

GURU KASHI UNIVERSITY



Master of Physiotherapy (M.P.T.)

in NeuroSciences

Session: 2026-27

Faculty of Allied and Healthcare

PROGRAMME LEARNING OUTCOMES

Master of Physiotherapy (M.P.T)

A Postgraduate Degree in Physiotherapy is awarded to students who have demonstrated advanced competency-based learning outcomes corresponding to Level 6.5/7 of the National Higher Education Qualification Framework and NCAHP curriculum.

Element of the Descriptor	Programme Learning Outcomes relating to M.P.T
Knowledge and understanding	The graduates shall acquire advanced theoretical and clinical knowledge in their respective specialty areas, research methodology, evidence-based practice, advanced diagnostics, rehabilitation sciences, healthcare management, and contemporary physiotherapy interventions.
General, technical and professional skills required to perform and accomplish tasks	The graduates shall demonstrate advanced competency in specialized clinical assessment, rehabilitation planning, evidence-based intervention, critical clinical reasoning, teaching-learning methodologies, research implementation, healthcare leadership, and interdisciplinary collaboration.
Application of knowledge and skills	The graduates shall independently apply advanced physiotherapy knowledge and clinical expertise in specialty practice, rehabilitation research, patient management, academic training, and healthcare administration.
Generic learning outcomes	The graduates shall demonstrate advanced communication skills, leadership, mentorship, research aptitude, ethical professionalism, lifelong learning attitude, critical thinking, and innovation in healthcare practice.
Constitutional, humanistic, ethical, and moral values	The graduates shall practice with integrity, social accountability, professional ethics, inclusiveness, patient advocacy, empathy, and respect for human rights and dignity.

Employability and job-ready skills, and entrepreneurship skills and capabilities/qualities and mindset	The graduates shall develop advanced employability skills for clinical specialization, teaching, research, healthcare management, consultancy, entrepreneurship, and independent specialty practice.
Credit requirements	Successful completion of prescribed theory credits, clinical training, dissertation work, competency-based assessments, specialty practical examinations, and university evaluation requirements.
Entry requirements	Candidates possessing Bachelor of Physiotherapy (BPT) degree from a recognized institution and fulfilling eligibility requirements prescribed by the university/NCAHP guidelines.

**SCHEME OF STUDY: MASTER OF PHYSIOTHERAPY (M.P.T.) in
NeuroSciences (M.P.T(N))**

First Year M.P.T Examination Scheme

Component	Learning Outcomes
Advanced Knowledge	Acquire advanced knowledge in neuroanatomy, neurophysiology, neurological rehabilitation, motor control, neuroplasticity, and neurotherapeutic approaches.
Clinical Competency	Demonstrate competency in neurological assessment, balance evaluation, gait analysis, motor function assessment, and neuro-rehabilitation planning.
Research Competency	Apply evidence-based neurophysiotherapy principles and research methodology in neurological rehabilitation.
Professional Attributes	Demonstrate communication skills, ethical conduct, teamwork, leadership, and patient-centered neurological care.

S. No	Course Code	Course Title	L	T	P	No. of Credits	Internal Examination		External Examination		Total Marks
							Theory	Practical	Theory	Practical	
1.	M.P.T(N)-101	Laws, Ethics, Administration & Educational Methodology (LEM)	6	0	0	6	50*	-	100	-	100
2.	M.P.T(N)-102	Research methodology and biostatistics, EBP (RMB)	6	0	0	6	50*	-	100	-	100
3.	M.P.T(N)-103	Biomechanics & Therapeutics (BCT)	6	0	0	6	50*	-	100	-	100
4.	M.P.T(N)-	Clinical,	8	0	8	12	50*	50*	100	-	100

	104	Physical and Functional diagnosis in Neuro-Physiotherapy (NCPFD)									
5.	M.P.T(N)-105	Skills Acquisition & Refinement (SAR-I)	0	0	16	8	-	50*	Non Creditable Marks		
6.	M.P.T(N)-106	Clinical Training (CT-I)	0	0	46	23	-	50*	Non Creditable Marks		
7.	M.P.T(N)-107	Dissertation (DSS-I)	0	0	6	3	-	50*	Non Creditable Marks		
	Grand Total		26	0	76	64	-	-	400		400

* Non Creditable Marks

The practical competencies of M.P.T(N)-104, shall be assessed through the Comprehensive Final University Practical Examination conducted at the end of the programme as prescribed by NCAHP.

Second Year M.P.T Examination Scheme

Component	Learning Outcomes
Advanced Specialty Practice	Demonstrate advanced expertise in neuro-rehabilitation, functional recovery techniques, task-oriented training, balance rehabilitation, gait retraining, and advanced neurological physiotherapy interventions.
Clinical Decision Making	Apply advanced clinical reasoning and independent rehabilitation planning for neurological conditions.
Research and Innovation	Conduct dissertation research and critically appraise current evidence in neurophysiotherapy practice.
Professional Development	Demonstrate leadership, mentorship, teaching competency, and professional accountability in neurophysiotherapy practice.

S.N o.	Course Code	Course Title	L	T	P	No. of Credits	Internal Examination		External Examination		Total Marks
							Theory	Practical	Theory	Practical	
1.	M.P.T(N)-201	Exercise Physiology (EP)	6	0	0	6	50*	-	100	-	100
2.	M.P.T(N)-202	Neurological Physiotherapy (NPT)	8	0	8	12	50*	50*	100	-	100
3.	M.P.T(N)-203	Recent advances and Evidence Based Practice in Neuro-Physiotherapy (NRAEB)	8	0	8	12	50*	50*	100	-	100
4.	M.P.T(N)	Dissertation	0	0	44	22	-	50*	-	-	-

	-204	(DSS-II)									
5.	M.P.T(N) -205	Skills Acquisition & Refinement (SAR-II)	0	0	16	8	-	50*	Non Creditable Marks		
6.	M.P.T(N) -206	Clinical Training (CT-II)	0	0	40	20	-	50*	Non Creditable Marks		
	Practical										
7.	Long case=1	M.P.T(N)-104								150	150
		M.P.T(N)-202									
8.	Short case=2	M.P.T(N)-203								150	150
		M.P.T(N)-204									
9.	OSCE/O SPE									100	100
10.	Dissertation									50	50
	Grand Total		22	0	116	80	-	-	300	450	750

The practical competencies of M.P.T(N)-104, M.P.T(N)-202, M.P.T(N)-203 and M.P.T(N)-204 shall be assessed through the Comprehensive Final University Practical Examination conducted at the end of the programme as prescribed by NCAHP.

First Year**COURSE CODE: M.P.T(N)-101****COURSE TITLE: Laws, Ethics, Administration & Educational Methodology-Theory****Credits: 6****Total Hours: 90****LEM 1.0 Subject Description**

This course is designed to provide postgraduate physiotherapy students with comprehensive knowledge of professional ethics, legal responsibilities, healthcare administration, educational methodology, and entrepreneurship relevant to advanced physiotherapy practice. The course emphasizes ethical decision-making, professional conduct, research ethics, institutional governance, healthcare management principles, quality assurance, communication skills, and educational strategies required for clinical teaching and leadership roles. It also develops competencies in curriculum planning, adult learning principles, assessment strategies, and administration of physiotherapy services. The course prepares students to function effectively as clinicians, educators, researchers, managers, and healthcare leaders while adhering to legal and ethical standards prescribed by national and international regulatory bodies.

LEM 1.0.1 Course Outcomes

At the completion of the course, the student will be able to:

1. Explain the historical evolution and principles of ethics applicable to healthcare professions. (K)
2. Demonstrate understanding of professional conduct and ethical responsibilities in physiotherapy practice. (KH)
3. Apply ethical principles in clinical practice, research, education, and administration. (P)

4. Discuss national and international ethical guidelines governing healthcare research. (KH)
5. Analyze informed consent procedures and ethical issues in vulnerable populations. (KH)
6. Explain the structure and functions of Institutional Ethics Committees. (K)
7. Evaluate ethical challenges and conflict-of-interest situations in professional practice. (KH)
8. Apply principles of healthcare management and administration to physiotherapy services. (P)
9. Demonstrate effective communication and leadership skills in healthcare settings. (SH)
10. Develop teaching-learning plans using contemporary educational methodologies. (P)
11. Formulate learning outcomes and assessment strategies for physiotherapy education. (P)
12. Explore entrepreneurship opportunities and professional development pathways in physiotherapy. (KH)

Competency Levels:

K – Knows

KH – Knows How

SH – Shows How

P – Performs Independently

LEM 1.0.2 Teaching Learning Methods

1. Interactive Lectures
2. Seminars
3. Group Discussions
4. Problem-Based Learning
5. Case-Based Learning
6. Self-Directed Learning
7. Journal Club Activities
8. Workshops
9. Role Play
10. Reflective Learning Exercises
11. Educational Technology Demonstrations
12. Assignments and Presentations

LEM 1.0.3 Assessment Methods

1. Multiple Choice Questions (MCQs)
2. Short Answer Questions

3. Long Answer Questions
4. Case-Based Discussions
5. Seminar Presentations
6. Assignments
7. Reflective Reports
8. Viva Voce
9. End Semester Examination

Unit I: Ethics and Professional Practice

Total Hours: 18

LEM 1.1 History and evolution of ethics

LEM 1.2 Helsinki Declaration and Nuremberg Code

LEM 1.3 Principles of ethics:

- Autonomy
- Beneficence
- Non-maleficence
- Justice

LEM 1.4 Professionalism in healthcare

LEM 1.5 Ethics in physiotherapy practice

LEM 1.6 Privacy, confidentiality and patient rights

LEM 1.7 Shared decision-making and informed consent

LEM 1.8 Equality, equity and justice in healthcare

Unit II: Research Ethics and Legal Framework

Total Hours: 18

LEM 2.1 ICMR ethical guidelines

LEM 2.2 Responsible conduct of research

LEM 2.3 Risk-benefit assessment

LEM 2.4 Informed consent process

LEM 2.5 Components of informed consent documentation

LEM 2.6 Special situations and proxy consent

LEM 2.7 Institutional Ethics Committee:

- Constitution
- Functions
- Review process

LEM 2.8 Research involving vulnerable populations

LEM 2.9 Conflict of interest:

- Definition
- Types
- Identification
- Management

LEM 2.10 Publication ethics and plagiarism

LEM 2.11 Authorship guidelines (ICMJE)

LEM 2.12 NCAHP Act

LEM 2.13 Consumer Protection Act

LEM 2.14 Rights of Persons with Disabilities Act

Unit III: Healthcare Administration and Management

Total Hours: 18

LEM 3.1 Principles of management

LEM 3.2 Healthcare administration

LEM 3.3 Planning and strategic management

LEM 3.4 Organizing and staffing

LEM 3.5 Financial management

LEM 3.6 Marketing of healthcare services

LEM 3.7 Leadership and supervision

LEM 3.8 Monitoring and controlling

LEM 3.9 Quality assurance in healthcare

LEM 3.10 Total Quality Management

LEM 3.11 Medical audit

LEM 3.12 Accreditation systems

LEM 3.13 International quality standards

LEM 3.14 Establishment and management of physiotherapy services

Unit IV: Communication and Educational Methodology

Total Hours: 18

LEM 4.1 Communication process

LEM 4.2 Types of communication

LEM 4.3 Written versus oral communication

LEM 4.4 Barriers to communication

LEM 4.5 Principles of effective communication

LEM 4.6 Education: concept, aims and objectives

LEM 4.7 Formal and informal education

LEM 4.8 Educational philosophies

LEM 4.9 Taxonomy of educational objectives

LEM 4.10 Adult learning theories

LEM 4.11 Learning styles and motivation

LEM 4.12 Teaching-learning process

LEM 4.13 Clinical teaching methods

LEM 4.14 Lesson planning and unit planning

LEM 4.15 Educational technology

LEM 4.16 Teaching aids

Unit V: Curriculum Planning and Entrepreneurship

Total Hours: 18

LEM 5.1 Intended Learning Outcomes

LEM 5.2 Tyler's Principles

LEM 5.3 Bloom's Taxonomy

LEM 5.4 Miller's Pyramid

LEM 5.5 Clinical Competence Framework

LEM 5.6 Dreyfus Model of Skill Acquisition

LEM 5.7 Assessment and evaluation methods

LEM 5.8 Curriculum planning

LEM 5.9 Programme evaluation

LEM 5.10 Entrepreneurship in physiotherapy

LEM 5.11 Opportunities in private practice

LEM 5.12 Healthcare consultancy

LEM 5.13 Startup development in rehabilitation services

LEM 5.14 Professional leadership and future trends

Recommended Books

1. Swisher LL, Page CG. Professionalism in Physical Therapy.
2. Purtilo RB, Jensen GM. Ethical Dimensions in Rehabilitation.
3. APTA Guide to Professional Conduct.
4. Basavanthappa BT. Nursing Administration.
5. Gupta SC. Fundamentals of Management.
6. Suresh K Sharma. Educational Technology and Teaching Strategies.
7. ICMR National Ethical Guidelines for Biomedical and Health Research.
8. NCAHP Act and Associated Regulations.
9. Consumer Protection Act of India.
10. UNESCO Handbook on Higher Education Teaching and Learning.

COURSE CODE: M.P.T(N)-102

COURSE TITLE: Research Methodology, Biostatistics & EBP-Theory

Credits: 6

Total Hours: 90

RMB 1.0 Subject Description

This course is designed to develop advanced competencies in research methodology, biostatistics, scientific inquiry, evidence-based practice, and

scholarly communication. It enables postgraduate physiotherapy students to formulate research questions, design appropriate research methodologies, critically appraise scientific literature, analyze quantitative and qualitative data, interpret statistical findings, and translate research evidence into clinical practice. The course also focuses on scientific writing, publication ethics, thesis preparation, and dissemination of research findings. The knowledge and skills acquired through this course will facilitate evidence-informed clinical decision-making and contribute to the advancement of physiotherapy practice and research.

RMB 1.0.1 Course Outcomes

At the completion of the course, the student will be able to:

1. Explain the principles and processes of scientific research. (K)
2. Formulate clinically relevant research questions and hypotheses. (KH)
3. Differentiate qualitative and quantitative research methodologies. (KH)
4. Select appropriate study designs for research problems. (P)
5. Apply principles of sampling and sample size estimation. (P)
6. Evaluate reliability, validity, responsiveness, and outcome measures.
(KH)
7. Critically appraise published research literature. (P)
8. Apply evidence-based practice principles in clinical decision-making. (P)
9. Perform statistical analyses using appropriate biostatistical techniques.
(SH)
10. Interpret research findings and statistical outcomes accurately. (P)

11. Prepare scientific manuscripts, reports, abstracts, and dissertations. (P)
12. Demonstrate competency in scientific communication and publication processes. (P)

Competency Levels

K – Knows

KH – Knows How

SH – Shows How

P – Performs Independently

RMB 1.0.2 Teaching Learning Methods

1. Interactive Lectures
2. Seminars
3. Journal Club Discussions
4. Critical Appraisal Exercises
5. Research Proposal Development
6. Group Discussions
7. Computer-Assisted Statistical Analysis
8. Problem-Based Learning
9. Case-Based Learning
10. Workshops on Research and Scientific Writing

11. Self-Directed Learning
12. Literature Review Assignments

RMB 1.0.3 Assessment Methods

1. Multiple Choice Questions (MCQs)
2. Short Answer Questions
3. Long Answer Questions
4. Critical Appraisal Assignments
5. Research Proposal Preparation
6. Statistical Data Analysis Exercises
7. Seminar Presentations
8. Journal Review
9. Viva Voce
10. End Semester Examination

Unit I: Foundations of Research Methodology

Total Hours: 18

RMB 1.1 Introduction to research

RMB 1.2 Importance of research in physiotherapy

RMB 1.3 Types of research

RMB 1.4 Research process

RMB 1.5 Defining a research problem

RMB 1.6 Formulating research questions

RMB 1.7 Hypothesis formulation

RMB 1.8 Variables in research

RMB 1.9 Qualitative research designs

RMB 1.10 Quantitative research designs

RMB 1.11 Ethical considerations in research

RMB 1.12 Literature review and evidence synthesis

Unit II: Research Design and Measurement

Total Hours: 18

RMB 2.1 Study designs and classifications

RMB 2.2 Case study design

RMB 2.3 Case series

RMB 2.4 Cohort studies

RMB 2.5 Longitudinal studies

RMB 2.6 Pre-test and post-test designs

RMB 2.7 Time series designs

RMB 2.8 Repeated measures designs

RMB 2.9 Randomized controlled trials

RMB 2.10 Sampling techniques

RMB 2.11 Sample size calculation

RMB 2.12 Reliability and validity

RMB 2.13 Responsiveness and MCID

RMB 2.14 Outcome measures in rehabilitation research

Unit III: Evidence-Based Practice and Critical Appraisal

Total Hours: 18

RMB 3.1 Designing research methodology

RMB 3.2 Data collection methods

RMB 3.3 Reporting research findings

RMB 3.4 Sources of bias

RMB 3.5 Type I and Type II errors

RMB 3.6 Evaluating published literature

RMB 3.7 Levels of evidence

RMB 3.8 Principles of evidence-based practice

RMB 3.9 Asking clinical questions (PICO framework)

RMB 3.10 Searching scientific databases

RMB 3.11 Critical appraisal of evidence

RMB 3.12 Clinical practice guidelines

RMB 3.13 Clinical pathways

RMB 3.14 Clinical prediction rules

RMB 3.15 Translating evidence into clinical practice

Unit IV: Biostatistics

Total Hours: 18

RMB 4.1 Introduction to biostatistics

RMB 4.2 Descriptive statistics

RMB 4.3 Measures of central tendency

RMB 4.4 Measures of dispersion

RMB 4.5 Inferential statistics

RMB 4.6 Hypothesis testing

RMB 4.7 t-tests

RMB 4.8 Analysis of variance (ANOVA)

RMB 4.9 Multiple comparison tests

RMB 4.10 Parametric tests

RMB 4.11 Non-parametric tests

RMB 4.12 Correlation analysis

RMB 4.13 Regression analysis

RMB 4.14 Chi-square test

RMB 4.15 Statistical measures of validity and reliability

RMB 4.16 Factorial design analysis

RMB 4.17 Power analysis

RMB 4.18 Epidemiological measures:

- Rate
- Ratio
- Proportion
- Incidence
- Prevalence
- Relative Risk
- Odds Ratio

RMB 4.19 Application of statistical software

Unit V: Scientific Writing and Dissertation Preparation

Total Hours: 18

RMB 5.1 Scientific communication

RMB 5.2 Types of scientific documents

RMB 5.3 Research papers

RMB 5.4 Review articles

RMB 5.5 Conference papers

RMB 5.6 Thesis and dissertation writing

RMB 5.7 Project reports

RMB 5.8 Role of authors, guides, and co-authors

RMB 5.9 Structure of scientific manuscripts

RMB 5.10 Citation and referencing styles

RMB 5.11 APA style

RMB 5.12 MLA style

RMB 5.13 Abstract writing

RMB 5.14 Oral presentation of research

RMB 5.15 Poster presentation

RMB 5.16 Research report writing

RMB 5.17 Thesis structure and formatting

RMB 5.18 Dissertation planning and preparation

Recommended Books

1. Portney LG, Watkins MP. Foundations of Clinical Research: Applications to Practice.
2. Hicks CM. Research Methods for Clinical Therapists.
3. Domholdt E. Rehabilitation Research: Principles and Applications.
4. Jewell DV. Guide to Evidence-Based Physical Therapist Practice.
5. Mahajan BK. Methods in Biostatistics.

