5.20. M.P.T. Curriculum

5.20.1. COURSE CODE -M.P.T-101

COURSE TITLE - **Laws, Ethics & Administration and Eductional Methodology: (LEM)**

Course Contents: M.P.T LEM Theory (L)

SECTION -A: ETHICS AND LAW

LEM 1.1. Principles of ethics History and evolution of ethics - Helsinki declaration; Nuremberg Code; Principles of ethics and its importance - Autonomy, Beneficence, Non-maleficence, Justice

LEM 1.2. Professionalism

LEM 1.3. Ethics in professional practice Principles of practice in respective profession. Privacy, confidentiality, shared decision making, informed consent, equality and equity, justice

LEM 1.4. ICMR Guidelines General principles, Responsible conduct of research, Risk benefit assessment

LEM 1.5. Informed Consent Process Components of informed consent document, Procedure in obtaining informed consent, Special situations, waivers, and proxy consent

LEM 1.6. Roles and Responsibilities of IEC Ethical Review process, Classification of projects for review, Roles and responsibilities of members, Communications with investigators and authorities

LEM 1.7. Ethics in Special and Vulnerable Populations Types of Vulnerability and vulnerable population, Challenges for research in vulnerable population, Guidelines for research in special and vulnerable population

LEM 1.8. Conflict of Interest Definition and Types of Conflict of Interest, Identifying, mitigating and managing Conflict of Interest, Conflicts of interest in international collaborations

LEM 1.9. Publication Ethics Importance of publishing, Authorship guidelines according to ICMJE, Plagiarism

LEM 1.10. Laws governing Physiotherapy practice: NCAHP Act, Consumer Protection Act, Rights of persons with disability act Ethical issues in practice of Physiotherapy-Clinical, Research and Academics

SECTION -B: Management and administration in Physiotherapy

LEM 2.1. Principles and applications of Management and Administration to Physio Therapy practice:

LEM 2.2. Management PROCESS: planning, organizing, staffing, finance, marketing, controlling, directing.

LEM 2.3. Quality assurance: Total Quality Management: basis of quality management, qualityassurance program in hospitals, medical audit and international quality system.

LEM 2.4. COMMUNICATION: Process of Communication Barriers to Communication Types of Communication Written vs. Oral Communication Elements of good communication

LEM 2.5. Hospital as an organization: functions and types of hospitals MANAGEMENT IN HOSPITAL Setting of a physiotherapy service unit

SECTION-C: Management of Teaching Institution and Educational Methodology In Physiotherapy

LEM 3.1. Education: definition, aims and objectives of education, Agencies of education, Formal and informal education, brief introduction to the philosophies of education, taxonomy of educational objectives, essentials of Physiotherapy education, NEP

LEM 3.2. Basics of Adult Learning Theories including Learning Styles and Motivation

LEM 3.3. Concept of teaching – learning - nature of learning, type and stages of learning, factors affecting learning, laws of learning, learning style teaching learning process, role of teacher in teaching learning process, Adult learning

LEM 3.4. Teaching skills, Teaching Methods in Classroom Setting, clinical teaching methods, planning of teaching: lesson planning and unit planning Teaching aids and educational technology

LEM 3.5. Formulating Intended Learning Outcomes Including Tyler's principles, Bloom's Taxonomy, Miller's Pyramid, Clinical Competence, and Dreyfus' Model of Skill Acquisition

LEM 3.6. **Entrepreneurship in Physiotherapy Practice: Need, Advantages and Opportunities,**

Recommended books for LEM

1. Beauchamp and Childress, Principles of Biomedical Ethics, Fourth Edition. Oxford.
2. Patricia A Marshall. Ethical challenges in study design and informed consent for health research in resource poor settings. World Health Organization. 2007.
3. Natio4n2a6l Ethical guidelines for Biomedical and Health Research involving human participants. Indian Council of Medical Research. 2017.
4. ABC of Learning and Teaching in Medicine. Editor(s): Peter Cantillon, Diana Wood, Sarah Yardley. Ed: 3
5. Understanding Medical Education: Evidence, Theory, and Practice, Editor(s): Tim Swanwick Kirsty Forrest Bridget C. O'Brien. Ed 3
6. Principles of Medical Education. Editor(s): Tejinder Singh, Piyush Gupta, Daljit Singh. Jaypee Brothers. 2012. New Delhi.

5.20.2. COURSE CODE -M.P.T-102

COURSE TITLE - Research methodology and Biostatistics and Evidence based practice (RMB)

Course Contents: M.P.T RMB Theory (L)

SECTION-A: RESEARCH METHODOLOGY

RMB 1.1. Introduction to research

RMB 1.2. Types of research

RMB 1.3. Defining a research question

RMB 1.4. Qualitative study designs

RMB 1.5. Quantitative study

RMB 1.6. Type I and type II bias

RMB 1.7. Study design: types

RMB 1.8. Case study, Case series, longitudinal cohort, Pre post design, Time series design, repeated measures design, Randomized control design.

RMB 1.9. Sampling design, calculating minimum sample size based on design

RMB 1.10. Measurement: Properties of measurement: reliability, validity, responsiveness, MCID.

RMB 1.11. Outcome measures: Use of outcome measures in rehabilitation research

RMB 1.12. Research Methods: Designing methodology, Reporting results, Type I and Type II bias.

RMB 1.13. Communicating research.

RMB 1.14. Evaluating published research: looking at the evidence

RMB 1.15. Introduction to evidence-based practice, evaluating evidence,

RMB 1.16. Asking clinical questions

RMB 1.17. Translating of evidence into practice: strategies

RMB 1.18. Use of clinical practice guidelines, clinical pathways, prediction rules to inform practice.

SECTION-B: BIOSTATISTICS

RMB 2.1. Descriptive Statistics and measurement variability

RMB 2.2. Inferential Statistics

RMB 2.3. Comparison of group means: T-test

RMB 2.4. Analysis of variance

RMB 2.5. Multiple comparison tests

RMB 2.6. Parametric and Non parametric tests

RMB 2.7. Correlations

RMB 2.8. Regression

RMB 2.9. Analysis of frequencies: Chi square

RMB 2.10. Statistical measure of validity and reliability

RMB 2.11. Factorial Design analysis

RMB 2.12. Power analysis – Determining sample size, Epidemiological Measures – Rate, Ratio, Proportion, Incidence and prevalence, Relative risk, Risk ratio, Odds ratio

RMB 2.13. Application of various statistical software.

SECTION-C: SCIENTIFIC WRITING

RMB 3.1. Definition and kinds of scientific documents – Research paper, Review paper, Book, Reviews, Thesis, Conference and project reports (for the scientific community and for funding agencies).

RMB 3.2. Publication – Role of author, Guide, Co-authors.

RMB 3.3. Structure, Style and contents; Style manuals (APA, MLA); Citation styles: Footnotes, References; Evaluation of research

RMB 3.4. Significance of Report writing; Different steps in Report writing; Mechanics and precautions of writing research reports Oral and poster presentation of research papers in conferences/symposia; Preparation of abstracts.

RMB 3.5. Structure of Thesis and Content – Preparing Abstracts.

