



CURRICULUM

MASTERS IN NEUROLOGY PHYSICAL THERAPY

SESSION 2018 onward

KHYBER MEDICAL UNIVERSITY

Institute of Physical Medicine & Rehabilitation
Hayatabad, Peshawar

INTRODUCTION TO MASTER PROGRAM IN PHYSICAL THERAPY

Institute of Physical Medicine and Rehabilitation was established in Jan 2009. Initially a four years of BSPT (Bachelor of Physical Therapy Sciences) was offered, that later got changed in to five years of Doctor of Physical Therapy program in 2010.

Khyber Medical University realizes the need of highly qualified Physical Therapist both for KPK Nationwide, and abroad (as per demand of the field) . It was proud to announce the program of Master in Physical Therapy in two disciplines, Musculoskeletal and Neurological Physiotherapy in 2012.

This program is providing physiotherapy graduates with advanced, specialized training in respective disciplines of physiotherapy. They will have a sound base of scientific knowledge and clinical skills required to critically evaluate and contribute to current research in the basic and applied sciences relevant to disorders of the musculoskeletal and neurological system.

This program has been designed to meet both national and international standards fulfilling criteria for further education and job opportunities. Both of these courses are designed to enable full time study over two years period.

PROGRAM MISSION

The MSPT Program is committed to produce professional practitioners and effective teachers to address complex neurological problems in dynamic educational and healthcare environments to serve the community.

AIM OF THE COURSE

To produce proficient physical therapists who are capable to deal in uncertain, complex and dynamic situations.

OBJECTIVES

After completion of this course, students of MSPT (neurological) will able to;

1. Apply knowledge to manage patient/client with complex neurological problems.
2. Communicate effectively with patients and their families regarding health-related conditions.
3. Effectively write and verbally communicate with health professional and other service providers.
4. Demonstrate advance theoretical concepts and principals relative to physical therapy practice.

5. Apply evidence based physical therapy practice under dynamic situations. Advancement of quality care in different neurological disorders.
6. Develop effective teachers by introducing them to the concepts of educational psychology, curriculum development, assessment, teaching and learning.
7. Prepare research project and disseminate findings in form of reports and research articles.
8. Demonstrate ethical and professional practices in dynamic health care and educational environments.

PROGRAM OUT-COMES

After completion of the program, students will be able to;

1. Examine and provide Physical Therapy services to the patients having neurological disorders in their own discipline.
2. Function as a member of multidisciplinary rehabilitation team to deal with neurological disorders efficiently.
3. Design evidence based and research oriented Physical Therapy practice.
4. Use communication skills verbally and in descriptive pattern to interact with patients and community.
5. Conduct their activities in a professional and ethical manner.
6. Development of lifelong learning and professional growth.
7. Describe problem in the Physical Therapy practice and understand their difficulties. Current trends of treatments understanding their strength, flaws, weakness and gaps.
8. Theory, clinical implementation of theoretical knowledge, conversion of clinical trends into research, and inclusion of latest trends of research into theory re consideration of syllabus time to time to meet the future challenges in the field of neurological physical therapy.

COURSES DESCRIPTION

SEMESTER	Course Code	NAME OF SUBJECT	CREDITS
FIRST	FIRST YEAR		
	NEU-701	The Science of Physical Therapy Practice in Neurology-I	3 (2+1)
	NEU-702	Principles of Physiotherapy Management of Neurological Disorders	3 (2+1)
	RSC-701	Biostatistics & Epidemiology	3 (3+0)
	NEU-703	Advance Application of Physical Therapy Treatment Procedures for the Neurological Disorders-I	3 (2+1)
			12
SECOND	NEU-704	The Science of Physical Therapy Practice in Neurology-II	3 (2+1)
	RSC-702	Research Methodology	3 (2+1)
	NEU-705	Advance Application of Physical Therapy Treatment Procedures for the Neurological Disorders-II	3 (2+1)
			9
THIRD	SECOND YEAR		
	NEU-706	Neuro-practicum-I	3 (0+3)
	NEU-707	Neuro-practicum-II	3 (0+3)
			6
FOURTH	RSC-710	Research Thesis / Dissertation	6
			6
		TOTAL CREDITS	33