6. Daniel WW, Cross CL. Biostatistics: A Foundation for Analysis in the Health Sciences.
7. Katz DL. Clinical Epidemiology and Evidence-Based Medicine.
8. Greenhalgh T. How to Read a Paper: The Basics of Evidence-Based Medicine.
9. APA Publication Manual.
10. ICMJE Recommendations for the Conduct, Reporting, Editing, and Publication of Scholarly Work.

COURSE CODE: M.P.T(N)-103

COURSE TITLE: Biomechanics & Therapeutics-Theory

Credits: 6

Total Hours: 90

BCT 1.0 Subject Description

This course provides advanced knowledge of biomechanics, kinesiology, movement analysis, therapeutic exercise, electrotherapeutic interventions, and evidence-based rehabilitation techniques applicable to musculoskeletal physiotherapy practice. The course emphasizes biomechanical principles governing human movement, kinetic and kinematic analysis, gait assessment, ergonomics, therapeutic exercise prescription, electrodiagnostic procedures, and advanced physiotherapy interventions. Students will develop competencies in clinical reasoning, movement dysfunction analysis, selection of therapeutic techniques, and application of advanced rehabilitation technologies to optimize functional outcomes in patients with musculoskeletal disorders.

BCT 1.0.1 Course Outcomes

At the completion of the course, the student will be able to:

1. Explain advanced biomechanical principles governing human movement and function. (K)
2. Analyze kinetics and kinematics of normal and pathological movement patterns. (KH)
3. Interpret biomechanical assessment findings for clinical decision-making. (P)
4. Evaluate movement dysfunctions using advanced biomechanical tools. (SH)
5. Analyze gait and posture using quantitative and qualitative methods. (P)
6. Apply ergonomic principles in injury prevention and rehabilitation. (P)
7. Prescribe advanced therapeutic exercise programs based on biomechanical principles. (P)
8. Demonstrate proficiency in proprioceptive neuromuscular facilitation and functional re-education techniques. (SH)
9. Interpret electrodiagnostic investigations relevant to physiotherapy practice. (KH)
10. Apply electrotherapeutic modalities safely and effectively. (P)
11. Integrate evidence-based therapeutic interventions into musculoskeletal rehabilitation. (P)

12. Develop advanced clinical reasoning skills for differential diagnosis and treatment planning. (P)

Competency Levels

K – Knows

KH – Knows How

SH – Shows How

P – Performs Independently

BCT 1.0.2 Teaching Learning Methods

1. Interactive Lectures
2. Laboratory Demonstrations
3. Practical Workshops
4. Clinical Case Discussions
5. Movement Analysis Sessions
6. Video-Based Gait Analysis
7. Problem-Based Learning
8. Journal Club Activities
9. Simulation-Based Learning
10. Skill Demonstrations
11. Self-Directed Learning

12. Clinical Presentations

BCT 1.0.3 Assessment Methods

1. Multiple Choice Questions
2. Short Answer Questions
3. Long Answer Questions
4. Practical Demonstrations
5. Case-Based Discussions
6. Clinical Problem Solving Exercises
7. Assignments
8. Seminar Presentations
9. Viva Voce
10. End Semester Examination

Unit I: Foundations of Biomechanics

Total Hours: 18

BCT 1.1 Introduction to kinesiology and biomechanics

BCT 1.2 Biomechanics of musculoskeletal tissues

BCT 1.3 Mechanical properties of connective tissues

BCT 1.4 Principles of biomechanics

BCT 1.5 Force systems and mechanical loading

BCT 1.6 Levers and torque

BCT 1.7 Center of gravity and stability

BCT 1.8 Nature and importance of biomechanics in physiotherapy

BCT 1.9 Kinetics and kinematics of human movement

BCT 1.10 Introduction to biomechanical analysis

Unit II: Biomechanical Analysis of Human Movement

Total Hours: 17

BCT 2.1 Methods of kinetic investigation

BCT 2.2 Methods of kinematic investigation

BCT 2.3 Instrumentation in biomechanics

BCT 2.4 Isokinetic dynamometry

BCT 2.5 Kinesiological electromyography

BCT 2.6 Electronic goniometry

BCT 2.7 Force platform analysis

BCT 2.8 Videography and motion analysis

BCT 2.9 Upper extremity biomechanics:

- Shoulder complex
- Elbow joint
- Wrist and hand

BCT 2.10 Lower extremity biomechanics:

- Pelvis
- Hip
- Knee

- Ankle and foot

BCT 2.11 Spinal biomechanics

Unit III: Gait, Ergonomics and Functional Movement

Total Hours: 18

BCT 3.1 Normal gait cycle

BCT 3.2 Kinetic analysis of gait

BCT 3.3 Kinematic analysis of gait

BCT 3.4 Pathological gait patterns

BCT 3.5 Gait deviations and compensatory mechanisms

BCT 3.6 Functional movement analysis

BCT 3.7 Ergonomic principles

BCT 3.8 Manual handling techniques

BCT 3.9 Safe lifting techniques

BCT 3.10 Workspace design and ergonomics

BCT 3.11 Patient positioning

BCT 3.12 Body mechanics

BCT 3.13 Transfer techniques

Unit IV: Therapeutic Exercise and Manual Therapy Approaches

Total Hours: 19

BCT 4.1 Principles of therapeutic exercise

BCT 4.2 Dynamic exercises

BCT 4.3 Plyometric exercises

BCT 4.4 Isokinetic exercises

BCT 4.5 Kinetic chain exercises

BCT 4.6 Balance and coordination training

- BCT 4.7 Response of tissues to mechanical loading
- BCT 4.8 Biophysics of contractile tissues
- BCT 4.9 Biophysics of non-contractile tissues
- BCT 4.10 Functional assessment and re-education
- BCT 4.11 Clinical reasoning in musculoskeletal practice
- BCT 4.12 Maitland concept
- BCT 4.13 Kaltenborn concept
- BCT 4.14 Cyriax approach
- BCT 4.15 Mulligan concept
- BCT 4.16 McKenzie approach
- BCT 4.17 Proprioceptive Neuromuscular Facilitation (PNF)
- BCT 4.18 Hydrotherapy techniques
- BCT 4.19 Yoga in rehabilitation:
- Historical background
 - Asanas
 - Pranayama
 - Therapeutic applications

Unit V: Electrodiagnosis and Advanced Therapeutics

Total Hours: 18

- BCT 5.1 Principles of electrodiagnosis
- BCT 5.2 Strength-Duration Curve
- BCT 5.3 Electromyography:
- Technique

- Interpretation

BCT 5.4 Nerve conduction studies:

- Motor nerve conduction velocity
- Sensory nerve conduction velocity

BCT 5.5 Factors affecting nerve conduction

BCT 5.6 Interpretation of electrodiagnostic findings

BCT 5.7 Evoked potentials

BCT 5.8 H-reflex and F-wave studies

BCT 5.9 Visual, auditory and somatosensory evoked potentials

BCT 5.10 Superficial heating modalities

BCT 5.11 Deep heating modalities

BCT 5.12 Ultrasound therapy

BCT 5.13 Cryotherapy

BCT 5.14 Low-frequency currents

BCT 5.15 Diadynamic currents

BCT 5.16 Iontophoresis

BCT 5.17 High-voltage pulsed stimulation

BCT 5.18 TENS

BCT 5.19 Interferential therapy

BCT 5.20 Russian currents

BCT 5.21 LASER therapy

BCT 5.22 Advanced electrotherapeutics in tissue healing

BCT 5.23 Wound management

BCT 5.24 Scar and keloid management

BCT 5.25 Biofeedback applications

Recommended Books

1. Nordin M, Frankel VH. Basic Biomechanics of the Musculoskeletal System.
2. Hamill J, Knutzen KM. Biomechanical Basis of Human Movement.
3. Neumann DA. Kinesiology of the Musculoskeletal System.
4. Magee DJ. Orthopedic Physical Assessment.
5. Kisner C, Colby LA. Therapeutic Exercise: Foundations and Techniques.
6. Hall CM, Brody LT. Therapeutic Exercise.
7. O'Sullivan SB, Schmitz TJ. Physical Rehabilitation.
8. Prentice WE. Therapeutic Modalities in Rehabilitation.
9. Robinson AJ, Snyder-Mackler L. Clinical Electrophysiology.
10. Cameron MH. Physical Agents in Rehabilitation.
11. Basmajian JV. Biofeedback Principles and Practice.
12. Lehmann JF. Therapeutic Heat and Cold.

COURSE CODE: M.P.T(N)-104

COURSE TITLE: Clinical, Physical and Functional Diagnosis in Neuro-Physiotherapy-Theory

Credits: 8

Total Hours: 120

NFD 1.0 Subject Description

This course is designed to develop advanced competencies in neurological examination, physical diagnosis, functional assessment, differential diagnosis, and clinical decision-making in Neuro-Physiotherapy. The course emphasizes comprehensive neurological evaluation, neuroanatomical correlation, movement analysis, neurophysiological assessment, diagnostic investigations, functional outcome measurement, disability evaluation, and evidence-based clinical reasoning. Students will develop expertise in identifying neurological impairments, activity limitations, participation restrictions, and formulating physiotherapy diagnoses for individuals with neurological disorders.