Recommended books for RMB

1. Bailey, N.T.J. -Statistical methods in Biology. The English universities press, London
2. Bajpai, S.R.- Methods of Social Survey and Research, Kitab Ghar, Kanpur.
3. Colton - Statistics in medicine, Little Brown Company, Boston
4. Gupta, S.P -Statistical methods. Sultan Chand and Sons Publishers , New Delhi.
5. Goulden C.H.- Methods of Statistical Analysis. Asia Publishing House , New Delhi.
6. Mohsin S.M.- Research Methods in Behavioral Sciences: Orient Publications. New Delhi.
7. Mahajan - Methods in Biostatistics, Jay Pee Brothers.Medical Publishers (P) Ltd. New Delhi.
8. Hicks- Research for Physiotherapists, Churchill Livingstone, London.
9. Meenakshi. - First Course in Methodology of Research. Kalia Prakashan, Patiala.
10. Kumar , R.- Research Methodology. Pearson Education , Australia.
11. Snedecor,G.W -Statistical Methods, Allied Pacific Pvt. Ltd., London
12. Singh, I.- Elementary Statistics for Medical Workers. Jaypee Brothers Medical Publishers (P) Ltd. New Delhi.
13. Rehabilitation Research: Principles and Applications by Elizabeth Domholdt (Elsevier Science Health Science Div, 2004)

5.20.3.COURSE CODE -M.P.T-103

COURSE TITLE -BIOMECHANICS & THERAPEUTICS (BCT)

Course Contents: M.P.T BCT Theory (L)

SECTION A – Concepts of Biomechanics:

BCT 1.1. Introduction to Kinesiology and Biomechanics. Biomechanics of Tissues and structures of the musculoskeletal system

BCT 1.2. Principle of Biomechanics

BCT 1.3. Nature and importance of Biomechanics in Physiotherapy.

BCT 1.4. Methods of kinetics and kinematics investigation

BCT 1.5. Introduction to biomechanical analysis of human motion.

BCT 1.6. Analytical tools and techniques –

1. Isokinetic Dynamometer,
2. Kinesiological EMG,
3. Electronic Goniometer,
4. Force Platform,
5. Videography.

BCT 1.7. Upper Extremity: Shoulder and Shoulder girdle, Elbow joint, Wrist joint and Hand.

BCT 1.8. Lower Extremity: Pelvic Girdle, Hip joint, Knee joint, Ankle & Foot

BCT 1.9. Spine

BCT 1.10. Gait

BCT 1.11. Gait Analysis: Kinetic & Kinematic Analysis.

BCT 1.12. Pathological Gait: Kinetic & Kinematic Analysis

BCT 1.13. Ergonomic approach to lifting and handling, workspace and environment. Patient positioning, body mechanics and Transfer techniques

SECTION-B: Physiotherapy techniques

BCT 2.1. Principle of therapeutic exercises

BCT 2.2. Definition, details of effects and uses of following exercises.

BCT 2.3. Dynamic Exercises

BCT 2.4. Plyometric Exercises

BCT 2.5. Isokinetic Exercises

BCT 2.6. Kinetic chain exercises

BCT 2.7. Balance and coordination exercises

BCT 2.8. Biophysics of contractile and non-contractile tissues, Response to mechanical loading

BCT 2.9. Clinical reasoning and differential clinical diagnosis based on various approaches such as Maitland, Kaltenborne, Cyriax, Mulligan, Mckenzie etc.

BCT 2.10. Proprioceptive neuromuscular Facilitation,

BCT 2.11. Hydrotherapy Techniques

BCT 2.12. Functional assessment and re-education

BCT 2.13. Yoga: Introduction, Historical background and Origin of Yoga, Meaning and Concept of Yoga and its relationship with Physical Education and Sports, **Yoga in Global Scenario**, **Pranayama:** Meaning, Types and its importance. **Asanas:** Asanas- meaning, types, principles, Techniques of asanas and effects of asanas on various systems of the body - circulatory, respiratory and digestive system.

BCT 2.14. Electro diagnosis: introduction to methods of electro diagnosis SD CURVE

BCT 2.15. Electromyography: technique of EMG, interpretation of normal and abnormal responses

BCT 2.16. Nerve conduction studies: MNCV, SNCV, variables affecting nerve conduction, measurement of NCV of nerves of upper limb and lower limb, interpretations of normal and abnormal responses.

BCT 2.17. Evoked potentials, H-reflex, P wave, repetitive nerve stimulation, VEP, BAEP, SSEP, SSR.

BCT 2.18. Review of Principles underlying the application of following modalities with reference to their Production, biophysical and therapeutic effects, indications and contraindications and the specific uses of:

1. Superficial heating modalities
2. Deep heating modalities
3. Ultrasound
4. Cryotherapy

BCT 2.19. Review of Principles underlying the application of following modalities with reference to their Production, biophysical and therapeutic effects, indications and contraindications and the specific uses of Physiotherapy

BCT 2.20. Low Frequency Current: Diadynamic Current, Iontophoresis

BCT 2.21. High Voltage, Pulsed Galvanic Stimulation, TENS, IFT, Russian Currents. LASER

BCT 2.22. Advanced Electro Therapeutics in Tissue healing, Wound care, Management of Scars, keloids, Muscle Plasticity & Integumentary Conditions.

BCT 2.23. BIO-FEED BACK

Recommended books for BCT

1. James G. Hay – The Biomechanics of Sports Techniques, Prentice Hall.
2. Brunnstrom - Clinical Kinesiology, F.A. Davis.
3. Luttgens K., Hamilton N.: Kinesiology – Scientific Basis of Human Motion, Brown & Benchmark.
4. Kreighbaum E., Barthels K.: Biomechanics – A Qualitative approach for studying human Motion, MacMillan.
5. Rasch and Burk: Kinesiology and Applied Anatomy, Lee and Fabiger.
6. White and Punjabi - Biomechanics of Spine - Lippincott.
7. Norkin & Levangie: Joint Structure and Function - A Comprehensive Analysis - F.A.
8. Davis.
9. Kapandji: Physiology of Joints Vol. I, II & III, W.B. Saunders.
10. Northrip et al: Analysis of Sports Motion: Anatomic and Biomechanics perspectives,
11. W.C. Brown Co., IOWA.
12. Leveac B.F.: Basic Biomechanics in Sports and Orthopedic Therapy, C.V. Mosby.
13. De Boer & Groot: Biomechanics of Sports, CRL Press, Florida.
14. Basmajian - Muscle alive - Williams & Wilkins.
15. Nordin & Frankel - Basic Biomechanics of Muscular Skeletal Systm - Williams & Wilkins.
16. Bartlet - Introduction to Sports biomechanics - F & FN Spon Madras.

5.20.4. Locomotor disability Assessment content:

DISABILITY (PERMANENT PHYSICAL IMPAIRMENT) ASSESSMENT AND CERTIFICATION GUIDELINES & GAZETTE NOTIFICATION:

Detail study of Government Gazette to be done: (The Gazette of India is regularly updated, and its publications can change over time. Refer the recent Gazette publications issued by the Government of India, from the official website)

PWD Act 1995 and Rights of person with Disability Act 2016, **to study in detail.**

5.20.5. BLS and ACLS Training:

Course Title: Basics of Emergency Care and Life Support Skills (ECLS): Theory (L) Practical (P)

ECLS 1.0. Subject Description and instruction to teacher

Basic life support (BLS) is the foundation for saving lives following cardiac arrest. Fundamental aspects of BLS include immediate recognition of sudden cardiac arrest (SCA) and activation of the emergency response system, early cardiopulmonary resuscitation (CPR), and rapid defibrillation with an auto- mated external defibrillator (AED). Initial recognition and response to heart attack and stroke are also considered part of BLS. The student is also expected to learn about basic emergency care including first aid and triage. The purpose of this course is to equip the students with the skill to save the life of a person in different emergency situation as first responder. The training should be provided using Mannequins and dummies and Videos presentations and Role plays should be also used to impart knowledge and skill besides the lecture - demonstrations.