M.S PHYSICAL THERAPY IN NEUROLOGY

M.S in Neurological Physical Therapy integrates the principles of neuroanatomy, neurophysiology, neuropathology and movement dysfunction to assess, analyze and manage the neurological disorders. Program provides the opportunity for students to integrate the theory and practical into the practice of neurological Physical Therapy. Students, who have successfully completed all components of the program, will be given the opportunity to apply their skills in a clinical setting. This program promotes a client-centered approach for neurological patients. It is based on the best practices with exposure to various roles of the multidisciplinary team. Learning strategies including interactive lectures, small group casework, clinical skills laboratories, structured clinical sessions as well as independent study time.

At the completion of this course, students will develop the following generic skills:

- Critical thinking, problem-solving and analytical skills
- Good written and verbal communication skills
- An ability to apply evidence-based knowledge and skills
- Appreciation of the importance of the team approach to problem solving
- A deeper understanding of the basic sciences and their integration with neurological Physical Therapy clinical practice
- A sound theoretical knowledge and understanding of conditions affecting the nervous system
- The anatomical rationale of the clinical tests used in differential diagnosis
- The ability to perform an appropriate subjective and physical examination, with development of suitable analytical skills to evaluate data obtained
- The ability to develop and implement a clinical management plan based on the interpretation of assessment findings
- The ability to monitor patient response to modify or progress treatment appropriately
- An awareness of patient safety at all times
- Knowledge of the role of other health care professionals involved in patient care

Semester-I

Course codes	Course title	Credit hours
NEU-701	The Science of Physical Therapy Practice in Neurology-I	3 (2+1)
NEU-702	Principal of Physiotherapy Management Of Neurological Disorders	3 (2+1)
RSC-701	Biostatistics & Epidemiology	3 (3+0)
NEU-703	Advance Application of Physical Therapy Treatment Procedures for the Neurological Disorders-I	3 (2+1)

Aims:

1. To advance students' knowledge of pathology and pathogenesis of disorders encountered in their clients
2. To enhance students' knowledge of the physiotherapy theory of the assessment process and its application in elderly and neurological clients
3. To develop skills in the use of clinical reasoning in order to determine physiotherapy diagnosis in clients
4. To advance understanding of the process of clinical reasoning
5. To extend students ability to plan and holistic program with consideration of all impacting factors
6. To extend student knowledge of physiotherapy management procedures and modalities for a variety of neurological disorder
7. To encourage students to critically review literature and evaluate various treatment approach and modalities
8. To enhance students' knowledge of measurements which may be used to measure outcome

CONTENTS:**Neurological Disorders of Brain**

- **Stroke**
Prevalence, introduction, types, Patho-physiology , clinical features ,Assessment , management .
- **Traumatic brain injury**
Prevalence, introduction, types, Patho-physiology, clinical features ,Assessment , management
- **Parkinson's Disease**
Prevalence, introduction, types, Patho-physiology , clinical features ,Assessment , management .
- **Multiple Sclerosis**
Prevalence, introduction, types ,Patho-physiology , clinical features ,Assessment , management .
- **Ataxia and its types,**
Prevalence , introduction , types ,Patho-physiology , clinical features ,Assessment , management .

Motor Neuron Disorders

- Motor Neuron Disease
- Polyneuropathies
 - **GBS**

- Prevalence , introduction , types ,Patho-physiology , clinical features ,Assessment , management .
- **CIDP**
Prevalence , introduction , types ,Patho-physiology , clinical features ,Assessment , management .
- **ALS**
Prevalence , introduction , types ,Patho-physiology , clinical features ,Assessment , management .
- **Charcot–Marie–Tooth disease (CMT)**
Prevalence , introduction , types ,Patho-physiology , clinical features ,Assessment , management .
- **Diabetic neuropathies**
Prevalence , introduction , types ,Patho-physiology , clinical features ,Assessment , management .
- **Peripheral nerve injuries**
Prevalence , introduction , types ,Patho-physiology , clinical features ,Assessment , management .
- **Myasthenia Gravis**
Prevalence , introduction , types ,Patho-physiology , clinical features ,Assessment , management .

