome scale
   d. Quality of life : a measure
   e. Environmental assessment – non standard

7. Multiple sclerosis;
   a. Kurtzke multiple sclerosis rating scale
   b. An illness severity for multiple sclerosis

8. Stroke scales;
   a. Mathew stroke scale
   b. National institute of health stroke scale
   c. Canadian neurological scale
   d. Orgogozo score
   e. hemispheric stroke scale
   f. clinical classification of scale

g. Clinical classification of stroke (Bamford)
h. Allen score for prognosis of stroke
i. Guy's hospital score for haemorrhage

9. Head injury;
    a. Galveston orientation and amnesia test
    b. Rappaport disability rating scale

10. Parkinson's disease;
    a. Parkinson's disease impairment index, disability index
    b. Hoehn and Yahr grades
    c. Unified Parkinson's diseases rating scale version 3

11. Spinal cord injury;
    a. Frankel's scale
    b. Motor index and sensory indices
    c. American spinal cord injury association assessment chart
    d. Pain assessment and evaluation

12. Basic elements of Neuro Diagnostic Tests;
    a. CT scan
    b. MRI
    c. Carotid Angiography
    d. Myelography
    e. X- ray
    f. Nuclear imaging
    g. Electroencephalogram
    h. Electromyography
    i. Nerve Conduction Velocity
    j. Evoked potential tests
    k. Muscle and Nerve Biopsy
    l. CSF examination

13. Assessment of posture, gait, coordination, voluntary control

Recommended books:

1. Goodman; pathology implications for the physical therapist
2. Barbara; muscles, nerves and movement kinesiology in daily living.
3. Greame; clinical neurology

4. Brandt; neurological disorders course and treatment
5. Brains; Disease of the nervous system
6. Shirley; diagnosis , treatment of movement impairment syndromes
7. Richard; neurological rehabilitation
8. Susan; neurological physiotherapy
9. Helen; Neuroscience of rehabilitation
10. Wade DT 1992 , assessment in neurological rehabilitation, oxford press
11. Omer; management of peripheral nerve problems
12. Darcy; neurological rehabilitation
13. Gerald; evaluation and treatment of chronic pain
14. Alfred; Early diagnosis and therapy in cerebral palsy
15. Charles; The neuroscience of human movement
16. Traumatic brain injury rehabilitation

Paper-VI Elective:

Physiotherapeutic Interventions in Clinical Neurological Conditions

Section-I: CLINICAL NEUROLOGICAL CONDITIONS

1. Causes, clinical features, pathophysiology, general investigation (blood test, serum creatinine, CSF analysis, etc) Medical and surgical management of the below mentioned conditions
2. Intracranial neoplasms, Gliomas, meningiomas, neuromas, angiomas, cranio, pharyngiomas, pituitary adenomas, medical and surgical management.
3. Pyogenic infections of CNS: Meningitis, brain abscess, tuberculosis, neurosyphillis.
4. Viral infections of CNS: Poliomyelitis, viral encephalitis, substance sclerosing encephalitis, AIDS
5. Cerebro vascular disease: Stroke syndrome, ischaemic stroke infarction, thrombo-embolic stroke, Hemorrhagic stroke, Transient ischaemic attack, arterio- venous malformation of the brain, intracranial hemorrhage
6. Metabolic disorders of brain : Hypoencephalopathy, hypoglycemic encephalopathy, hepatic encephalopathy
7. Degenerative disease of the brain: Parkinson's disease, motor neurone disease, amyotrophic lateral sclerosis, progressive bulbar palsy, Alzheimer's disease.
8. Cerebral palsy
9. Spina bifida
10. Polyneuropathy: Post infective Polyneuropathy (gullian bare syndrome) diabetic neuropathy, hereditary sensory neuropathy.
11. Disorders of spinal cord: Compression of spinal cord, neoplasm of the vertebral column, inter vertebral disc prolapsed, extra dural or epidural abscess.
12. Syringomyellia, multiple sclerosis, myasthenia gravis
13. Peripheral nerve and plexus lesions
14. Carniovertebral junction abnormalities
15. Hydrocephalus
16. Cerebral lesions.