ECLS 1.0.1. Course Outcomes:

After completion of this course the student shall be able to

1. Perform Opening and maintaining and patent airway: assessment and knowledge of airway maneuvers and adjuncts
2. Ventilate patients: Assessment and management of breathing with Mouth to mouth and mouth to mask
3. Administer basic life support skills including cardiopulmonary resuscitation
4. Provide first aid of simple and multiple system trauma such as • Controlling hemorrhage • Managing Burns and wounds • Response to effects of weapons of mass destruction • manually stabilizing injured extremities
5. Provide first aid to patients with medical emergencies like heart attack and stroke • Identifying signs of Stroke and heart attack and safe transfer after first aid without delay in transfer. • Manage general medical complaints seizures and animal bites (snake /dog bite)

6. Reassure patients and bystanders by working in a confident, efficient manner • Avoid mishandling and undue haste while working expeditiously to accomplish the task
7. Manage safe patient transport Entailing-Extrication of the victim, helmet removal and spine protection during transport.
8. Explain Roles, responsibilities and limitation of first responder.

Course Contents:

SECTION -A

UNIT 1

ECLS 1.1. Emergent conditions and magnitude, Concept of golden hour, Duties and responsibilities of first responder

ECLS 1.2. Ethical issues and Gather information from observation, experience and reasoning. Identification of rapidly changing situations and adapt accordingly. Planning and organization of work. Scene safety. Dealing with emotional reactions family members and bystanders

ECLS 1.3. Well-being of first responder Personal protection

1. Steps to be taken against airborne and blood-borne pathogens
2. Personal protective equipment necessary for each of the following situations: Hazardous materials Rescue Operations Violent Scenes Crime scenes
3. Electricity, Water and ice
4. Exposure to blood-borne pathogens Exposure to airborne pathogens

UNIT 2

ECLS 2.1. Airway

1. Signs of inadequate breathing
2. Mechanism of injury to opening the airway
3. Steps in the head-tilt chin-lift
4. Steps in the jaw thrust
5. Taking out foreign body
6. Ensuring patent airway during seizures and vomiting.

ECLS 2.2. Ventilation

1. Of a patient with a mask or barrier device
2. Steps in providing mouth-to-mouth and mouth-to-stoma ventilation

ECLS 2.3. Circulation

1. Evaluate the cardiac status of the patient
2. Determine the need for and take necessary action to proper circulation
3. Steps for control of bleeding: Pressure bandage and tourniquet

ECLS 2.4. Clearing a foreign body airway obstruction

ECLS 2.5. CPR

1. Implications of cardiac arrest
2. Cardiopulmonary resuscitation (CPR)
    i. How it works
    ii. Steps
    iii. When to stop CPR
3. Brief overview of AED Automated external defibrillator (only demonstration –no hands on)

SECTION -B

UNIT 3

ECLS 3.1. Bleeding and Soft Tissue Injuries

1. Difference between arterial and venous bleeding
2. Stopping external bleeding
3. Identification of Internal bleeding
4. types and Functions of dressings and bandages
5. How to help a victim of burn injury

ECLS 3.2. Injuries to Muscles and Bones

1. Suspecting bony/spinal injury
2. Splinting –materials used
3. Importance of splinting

UNIT 4

ECLS 4.1 Medical Emergencies

ECLS 4.2 Identification of the patient steps in providing first aid to a patient with

i. A general medical complaint –

ii. Seizures

iii. Chest-pain

iv. Shortness of breath

v. Exposure to heat

vi. Including other medical complaints like allergy, diarrhea, fainting, low blood sugar, stroke

vii. Drowning

viii. Poisoning

ECLS 4.3 Transportation Importance of timely and proper transportation methods of transportation of victim from site of injury to ambulance. Importance of spine protection methods of spine protection during transportation

ECLS 4.4 Disaster preparedness -. Preparedness and risk reduction Incident command and institutional mechanisms Resource management

Practicals

Student should practice on Mannequins and dummies and should be able to

ECLS (P) 5.1. Provide Airway & Ventilation

ECLS (P) 5.2. Perform Basic Life Support: CPR

ECLS (P) 5.3. Perform Initial management of Thermal injury, electric injury

ECLS (P) 5.4. Perform stabilizing injured extremity and wound management

ECLS (P) 5.5. Demonstrate bandaging techniques to various body parts

ECLS (P) 5.6. Demonstrate Extrication, Helmet removal and spine protection

ECLS (P) 5.7. Demonstrate Stretcher use

Recommended text books for ECLS

Indian red cross : INDIAN FIRST AID MANUAL 2016 (7th edition) available at https://www.indianredcross.org/publications/FA-manual.pdf

5.20.6. **Disaster Management:**

Course Title: Disaster Management (DM): Theory (L)

DM 1.0 Subject Description and instruction to teacher: The commission's goal is to emphasize the vital role physical therapists (physios) play in disaster management and contribute to national and global preparedness. To achieve this, it's essential to raise awareness among physiotherapists about national and international organizations and emphasize the crucial role physical therapists play in disaster management, particularly within Emergency Medical Teams. Also it may be noted that the acts, policies, gazettes are regularly updated, and its publications can change over time. The teachers and students should thus refer the recent publications issued on the official website

DM 1.0.1. Course Outcomes: After completion of this course the student shall be able to

1. Understand the crucial role physical therapists play in disaster management, particularly within Emergency Medical Teams.
2. Should be able to identify national and international organizations that play a vital role in disaster management
3. Should be able to identify the legal framework for disaster management in India and disaster prone areas.
4. Provide essential information to other physical therapists interested in disaster response work and to make them aware of national and international agencies already active in the field.
5. Promote global preparedness and support physical therapists in making a meaningful difference in disaster response and recovery efforts

Course Content: Disaster Management (DM): Theory (L)

DM 1.1. Definition of disaster and the hazards associated with disaster, Vulnerable groups in Disaster

DM 1.2. Definition of Advocacy, disability advocacy, Contingency planning wrt to disaster management, Hazard, Risk , Vulnerable groups

DM 1.3. History of involvement of Physiotherapists in rehabilitation efforts during emergencies

DM 1.4. National organisations who are involved in disaster preparedness and management strategies:

1. The legal framework for disaster management in India: Key takeaways of Disaster Management Act 2005, National Policy on Disaster Management 2009 and National Disaster Management Plan 2018
2. Different types of disasters managed in India, Epidemiologic surveillance and disease control, main goal of the National Disaster Management Authority, areas in India are most prone to disasters, Institutional structure for disaster management in India at various levels, Central Ministry that coordinates disaster management and leader of NDMA in India
3. Disaster Management Act of 2005 key take aways and its significance, Phases of Disaster management, Long term prevention measures, role of various stake holders in disaster management, role of community involvement in disaster management, challenges faced in disaster management in India
4. Prime minister's 10 point agenda and Community based and Technology driven approaches: Key policies and strategies

DM 1.5. International organisations who facilitate contributions of physiotherapists in disaster preparedness and management strategies. Role of physiotherapists in:

1. Disaster management within their own countries, benefits of rehabilitation provided following disasters
2. Prevention of a disaster
3. Preparedness for disaster with respect to essential locally appropriate preparedness for a disaster,
4. Identifying and connecting professional associations, health service providers and training institutions.
5. Developing international humanitarian response
6. Response to disaster: Required skills and knowledge and required actions and secure resources with respect to assessment, coordination, psycho-social support and advocacy
7. Recovery: with respect to planning of medical management and local capacity building and physiotherapy rehabilitation, advocacy

DM 1.6. The type and distribution of injuries caused by disasters, the type of hazards, common injuries that can lead to long-lasting or permanent disability.