Disorders of muscle

- Muscular dystrophies
- Myopathies

Cranial Nerves Disorders

- Cranial Nerve examination and its pathologies

Compensatory strategies in different Neurological Disorders

- Abnormal Postural Control, Abnormal flexion, extension and mixed synergies in upper and lower limbs and their coping strategies, decorticate, decerebrate posture .

Recommended Readings:

1. Neurological Rehabilitation, 6e (Umphreds Neurological Rehabilitation) by Darcy Ann Umphred PT PhD FAPTA, Rolando T. Lazaro, Margaret Roller and Gordon Burton (Aug 28, 2012)
2. Maria Stokes, Physical Management in Neurological Rehabilitation, 2nd ed, Elsevier
3. Neurological Rehabilitation, 5th Edition by Darcy Ann Umphred (Nov 24, 2006)
4. Neurological Rehabilitation: Optimizing motor performance, 2e by Janet H. Carr MA EdD (Columbia) FACP and Roberta B. Shepherd MA EdD (Columbia) FACP (Sep 22, 2010)

5. Quick Reference Neuroscience for Rehabilitation Professionals: The Essential Neurological Principles Underlying... by Sharon A. Gutman PhD OTR (Dec 1, 2007)
6. Motor Control: Translating Research into Clinical Practice by Anne Shumway-Cook PT PhD FAPTA and Marjorie H. Woollacott PhD (Jan 21, 2011)
7. Bobath Concept: Theory and Clinical Practice in Neurological Rehabilitation by Sue Raine, Linzi Meadows and Mary Lynch-Ellerington (Jul 20, 2009)
8. Stroke Rehabilitation Motor Relearning Program by Corr and Shepherd
9. Physical Rehabilitation (O'Sullivan, Physical Rehabilitation) by Susan B. O'Sullivan and Thomas J. Schmitz (Aug 4, 2006)

NEU- 702 PRINCIPAL OF PHYSIOTHERAPY MANAGEMENT OF NEUROLOGICAL DISORDERS
3(2+1)

Aims and objectives:

1. To advance the students' knowledge of neuroanatomy, neurophysiology
2. To advance the student knowledge of the effect of aging of the multiple system of body
3. To advance the students understanding of motor control
4. To develop an understanding of motor learning, skill acquisition and the implications for practice
5. To understand the issues involved in the recovery of function
6. To enhance students' ability to critically evaluate established and new knowledge
7. To develop an understanding of memory and cognition

Course Content:

Introduction of CNS

- **Brain**
Cerebral cortex and its lobes sulci and gyrai, Brodman,s Area, layers of Cerebral cortex , Basal nuclei and its connections ,Diencephalan ,Mesen cephalan ,Pons , Rhobencephalan ,medulla oblanagata and cerebellum ,Ascending and descending tracts , Cranial nerves and its nuclei ,
- **Spinal cord**
Neurological Examination and Assessment in Neurological disorder
Cranial nerve examination
Consciousness scale G.C.S and Rhoncho los Amigo Scale

Outcome Measures

- Introduction of outcome measure scale
- Clinical applicability of different outcome measures
- Motor Assessment Scale, COVS Scale , CTSIB , Mini-mental scale , Gait Ambulatory index , Berg Balance Scale , Barthel index , FIM,s scale , Day Pastor and Mazten test ,Functional Reach test ,TUG test
- Selection of suitable Outcome measures for clinical and Research purposes for different Neurological disorders.

Neuroplasticity

- Introduction
- Rules of Neuroplasticity
- Sprouting and its types
- Clinical Applicability of neuroplasticity

Motor Control

- Introduction
- Difference between motor control and motor strength.
- Motor control theories
- Reflex Theory, Hierarchy Theory, Dynamic Theory, System Theory and Ecological Theory .

Discharge Note writing for different neurological disorders.