17. Disorders of motor unit (Neuromuscular disease)

    a. Muscle pain and tenderness
    b. Muscle weakness
    c. Changes in muscle mass
    d. Muscle hyperactivity states
    e. Muscle fatigability
    f. Abnormal muscle tone (Hypotonic)
    g. Abnormalities of sensation
    h. Reduced or absent stretch reflexes

18. Disorders of muscle (Myopathies)

    a. Myasthenia gravis and other disorders of neuromuscular transmission
    b. Disorders of the peripheral nervous system
    c. Disorders of the anterior horn cells (Neuronopathies)

19. Disorders of central motor control

    a. Abnormal muscle tone
    b. Muscle weakness
    c. Loss of muscular endurance
    d. Altered muscle activation patterns
    e. Involuntary movements
    f. Associated reactions
    g. Abnormalities of coordination
    h. Apraxia
    i. Hypokinesia
    j. Abnormal skeletal muscle reflexes
    k. Abnormal balance
    l. Abnormalities of sensation

20. Other associated manifestations

    a. Abnormalities in communications
    b. Abnormalities in swallowing
    c. Abnormalities of bladder and bowel functions
    d. Learning disorders
    e. Visual dysfunction
    f. Cognitive and perceptual dysfunction

Section-II: Physiotherapy Interventions in Neurological Conditions

A. Student should be able to plan appropriate treatment regime based on the knowledge of various subjects learned during the two year programme for the below mentioned conditions. Additionally emphasis should be on special techniques/ approaches like Bobath, Neurodevelopment therapy, Motor relearning programme, Sensory integration, PNF, Roods approach etc. Student should update himself/ herself with latest advancement in the therapeutic approaches.

a. Physiotherapeutic interventions for relief of pain
b. Physiotherapy management of patients with postural control , mobility control disorders.
c. Neurological rehabilitation – neurofacilitation approach
d. Intracranial neoplasms; Gliomas, meningiomas, neuromas, angiomas, craniopharyngiomas, pituitary adenomas, medical and surgical management.
e. Pyogenic infections of CNS; Msis, Neurosyphilis
f. Viral infection on CNS; Poliomyelitis, viral encephalitis, Substance sclerosing encephalitis, AIDS
g. Cerebro – vascular Diseases; Stroke syndrome, ischaemic stroke infarction, thrombo-embolic stroke, hemorrhagic stroke, Transient ischaemic attack, Arterio- venous malformations of the brain, Intra cranial hemorrhage.
h. Metabolic disorders of the brain; Hypoxic encephalopathy, hypoglycemic encephalopathy, hepatic encephalopathy.
i. Degenerative disease of the brain Parkinson's disease, motor neuron disease, amyotrophic lateral sclerosis, progressive bulbar palsy, Alzheimer's disease.
j. Cerebral palsy
k. Spina bifida
l. Polyneuropathy Post infective poly radiculo-neuropathy (Gullain-barre syndrome) diabetic neuropathy, hereditary sensory neuropathy.
m. Disorders of spinal cord Compression of spinal cord, neoplasm of the vertebral column, inter vertebral disc prolapsed, extra dural or epidural abscess.
n. Syringomyellia, multiple sclerosis, myasthenia gravis

o. Peripheral nerve and plexus lesions

p. Carniovertebral junction abnormalities

q. Hydrocephalus

r. Cerebral lesions.

Recommended books:

1. Neurological Physiotherapy - Susan Edward.
2. Stroke Patient - Principles of Rehabilitation - John Stone (Churchill Livingstone).
3. Motor Relearning Programme for Stroke - Carr & Shephered.
4. Adult Hemiplegia: Evaluation and Treatment - Bobath & Bobath.
5. Neuro Rehabilitation - Farber, WB Saunders, Philadelphia.
6. The Neural Basis of Motor Control - Black I, Churchill Livingstone.
7. Tetraplegia & Paraplegia - Ida Bromley, Churchill Livingstone.
8. Proprioceptive Neuro Muscular Facilitation Techniques Knot M. and Voss, Harper and Row.
9. De Jong's the Neurological Examination, Armin F. Haerer Lippoincott - Raven.
10. Abnormal Postural Reflex Activity caused by Brain Lesions. Bobath B. Aspen, Publications Rockville.
11. Spinal Cord Injuries - Orthopaedic & Neurological Aspects A.G. Hardy & Rossier A.B.
12. Physical Rehabilitation (O'Sullivan, Physical Rehabilitation) by Susan B. O'Sullivan and Thomas J. Schmitz (Aug 4, 2006)
13. Rehabilitation for Traumatic Brain Injury by Walter M. High, Angelle M. Sander, Margaret A. Struchen and Karin A. Hart (Jul 7, 2005)
14. Neurological Rehabilitation by Darcy Ann Umphred PT PhD FAPTA (Nov 10, 2006)
15. Neurological Physiotherapy: Bases of Evidence for Practice, Treatment and Management of Patients Described by Specialist Clinicians by Cecily Partridge (May 15, 2002)
16. Motor Control and Learning by Markus Latash and Francis Lestienne (Feb 7, 2006)
17. Physical Management for Neurological Conditions: by Maria Stokes and Emma Stack (Apr 25, 2011)
18. Neuro-developmental Treatment Approach: Theoretical Foundations & Principles by Janet M. Howle (Jan 2002)
19. Guide to Evidenced-Based Physical Therapist Practice, Second Edition by Dianne V. Jewell (Aug 23, 2010)
20. Physical Therapy for Children by Suzann K. Campbell, Robert J. Palisano PT ScD and Margo Orlin (Jan 24, 2011).
21. Improving Functional Outcomes in Physical Rehabilitation by O'Sullivan and Schmitz (Dec 9, 2009)

Master of Physiotherapy in Cardio-Pulmonary Sciences

Total hours:	275
Theory:	125
Practical/Oral:	150

Paper-V: Elective:

Cardio-Pulmonary Conditions: Basics, Assessment and Evaluation

Objectives:

The course shall enable the candidate to expertise in the knowledge and skill of operating advanced instrumentation at the intensive care area as well as modern investigative procedures such as stress testing in the presence of a physician. Such candidate shall also attend an ability to function as an essential team member of intensive care units, as well as team of experts in the cardio-pulmonary rehabilitation general fitness and health promotion at the hospital set-ups industrial/ geriatric set-ups, health clubs, sports fitness/ training and women's health. The sub- specialities are

a. Adult and paediatric emergency.
b. Cardiac rehabilitation and management.
c. Pulmonary Rehabilitation.
d. Geriatric and Industrial Health.
e. Women's health.
f. Sports sciences and health preparations.

Section-I: Cardio-Pulmonary Conditions- Basics

Anatomy

Fundamentals in cardio-respiratory conditions

1. Cardio-Vascular System: Mediastinum: Divisions and contents Pericardium: Thoracic Wall: position, shape and parts of the heart; conducting System; blood Supply and nerve supply of the heart, anatomy of arteries, veins, and capillaries.

2. Respiratory system: Outline of respiratory passages**.** Pleura and lungs: position, parts,

relations, blood supply and nerve supply; Lungs – emphasize on Bronchopulmonary segments**.** Diaphragm: Origin, insertion, nerve supply and action, openings in the

diaphragm. Intercostal muscles and Accessory muscles of respiration: Origin, insertion, nerve supply and action.

Physiology

Cardiac System:

1. Cardiac muscles: Structure. Ionic basis of action potential and pacemaker potential. Properties.

2. Conducting system: Components. Cardiac Cycle: Definition. Phases of cardiac cycle. Heart sounds – causes, character.

3. Cardiac Output: Definition. Normal value. Determinants. Stroke volume and its regulation. Heart rate and its regulation and their variations.

4. Arterial Blood Pressure: Definition. Normal values and its variations. Determinants. Peripheral resistance. Regulation of BP.

5. Arterial pulse.

6. Shock – Definition. Classification–causes and features

7. Regional Circulation: Coronary, Cerebral and Cutaneous circulation.

Respiratory System:

1. Function of respiratory system: Pleura, tracheo-bronchial tree, alveolus, respiratory membrane and their nerve supply. Respiratory muscles.

2. Mechanics of breathing: Intrapleural and Intrapulmonary pressure changes during respiration.

3. Lung compliance: Normal value, pressure-volume curve, factors affecting compliance and its variations. Surfactant – Composition, production, functions.

4. Spirometry: Lung volumes and capacities. Timed vital capacity and its clinical significance. Maximum ventilation volume. Respiratory minute volume.

5. Dead Space: Types and their definition.

6. Pulmonary Circulation. Ventilation-perfusion ratio and its importance.
7. Transport of respiratory gases: Diffusion across the respiratory membrane. Oxygen- haemoglobin dissociation curve. Factors affecting it. Haldane and Bohr Effect. Carbon dioxide transport: Different forms, chloride shift.