DM 1.7. Clinical Practice in Response phase along with documentation (conservative and surgical), record management, data and research, informed consent and confidentiality, regulations and scope of practice, hand hygiene and infection control, communication, referral, discharge planning with respect to international management strategies.

DM 1.8. International Disaster Management Rehabilitation Response Plans and role of Physiotherapists with respect to: Systems in Place, Identifying Personnel, Facilities and Resources, Advocacy and Partnerships, Training and Capacity Building

DM 1.9. Elements to be considered "essential" components in any disaster education or training programme for health professionals as defined by Global Response Framework,

DM 1.10. The World Health Organization (WHO) : the lead UN agency in the health cluster and its emergency response framework and Humanitarian principles

Recommended websites for references: Disaster management

National Disaster Management Plan, 2016. A publication of the National Disaster Management Authority, Government of India. May 2016, New Delhi at www.mha.gov.in

www.wcpt.org/disaster-management.

5.20.7. **Exercise Physiology**

Details presented on next page

5.20.8. **Dissertation:**

Each candidate will have to carry out of a dissertation on Speciality related subject of MPT. Ethical approval certificate from **Registered Institutional Ethical committee** and Clinical Trial Registration is mandatory for intervetional Dissertation study topic. The dissertation to be guided by Guide of the speciality of faculty of physiotherapy of the department under whom the student is persuing MPT. The dissertation will be evaluated by the External/Internal Examiners. The final dissertation duly approved by the External/Internal examiners will be submitted to the Dean/Principals office with the result. The dean/ Principal's office will send the dissertation to the library for record.

5.20.9. **Practical / clinical examination**

Compulsary rotatory Clinical Posting as per the Speciality and Clinical Assessment during Clinical posting is mandatory .

2ND YEAR M.P.T

5.20.7. COURSE CODE -M.P.T-201

COURSE TITLE -EXERCISE PHYSIOLOGY (EP) Theory (L) Practical (P)

EP 1.0. Subject description Course outcomes

1. CO1: Comprehend the basic knowledge of sources of energy, aerobic and anaerobic synthesis of ATP along with the understanding of utilization of substrates in relation to the intensity and duration of exercise
2. CO2: Appreciate the measurement of energy cost of exercise and importance of energy transfer and energy expenditure at rest and during various physical activities
3. CO3: Understand the role of various macro and micro nutrients as well as their caloric requirements along with the basic classification, functions and utilization of nutrients.
4. CO4: Acquire about importance of diet for various competitions, nutrient supplements for performance and to design caloric requirements for various sports and age groups.
5. CO5: Critically evaluate the central and peripheral mechanism that regulates the cardiovascular and respiratory systems in exercise along with the physiological responses and adaptations of these systems to exercise and training.
6. CO6: Identify the regulation and significance of acid base balance following exercise CO7: Understand the responses of various hormones with respect to exercise

SECTION -A

EP 1.1. **Bioenergetics of exercise:** High energy phosphates, Anaerobic and aerobic ATP synthesis, Bioenergetics Control, exercise intensity & substrate utilization, protecting CHO stores, muscle adaptation to endurance training, processes that potentially limit the rate of fat oxidation, regulation of substrate utilization, training - induced increase in FFA oxidization:

EP 1.2. Basal metabolic and resting metabolic rates and factors affecting them, Classification of Physical Activities by energy expenditure. Concept of MET measurement of energy cost of exercise

EP 1.3. **Nutrition metabolism** of Carbohydrate, fats, proteins, vitamin, mineral and water

EP 1.4. **Nutrition in exercise** optimum nutrition for exercise, nutrition for physical performance, pre game meal carbohydrate loading, food for various athletic events, fluid and energy replacement in prolonged exercise

EP 1.5. **Respiratory responses to exercise:** Ventilation at Rest and during Exercise, Ventilation and the Anaerobic Threshold, static and dynamic lung volume. Gas diffusion, Oxygen and carbon dioxide transport second wind, stich by side control of pulmonary ventilation during exercise adaptive changes in the respiratory systems due to regular physical activities.

EP 1.6. **Cardiovascular responses to exercise-** Cardiovascular system and exercise, acute vascular effects of exercise, Circulatory responses to various types of exercise regulation of cardiovascular system during exercise, Pattern of redistribution of blood flow during exercise, adaptive responses of cardiovascular system to aerobic and anaerobic training. Athlete heart

EP 1.7. **Exercise and Acid Base Balance:** Acid and Bases, Buffers, pH, Respiratory Regulation of pH, Alkali Reserve, The kidneys and Acid base balance, Alkalosis and Acidosis, Acid base balance following heavy exercise.

EP 1.8. **Hormonal responses to exercise with respect to** Growth Hormone (GH), Thyroid and Parathyroid Hormones. Antidiuretic Hormone (ADH) and Aldosterone, Insulin and Glucagons, The catecholamine; epinephrine and norepinephrine. The sex hormones. The glucocorticoids (Cortisol) and Adreno Corticotropic Hormones (ACTH). Prostaglandins and Endorphins.

SECTION -B

EP 2.1. **Training and conditioning**

Physiological basis of physical training, training principles, interval training, continues running concept of anaerobic threshold and vo2 max, physiological effects of various physical training methods- aerobic and anaerobic training, strength training factors influencing training effects – intensity, frequency, duration, detraining, process of recovery, post exercise oxygen consumption factors affecting recovery process, overtraining

EP 2.2. **Body temperature regulation during exercise**

Mechanism of regulation of body temperature, Body temperature responses during exercise, Physiological responses to exercise in the heat, Acclimatization to exercise in the heat, Effects of age and gender on body temperature regulation during exercise, Physical activity and heat illness [heat exhaustion, dehydration exhaustion heat cramps & heat stroke] Prevention of Heat Disorders

EP 2.3. **Exercise in the Cold**

Effects of exposure to cold and severe cold, Wind chill, Temperature receptors, Role of hypothalamus, shivering, Frost Bite and other problems, Clothing and Environment

EP 2.4. Exercise at Altitude

Exercise at altitude immediate physiological responses at high altitude, physiological basis of altitude training, phases of altitude training and specific training effects, altitude acclimatization, oxygen dissociation curve at altitude, disorders associated with altitude training

EP 2.5. Exercise and body fluids

Measurement and regulation of body fluids, Body fluid responses and adaptations to exercise, Effects of dehydration and fluid replenishment on physiological responses to exercise and performance Fluid/carbohydrate replacement beverages

EP 2.6. Physical activity, body composition, energy balance and weight control

Significance and measurement of body composition, Body composition during growth and aging, Body composition and physical performance, Effect of diet and exercise on body composition, Physical activity, energy balance, nutrient balance and weight control, Physical activity, fat distribution and the metabolic syndrome , Healthy weight loss, Ways and methods of weight reduction , fluid maintenance, disordered eating, nutritional ergogenic aids, diet supplements in athletes and others involved in physical activity.