Aims of the course:

This course will focus on Biostatistical analysis of research articles in the field of Physical Therapy

Objective:

On completion of the study of this subject the student should be able to:

- Enumerate the steps in Physiotherapy research process
- Acquire skills of reviewing literature, formulating a hypothesis, collect data, writing research proposal etc
- Describe the importance & use of biostatistics for research work

Contents:**Biostatistics**

- Introduction
- Definition
- Types
- Application in Physiotherapy

Data

- Definition
- Types
- Presentation
- Collection methods

Measures of central value

- Arithmetic mean, median, mode. Relationship between them
- Partitioned values- Quartiles, Deciles, Percentiles
- Graphical determination

Measures of Dispersion

- Range
- Mean Deviation
- Standard Deviation

Normal Distribution Curve

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

Correlation analysis

- Bivariate distribution
- Scatter Diagram
- Coefficient of correlation
- Calculation & interpretation of correlation coefficient
- T-test, Z-test, P-value

Regression analysis

- Lines of regression
- Calculation of Regression coefficient

Sampling

- Methods of Sampling
- Sampling distribution
- Standard error
- Types I & II error

Probability (in Brief)

Hypothesis Testing

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

Parametric & non-Parametric tests

- Chi square test
- Mann-Whitney U test
- Wilcoxon Signed test
- Kruskal-Wallis test
- Friedman test
- T-test/student T test
- Analysis of variance (ANOVA)
- Regression analysis

Introduction to SPSS

Recommended reading

- Fundamentals of Biostatistics by Bernard Rosner (Aug 19, 2010)
- Biostatistics: A Foundation for Analysis in the Health Sciences (Wiley Series in Probability and Statistics) by Wayne W. Daniel (Dec 31, 2008)
- Biostatistics: A Foundation for Analysis in the Health Sciences (Wiley Series in Probability and Statistics) by Wayne W. Daniel and Chad L. Cross (Jan 9, 2013)
- Leon Gordis, Epidemiology, 2013

Journals:

- International journal of biostatistics

- Clinical implementations of P.N.F in different Neurological disorders

Section 5: Bobath,s techniques

- Introduction
- Techniques
- Principles
- Clinical implementations in different neurological disorders

Recommended Readings:

1. Neurological Rehabilitation, 6e (Umphreds Neurological Rehabilitation) by Darcy Ann Umphred PT PhD FAPTA, Rolando T. Lazaro, Margaret Roller and Gordon Burton (Aug 28, 2012)
2. Maria Stokes, Physical Management in Neurological Rehabilitation, 2nd edt, Elsevier
3. Neurological Rehabilitation, 5th Edition by Darcy Ann Umphred (Nov 24, 2006)
4. Neurological Rehabilitation: Optimizing motor performance, 2e by Janet H. Carr MA EdD (Columbia) FACP and Roberta B. Shepherd MA EdD (Columbia) FACP (Sep 22, 2010)
5. Physical Rehabilitation (O'Sullivan, Physical Rehabilitation) by Susan B. O'Sullivan and Thomas J. Schmitz (Aug 4, 2006)
6. Quick Reference Neuroscience for Rehabilitation Professionals: The Essential Neurological Principles Underlying... by Sharon A. Gutman PhD OTR (Dec 1, 2007)
7. Motor Control: Translating Research into Clinical Practice by Anne Shumway-Cook PT PhD FAPTA and Marjorie H. Woollacott PhD (Jan 21, 2011)
8. Bobath Concept: Theory and Clinical Practice in Neurological Rehabilitation by Sue Raine, Linzi Meadows and Mary Lynch-Ellerington (Jul 20, 2009)

Semester-II

Course codes	Course title	Credit hours
NEU-704	The Science of Physical Therapy Practice in Neurology-II	3 (2+1)
RSC-702	Research Methodology	3 (2+1)
NEU-705	Advance Application of Physical Therapy Treatment Procedures for the Neurological Disorders-II	3 (2+1)

Aims:

1. To extend students ability to analyze movement postural and functional dysfunction; proficiently identify impairments and interpret the relationship of the impairments to functional ability in spinal cord injuries and pediatric Physical Therapy
2. To develop skills in the use of clinical reasoning in order to plan the management of the in spinal cord injury patients and pediatrics with different neurological disorders.
3. To extend students ability to select and apply physiotherapy management procedures
4. To develop skills to provide evidence-based treatment
5. To develop the ability to apply motor learning principles; select and develop programs that are goal directed; and maximize outcomes through optimal practice opportunities
6. To enhance student's ability to predict and measure outcome in clients
7. To encourage the use of literature to evaluate various treatment approaches, strategies and modalities