NFD 1.0.1 Course Outcomes

At the completion of the course, the student will be able to:

1. Perform comprehensive neurological examination and assessment. (P)
2. Interpret clinical signs and symptoms associated with neurological disorders. (P)
3. Correlate neuroanatomical and neurophysiological findings with clinical presentations. (KH)
4. Analyze diagnostic investigations relevant to neurological rehabilitation. (KH)
5. Conduct functional and disability assessments using standardized tools. (P)
6. Apply principles of differential diagnosis in neurological physiotherapy. (P)

7. Identify impairments, activity limitations, and participation restrictions using the ICF framework. (P)
8. Formulate evidence-based physiotherapy diagnoses and rehabilitation goals. (P)
9. Demonstrate advanced clinical reasoning in neuro-rehabilitation practice. (P)
10. Recognize red flags and conditions requiring urgent medical referral. (P)

Competency Levels

K – Knows

KH – Knows How

SH – Shows How

P – Performs Independently

NFD 1.0.2 Teaching Learning Methods

1. Interactive Lectures
2. Clinical Demonstrations
3. Neurological Assessment Workshops
4. Case-Based Learning
5. Problem-Based Learning
6. Clinical Grand Rounds

7. Video-Based Assessment Sessions
8. Journal Clubs
9. Simulation-Based Learning
10. Self-Directed Learning

NFD 1.0.3 Assessment Methods

1. MCQs
2. Short Answer Questions
3. Long Answer Questions
4. Clinical Case Discussions
5. Practical Demonstrations
6. Seminar Presentations
7. Viva Voce
8. End Semester Examination

Unit I: Foundations of Neurological Assessment (Total Hours: 24)

- NFD 1.1 Applied neuroanatomy
- NFD 1.2 Applied neurophysiology
- NFD 1.3 Neurological history taking
- NFD 1.4 Observation and clinical screening
- NFD 1.5 Mental status examination

NFD 1.6 Higher mental functions

NFD 1.7 Cranial nerve examination

NFD 1.8 Sensory system assessment

NFD 1.9 Motor system assessment

NFD 1.10 Reflex examination

Unit II: Clinical Neurological Examination (Total Hours: 24)

NFD 2.1 Muscle tone assessment

NFD 2.2 Coordination assessment

NFD 2.3 Balance assessment

NFD 2.4 Postural control evaluation

NFD 2.5 Vestibular assessment

NFD 2.6 Movement disorder assessment

NFD 2.7 Gait analysis

NFD 2.8 Functional mobility assessment

NFD 2.9 Neurodevelopmental assessment

NFD 2.10 Clinical reasoning in neurological assessment

Unit III: Diagnostic Investigations in Neurology (Total Hours: 24)

NFD 3.1 Neuroimaging principles

NFD 3.2 Computed tomography (CT)

NFD 3.3 Magnetic resonance imaging (MRI)

NFD 3.4 Functional neuroimaging

NFD 3.5 Electroencephalography (EEG)

NFD 3.6 Electromyography (EMG)

NFD 3.7 Nerve conduction studies

NFD 3.8 Evoked potentials

NFD 3.9 Laboratory investigations in neurology

NFD 3.10 Interpretation of diagnostic findings

Unit IV: Functional Evaluation and Outcome Measurement (Total Hours: 24)

NFD 4.1 Functional assessment principles

NFD 4.2 Disability assessment

NFD 4.3 Activities of daily living assessment

NFD 4.4 Functional Independence Measure (FIM)

NFD 4.5 Berg Balance Scale

NFD 4.6 Dynamic Gait Index

NFD 4.7 Motor Assessment Scale

NFD 4.8 Functional Reach Test

NFD 4.9 Quality of life assessment

NFD 4.10 Outcome measure selection and interpretation

Unit V: Differential Diagnosis and Clinical Decision Making (Total Hours: 24)

NFD 5.1 Differential diagnosis in neurological physiotherapy

NFD 5.2 Central nervous system disorders

NFD 5.3 Peripheral nervous system disorders

NFD 5.4 Neuromuscular disorders

NFD 5.5 Vestibular disorders

NFD 5.6 Cognitive and perceptual dysfunctions

NFD 5.7 Red flag identification

NFD 5.8 ICF-based clinical assessment

NFD 5.9 Physiotherapy diagnosis formulation

NFD 5.10 Evidence-based clinical decision making

COURSE CODE: M.P.T(N)-104

COURSE TITLE: Clinical, Physical and Functional Diagnosis in Neuro-Physiotherapy – Practical

Credits: 4

Total Hours: 120

Practical Competencies

Section A: Neurological Examination Skills (24 Hours)

1. Neurological history taking
2. Cranial nerve examination
3. Motor examination
4. Sensory examination
5. Reflex assessment

Section B: Movement and Functional Assessment (24 Hours)

6. Tone assessment
7. Coordination assessment
8. Balance assessment
9. Gait analysis
10. Functional mobility evaluation

Section C: Neurophysiological Assessment (24 Hours)

11. Interpretation of EMG findings

12. Interpretation of nerve conduction studies
13. Interpretation of EEG findings
14. Interpretation of neuroimaging
15. Clinical correlation of investigations

Section D: Outcome Measurement (24 Hours)

16. Functional Independence Measure
17. Berg Balance Scale
18. Motor Assessment Scale
19. Dynamic Gait Index
20. Disability and participation assessment

Section E: Clinical Reasoning and Diagnosis (24 Hours)

21. Differential diagnosis exercises
22. ICF-based assessment
23. Physiotherapy diagnosis formulation
24. Goal setting
25. Comprehensive neurological case presentation

Recommended Books

1. Umphred DA. Neurological Rehabilitation.

2. O'Sullivan SB, Schmitz TJ. Physical Rehabilitation.
3. DeLisa JA. Physical Medicine and Rehabilitation.
4. Campbell WW. DeJong's The Neurologic Examination.
5. Blumenfeld H. Neuroanatomy through Clinical Cases.
6. Shumway-Cook A, Woollacott MH. Motor Control.
7. Carr JH, Shepherd RB. Neurological Rehabilitation.
8. Lundy-Ekman L. Neuroscience: Fundamentals for Rehabilitation.

COURSE CODE: M.P.T(N)-105

COURSE TITLE: Skills Acquisition & Refinement (SAR-I)-Practical

Credits: 8

Total Hours: 240

SAR-I 1.0 Subject Description

Skills Acquisition and Refinement (SAR-I) is designed to facilitate the development of advanced clinical competencies in Neuro-Physiotherapy through structured practical training, supervised skill laboratories, simulation-based learning, and clinical problem-solving activities. The course focuses on neurological assessment, movement analysis, functional evaluation, neurophysiological principles, motor control, balance and gait assessment, therapeutic handling, and evidence-based neuro-rehabilitation techniques. Students will progressively develop advanced psychomotor, cognitive, and clinical reasoning skills necessary for independent neurological physiotherapy practice.

SAR-I 1.0.1 Course Outcomes

At the completion of the course, the student will be able to:

1. Demonstrate advanced neurological assessment skills. (P)
2. Perform comprehensive motor, sensory, and functional evaluations. (P)
3. Apply neurophysiological principles in clinical practice. (P)
4. Analyze movement dysfunctions in neurological conditions. (P)
5. Demonstrate proficiency in therapeutic handling techniques. (P)
6. Conduct balance, gait, and mobility assessments. (P)
7. Apply evidence-based neuro-rehabilitation strategies. (P)
8. Utilize outcome measures in neurological rehabilitation. (P)
9. Demonstrate effective communication with patients and caregivers. (P)
10. Integrate clinical reasoning into neurological physiotherapy management. (P)

Competency Levels

K – Knows

KH – Knows How

SH – Shows How

P – Performs Independently

SAR-I 1.0.2 Teaching Learning Methods

1. Practical Demonstrations
2. Skill Laboratories

3. Simulation-Based Learning
4. Clinical Workshops
5. Case-Based Learning
6. Video Analysis
7. Peer-Assisted Learning
8. Journal Clubs
9. Reflective Learning
10. Self-Directed Learning

SAR-I 1.0.3 Assessment Methods

1. Objective Structured Clinical Examination (OSCE)
2. Skill Demonstration
3. Clinical Viva Voce
4. Logbook Assessment
5. Portfolio Assessment
6. Case Presentation
7. Direct Observation of Procedural Skills (DOPS)

Students must be engaged in

- Teaching Assignment, Seminars, journal club & Case Studies etc

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.

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 automated 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>

Assessment Methods

1. Objective Structured Clinical Examination (OSCE)
2. Direct Observation of Procedural Skills (DOPS)
3. Case Presentation
4. Clinical Viva Voce
5. Logbook Assessment
6. Reflective Portfolio
7. Skill Demonstration

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.

COURSE CODE: M.P.T(N)-106

COURSE TITLE: Clinical Training (CT-I)-Practical

Credits: 23

Total Hours: 690

CT-I 1.0 Subject Description

Clinical Training-I provides structured supervised clinical exposure in Neuro-Physiotherapy settings. The course is designed to facilitate the integration of theoretical knowledge, practical skills, neurophysiological principles, evidence-based practice, and professional behavior into neurological rehabilitation. Students will gain experience in neurological assessment, functional evaluation, movement analysis, therapeutic interventions, assistive technology,

caregiver education, and interdisciplinary rehabilitation. The training aims to develop competency in managing patients with neurological disorders across acute, subacute, and chronic stages of recovery.