EP 2.7. Exercise and Diabetes Mellitus

Exercise in insulin, requiring diabetes and non-insulin dependent diabetes mellitus, Effect of physical training on glucose tolerance and insulin sensitivity, Management of diabetes by diet and insulin

Books suggested for EP

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

5.21. Specialty papers

COURSE CODE -M.P.T-104, M.P.T 202, & M.P.T-203

1) Master of Physiotherapy in Musculoskeletal Sciences

MPT (MS)104: Clinical, Physical and Functional diagnosis in Musculoskeletal Physiotherapy

MPT (MS) 202: Musculoskeletal Physiotherapy

MPT (MS) 203: Recent advances in Musculoskeletal Physiotherapy

COURSE CODE-M.P.T (MS)-104

COURSE TITLE **Clinical, Physical and Functional diagnosis in Musculoskeletal physiotherapy (MCPFD)**

MCPFD 1.0. Subject description

MCPFD 1.0.1. Course outcome students will be able to:

1. Elicit and interpret clinical signs and symptoms of diseases commonly seen in Orthopedics& interpret clinical tests and special investigations commonly used in the diagnosis of these conditions.
2. Generate a primary diagnosis and a list of differential diagnoses consistent with typical presentations.
3. Identify normal & pathological anatomy on diagnostic images.
4. Discuss how the serious and common disorders and the specialized areas of medical practice may impact on Orthopedic Physiotherapy practice.
5. Demonstrate a broad range of technical skill in diagnosing the Physiotherapy related Orthopedic conditions.
    a) Cardiac efficiency tests and spirometry
    b) Fitness test for sports
    c) Physical disability evaluation and disability diagnosis. Gait analysis and diagnosis.
    d) Coping Strategies in chronic painful musculoskeletal conditions. Checkouts of orthotics and prosthetics for neuro-musculoskeletal problems. Effect of Immobilization on Musculoskeletal System
    e) Application of ICF in Musculoskeletal diagnosis
    f) Medical screening for potential referred pain and Red Flags

Course Content: M.P.T (MS)-104

Part I

MCPFD 1.1. Clinical Decision Making - Planning Effective Treatment. Clinical decision making models, Team approach, Foundation for clinical decision making.

MCPFD 1.2. 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.

MCPFD 1.3. 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

MCPFD 1.4. 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.

i. 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

k. Spasm

l. Trigger Point

m. Tender Point

n. Spasm

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

MCPFD 1.5. Electro-Diagnosis:

i. Characteristics and components of Electro therapeutic stimulation systems and Electro physiological assessment devices.

ii. Instrumentation for neuromuscular electrical stimulation.

iii. Electrical properties of muscle and nerve.

iv. Neurobiology of afferent pain transmission and central nervous system mechanisms of pain modulation.

v. Electrical stimulation and circulation.

MCPFD 1.6. 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

MCPFD 1.7. Concepts of electro physiological studies in neuro muscular diseases as a diagnostic and therapeutic tool.

MCPFD 1.8. Evoked potentials – VEP, SSEP, MEP, BAEP

Part II

MCPFD 2.1. Psychological aspects of rehabilitation in disability: Psychological tests.

MCPFD 2.2. Developmental Screening

i. Factors Motor control assessment

ii. Motor control theories/mechanism

iii. Patterns of normal development

iv. specific procedures and tests used to assess motor control defects

MCPFD 2.3. Anthropometry

1. Body measurements - Height - Weight - Circumference
2. Body Proportion - Body Mass Index (BMI) - Waist Hip Ratio (WHR)

3. Body Composition

    i. Somatotyping

    ii. Methods of measurement

        a. Water displacement method for body fat.

        b. Skin fold measurement

        c. Under water weighing

        d. Bioelectric Impedance Analysis (BIA)

MCPFD 2.4. Differential diagnosis in Physiotherapy

MCPFD 2.5.

i. Functional evaluation.

a. The concepts of health status impairment; functional limitations;
b. Disability and Persons with Disabilities;
c. Definition of functional activity and the purposes and components of the functional assessment;
d. Selection of activity and roles for an individual based on his or her capabilities and functional limitations.

ii. Various forms of functional tests;

a. Physical function test
b. Multi-dimensional functional assessment instrument,
c. Identification of instrument for testing function.

iii. Various scoring methods used in functional assessment;

iv. Reliability and validity of various functional assessments.

MCPFD 2.6. Evaluation of aging

SPECIALITY PAPER 2 COURSE CODE-202

COURSE CODE-M.P.T (MS)-202

COURSE TITLE **Musculoskeletal physiotherapy (MSK)**

MSK 1.0. Subject description

MSK 1.0.1. Course outcome students will be able to:

1. Develop a management plan, generally including some lifestyle factors, in co-operation with the Clinical Supervisor and consider a prognosis that reflects on the patient's problem.
2. Manage a patient in consultation and co-operation with the clinical supervisor, identifying the presenting problem, developing a basic working diagnosis and selecting a treatment regime that considers the presenting problem with some consideration for ethical, practical and pragmatic concerns.
3. Maintain legal (accurate, clear and legible) patient histories, write basic referral letters and recognize the need of further referral in conference with Clinical Supervisor and peers.
4. Discuss the Common exercise prescriptions and their clinical use, and the sequence of treatment and how to advise different sorts of patients

SECTION -A

MSK 1.1. Advanced instruction in treatment and follow-up of the musculoskeletal system

MSK 1.2. Upper Quarter and Lower Quarter Muscle imbalances leading to dysfunction with corrective measures Exercise planning and Exercise Prescription for musculoskeletal conditions

MSK 1.3. Management of pathological gaits and Postural deviations

MSK 1.4. Orthopaedic implants - designs, materials indications, post – operative Physiotherapy

MSK 1.5. Manual therapy – Principles, indications, contraindications, and methods of application of joint mobilization techniques and soft tissue manipulations Cumulative Traumatic Disorders and management

MSK 1.6. Aids and appliances, adaptive functional devices to improve neuro-musculoskeletal dysfunctions Physiotherapy management of locomotor impairments, and disabilities at institutional & community levels

MSK 1.7. Taping techniques in orthopedic conditions Sports injuries and their management

SECTION- B

MSK 2.1. Physiotherapy management in Fractures, Joint Instabilities, Soft Tissue Disorders, Deformities, Nerve Injuries, Metabolic, Hormonal Conditions, Neoplastic, Infective Conditions of Bones and Joints of musculoskeletal system pertaining to upper quarter lower quarter and spine

MSK 2.2. Pre and Post surgical Rehabilitation of Joint replacement surgeries

MSK 2.3. Physiotherapy management after tendon transfer, Electrical stimulation and biofeedback procedures Assessment and management of Paediatric and geriatric musculoskeletal disorders

MSK 2.4. Physical Agents and Electrotherapeutic management in orthopedic conditions. Rehabilitation of congenital conditions and malformation of musculoskeletal disorders. Physiotherapy management in Amputation and Prosthetic Prescription.

MSK 2.5. Equipment in orthopedic Physiotherapy such as: Isokinetic, EMG and Biofeedback, Proprioception assessment equipments, Gait analyzers. Home and self-help programme in orthopedic Physiotherapy.

MSK 2.6. Disability prevention and management

SPECIALITY PAPER 3

COURSE CODE-M.P.T (MS) 203

Course Title: Recent advances and Evidence Based Practice in Musculoskeletal Physiotherapy (MRAEB)

MRAEB 1.0. Subject description

MRAEB 1.0.1. **Course outcome**

Students will be able to:

1. Understand and apply the information regarding recent advances in Orthopedic Manual Therapy for patient care.
2. Search the evidences available for assessment and management of orthopedic conditions.
3. Apply the evidences available for the management of various orthopedic conditions.

SECTION A:

MRAEB 1.1. Manual therapy: soft tissue manipulations and mobilization, neural mobilization, acupressure.(Cyriax, Maitland, Butler, McKenzie, Kaltenborn, Mulligan)

MRAEB 1.2. EBP and Recent advances in clinical assessment, laboratory investigations and diagnosis of musculoskeletal disorders. EBP in Management of pain in musculoskeletal disorders.

MRAEB 1.3. Recent Advances in management of orthopedic conditions- medical, surgical and Physiotherapy Recent Advances in Physiotherapy management in arthritis and allied conditions.