Contents**Section 1: Pediatric Physical Therapy**

- Introduction of pediatric neurodevelopmental techniques
- Evidence based decision making in pediatric physical therapy
- Developmental milestones included sensory, gross motor, fine motor, cognitive, functional and social.
- Assessment and management of Delayed developmental milestones
- Primitive reflexes and its span
- Cerebral palsy assessment and management
- Genetic disorders assessment and management
- Normal gait parameters in children ,Gait disorders in pediatrics assessment and management
- Motor control developmental aspects of motor control in skill acquisition
- Physical fitness during childhood and adolescents
- Spinal muscular atrophy in children
- Brain injuries ,traumatic brain injuries ,near downing and brain tumors
- The special care nursery
- Osteogenesis imperfect

Section 2: Spinal cord injury management

- **Background information**
 - Motor, sensory and autonomic pathways
 - The ASIA assessment of neurological deficit
 - Common patterns of neurological loss with incomplete lesions
 - Upper and lower motor neuron lesions
 - Prognosis
 - Impairments associated with spinal cord injury
 - Skin management

- Psychological well-being
- Spinal cord injury and traumatic brain injury
- Aging with spinal cord injury
- **A framework for physiotherapy Management**
- Assessing impairments, activity limitations and participation restrictions
- Step two: setting goals
- Step three: identifying key impairments
- Step four: identifying and administering treatments
- Step five: measuring outcomes
- Physiotherapy as part of the multi-disciplinary team
- **Transfers and bed mobility of people with lower limb paralysis**
- Sitting unsupported
- Rolling
- Lying to long sitting
- Vertical lift
- Transfers
- Vertical transfers
- Other factors which influence the ability to perform mobility tasks
- **Wheelchair mobility**
- Mobilizing with power wheelchairs
- Mobilizing with manual wheelchairs
- Providing assistance for people in manual wheelchairs
- Hand function of people with Tetraplegia
- **Loss of Hand function and principles of therapy**
- Tenodesis grip
- Reconstructive surgery and electrical stimulation
- **Standing and walking with lower limb paralysis**
- Standing for therapeutic purposes
- Walking with thoracic paraplegia
- Walking with partial paralysis of the lower limbs
- Electrical stimulation
- **Training motor tasks**
- Motor control and motor learning
- Principles of effective motor task training
- Treadmill training with body weight support.
- A way of providing intensive practice
- **Strength training**
- Assessment of strength
- Neurally intact muscles training
- Strength training for partially paralyzed muscles
- Avoiding injury and other complications
- Strength training for general well-being

- **Pain management**
 - Assessment
 - Neuropathic pain
 - Nociceptive pain
 - Role of psychosocial factors in chronic pain
- **Respiratory management**
 - The direct and indirect effects of respiratory muscle weakness
 - Respiratory complications in the period immediately after injury
 - Assessment of respiratory function
 - Treatment options
 - Ventilation for patients with C1–C3 tetraplegia
- **Cardiovascular fitness training**
 - Assessment of cardiovascular fitness
 - The response of people with spinal cord injury to exercise
 - Exercise prescription
 - Exercise in the community.
- **Wheelchair designing for different level of spinal cord lesion.**
- **Wheely training**

Recommended readings

1. Physical Therapy for Children by Suzan K. Campbell
2. Spinal cord injury management by Liza Harvey
3. Spinal cord injury
Rehabilitation medicine a quick reference by Thomas N Bryce

Objective:

On completion of the study of this subject the student should be able to:

- Enumerate the steps in Physiotherapy research process
- Acquire skills of reviewing literature, formulating a hypothesis, collect data, writing research proposal etc
- Describe the importance & use of biostatistics for research work

Course Content:

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

1. Research in Physiotherapy

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

2. Research Fundamentals

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

3. Writing a Research Proposal, Critiquing a research article

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

4. Research Design

Principle of Designing

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

5. Research Ethics

- Importance of Ethics in Research

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

Recommended Readings:

- Leon Gordis, Epidemiology, 2013
- Introduction to Health Research Methods by Kathryn H. Jacobsen (Mar 23, 2011)
- DePoy E. and Gitlin L.N. (2011) Introduction to Research. Understanding and Applying Multiple Strategies.
- Guide to Evidence-Based Physical Therapist Practice, Dianne V. Jewell – 2014 Jones & Bartlett