8. Neural Regulation of Respiration. Hering-breuer's reflex. Voluntary control. Chemical Regulation.

9. Physiology of microcirculation and edema

10. Hypoxia: Effects of hypoxia. Types of hypoxia. Asphyxia. Cyanosis – types and features.

11. Periodic breathing – definition and types.

12. Artificial respiration

Cardio-Pulmonary Conditions- Biomechanics, pathomechanics & Applied Anatomy

1. General structure and function

2. Rib cage and the muscles associated with the rib cage

3. Ventilatory motions: its coordination and integration

4. Developmental aspects of structure and function

5. Body positioning and various systemic changes

6. Changes in normal structure and function I relation to pregnancy, scoliosis and COPD

7. Respiratory muscle fatigue and training

8. Development of the Cardio Vascular, Pulmonary systems and deviations from the

normal development.

9. Age related changes in Cardiovascular & Pulmonary System

10. Normal and abnormal responses of Cardiovascular & Pulmonary System during Exercise

.

Section-II: Cardio-Pulmonary Conditions - Assessment and Evaluation

1. Assessment of cardio-pulmonary system, Adult and Pediatric:

    a. Medical Chart Review
    b. Patient/Family interview

2. Vitals:

    a. Heart rate measurement
    b. Blood pressure measurement
    c. Respiratory rate measurement
    d. Temperature measurement

3. Physical Therapy Examination:

    a. Inspection
    b. Auscultation
    c. Palpation
    d. Percussion

4. Exercise Assessment:

    a. Exercise Stress testing
    b. Activity and Endurance Evaluation
    c. Walk tests

5. Clinical Monitoring:

    a. Heart Rate and heart rate response to exercise
    b. Heart rhythm
    c. ECG monitoring
    d. Pace-maker rhythm
    e. Blood Pressure and Blood pressure response to exercise
    f. Respiratory rate and respiratory response to exercise
    g. ABG analyses

h. Pulse Oximetry, oxygen saturation monitoring
i. RPE
j. Other signs and symptoms of exercise intolerance
k. Exercise capacity

6. Other assessment tools: Body composition and body composition measures

7. Respiratory muscle strength and endurance

8. Autonomic dysfunction

9. Questionnaires survey and Scales

10. Assessment of findings:

a. Chest assessment
b. Activity and endurance evaluation
c. Defining the physiotherapy problem

11. Basic interpretation of investigative procedures used in cardio-respiratory conditions:

a. Thoracic imaging
b. Chest X-ray
c. CT scan
d. MRI,
e. Bronchogram

12. Pulmonary function test

13. Evaluation Of peripheral vascular diseases

14. Clinical decision making skills in functional diagnosis in neonate, pediatrics, adults and geriatrics

15. Laboratorical investigations

16. Differential diagnosis

17. ADL analysis

Recommended books:

1. Cardiopulmonary physical therapy – A guide to practice By scot Irwin & Jan Stephen tecklin.
2. Cardiovascular and Pulmonary Physical Therapy By Donna frownfelter & Elizabeth dean.

3. Diagnosis and Management of acute respiratory failure By Farokh erach Udawadia.
4. Clinical application of mechanical ventilation By David W.Chang.
5. Physiotherapy for Respiratory and cardiac problems – adults and pediatrics By Jenifer Pryor & S.Ammani Prasad.
6. Physiotherapy in Respiratory care By Alexandra Hough.
7. ECG By P.J.Mehta
8. Chest physiotherapy in Intensive care unit – Makezie, Willams & Wilkins, Baltimore.
9. Cardiopulmonary symptoms in physiotherapy – Cohen M, Churchill, Livingstone, London- 1988.
10. Katch: Exercise physiology, energy nutrition and human performance
11. Scott K Powers: Theory and application to fitness and performance.
12. ACSM"s "Health Related Physical Fitness Assessment Manual Lippincott Williams.
13. Handbook of nutrition and food.2nd Edition. Carolyn Berdanier , Johanna Dwyer.
14. Axen: Illustrated principle of exercise physiology.
15. Frank: Exercise physiology for health care professional.
16. Evidence based practice

Paper-VI Elective:

Physiotherapeutic Interventions in Clinical Cardio-Pulmonary Conditions

Section-I: Clinical Cardio-Pulmonary Conditions

Causes, clinical features, pathophysiology, general investigation, Medical and surgical management of the below mentioned conditions

1. **Respiratory Conditions:**

    a. Obstructive lung disease: Asthma, Chronic bronchitis, emphysema, Bronchiectasis, Cystic fibrosis, etc.
    b. Restrictive lung disease: Atelectesis, pneumonia, Pleural effusion, Pneumothorax, ARDS,
    c. Suppurative lung diseases like lung abscess, etc.
    d. Occupational lung diseases-occupational asthma, inhalation injuries, etc.
    e. Chest trauma
    f. Chest wall deformities
    g. Lung cancers
    h. Pediatric/Neonatal Pulmonary diseases
    i. Sleep apnea
    j. Respiratory failure

2. **Cardio Vascular Conditions:**

    a. Pediatric Cardio-vascular disorder: Fallot's tetralogy, Co-arctation of aorta, Patent ductus arteriosus, Arterial septal defect, ventricular septal defect, Transposition of great vessels.

    b. Acquired heart diseases: Coronary Artery Diseases, Cardiac arrhythmias, Valvular heart diseases, Cardiomyopathies,
    c. Myocardial infarction
    d. Hypertension and diabetes
    e. Diseases of the myocardium
    f. Pericardial diseases
    g. Tumors of the heart
    h. Peripheral vascular diseases: Definition, Etiology, Clinical features, signs and symptoms, complications, management and treatment of following diseases : Arteriosclerosis, Atherosclerosis, Aneurysm, Buerger's disease, Raynaud's Disease, Thrombophlebitis, Deep Vein Thrombosis, Pulmonary Embolism, Varicose Veins.
    i. Cardiac arrest

Section-II: Physiotherapy Interventions in Cardio-Pulmonary Conditions

Student should be able to plan appropriate treatment regime based on the knowledge of various subjects learned during the two year programme for the below mentioned conditions. Additionally emphasis should be on special techniques/ approaches like Suctioning, Chest PNF, Inhalation and Humidification therapy, FET's. Student should update himself/ herself with latest advancement in the therapeutic approaches.

1. Cardio respiratory physiotherapy management principles, pre and post surgical intervention including critical care.

2. Cardio-Respiratory physiotherapeutic techniques in adult and pediatric:
    a. To improve lung volumes
    b. To decrease work of breathing
    c. To clear secretions
    d. To Increase exercise tolerance
    e. To improve ventilation and gas exchange
    f. To Improve ADL demands

3. Physiotherapy management in Obstructive and Restrictive lung diseases.
4. Post operative management of Respiratory conditions
5. Pulmonary rehabilitation
6. Adjuncts to chest PT
7. Post operative management of cardiac conditions
8. PT management in acquired and congenital heart diseases
9. Cardiac rehabilitation
10. CPR
11. PT management in Peripheral vascular diseases
12. Cardiac transplantation
13. Lung transplantation
14. Respiratory and cardiology pharmacology in brief.
15. Surgical interventions in brief: Cardio-Respiratory and Peripheral Vascular Disorder.

ICU Management

1. Intensive Care unit: concept and set up, equipments for advanced methods of resuscitation, monitoring and patient management

2. Artificial airways, ventilators, pulse oximetry, O2 therapy
3. PT management in ICU
4. Transfer and turning of patient
5. Common complications in ICU
6. PICU and NICU management

Recommended books:

1. Cardiopulmonary Physical Therapy - Irwin & Tecklin (Mosby).
2. Cardiopulmonary Rehabilitation - Barbara.
3. Cardiopulmonary Rehabilitation: Basic Theory and Application (Contemporary Perspectives in Rehabilitation) by Brannon, Foley, Saul and Starr (Sep 15, 1997)
4. Chest Physiotherapy in Intensive Care Unit - Mackezie, Williams & Wilkins, Baltimore.
5. Cardiopulmonary symptoms in Physiotherapy - Cohen M, Churchill, Livingstone.
6. A Manual of Neonatal Intensive Care - Robert NRC, Edward Arnold.
7. Cardiopulmonary Equipments - David Eubanks & Bone.
8. Clinical application of Ventilator support - Kinby, Churchill Livingstone.
9. Cardiac Rehabilitation - Amundsen, Churchill Livingstone.
10. Mechanical Ventilation by Irwin R.S. Beamers
11. ECG by Schamroth
12. Interpretation of Pulmonary Function Tests: A Practical Guide by Hyatt, Robert E.; Scanlon, Paul D
13. Principles of Exercise Testing and Interpretation: Including Pathophysiology and Clinical Applications by Kalman Wasserman
14. Egan's Fundamentals of Respiratory care by Robert Wilkins
15. Harrison's Textbook of medicine
16. API's Text book of Medicine
17. Advancing the Frontiers of Cardioplumonary Rehabilitation by Jean Jobin, Francois Maltais, Paul Poirier and Clermont Simard (May 20, 2002)
18. Cardiopulmonary Physical Therapy: A Guide to Practice by Scot Irwin MS PT DPT and Jan S. Tecklin MS PT (Apr 9, 2004)
19. Physiotherapy for Respiratory and Cardiac Problems: Adults and Paediatrics by Ammani S Prasad and Jennifer A. Pryor (2008)
20. Cardiopulmonary Physical Therapy: A Clinical Manual by Joanne Watchie.
21. Cardiopulmonary Physical Therapy: A Clinical Manual by Sadowsky.
22. Cardiovascular and Pulmonary Physical Therapy : An Evidence-based Approach by William DeTurk and Lawrence Cahalin (Mar 12, 2004)
23. Cardiovascular and Pulmonary Physical Therapy: Evidence and Practice by Donna Frownfelter PT DPT MA CCS RRT FCCP and Elizabeth Dean PhD PT

(Dec 5, 2005)
24. Essentials of Cardiopulmonary Physical Therapy by Ellen Hillegass EdD PT CCS FAACVPR and H. Steven Sadowsky MS RRT PT CCS (May 11, 2001)
25. Cardiopulmonary Physiotherapy by M. Jones and F Moffatt (Jan 2003)
26. Clinical Management Notes and Case Histories in Cardiopulmonary Physical Therapy by W. Darlene Reid BMR(PT) PhD and Frank Chung BSc(PT) MSc (Jun 23, 2004)
27. Advances in Cardiopulmonary Rehabilitation by Jean Jobin, Francois Maltais, Pierre LeBlanc and Clermont Simard (May 15, 2000

RECOMMENDED JOURNALS:

1. Physical therapy - APTA, USA
2. Physiotherapy - CSP, London
3. Physiotherapy - Canada
4. Australian Journal of Physiotherapy
5. American Journal of Physical Medicine and Rehabilitation
6. Archives of Physical Medicine and Rehabilitation
7. Clinical Kinesiology
8. Journal of Biomechanics
9. American Journal of Sports Medicine
10. Journal of Sports Physiotherapy
11. British Journal of Sports Medicine
12. Spine
13. Journal of Neurological Sciences
14. IJPOT, India
15. Manual Therapy
16. Advances in Physiotherapy
17. Physiotherapy Review
18. Hong Kong Physiotherapy Journal
19. Journal of Manual and Manipulative Therapy
20. Journal of Neurologic Physical Therapy
21. Journal of Orthopedic and Sports Physical Therapy
22. Journal of Physical Therapy Science - English version
23. Journal of Sports Science and Medicine
24. Journal of Women's Health Physical Therapy
25. Rheumatology
26. Physical Therapy Reviews
27. Physiotherapy Singapore
28. Physiotherapy Theory and Practice

Listed below are some of the completely **Open Access Journals** in Physiotherapy and Rehabilitation.

1. International Journal of Physiotherapy and Rehabilitation
2. Journal of Physical Therapy
3. Asian Journal of Sports Medicine
4. Human Movement
5. Journal of Foot and Ankle Research
6. Journal of Human Sport and Exercise
7. Motricidad. European Journal of Human Movement
8. Open Access Journal of Sports Medicine
9. The Open Sports Medicine Journal
10. Indian Journal of Physical Medicine and Rehabilitation
11. Journal of Rehabilitation Research and Development
12. Rehabilitation Research and Practice
13. BMC Cardiovascular Disorders
14. International Journal of Exercise Science
15. Journal of Exercise Physiology
16. Archives of Exercise in Health and Disease
17. Arthritis Research and Therapy
18. BMC Musculoskeletal Disorders
19. Paediatric Rheumatology
20. Sports Medicine, Arthroscopy, Rehabilitation, Therapy and Technology
21. European Journal of Physical and Rehabilitation Medicine
22. Journal of Physical Therapy Science