MRAEB 1.4. Recent Advances and Controversies in Electrotherapy for orthopedic conditions.

MRAEB 1.5. Assessment and training for Core, postural stability and balance in musculoskeletal conditions Recent advances in Kinematic & kinetic analysis.

MRAEB 1.6. Use of advance Assistive devices and technologies in musculoskeletal system Current trends in sports injuries and management.

MRAEB 1.7. Evidence Based Physiotherapy in management of metabolic and hormonal, neoplastic and infective conditions of bones and joints.

SECTION-B

MRAEB 2.1. Recent Advances in Physiotherapy following arthroplasty, implants and soft tissue repairs.

MRAEB 2.2. EBP and recent advances in Physiotherapy after tendon transfer, Electrical stimulation and biofeedback procedures. EBP in Rehabilitation of congenital conditions and malformation of musculoskeletal disorders.

MRAEB 2.3. Recent Advances in External aids, appliances, adaptive self-help devices; prescription, biomechanical compatibility, check- out and training. EBP and Recent advances in electro diagnosis, Electromyography, NCV and evoked potential studies.

MRAEB 2.4. Community based rehabilitation in musculoskeletal disorders. Recent Advances and Controversies in Orthopaedic physiotherapy. Ergonomics assessment and management at work place.

MRAEB 2.5. Evidence Based Practice and Recent Advances of Manual Therapy in Musculoskeletal Conditions Evidence based practice and recent advances of Aquatic therapy in Orthopaedic conditions.

Suggested reading

1. Jones, M. A., &Rivett, D. A. Clinical reasoning for manual therapists. Edinburgh: Butterworth Heinemann.
2. Eyal Lederman - Fundamentals of manual therapy.
3. Grieve's Modern manual therapy
4. Walter Herzog - Clinical Biomechanics of spinal manipulation
5. Sandy Fritz, Kathleen Paholsky and M.JanesGrosenbach - Basic Science for soft tissue and movement therapies.
6. Jean Sayne Adams, Steve Wright - Theory and practice of therapeutic touch.
7. AkhouryGourang Sinha – Principle and practice of therapeutic massage
8. Carol Manheim – The Myofascial release manual 3rd Edition
9. Maitland's – Peripheral manipulation
10. Maitland's – Vertebral manipulation
11. Chaitow – Cranial manipulation theory and practice
12. Lynn Paul Taylor – Taylor's manual of physical evaluation and treatment
13. Denise Deic – Positional release technique from a dynamic systems perspective.
14. Goodman and Snyder – Differential diagnosis in physical therapy
15. Tidy's Physiotherapy, Elsevier Publication.
16. Chaitow - Muscle energy technique
17. Reid et al – Sports injury assessment and rehabilitation.
18. Kjaer et al – Text book of sports medicine
19. Scudder Mc Can - Sports medicine, A comprehensive approach
20. Norris – Sports injuries, diagnosis and management for physiotherapists.
21. Werner Kuprian – Physical therapy for sports.
22. McGinnis – Biomechanics of sports and exercises.
23. Chew, F. Skeletal radiology: The bare bones. Baltimore, MD: Williams & Wilkins.
24. Eisenberg, R. L., & Johnson, N. M. Comprehensive radiographic pathology St Louis, MO: Mosby.
25. Hughes, J., & Hughes, M.. Imaging: Picture tests. Edinburgh: Churchill Livingstone.
26. Mace, J. D., & Kowalczyk, N. Radiographic pathology for technologists. St Louis, MO: Mosby.
27. Redhead, D. N. Imaging: Colour guide. Edinburgh: Churchill Livingstone.

28. Yochum, T. R., & Rowe, L. R. Yochum and Rowe's essentials of skeletal radiology. Baltimore, MD: Lippincott Williams & Wilkins.
29. Gunn, C. Bones and joints: A guide for students. London: Churchill Livingstone.
30. Haines, D. E. Fundamental neuroscience W. B. Saunders Co.
31. Kandel, E. R., Schwartz, J. H., & Jessell, T. M. Principles of neural science McGraw-Hill.
32. Longmore, J., Wilkinson, I., & Rajagopalan, S. Oxford handbook of clinical medicine Oxford: OUP.
33. Newman D4o4r5land, W. A. Dorland's illustrated medical dictionary W. B. Saunders Co.
34. Nolte, J. The human brain: An introduction to its functional anatomy. St Louis, MO: Mosby.
35. Nolte, J., & Angevine, Jr. J. B. The human brain in photographs and diagrams. St Louis, Mosby.
36. Wicke, L. Atlas of radiologic anatomy, Munich, Germany: Lea &Febiger.
37. Seidel, H. Mosby's guide to physical examination. St Louis, MO: C.V. Mosby.
38. Cailliet, R. Neck and arm pain Philadelphia: FA Davis.
39. Cailliet, R. Shoulder pain Philadelphia: FA Davis.
40. Cailliet, R. Knee pain and disability Philadelphia: FA Davis.
41. Cailliet, R. Hand pain and impairment Philadelphia: FA Davis.
42. Cailliet, R. Low back pain syndrome Philadelphia: FA Davis.
43. Cailliet, R. Soft tissue pain and disability Philadelphia: FA Davis.
44. Chaitow, L. Cranial manipulation: Theory and practice Edinburgh: Churchill Livingstone.
45. Greenman, P. E. Principles of manual medicine. Philadelphia: Lippincott Williams & Wilkins.
46. Wilson, A. Effective management of musculoskeletal injury: A clinical ergonomics approach to prevention. Churchill Livingstone.
47. O'Sullivan, F.A. Davis, Philadelphia. Physical rehabilitation: assessment and treatment.
48. Victor H. Frankel and Mangareta Nordin Basic Biomechanics of the Musculoskeletal system 2nd Edition
49. Essentials of Orthopedics for physiotherapists by John Ebenezer – Jaypee Publications
50. Practical Fracture Treatment by Ronald Mc Rae, Max Esser – Churchill Livingstone
51. Oxford Textbook of Orthopedics & Trauma – Christopher Bulstrode, Joseph Buckwalter, Oxford University Press
52. Fractures & Joint Injuries – By Watson Jones – Churchill Livingstone
53. Measurement in Physical Therapy – Churchill Livingstone, London

54. Soft Tissue Pain & Disability – Cailliet Rene, Jaypee Brothers, New Delhi
55. Physical therapy of the low back –Twomey, Churchill, Livingstone, London
56. Clinical Orthopaedic Examination by Ronald McRae – Churchill Livingstone
57. Campbell's operative orthopedics – By S. Terry Can ale, James H. Beaty – Mosby
58. Orthopedic Physical Assessment, By David J. Magee – Saunders
59. Diagnostic Imaging for Physical Therapists – by James Swain, Kenneth W. Bush & Juliette Brosing – Elsevier
60. Differential Diagnosis For Physical Therapists: Screening for Referral – by Catherine C. Goodman & Teresa Kelly Snyder – Saunders
61. Lynn Paul Taylor – Taylor's manual of physical evaluation and treatment
62. Goodman and Snyder – Differential diagnosis in physical therapy.
63. Leon Chaitow, and Judith Walker Delany - Clinical application on neuromuscular techniques: Vol-2 (The lower body).