CT-I 1.0.1 Course Outcomes

At the completion of the course, the student will be able to:

1. Independently assess patients with neurological disorders. (P)
2. Formulate physiotherapy diagnoses based on neurological findings. (P)
3. Develop individualized neuro-rehabilitation programmes. (P)
4. Apply evidence-based neurological physiotherapy interventions. (P)
5. Evaluate functional outcomes using standardized measures. (P)
6. Demonstrate competency in gait, balance, and mobility rehabilitation. (P)
7. Educate patients and caregivers regarding rehabilitation strategies. (P)
8. Work effectively within interdisciplinary rehabilitation teams. (P)
9. Maintain professional documentation and clinical records. (P)
10. Demonstrate ethical and professional conduct in neurological rehabilitation practice. (P)

Competency Levels

K – Knows

KH – Knows How

SH – Shows How

P – Performs Independently

CT-I 1.0.2 Clinical Training Areas

Adult Neuro-Rehabilitation Unit (Total Hours: 180)

CT 1.1 Stroke rehabilitation

CT 1.2 Traumatic brain injury rehabilitation

CT 1.3 Spinal cord injury rehabilitation

CT 1.4 Parkinsonism management

CT 1.5 Multiple sclerosis rehabilitation

CT 1.6 Balance and mobility training

CT 1.7 Functional outcome evaluation

CT 1.8 Documentation and reporting

Acute Neurology and Neurosurgery Unit (Total Hours: 120)

CT 1.9 Acute neurological assessment

CT 1.10 Intensive care rehabilitation

CT 1.11 Early mobilization

CT 1.12 Neurosurgical rehabilitation

CT 1.13 Respiratory management in neurological patients

CT 1.14 Prevention of secondary complications

CT 1.15 Interdisciplinary management

CT 1.16 Patient monitoring

Pediatric Neuro-Rehabilitation Unit (Total Hours: 90)

CT 1.17 Cerebral palsy management

CT 1.18 Developmental disorders

CT 1.19 Pediatric neurological assessment

CT 1.20 Functional skill training

CT 1.21 Family-centered rehabilitation

CT 1.22 Pediatric outcome measures

CT 1.23 Positioning and handling

CT 1.24 Pediatric mobility training

Functional Rehabilitation and Community Services (Total Hours: 90)

CT 1.25 Activities of daily living training

CT 1.26 Community reintegration

CT 1.27 Wheelchair assessment

CT 1.28 Assistive technology services

CT 1.29 Home programme development

CT 1.30 Community-based rehabilitation

CT 1.31 Caregiver education

CT 1.32 Environmental modification

Specialized Neuro-Rehabilitation Services (Total Hours: 90)

CT 1.33 Vestibular rehabilitation

CT 1.34 Gait laboratory exposure

CT 1.35 Functional electrical stimulation applications

CT 1.36 Balance training programmes

CT 1.37 Robotics-assisted rehabilitation

CT 1.38 Neuroplasticity-based interventions

CT 1.39 Outcome measure application

CT 1.40 Functional performance evaluation

Academic and Professional Activities (Total Hours: 120)

CT 1.41 Case presentations

CT 1.42 Journal clubs

CT 1.43 Clinical conferences

CT 1.44 Rehabilitation team meetings

CT 1.45 Research discussions

CT 1.46 Clinical audits

CT 1.47 Reflective practice

CT 1.48 Professional development activities

Clinical Requirements

1. Minimum 50 complete neurological case records.
2. Minimum 20 detailed neurological case presentations.
3. Participation in interdisciplinary rehabilitation meetings.
4. Maintenance of clinical logbook.
5. Participation in journal clubs and clinical audits.
6. Completion of neurological assessment portfolio.
7. Documentation of rehabilitation outcomes.

CT-I 1.0.3 Assessment Methods

1. Clinical Performance Evaluation
2. Case Presentation
3. Clinical Viva Voce
4. Logbook Assessment
5. Portfolio Assessment

6. Supervisor Evaluation
7. Professional Behaviour Assessment
8. Competency-Based Clinical Assessment

Recommended Books

1. Umphred DA. Neurological Rehabilitation.
2. O'Sullivan SB, Schmitz TJ. Physical Rehabilitation.
3. Carr JH, Shepherd RB. Neurological Rehabilitation.
4. Lundy-Ekman L. Neuroscience: Fundamentals for Rehabilitation.
5. Shumway-Cook A, Woollacott MH. Motor Control.
6. DeLisa JA. Physical Medicine and Rehabilitation.
7. Edwards S. Neurological Physiotherapy.
8. Lennon S, Ramdharry G, Verheyden G. Physical Management for Neurological Conditions.

COURSE CODE: M.P.T(N)-107

COURSE TITLE: Dissertation (DSS-I)-Practical

Credits: 3

Total Hours: 90

DSS-I 1.0 Subject Description

The Dissertation (DSS-I) course introduces postgraduate students to scientific research in Neuro-Physiotherapy and Neuro-Rehabilitation. The course focuses on identification of clinically relevant neurological research problems, literature

review, research methodology, protocol development, ethical considerations, and preparation of a dissertation synopsis. Students will acquire competencies necessary to conduct independent neurological rehabilitation research and contribute to evidence-based neuro-physiotherapy practice.

DSS-I 1.0.1 Course Outcomes

At the completion of the course, the student will be able to:

1. Identify clinically relevant research problems in Neuro-Physiotherapy. (P)
2. Conduct comprehensive literature reviews. (P)
3. Formulate research questions and hypotheses. (P)
4. Design appropriate neurological rehabilitation research protocols. (P)
5. Select suitable outcome measures for neurological research. (P)
6. Prepare ethics committee submissions. (P)
7. Develop scientifically sound research proposals. (P)
8. Present and defend research protocols effectively. (P)
9. Apply principles of scientific writing and research ethics. (P)
10. Demonstrate readiness for dissertation implementation. (P)

Competency Levels

K – Knows

KH – Knows How

SH – Shows How

P – Performs Independently

DSS-I 1.0.2 Teaching Learning Methods

1. Research Supervision Meetings
2. Literature Review Sessions
3. Research Methodology Workshops
4. Journal Clubs
5. Research Seminars
6. Proposal Development Workshops
7. Statistical Planning Sessions
8. Self-Directed Learning
9. Peer Review Activities
10. Research Presentations

DSS-I 1.0.3 Assessment Methods

1. Literature Review Assessment
2. Research Protocol Evaluation
3. Synopsis Presentation
4. Ethics Submission Review
5. Research Proposal Defense
6. Viva Voce

Module I: Research Problem Identification (Total Hours: 15)

DSS 1.1 Identification of research areas in neuro-rehabilitation

DSS 1.2 Selection of dissertation topic

DSS 1.3 Problem statement formulation

DSS 1.4 Feasibility assessment

DSS 1.5 Development of research objectives

DSS 1.6 Formulation of hypotheses

Module II: Literature Review

Total Hours: 25

DSS 1.7 Literature search strategies

DSS 1.8 Database searching

DSS 1.9 Critical appraisal of literature

DSS 1.10 Evidence synthesis

DSS 1.11 Gap identification

DSS 1.12 Review writing

Module III: Research Methodology Development (Total Hours: 25)

DSS 1.13 Selection of study design

DSS 1.14 Sampling methods

DSS 1.15 Sample size estimation

DSS 1.16 Selection of outcome measures

DSS 1.17 Data collection procedures

DSS 1.18 Statistical planning

DSS 1.19 Research protocol preparation

Module IV: Ethics and Regulatory Requirements (Total Hours: 10)

DSS 1.20 Research ethics

DSS 1.21 Informed consent procedures

DSS 1.22 Ethics committee submission

DSS 1.23 Participant confidentiality

DSS 1.24 Research governance

Module V: Synopsis Preparation and Presentation (Total Hours: 15)

DSS 1.25 Synopsis writing

DSS 1.26 Research proposal presentation

DSS 1.27 Protocol defense

DSS 1.28 Expert review and revision

DSS 1.29 Final protocol submission

DSS 1.30 Dissertation progress reporting

DSS-I Deliverables

1. Approved dissertation topic.
2. Comprehensive literature review.
3. Completed research protocol.
4. Ethics committee application.
5. Approved synopsis presentation.
6. Dissertation progress report.

Recommended Books

1. Portney LG, Watkins MP. Foundations of Clinical Research: Applications to Practice.

2. Domholdt E. Rehabilitation Research: Principles and Applications.
3. Hicks CM. Research Methods for Clinical Therapists.
4. Greenhalgh T. How to Read a Paper.
5. Mahajan BK. Methods in Biostatistics.
6. APA Publication Manual.
7. ICMJE Recommendations for Scholarly Publications.
8. CONSORT and STROBE Reporting Guidelines.

Second Year

COURSE CODE: M.P.T(N)-201

COURSE TITLE: Exercise Physiology-Theory

Credits: 6

Total Hours: 90

EP 1.0 Subject Description

Exercise Physiology is an advanced course designed to provide postgraduate physiotherapy students with an in-depth understanding of physiological responses and adaptations to exercise in healthy individuals, athletes, and patients with various musculoskeletal conditions. The course emphasizes cellular, cardiovascular, respiratory, neuromuscular, endocrine, and metabolic adaptations to physical activity and exercise training. It also focuses on exercise testing, fitness assessment, fatigue mechanisms, environmental physiology, and exercise prescription. The knowledge gained through this course will facilitate evidence-based exercise programming and rehabilitation planning in musculoskeletal physiotherapy practice.

EP 1.0.1 Course Outcomes

At the completion of the course, the student will be able to:

1. Explain physiological responses to acute and chronic exercise. (K)
2. Analyze cardiovascular and respiratory adaptations to exercise. (KH)
3. Interpret neuromuscular and metabolic responses during physical activity. (KH)
4. Evaluate energy systems involved in exercise performance. (P)
5. Assess physical fitness using standardized testing procedures. (P)
6. Explain mechanisms of fatigue and recovery. (KH)
7. Apply exercise physiology principles in rehabilitation and performance enhancement. (P)
8. Design evidence-based exercise programs for different populations. (P)

9. Evaluate environmental influences on exercise performance. (KH)
10. Interpret exercise testing results and prescribe appropriate interventions. (P)
11. Demonstrate competency in fitness assessment and exercise prescription. (SH)
12. Integrate exercise physiology principles into musculoskeletal rehabilitation. (P)

Competency Levels

K – Knows

KH – Knows How

SH – Shows How

P – Performs Independently

EP 1.0.2 Teaching Learning Methods

1. Interactive Lectures
2. Seminars
3. Laboratory Demonstrations
4. Practical Exercise Testing Sessions
5. Case-Based Learning
6. Journal Club Discussions
7. Fitness Assessment Workshops

8. Problem-Based Learning
9. Self-Directed Learning
10. Research Article Reviews

EP 1.0.3 Assessment Methods

1. Multiple Choice Questions
2. Short Answer Questions
3. Long Answer Questions
4. Practical Demonstrations
5. Exercise Prescription Assignments
6. Case Presentations
7. Seminar Presentations
8. Viva Voce
9. End Semester Examination