Journals:

- International journal of social research methodology
- Physiotherapy research international journal

**NEU- 705 Advance Application of Physical Therapy treatment procedure for
neurological disorders-II 3(2+1)**

Aims:

On completion of the study of this subject the student should be able to

- To formulate a rationalized treatment plan for the patient
- Applications of advance treatment approaches in Neuro-Rehabilitation
- Compare & contrast the outcome of various treatment approaches
- Document the status to the patient as written records

Course Content:

Advanced Treatment approaches

- Skill acquisition
 - Motor control : Issues and theories
 - Motor learning and recovery of function
 - Physiology of motor control
- Vestibular training
- Circuit Training
- Visual Imaginary training
- Virtual reality
 - Introduction
 - Types
 - Clinical implementation in Neuro-Rehab for different neurological disorders
- Biofeedback
- Functional electrical stimulation (FES)
- Constraint Induced Movement Therapy (CIMT)
- Robotics
 - Introduction
 - Types
 - Clinical implementation in Neuro-Rehab for different neurological disorders
- Biodex

Recommended Readings:

1. Neurological Rehabilitation, 6e (Umphreds Neurological Rehabilitation) by Darcy Ann Umphred PT PhD FAPTA, Rolando T. Lazaro, Margaret Roller and Gordon Burton (Aug 28, 2012)
2. Maria Stokes, Physical Management in Neurological Rehabilitation, 2nd ed, Elsevier
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6. Quick Reference Neuroscience for Rehabilitation Professionals: The Essential Neurological Principles Underlying... by Sharon A. Gutman PhD OTR (Dec 1, 2007)
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8. Bobath Concept: Theory and Clinical Practice in Neurological Rehabilitation by Sue Raine, Linzi Meadows and Mary Lynch-Ellerington (Jul 20, 2009)

RECOMMENDED JOURNALS:

1. Physical therapy - APTA, USA
2. Physiotherapy - CSP, London
3. Physiotherapy - Canada
4. Australian Journal of Physiotherapy
5. American Journal of Physical Medicine and Rehabilitation
6. Archives of Physical Medicine and Rehabilitation

Semester-III

Course codes	Course title	Credit hours
NEU-706	Neuro-practicum-I	3 (0+3)
NEU-707	Neuro-practicum-II	3 (0+3)

Aims:

On completion of the study of this subject the student should be able to

- Perform a thorough physiotherapy assessment &
- Plan individualized physiotherapy goals for neurological Conditions covered in the first year.
- Apply Effective physiotherapy treatment techniques,
- Compare & contrast the efficacy of different treatment approaches
- Communicate the status of the patient with other rehabilitation team members & patient's attendants.

Course Content:**Section 1- Physiotherapy assessment**

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

Section 2-Advance Physiotherapy Treatment approaches

1. Neurodevelopment technique
2. Bo bath
3. Vojta
4. Brunnstrom
5. PNF

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

Section 3- Practical Examination-

Practical examination will be divided into two parts:

1. Two long Cases
2. One short Case

Recommended Readings:

1. Bentley J (2001) A Physical Therapy perspective on the dilemmas of outcome measurement in severe and complex brain injury rehabilitation. *Physical Therapy* November, 87, 11, 593-598.
2. Burton C.R. (2000) Re-thinking stroke rehabilitation: the Corbin and Strauss chronic illness trajectory framework *Journal of Advanced Nursing* 32,3,595-602
3. Campbell M (2000) *Rehabilitation for Traumatic Brain Injury*. Edinburgh: Churchill Livingstone.
4. Churchill Livingstone.
5. Edwards S (2002) *Neurological Physical Therapy: A Problem Solving Approach*. Edinburgh: Churchill Livingstone.
6. *Neuromusculoskeletal Examination and Assessment A Handbook for Therapists*
By: Nicola J Petty, Ann P Moore & G D Maitland, Second Edition Churchill Livingstone

Aims:

On completion of the study of this subject the student should be able to

- Perform a thorough physiotherapy assessment &
- Plan individualized physiotherapy goals for neurological Conditions covered in the first year.
- Apply Effective physiotherapy treatment techniques,
- Compare & contrast the efficacy of different treatment approaches
- Communicate the status of the patient with other rehabilitation team members & patient's attendants.