2) Master of Physiotherapy in NeuroSciences

SPECIALITY PAPER ONE

COURSE CODE-MPT-104

1. **MPT(N) 104: Clinical, Physical and Functional diagnosis in Neuro-Physiotherapy (NCPFD)**
2. **MPT (N) 202: Neurological Physiotherapy (NPT)**
3. **MPT (N) 203: Recent advances and Evidence Based Practice in Neuro-Physiotherapy (NRAEB)**

Course Title: MPT(N) 104: **Clinical, Physical and Functional diagnosis in Neuro-Physiotherapy** (NCPFD)

NCPFD 1.0. Course description

NCPFD 1.0.1. Course outcome

On successful completion of this unit, it is expected that students will be able to:

1. Elicit and interpret clinical signs and symptoms of diseases commonly seen in Neurology medicine & interpret clinical tests and special investigations commonly used in the diagnosis of these conditions.
2. Generate a primary physical diagnosis and a list of differential diagnoses consistent with typical presentations.
3. Identify normal & pathological anatomy on diagnostic images.
4. Discuss how the serious and common disorders and the specialized areas of medical practice may impact on Neurological physiotherapy practice.
5. Demonstrate a broad range of technical skill in diagnosing the physiotherapy related neurology conditions.

SECTION- A

NCPFD 1.1. ICF conceptual frame work

NCPFD 1.2. Importance of assessment & evaluation, Outlines of principles and Methods of evaluation

NCPFD 1.3. Need and types of Documentation

NCPFD 1.4. Critical decision making and selection of outcome measures in Musculoskeletal Physiotherapy

NCPFD 1.5. Assessment, differential diagnosis and diagnosis of various Neurology conditions

NCPFD 1.6. Associated functional disturbances of higher function and their testing

NCPFD 1.7. Outcome measures used in Neuro-physiotherapy-for Cognitive impairment and disability, Focal disabilities, Global measures of disability, Motor impairment, ADL and extended ADL tests, Person with Disabilities and quality of life, Multiple Sclerosis, Parkinson's disease, Stroke, Head injury, Spinal cord injury, Pain scales

NCPFD 1.8. Clinical analysis of posture, movement and gait, use of gait analyzer

NCPFD 1.9. Principles, Techniques and interpretation of Pathological investigations and diagnostic imaging (CT, MRI, Ultra sound, PET, fMRI, bone scan and other diagnostic imaging) for diagnosis of neurological conditions.

NCPFD 1.10. Clinical examination and detection of movement dysfunction

NCPFD 1.11. Evaluation of ANS dysfunction with reference to Psycho physiological testing

NCPFD 1.12. Motor control assessment, reflexes and automatic reactions

NCPFD 1.13. Neurodevelopment assessment

SECTION- B

NCPFD 2.1. Assessment of Hand Function

NCPFD 2.2. Voluntary control assessment

NCPFD 2.3. Neuropsychological tests

NCPFD 2.4. Electrophysiological assessment devices – Instrumentation, Characteristics and components EMG (Qualitative and Quantitative EMG), NCV, Conventional Methods, RNS, EPS, EEG related to neurological disorders with interpretation.

NCPFD 2.5. Physical disability evaluation and disability diagnosis

NCPFD 2.6. Assessment of progressive locomotor disorder- Neuropathic, myopathic and NMJ conditions

NCPFD 2.7. Assessment and scales for diagnosis of pain

NCPFD 2.8. Biomarkers specific to neurological disorders

NCPFD 2.9. Assessment of Emotional Intelligence

NCPFD 2.10. Assessment of Peripheral nerve injuries and Cranial nerve disorders.

NCPFD 2.11. Neurophysiology and evaluation of Balance and Coordination

NCPFD 2.12. Assessment of Physical and Neurological Functions of Patients in ICU.

SPECIALITY PAPER TWO COURSE CODE: MPT (N)-202

MPT (N) 202: **Neurological Physiotherapy** (NPT)

NPT 1.0. Course Description

NPT 1.0.1. Course outcome

1. Develop a management plan, generally including some lifestyle factors, in cooperation with the Clinical Supervisor and consider a prognosis that reflects on the patient's problem.
2. Manage a patient in consultation and co-operation with the clinical supervisor, identifying the presenting problem, developing a basic working diagnosis and selecting a treatment regime that considers the presenting problem with consideration for ethical, practical and pragmatic concerns.
3. Maintain legal (accurate, clear and legible) patient histories, write basic referral letters and recognize the need of further referral in conference with Clinical Supervisor and peers.
4. Discuss the Common exercise prescriptions and their clinical use, and the sequence of treatment and how to advise different sorts of patients.

SECTION- A

NPT 1.1. History of neurological Physiotherapy, Epidemiology, classification of Neurology disorders, ICF classification of Neurological Disorders, symptomatology, patho-physiology and management of Neurological Disorders.

NPT 1.2. Physiotherapy interventions of various disorders of Central Motor control

NPT 1.3. Physiotherapy interventions of various disorders of the Motor Unit – Neuropathies, Myopathies and Neuromuscular Junction Disorders.

NPT 1.4. Physiotherapy interventions for Autonomic Nervous system dysfunction

NPT 1.5. Physiotherapy intervention for Peripheral Nervous system conditions (injuries and lesions)

NPT 1.6. Physiotherapy interventions for Tonal abnormalities.

NPT 1.7. Physiotherapy intervention for Traumatic conditions of CNS

NPT 1.8. Physiotherapy management for Demyelinating, Inflammatory, Infectious and Degenerative conditions.

NPT 1.9. Physiotherapy management for CNS Neoplasia.

NPT 1.10. Metabolic and Deficiency Disorders and their management

NPT 1.11. Congenital Neurological Disorders and management

NPT 1.12. Disorders of Perception & Cognition & their Rehabilitation,

NPT 1.13. Sensory System Dysfunction and rehabilitation

NPT 1.14. Oromotor Dysfunctions and Management

NPT 1.15. Visual Deficits and its management.

SECTION- B

NPT 2.1. Vestibular Dysfunction and its rehabilitation

NPT 2.2. Psychosomatic conditions and management.

NPT 2.3. Neuro - Surgical conditions and its postoperative management.

NPT 2.4. Neuro-Physiotherapy management in Intensive Care Units (ICU).

NPT 2.5. Physiotherapy interventions for muscle imbalances and corrective measures. Musculo-skeletal and Neurological complications of Locomotor Disorders

NPT 2.6. Pain Management

NPT 2.7. Adaptive and Assistive Functional Devices and technologies to improve neurological dysfunction.

NPT 2.8. Management of Bladder and Bowel Dysfunction

NPT 2.9. Neuro-physiotherapeutic approaches – Compensatory training approach, Muscle reeducation approach, Novel Approach, Neuro-physiological approaches - NDT, Brunnstrom, Roods, PNF, Sensory integration therapy. Motor relearning program, Constraint Induced movement therapy, Task Oriented approach, Novel approach, Vojta therapy**.** Biofeedback training, Neural mobilization and Neuro Dynamics, Sensory rehabilitation, Body Weight Supported Treadmill Training, Myofacial Release Technique, Inhibitory and Facilitation technique, Functional Re-Education, Learning skills, A.D.L, Tapping in neurological conditions.

NPT 2.10. FES, NMES, Biofeedback, Various equipment used in Neuro-physiotherapy

NPT 2.11. Problem Based Learning clinical conditions in Neurology physiotherapy.

NPT 2.12. Pharmacology in Neurophysiotherapy.

NPT 2.13. Training of Emotional Intelligence.

NPT 2.14. Hydrotherapy for Neurological conditions.

NPT 2.15. Palliative Care Approach.

NPT 2.16. Physiotherapy Management of Cerebellar Disorders.

SPECIALITY PAPER -THREE COURSE CODE: MPT (N)-203

MPT (N) 203: **Recent advances and Evidence Based Practice in Neuro-Physiotherapy** (NRAEB)

NRAEB 1.0.1. Course outcome

1. Understand and apply the information regarding recent advances in Neuro Physiotherapy for patient care.
2. Search the evidences available for assessment and management of neurological conditions.
3. Apply the evidences available for the management of various neurological conditions

SECTION- A

NRAEB 1.1. Basics of Genetic counseling, Stem cell therapy, Gene therapy

NRAEB 1.2. Recent advances in Pain Modulation and Rehabilitation.