Unit I: Fundamentals of Exercise Physiology

Total Hours: 18

- EP 1.1 Introduction to exercise physiology
- EP 1.2 Homeostasis and exercise
- EP 1.3 Cellular physiology of exercise
- EP 1.4 Skeletal muscle structure and function
- EP 1.5 Muscle fiber types

EP 1.6 Neuromuscular adaptations to exercise

EP 1.7 Bioenergetics and energy transfer

EP 1.8 ATP production and utilization

EP 1.9 Aerobic and anaerobic metabolism

EP 1.10 Physiological basis of exercise performance

Unit II: Cardiovascular and Respiratory Responses to Exercise

Total Hours: 18

EP 2.1 Cardiovascular physiology during exercise

EP 2.2 Cardiac output and exercise

EP 2.3 Blood pressure regulation

EP 2.4 Peripheral circulation during exercise

EP 2.5 Respiratory physiology during exercise

EP 2.6 Pulmonary ventilation

EP 2.7 Gas exchange mechanisms

EP 2.8 Oxygen transport

EP 2.9 VO_2 Max

EP 2.10 Cardiovascular adaptations to training

EP 2.11 Respiratory adaptations to training

Unit III: Metabolic and Endocrine Responses to Exercise

Total Hours: 18

EP 3.1 Energy systems in exercise

EP 3.2 Carbohydrate metabolism

EP 3.3 Fat metabolism

EP 3.4 Protein metabolism

EP 3.5 Hormonal regulation during exercise

- EP 3.6 Endocrine responses to training
- EP 3.7 Fluid and electrolyte balance
- EP 3.8 Thermoregulation
- EP 3.9 Nutritional considerations in exercise
- EP 3.10 Exercise and body composition
- EP 3.11 Obesity and metabolic health

Unit IV: Exercise Testing, Fitness Assessment and Fatigue

Total Hours: 18

- EP 4.1 Principles of exercise testing
- EP 4.2 Aerobic fitness assessment
- EP 4.3 Anaerobic fitness assessment
- EP 4.4 Strength testing
- EP 4.5 Endurance assessment
- EP 4.6 Flexibility evaluation
- EP 4.7 Functional capacity testing
- EP 4.8 Physical activity assessment
- EP 4.9 Exercise tolerance testing
- EP 4.10 Mechanisms of fatigue
- EP 4.11 Recovery physiology
- EP 4.12 Overtraining syndrome

Unit V: Applied Exercise Physiology in Rehabilitation

Total Hours: 18

- EP 5.1 Principles of exercise prescription
- EP 5.2 Exercise programming
- EP 5.3 Exercise progression

EP 5.4 Exercise physiology in musculoskeletal rehabilitation

EP 5.5 Exercise for chronic pain conditions

EP 5.6 Exercise and aging

EP 5.7 Exercise in occupational health

EP 5.8 Environmental physiology:

- Heat
- Cold
- Altitude

EP 5.9 Exercise for health promotion

EP 5.10 Physical activity guidelines

EP 5.11 Evidence-based exercise prescription

EP 5.12 Contemporary advances in exercise physiology

Recommended Books

1. Powers SK, Howley ET. Exercise Physiology: Theory and Application to Fitness and Performance.
2. McArdle WD, Katch FI, Katch VL. Exercise Physiology: Nutrition, Energy and Human Performance.
3. Kenney WL, Wilmore JH, Costill DL. Physiology of Sport and Exercise.
4. Brooks GA, Fahey TD, Baldwin KM. Exercise Physiology: Human Bioenergetics and Its Applications.
5. ACSM's Guidelines for Exercise Testing and Prescription.

6. Heyward VH. Advanced Fitness Assessment and Exercise Prescription.
7. Ehrman JK, Gordon PM, Visich PS, Keteyian SJ. Clinical Exercise Physiology.
8. Kisner C, Colby LA. Therapeutic Exercise: Foundations and Techniques.
9. Brukner P, Khan K. Clinical Sports Medicine.
10. ACSM Resource Manual for Guidelines for Exercise Testing and Prescription.

COURSE CODE: M.P.T(N)-202

COURSE TITLE: Neurological Physiotherapy-Theory

Credits: 8

Total Hours: 120

NP 1.0 Subject Description

Neurological Physiotherapy is an advanced specialty course designed to provide comprehensive knowledge and clinical expertise in the assessment, treatment, rehabilitation, and long-term management of individuals with neurological disorders. The course emphasizes contemporary neuro-rehabilitation approaches, motor control theories, neuroplasticity, functional recovery, task-oriented training, and evidence-based neurological physiotherapy interventions. Students will develop advanced clinical reasoning and practical competencies necessary for managing patients with disorders affecting the central and peripheral nervous systems across all stages of rehabilitation.

NP 1.0.1 Course Outcomes

At the completion of the course, the student will be able to:

1. Demonstrate advanced knowledge of neurological rehabilitation principles. (P)

2. Apply motor control and motor learning concepts in neuro-rehabilitation.
(P)
3. Design evidence-based treatment programmes for neurological disorders.
(P)
4. Evaluate functional outcomes using standardized neurological outcome measures. (P)
5. Apply neuroplasticity principles to facilitate recovery. (P)
6. Manage patients with central and peripheral nervous system disorders.
(P)
7. Develop patient-centered rehabilitation plans. (P)
8. Integrate assistive technology into neurological rehabilitation. (P)
9. Demonstrate advanced clinical reasoning in neurological physiotherapy.
(P)
10. Function effectively within interdisciplinary neuro-rehabilitation teams. (P)

Competency Levels

K – Knows

KH – Knows How

SH – Shows How

P – Performs Independently

NP 1.0.2 Teaching Learning Methods

1. Interactive Lectures
2. Clinical Demonstrations
3. Case-Based Learning
4. Problem-Based Learning
5. Simulation-Based Learning
6. Journal Clubs
7. Clinical Conferences
8. Video Analysis Sessions
9. Workshops
10. Self-Directed Learning

NP 1.0.3 Assessment Methods

1. MCQs
2. Short Answer Questions
3. Long Answer Questions
4. Case Presentations
5. Seminar Presentations
6. Clinical Viva Voce

7. Practical Demonstrations

8. End Semester Examination

Unit I: Foundations of Neuro-Rehabilitation (Total Hours: 24)

NP 1.1 Principles of neurological rehabilitation

NP 1.2 Neuroplasticity and functional recovery

NP 1.3 Motor control theories

NP 1.4 Motor learning principles

NP 1.5 Task-oriented training

NP 1.6 Functional movement analysis

NP 1.7 Neurophysiological approaches

NP 1.8 ICF framework in neuro-rehabilitation

NP 1.9 Goal-oriented rehabilitation

NP 1.10 Evidence-based neurological physiotherapy

Unit II: Rehabilitation of Central Nervous System Disorders (Total Hours: 24)

NP 2.1 Stroke rehabilitation

NP 2.2 Traumatic brain injury rehabilitation

NP 2.3 Spinal cord injury rehabilitation

NP 2.4 Multiple sclerosis rehabilitation

NP 2.5 Parkinson's disease rehabilitation

NP 2.6 Cerebellar disorders

NP 2.7 Vestibular dysfunction rehabilitation

NP 2.8 Brain tumour rehabilitation

NP 2.9 Neurodegenerative disorders

NP 2.10 Functional outcome optimization

Unit III: Rehabilitation of Peripheral Nervous System Disorders (Total Hours: 24)

NP 3.1 Peripheral nerve injuries

NP 3.2 Guillain-Barré syndrome

NP 3.3 Bell's palsy

NP 3.4 Neuropathies

NP 3.5 Plexus injuries

NP 3.6 Neuromuscular disorders

NP 3.7 Myopathies

NP 3.8 Motor neuron diseases

NP 3.9 Functional electrical stimulation

NP 3.10 Community reintegration

Unit IV: Functional Rehabilitation and Assistive Technology (Total Hours: 24)

NP 4.1 Balance rehabilitation

NP 4.2 Gait rehabilitation

NP 4.3 Upper limb rehabilitation

NP 4.4 Hand function rehabilitation

NP 4.5 Activities of daily living training

NP 4.6 Wheelchair prescription

NP 4.7 Orthotic management

NP 4.8 Assistive technology applications

NP 4.9 Community-based rehabilitation

NP 4.10 Quality of life enhancement

Unit V: Contemporary Neuro-Rehabilitation Approaches (Total Hours: 24)

NP 5.1 Constraint-induced movement therapy

NP 5.2 Mirror therapy

NP 5.3 Virtual reality in neuro-rehabilitation

NP 5.4 Robotics-assisted rehabilitation

NP 5.5 Body-weight supported gait training

NP 5.6 Functional electrical stimulation

NP 5.7 Cognitive rehabilitation

NP 5.8 Dual-task training

NP 5.9 Telerehabilitation

NP 5.10 Emerging trends in neuro-rehabilitation

Recommended Books

1. Umphred DA. Neurological Rehabilitation.
2. O'Sullivan SB, Schmitz TJ. Physical Rehabilitation.
3. Carr JH, Shepherd RB. Neurological Rehabilitation.
4. Lundy-Ekman L. Neuroscience: Fundamentals for Rehabilitation.
5. Shumway-Cook A, Woollacott MH. Motor Control.
6. DeLisa JA. Physical Medicine and Rehabilitation.
7. Edwards S. Neurological Physiotherapy.
8. Lennon S, Ramdharry G, Verheyden G. Physical Management for Neurological Conditions.

COURSE CODE: M.P.T(N)-202

COURSE TITLE: Neurological Physiotherapy – Practical

Credits: 4

Total Hours: 120

NPP 1.0 Subject Description

This practical course focuses on advanced clinical skills required for neurological physiotherapy practice. Students will develop expertise in neurological rehabilitation techniques, movement facilitation, balance and gait training, functional rehabilitation, assistive technology applications, and evidence-based neuro-rehabilitation interventions.