Annexures:

I -VII

Master of Physiotherapy

ANNEXURE - I

MODEL CHECKLIST FOR EVALUATION OF JOURNAL REVIEW AND PRESENTATION

Name of the Student: ----------

Name of the Observer/Faculty: ----------

Date:

Sr. No	Items for observation during presentation	Poor (0)	Below average (1)	Average (2)	Good (3)	Very good (4)
1.	Article chosen					
2.	Extent of understanding of scope and objectives of the paper					
3.	Consultation of cross references					
4.	Consultation of other relevant publications					
5.	Ability to respond to questions on the subject					
6.	Audiovisuals used					
7.	Ability to defend the paper					
8.	Clarity of presentation					
	Total score					

ANNEXURE - II

MODEL CHECKLIST FOR EVALUATION OF SEMINAR PRESENTATION

Name of the Student: ----------

Name of the Observer/Faculty: ----------

Date:

Sr. No	Items for observation during presentation	Poor (0)	Below average (1)	Average (2)	Good (3)	Very good (4)
1.	Consultation of cross references					
2.	Consultation of other relevant publications					
3.	Completeness of preparation					
4.	Clarity of presentation					
5.	Understanding of subject					
6.	Appropriate Audiovisuals used					
7.	Ability to answer questions					
8.	Time scheduling					
9.	Overall performance					
	Total score					

ANNEXURE - III

MODEL CHECKLIST FOR EVALUATION OF CLINICAL WORK

Name of the Student: ----------

Name of the Observer/Faculty: ----------

Date:

Sr. No	Items for observation during clinical work	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 case during rounds					
6.	Investigations work up					
7.	Bedside manners					
8.	Rapport with patients and relatives					
9.	Treatment approaches and techniques					
10.	Overall quality of ward work					
	Total Score					

ANNEXURE – IV MODEL CHECKLIST FOR EVALUATION OF CLINICAL PRESENTATION

Name of the Student: ----------

Name of the Observer/Faculty: ---------- -Date:

Sr. No	Items for observation during presentation	Poor (0)	Below average (1)	Average (2)	Good (3)	Very good (4)
1.	Completeness of history					
2.	Elicitation of all relevant points					
3.	Clarity of presentation					
4.	Logical order					
5.	Mentioned all negative and positive points of importance					
6.	Accuracy of general physical examination					
7.	Elicitation of all physical signs					
8.	Logical diagnosis from history and findings					
9.	Relevant special investigations					
10.	Aims and Goals					
11.	Treatment techniques					
	Total Score					

ANNEXURE - V

MODEL CHECKLIST FOR DISSERTATION PRESENTATION

Name of the Student: ----------

Name of the Observer/Faculty: ----------

Date:

Sr. No	Items for observation during presentation	Poor (0)	Below average (1)	Average (2)	Good (3)	Very good (4)
1.	Interest shown in selection of topic					
2.	Appropriate review of literature					
3.	Discussion with guide and other faculty					
4.	Quality of protocol					
5.	Preparation of performa					
	Total Score					

ANNEXURE - VI

MODEL CHECKLIST FOR EVALUATION OF TEACHING SKILL

Name of the Student: ----------

Name of the Observer/Faculty: ----------

Date:

Sr. No	Items for observation during teaching	Poor (0)	Below average (1)	Average (2)	Good (3)	Very good (4)
1.	Communication skills					
2.	Evoking interest of listeners					
3.	Introduction					
4.	Sequence of ideas					
5.	Use of practical examples and illustrations					
6.	Speaking style					
7.	Attempting a\participation of listeners					
8.	Summarizing the main points at the end					
9.	Asking questions					
10.	Answering questions asked					
11.	Effectiveness of the talk					
12.	Usage of Audiovisual aids					
	Total Score					

ANNEXURE - VII

CONTINOUS EVALUATION OF DISSERTATION WORK BY GUIDE

Name of the Student: ----------

Name of the Observer/Faculty: ----------

Date:

Sr. No	Items for observation	Poor (0)	Below average (1)	Average (2)	Good (3)	Very good (4)
1.	Periodic interaction with guide					
2.	Regular collection of case material					
3.	Depth of analysis					
4.	Departmental presentation of findings					
5.	Quality of final output					
	Total Score					