Course Content:**Section 1- Physiotherapy assessment**

21. Review of General assessment
22. Assessment of Higher mental functions
23. Neurodevelopment assessment
24. Pain assessment
25. Sensory assessment
26. Assessment of Tone, flexibility, tightness
27. Motor Control assessment
28. Muscle Length Testing
29. Postural assessment
30. Limb length measurement
31. Range of Motion
32. Balance assessment
33. Coordination assessment
34. Reflex Testing
35. Cranial nerve testing
36. Nerve Tension testing
37. EMG/ NCV report reading & analysis
38. Clinical Gait assessment
39. Functional assessment
40. Physical disability evaluation (in brief)

Section 2-Advance Physiotherapy Treatment approaches

18. Neurodevelopment technique
19. Bo bath
20. Vojta
21. Brunnstrom
22. PNF

23. Rood's Approach
24. Pain management
25. Gait Training
26. Biofeedback
27. Hydrotherapy
28. Relaxation technique
29. Wheelchair Prescription
30. Pediatric Neurophysiotherapy
31. Geriatric Neurophysiotherapy
32. Assistive Technologies and its role in Neurorehabilitation
33. Prosthetics and Orthotics in Neurorehabilitation
34. Wheelchair skills- Basic

Section 3- Practical Examination-

Practical examination will be divided into two parts:

3. Two long Cases
4. One short Case

Recommended Readings:

7. Bentley J (2001) A Physical Therapy perspective on the dilemmas of outcome measurement in severe and complex brain injury rehabilitation. *Physical Therapy* November, 87, 11, 593-598.
8. Burton C.R. (2000) Re-thinking stroke rehabilitation: the Corbin and Strauss chronic illness trajectory framework *Journal of Advanced Nursing* 32,3,595-602
9. Campbell M (2000) *Rehabilitation for Traumatic Brain Injury*. Edinburgh: Churchill Livingstone.
10. Edwards S (2002) *Neurological Physical Therapy: A Problem Solving Approach*. Edinburgh: Churchill Livingstone.
12. *Neuromusculoskeletal Examination and Assessment A Handbook for Therapists*
By: Nicola J Petty, Ann P Moore & G D Maitland, Second Edition Churchill Livingstone

Semester-IV

Course codes	Course title	Credit hours
RSC 710	Research Thesis / Dissertation	6

Aims of the Study Unit

To apply the theoretical and practical knowledge gained in the course to the design, implementation and evaluation of Physical Therapy rehabilitation programs, using both individual and group models. Practical experience with all aspects of case management, including working as part of the rehabilitation team, report writing, professional ethics and exposure to the public and private health systems.

Content of the Study Unit

The dissertation will normally be 8,000 and 12, 000 words in length. 12000 words is the maximum word length permissible. Concise appendices are permissible, however, all information essential to the coherence of the dissertation needs to be located outside the appendices, within the main body of the dissertation.

The dissertation will normally contain the following elements;

- An abstract
- Clear statement of research questions and aims
- Background chapter including review of the pertinent literature and relevance of the study to the focus of the student's M.S Physical Therapy course
- Method section (with due reference to methodological issues, methods of data collection and analysis, sampling, critique and ethical consideration)
- Findings
- Discussion
- Conclusion
- Implication and recommendations (where applicable)

Recommended Reading

- The Essential Guide to Doing Your Research Project by Zina O'Leary (Nov 25, 2009)
- Doing Your Research Project (Open Up Study Skills) by Judith Bell (May 1, 2010)
- A Beginner's Guide to Doing Your Education Research Project by Mike Lambert (Sep 5, 2012)
- A Manual for Writers of Research Papers, Theses, and Dissertations, Eighth Edition: Chicago Style for Students... by Kate L. Turabian, Wayne C. Booth, Gregory G. Colomb and Joseph M. Williams (Mar 28, 2013)

Assessment Criteria

- Synopsis writing and defense in Institutional Review Committee (IRC)
- Synopsis defense in IRB
- Synopsis defense in ASRB
- Research WORK and THESIS writing
- Submission of Research Thesis / Dissertation