NPP 1.0.1 Course Outcomes

At the completion of the course, the student will be able to:

1. Perform advanced neurological rehabilitation techniques. (P)
2. Demonstrate competency in gait and balance rehabilitation. (P)
3. Apply motor learning principles in clinical practice. (P)
4. Conduct task-oriented functional training. (P)
5. Utilize assistive devices and orthotic interventions. (P)
6. Implement evidence-based neuro-rehabilitation programmes. (P)
7. Demonstrate advanced therapeutic handling skills. (P)
8. Monitor functional outcomes in neurological patients. (P)

Practical Competencies

Section A: Neuro-Rehabilitation Techniques (24 Hours)

1. Therapeutic handling techniques

2. Facilitation and inhibition techniques
3. Trunk control training
4. Postural control retraining
5. Functional movement facilitation

Section B: Balance and Gait Rehabilitation (24 Hours)

6. Static balance training
7. Dynamic balance training
8. Gait assessment
9. Gait retraining
10. Community mobility training

Section C: Functional Rehabilitation (24 Hours)

11. Upper limb rehabilitation
12. Hand function training
13. Activities of daily living training
14. Transfer training
15. Functional independence training

Section D: Assistive Technology Applications (24 Hours)

16. Wheelchair assessment

17. Orthotic prescription principles
18. Assistive device training
19. Functional electrical stimulation applications
20. Environmental adaptation

Section E: Advanced Neuro-Rehabilitation Approaches (24 Hours)

21. Constraint-induced movement therapy
22. Mirror therapy applications
23. Virtual reality-based rehabilitation
24. Robotics-assisted rehabilitation
25. Outcome measure application

Assessment Methods

1. Practical Demonstration
2. OSCE
3. Clinical Viva Voce
4. Logbook Assessment
5. Skill Assessment
6. Case Presentation

Recommended Books

1. Umphred DA. Neurological Rehabilitation.
2. O'Sullivan SB, Schmitz TJ. Physical Rehabilitation.
3. Carr JH, Shepherd RB. Neurological Rehabilitation.
4. Shumway-Cook A, Woollacott MH. Motor Control.
5. Edwards S. Neurological Physiotherapy.
6. Lennon S, Ramdharry G, Verheyden G. Physical Management for Neurological Conditions.

COURSE CODE: M.P.T(N)-203

COURSE TITLE: Recent Advances and Evidence-Based Practice in Neuro-Physiotherapy-Theory

Credits: 8

Total Hours: 120

RAEBP 1.0 Subject Description

This course is designed to provide postgraduate students with advanced knowledge of contemporary developments, emerging technologies, innovative rehabilitation approaches, and evidence-based clinical practices in Neuro-Physiotherapy. The course emphasizes neuroplasticity, motor learning advances, robotics-assisted rehabilitation, virtual reality, non-invasive brain stimulation, telerehabilitation, artificial intelligence, neurotechnology, and translation of research evidence into clinical practice. Students will develop competencies necessary to critically evaluate scientific evidence and integrate contemporary rehabilitation approaches into neurological physiotherapy practice.

RAEBP 1.0.1 Course Outcomes

At the completion of the course, the student will be able to:

1. Critically appraise current evidence in neuro-rehabilitation. (P)

2. Interpret systematic reviews, meta-analyses, and clinical practice guidelines. (KH)
3. Apply evidence-based decision-making in neurological rehabilitation. (P)
4. Evaluate emerging neuro-rehabilitation technologies. (KH)
5. Integrate neuroplasticity principles into rehabilitation programmes. (P)
6. Utilize contemporary outcome measures and assessment tools. (P)
7. Analyze advances in motor control and motor learning research. (P)
8. Apply digital health and telerehabilitation strategies. (P)
9. Evaluate innovative rehabilitation approaches for neurological disorders.
(P)
10. Demonstrate leadership in translating research evidence into clinical practice. (P)

Competency Levels

K – Knows

KH – Knows How

SH – Shows How

P – Performs Independently

RAEBP 1.0.2 Teaching Learning Methods

1. Interactive Lectures
2. Journal Clubs

3. Critical Appraisal Workshops
4. Research Seminars
5. Case-Based Learning
6. Problem-Based Learning
7. Technology Demonstrations
8. Clinical Practice Guideline Reviews
9. Student Presentations
10. Self-Directed Learning

RAEBP 1.0.3 Assessment Methods

1. MCQs
2. Short Answer Questions
3. Long Answer Questions
4. Journal Critique
5. Evidence Appraisal Assignment
6. Seminar Presentation
7. Case-Based Discussion
8. Viva Voce

9. End Semester Examination

Unit I: Evidence-Based Neuro-Rehabilitation (Total Hours: 24)

RAEBP 1.1 Principles of evidence-based practice

RAEBP 1.2 Hierarchy of evidence

RAEBP 1.3 Systematic reviews and meta-analysis

RAEBP 1.4 Clinical practice guidelines

RAEBP 1.5 Critical appraisal of literature

RAEBP 1.6 Outcome measures in neuro-rehabilitation

RAEBP 1.7 Knowledge translation

RAEBP 1.8 Clinical decision-making models

RAEBP 1.9 Evidence implementation strategies

RAEBP 1.10 Contemporary neuro-rehabilitation models

Unit II: Advances in Neuroplasticity and Motor Learning (Total Hours: 24)

RAEBP 2.1 Neuroplasticity mechanisms

RAEBP 2.2 Experience-dependent plasticity

RAEBP 2.3 Motor relearning principles

RAEBP 2.4 Task-specific training

RAEBP 2.5 Intensity and repetition in rehabilitation

RAEBP 2.6 Constraint-induced movement therapy

RAEBP 2.7 Mirror therapy

RAEBP 2.8 Action observation therapy

RAEBP 2.9 Mental practice and motor imagery

RAEBP 2.10 Dual-task training

Unit III: Emerging Technologies in Neuro-Rehabilitation (Total Hours: 24)

RAEBP 3.1 Robotics-assisted rehabilitation

RAEBP 3.2 Virtual reality applications

RAEBP 3.3 Augmented reality in rehabilitation

RAEBP 3.4 Brain-computer interfaces

RAEBP 3.5 Wearable technologies

RAEBP 3.6 Artificial intelligence in rehabilitation

RAEBP 3.7 Functional electrical stimulation

RAEBP 3.8 Neuroprosthetics

RAEBP 3.9 Telerehabilitation

RAEBP 3.10 Digital health technologies

Unit IV: Contemporary Neurological Rehabilitation Approaches (Total Hours: 24)

RAEBP 4.1 Stroke rehabilitation advances

RAEBP 4.2 Parkinson's disease rehabilitation advances

RAEBP 4.3 Spinal cord injury rehabilitation advances

RAEBP 4.4 Multiple sclerosis rehabilitation advances

RAEBP 4.5 Vestibular rehabilitation advances

RAEBP 4.6 Cognitive rehabilitation

RAEBP 4.7 Community-based neuro-rehabilitation

RAEBP 4.8 Interdisciplinary rehabilitation approaches

RAEBP 4.9 Patient-centered rehabilitation

RAEBP 4.10 Quality of life enhancement strategies

Unit V: Future Directions in Neuro-Rehabilitation (Total Hours: 24)

RAEBP 5.1 Precision rehabilitation

RAEBP 5.2 Personalized neurological rehabilitation

RAEBP 5.3 Biomarkers in rehabilitation

RAEBP 5.4 Neuroimaging in rehabilitation planning

RAEBP 5.5 Non-invasive brain stimulation

RAEBP 5.6 Transcranial magnetic stimulation

RAEBP 5.7 Transcranial direct current stimulation

RAEBP 5.8 Big data in neuro-rehabilitation

RAEBP 5.9 International consensus statements

RAEBP 5.10 Future trends in Neuro-Physiotherapy

Recommended Books

1. Umphred DA. Neurological Rehabilitation.
2. O'Sullivan SB, Schmitz TJ. Physical Rehabilitation.
3. Shumway-Cook A, Woollacott MH. Motor Control.
4. Carr JH, Shepherd RB. Neurological Rehabilitation.
5. Lundy-Ekman L. Neuroscience: Fundamentals for Rehabilitation.
6. Latest Clinical Practice Guidelines in Neuro-Rehabilitation.
7. Recent Systematic Reviews and Meta-Analyses in Neurological Rehabilitation.
8. World Physiotherapy Neurology Specialty Resources.

COURSE CODE: M.P.T(N)-203

COURSE TITLE: Recent Advances and Evidence-Based Practice in Neuro-Physiotherapy – Practical

Credits: 4

Total Hours: 120

Practical Competencies

Section A: Evidence-Based Practice Skills (24 Hours)

1. Literature searching
2. Critical appraisal of research articles
3. Interpretation of systematic reviews
4. Clinical guideline implementation
5. Evidence synthesis

Section B: Advanced Neuroplasticity-Based Interventions (24 Hours)

6. Constraint-induced movement therapy
7. Mirror therapy
8. Motor imagery training
9. Action observation therapy
10. Task-oriented training

Section C: Technology-Assisted Neuro-Rehabilitation (24 Hours)

11. Virtual reality applications
12. Robotics-assisted rehabilitation

13. Functional electrical stimulation
14. Wearable technology applications
15. Telerehabilitation implementation

Section D: Advanced Functional Rehabilitation (24 Hours)

16. Dual-task training
17. Cognitive-motor training
18. Advanced balance rehabilitation
19. Advanced gait rehabilitation
20. Community mobility programmes

Section E: Clinical Application and Research Translation (24 Hours)

21. Evidence-based case management
22. Neuro-rehabilitation programme design
23. Outcome measure selection
24. Clinical guideline-based intervention planning
25. Research-to-practice implementation

Assessment Methods

1. Practical Demonstration
2. OSCE

3. Clinical Viva Voce
4. Logbook Assessment
5. Skill Assessment
6. Case Presentation

Recommended Books

1. Umphred DA. Neurological Rehabilitation.
2. O'Sullivan SB, Schmitz TJ. Physical Rehabilitation.
3. Shumway-Cook A, Woollacott MH. Motor Control.
4. Carr JH, Shepherd RB. Neurological Rehabilitation.
5. Latest Neuro-Rehabilitation Clinical Practice Guidelines.
6. Recent Consensus Statements in Neuro-Rehabilitation.
7. Evidence-Based Neurological Physiotherapy Resources.
8. Current Research Publications in Neuro-Rehabilitation.