NRAEB 1.3. Recent advances in Vocational Rehabilitation in Neurology Disorders with disability

NRAEB 1.4. Recent advancement in Neurology Orthosis – prescription and training.

NRAEB 1.5. Psychiatry problems in Neurological conditions and Physiotherapy (BAT, CBT). Psychological aspects of adaptation during various aspects of neurological disabilities

NRAEB 1.6. Institutional & community-based rehabilitation for Neurological Dysfunction**.**

NRAEB 1.7. Recent Neuro Physiotherapy technique - Mental Imagery technique, Virtual Reality Therapy/Virtual Clinic, Robotic Movement Therapy, Pilates therapy, Mirror Box therapy, Mime therapy, Floatation Therapy, Cupping Therapy, Jadestone Therapy, Matrix Rhythm Therapy, IASTM and Dry needling, CranioSacral therapy, Neurodynamics in Neurological conditions and Neural Mobilization, Hippo-therapy, Transcranial Direct Current Stimulation, Transcranial Magnetic Stimulation, Artificial Intelligence, Whole Body Vibrator and Neuromuscular Technique

NRAEB 1.8. Eclectic Approach.

SECTION- B

NRAEB 2.1. History of Evidence Based Practice in Neurological Physiotherapy, Clinical Decision Making, importance of Evidence Based Practice, Evidence about prognosis, experience and diagnosis, locating evidences, challenges and barriers in EBP.

NRAEB 2.2. Evidences in interventions for Neurological Impairments (Sensory, Motor, Cognitive and Perceptual)

NRAEB 2.3. Evidences for Physiotherapy in Traumatic CNS conditions

NRAEB 2.4. Evidences in Physiotherapy management of Stroke, Cerebellar Ataxia.

NRAEB 2.5. Evidences in Physiotherapy management of Peripheral Nerve Injuries

NRAEB 2.6. Evidences in Physiotherapy management of Parkinson's Disease

NRAEB 2.7. Evidences in Physiotherapy management of Myopathies, Neuropathies and NMJ Disorders

NRAEB 2.8. Sports training in Neurological Physiotherapy.

NRAEB 2.9. Tele rehabilitation in Neurological Physiotherapy

Books for Masters in Neurosciences

For paper III, IV, V.

1. American Psychological Association. Publication manual of the American Psychological Association. Washington, DC: Author.
2. Chichester, UK: John Wiley. Domholdt, E. Physical therapy research: Principles and applications, WB Saunders, Philadelphia, USA.
3. Kuzma, J. W., & Bohnenblust, S. E. Basic statistics for the health sciences. Boston: McGraw Hill.
4. Munro, B. H. Statistical methods for Healthcare research. Philadelphia: Lippincott.
5. Coakes, S. J., & Steed, L. G. SPSS: Analysis without anguish: Version 11.0 for Windows. Milton, Australia: John Wiley & Sons Inc. Jenkins, S., Price CJ, &Straker L.
6. The researching therapist. A practical guide to planning, performing and communicating research. Edinburgh: Churchill Livingstone.
7. Campbell, M.J., &Machin, D. Medical statistics: A commonsense approach. Chichester, UK: John Wiley.
8. Domholdt, E. Physical therapy research: Principles and applications. Philadelphia: WB Saunders.
9. Gowitzke,Williams and Wilkins.Scientific Basis of Human Movement .Baltimore..
10. Handbook of Physiology in Aging- Masoro, C.R.C. Press.
11. Hicks C:Research of Physiotherapists. Chrchhill Living stone, Edingburgh
12. Polgar S.: Introduction to Research in Health Sciences. Livingstone London.
13. Currier D.P: Elements of Research Physical Therapy. Williams & Wilkins, Baltimore.
14. Sproull: Hand Book of Research method. Scarecrow Press
15. Wilenski, Hale &Iremonger: Public Power and Administration.
16. Hickik Robert J: Physical Therapy Administration and management.
17. Nosse Lorry J: Management Principles for Physiotherapists.
18. Carpenter M.B: Human Neuroanatomy. Williams & Wilkins, Baltimore, n
19. Fraser: Physical Management of Multiple Handicapped. William & Wilkins, Baltimore

20. Aisen: Orthotics in neurological rehabilitation. Demos Publication, New York
21. Delisa: Manual of nerve conduction velocity techniques. Raven press, New York,
22. Kimura J, F.A Davis: Electrodiagnosis in diseases of nerve and muscle. Philadelphia ,
23. O' Sullivan, F. A Davis: Physical rehabilitation: Assessment and treatment. Philadelphia ,
24. Farber: Neuro – rehabilitation. W.B. Saimders , Philadelphia
25. Kerb D: Bio- Feedback – A practitioners guide. Guiford press.
26. Black I: The neural basis of motor control. Churchill, Livingstone, London -
27. Turnbull Gerode I: Physical therapy management of Parkinson's disease. Churchill, Livingstone, Londo -
28. Bobath B: Abnormal postural reflex activity caused by Brain Lesions. Aspen publications, Rockville
29. Eagel: Disord4e5r5s of Voluntary Muscle. Churchill, Living stone Edingburgh
30. Knot M. and Voss: Proprioception, neuro muscular facilitation techniques. Harper and Row, New York
31. Laidler, Capman and Hall: Stroke rehabilitation. London
32. Carr J.H, Shephered R.B: Motor relearning programme for stroke. Aspen publication, Rock Ville,
33. Bobath B. Heinmann: Adult hemiplegia evaluation and treatment: London
34. Brombley: Paraplegia and tetraplegia. Churchill, Livingstone, Edingburgh
35. Measurement in Physical therapy – Churchill, Livingstone, London
36. Maria stokes: Physical management neurological rehabilitation, Elsevier, Mosby.
37. Misra U.K, Kalita J: Clinical Neurophysiology NCV, EMG, Evoked Potentials, Elsevier, New Delhi,
38. Joel A Delisa, Gans B.M: Rehabilitation medicine principles and practice, revan, Philadelphia, New York,
39. Robert Gunzbng, MarekSzpalski: Whiplash Injuries, current concepts in prevention diagnosis and treatment, Lippincot Williams & wilkins.
40. Krusen's: Hand book of physical rehabilitation, kottke, lehmann, Saunder's Publications,
41. Ropper A.H, Brown R.H: Adam and victors principle of neurology, Mcgraw – hill companies USA
42. Richard S. Snell: Clinical Neuroanatomy for medical students, Lippincott Williams &wilkins
43. Martha Freeman Somers: Spinal cord injury functional rehabilitation
44. David S Butler: Mobilisation of the nervous system Churchill Livingstone, New York.
45. Darcy A. Umphred: Neurological rehabilitation, Mosby, Sydney,

46. Kenneth W. Lindsay, Ian Bone: Neurology & Neurosurgery illustrated,

47. M Flint Beal, Anthony.E. Lang, Albert Ludolph: Neurodegenerative Diseases, Cambridge University Publication, USA

48. Jose I. Suarez : Critical Care Neurology and Neurosurgery, HUMANA PRESS PUBLICATIONS,USA.

49. David R. Lynch : Neurogenetics-Scientific& Clinical Advances,Taylor& Francis Group Publication New York

50. Asbury, Mckann, Medonald: Diseases of Nervous System- Vol. I and Vol. II, Mcarthur public, 3rd edition.