COURSE CODE: M.P.T(N)-204

COURSE TITLE: Dissertation (DSS-II)-Practical

Credits: 22

Total Hours: 660

DSS-II 1.0 Subject Description

Dissertation (DSS-II) represents the culmination of postgraduate research training in Neuro-Physiotherapy. The course provides students with opportunities to conduct independent, original, and clinically relevant research in neurological rehabilitation. Students are expected to implement approved research protocols, collect and analyze data, interpret findings, prepare a dissertation thesis, and disseminate research outcomes. The course aims to strengthen scientific inquiry, evidence generation, critical appraisal, and research translation skills essential for advanced neurological physiotherapy practice.

DSS-II 1.0.1 Course Outcomes

At the completion of the course, the student will be able to:

1. Conduct independent research in Neuro-Physiotherapy. (P)
2. Implement approved research protocols effectively. (P)
3. Apply appropriate outcome measures and data collection procedures. (P)
4. Utilize statistical methods for data analysis. (P)
5. Interpret research findings accurately and scientifically. (P)
6. Relate findings to current evidence and clinical practice. (P)
7. Prepare a dissertation according to academic standards. (P)
8. Present and defend research findings effectively. (P)
9. Demonstrate competency in scientific writing and publication. (P)
10. Translate research evidence into neuro-rehabilitation practice. (P)

Competency Levels

K – Knows

KH – Knows How

SH – Shows How

P – Performs Independently

DSS-II 1.0.2 Teaching Learning Methods

1. Research Supervision Meetings
2. Independent Research Activities
3. Statistical Analysis Workshops
4. Journal Clubs
5. Research Seminars
6. Scientific Writing Sessions
7. Progress Presentations
8. Dissertation Review Meetings
9. Peer Learning Activities
10. Self-Directed Learning

DSS-II 1.0.3 Assessment Methods

1. Research Progress Evaluation
2. Statistical Analysis Assessment
3. Dissertation Review
4. Scientific Writing Assessment

5. Dissertation Presentation
6. Dissertation Submission
7. Dissertation Viva Voce
8. External Evaluation

Module I: Research Implementation (Total Hours: 120)

- DSS 2.1 Finalization of research protocol
- DSS 2.2 Participant recruitment
- DSS 2.3 Baseline neurological assessment
- DSS 2.4 Informed consent procedures
- DSS 2.5 Pilot testing
- DSS 2.6 Standardization of procedures
- DSS 2.7 Quality assurance measures
- DSS 2.8 Research documentation
- DSS 2.9 Progress monitoring
- DSS 2.10 Protocol adherence

Module II: Data Collection and Management (Total Hours: 180)

- DSS 2.11 Participant screening
- DSS 2.12 Data collection procedures
- DSS 2.13 Intervention monitoring
- DSS 2.14 Functional assessment procedures
- DSS 2.15 Follow-up assessments
- DSS 2.16 Outcome measure administration
- DSS 2.17 Data coding

DSS 2.18 Data entry

DSS 2.19 Database management

DSS 2.20 Data validation

Module III: Statistical Analysis (Total Hours: 120)

DSS 2.21 Data organization

DSS 2.22 Data cleaning

DSS 2.23 Statistical software applications

DSS 2.24 Descriptive statistics

DSS 2.25 Inferential statistics

DSS 2.26 Hypothesis testing

DSS 2.27 Interpretation of findings

DSS 2.28 Graphical presentation

DSS 2.29 Tabular presentation

DSS 2.30 Statistical reporting

Module IV: Dissertation Writing (Total Hours: 180)

DSS 2.31 Introduction chapter

DSS 2.32 Review of literature

DSS 2.33 Methodology chapter

DSS 2.34 Results chapter

DSS 2.35 Discussion chapter

DSS 2.36 Conclusion and recommendations

DSS 2.37 Reference management

DSS 2.38 Formatting and editing

DSS 2.39 Dissertation compilation

DSS 2.40 Final manuscript preparation

Module V: Research Dissemination and Defense (Total Hours: 60)

DSS 2.41 Abstract preparation

DSS 2.42 Scientific poster preparation

DSS 2.43 Oral presentation skills

DSS 2.44 Manuscript preparation

DSS 2.45 Journal submission process

DSS 2.46 Dissertation presentation

DSS 2.47 Viva voce preparation

DSS 2.48 Dissertation defense

DSS 2.49 Incorporation of corrections

DSS 2.50 Final submission

Dissertation Requirements

1. Completion of approved dissertation research.
2. Maintenance of dissertation logbook.
3. Submission of periodic progress reports.
4. Completion of data collection and analysis.
5. Submission of dissertation in prescribed university format.
6. Presentation before departmental review committee.
7. Successful completion of dissertation viva voce.
8. Preparation of a manuscript suitable for publication.

Recommended Books

1. Portney LG, Watkins MP. Foundations of Clinical Research: Applications to Practice.
2. Domholdt E. Rehabilitation Research: Principles and Applications.
3. Hicks CM. Research Methods for Clinical Therapists.
4. Greenhalgh T. How to Read a Paper.
5. Mahajan BK. Methods in Biostatistics.
6. APA Publication Manual.
7. ICMJE Recommendations for Scholarly Publications.
8. CONSORT and STROBE Reporting Guidelines.

COURSE CODE: M.P.T(N)-205

COURSE TITLE: Skills Acquisition & Refinement (SAR-II)-Practical

Credits: 8

Total Hours: 240

SAR-II 1.0 Subject Description

Skills Acquisition and Refinement (SAR-II) is an advanced competency-based practical course focusing on specialized neurological physiotherapy skills, advanced neuro-rehabilitation techniques, clinical decision-making, technology-assisted rehabilitation, and interdisciplinary management. The course aims to develop expertise required for independent management of complex neurological conditions and advanced rehabilitation practice.

SAR-II 1.0.1 Course Outcomes

At the completion of the course, the student will be able to:

1. Demonstrate advanced neuro-rehabilitation skills. (P)
2. Apply contemporary neurological rehabilitation approaches. (P)

3. Design individualized rehabilitation programmes for complex neurological disorders. (P)
4. Integrate technology-assisted rehabilitation into clinical practice. (P)
5. Utilize advanced outcome measures for rehabilitation planning. (P)
6. Apply neuroplasticity principles in functional recovery. (P)
7. Demonstrate leadership within rehabilitation teams. (P)
8. Integrate evidence-based practice into neurological physiotherapy. (P)
9. Apply advanced clinical reasoning skills. (P)
10. Independently manage complex neuro-rehabilitation cases. (P)

Students must be engaged in

- Teaching Assignment, Seminars, journal club & Case Studies etc

COURSE CODE: M.P.T(N)-206

COURSE TITLE: Clinical Training (CT-II)-Practical

Credits: 20

Total Hours: 600

CT-II 1.0 Subject Description

Clinical Training-II provides advanced supervised clinical exposure in specialized neurological rehabilitation settings. Students are expected to independently assess, plan, implement, and evaluate comprehensive rehabilitation programmes for patients with complex neurological disorders while demonstrating professional competency, leadership, and evidence-based clinical practice.

CT-II 1.0.1 Course Outcomes

At the completion of the course, the student will be able to:

1. Independently assess and manage complex neurological disorders. (P)
2. Develop advanced rehabilitation plans. (P)
3. Apply specialized neuro-rehabilitation techniques. (P)
4. Utilize advanced rehabilitation technologies. (P)
5. Monitor functional outcomes effectively. (P)

6. Participate in interdisciplinary rehabilitation planning. (P)
7. Demonstrate professional leadership and accountability. (P)
8. Maintain comprehensive clinical documentation. (P)

Clinical Training Areas

Advanced Adult Neuro-Rehabilitation Unit – 180 Hours

1. Stroke rehabilitation
2. Traumatic brain injury rehabilitation
3. Spinal cord injury rehabilitation
4. Parkinsonism rehabilitation
5. Multiple sclerosis rehabilitation

Acute Neurology and Neurosurgery Unit – 120 Hours

6. Intensive care rehabilitation
7. Early mobilization
8. Neurosurgical rehabilitation
9. Acute neurological management
10. Prevention of complications

Pediatric Neuro-Rehabilitation Unit – 90 Hours

11. Cerebral palsy management

- 12. Developmental disorders
- 13. Pediatric functional rehabilitation
- 14. Family-centered rehabilitation

Specialized Neuro-Rehabilitation Services – 90 Hours

- 15. Vestibular rehabilitation
- 16. Gait laboratory exposure
- 17. Robotics-assisted rehabilitation
- 18. Functional electrical stimulation

Community Rehabilitation Services – 60 Hours

- 19. Community reintegration
- 20. Home programme implementation
- 21. Assistive technology services
- 22. Caregiver education

Academic and Professional Activities – 60 Hours

- 23. Case presentations
- 24. Journal clubs
- 25. Clinical conferences
- 26. Clinical audits

- 27. Research discussions
- 28. Professional development activities

Clinical Requirements

- 1. Minimum 75 complete neurological case records.
- 2. Minimum 40 detailed neurological case presentations.
- 3. Maintenance of clinical logbook.
- 4. Participation in interdisciplinary rehabilitation meetings.
- 5. Completion of outcome assessment portfolio.
- 6. Documentation of rehabilitation outcomes.