Syllabus For

MASTER OF PHYSIOTHERAPY NEUROLOGY
MASTER OF PHYSIOTHERAPY NEUROLOGY

About the course: Neurological physiotherapy is a discipline concerned with disorders of the nervous system; neurological physiotherapists assess the impact of neurological conditions (like Cerebral Palsy, Parkinson's disease or multiple sclerosis) and neurological trauma (such as head or spinal injuries, strokes, or brain surgery) on patients' normal bodily functions and movements. Common symptoms of neurological disorders include paralysis, vision impairment, poor balance, inability to ambulate, and loss of functional independence. Therapists work to improve these areas of dysfunction. They also design and implement strategies that can assist in the recovery of normal function, usually in conjunction with other medical or health care professionals. This course promotes development of skills, knowledge and attributes of a reflective, evidence-based practitioner who might seek to specialise in neurological physiotherapy.

Graduate Attributes: On completion of this course, graduates will be expected to be able to demonstrate the following specific skills:

- An advanced knowledge of anatomy and physiology applied to physiotherapy.
- An advanced understanding of the recent knowledge base in areas of physiotherapy.
- Advanced clinical skills and techniques applicable to relevant physiotherapy areas, including assessment techniques, clinical reasoning and decision-making skills in developing treatment plans and comprehensive patient management.
- A capacity to undertake detailed searching, analysis and interpretation of computerised medical literature databases.
- An ability to promote evidence-based practice in physiotherapy.

Job prospects & Career options: Employment opportunities for physiotherapists are tremendous as it is a career where the demand exceeds supply. A physiotherapist could be employed in the rehabilitation departments, municipal corporations and private bodies. Their demand in medical institutions is increasing since physiotherapy plays an important role in the treatment of patients with muscular and cerebral problems. Like all other medical and paramedical professionals, physiotherapists can work in hospitals, orthopaedic departments, rehabilitation centres for the handicapped, schools for the mentally retarded and physically disabled children, health institutions and defense medical establishments. Physiotherapists can also opt for teaching, while those with adequate capital can establish private clinics of their own.

The demand for physiotherapists in the country as well as abroad is immense. They are in great demand in USA, Canada and Australia.
(NEUROLOGY)

**FIRST YEAR**

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<tr>
<th>COURSE CODE</th>
<th>COURSE NAME</th>
<th>YEARLY CREDITS*</th>
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<tr>
<td>MPT (N) 501</td>
<td>Basic sciences &amp; Biomechanics</td>
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<td>MPT (N) 502</td>
<td>Research Methodology &amp; Biostatistics</td>
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<td>MPT (N) 503</td>
<td>Neurological Disorders-I</td>
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<td>Physiotherapy Assessment &amp; Goal planning-I</td>
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<td>Neurological Physiotherapy Management -I</td>
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**PRACTICALS**

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<td>MPT (N) 551</td>
<td>Neurological physiotherapy Assessment &amp; Management</td>
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<tr>
<td>MPT (N) 591</td>
<td>P.T. Clinics / Symposia / Presentation.**</td>
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Total 50

* Yearly Credits have been calculated by multiplying the Semester-wise credits by two for theory papers.
** NUES stands for Non University Examination Subject.

**SECOND YEAR**
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<th>COURSE CODE</th>
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<tr>
<td>MPT (N) 601</td>
<td>Pedagogy in Physiotherapy Education</td>
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<td>MPT (N) 602</td>
<td>Administration, Management &amp; Ethical issues</td>
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<td>MPT (N) 603</td>
<td>Neurological Disorders-II</td>
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<td>MPT (N) 604</td>
<td>Physiotherapy Assessment &amp; Goal Planning –II</td>
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**PRACTICALS**

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<td>MPT (N) 651</td>
<td>Neurological Physiotherapy Assessment and Management</td>
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<td>MPT (N) 691</td>
<td>P.T. Clinics/ Symposia / Presentation**</td>
<td>8</td>
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<tr>
<td>MPT (N) 692</td>
<td>Dissertation</td>
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Total Credits of the Programme are –
Every student will be required to register themselves for all courses of the programme and shall also be required to take up examination to all courses; however a student shall be entitled to the award of the degree if he or she is able to earn a total of 100 credits.
Objective:
On completion of the study of this subject the student should be able to:

- Comprehend the structure & function of parts of the nervous system in relevance to Physiotherapy
- Correlate the knowledge gained, in understanding the neurological dysfunction

Following are the topics to be included:

**Basic Sciences:**

UNIT – I

**Neuroanatomy (Review)**

1. Development of nervous system,
2. Peripheral nerves and ganglia, receptors and effectors, dermatomes and muscular activity, CNS an overview, spinal cord, brainstem.
   - Cerebellum and fourth ventricle
   - Diencephalon and third ventricle
   - Cerebrum,
   - Basal nuclei
4. Blood supply of the brain
5. Meninges, cerebrospinal fluid and Fluid compartments and fluid balance in the CNS
6. Somatic motor and sensory pathways
   - Special senses and their neural pathways
   - Reticular formation and limbic system
   - Sensory system, spinal cord and its connection
7. Autonomic nervous system

UNIT – II

**Neurophysiology**

Organization and function of nervous system
Basic Neurophysiology, concerned to motor unit potentials, nerve conduction
- neuromuscular junction transmission and reflexes
- Somatosensory function
- Higher intellectual function
- Reflex maturation- Neurophysiologic basis
- Normal sequential physiological changes throughout the developmental age
- Physiology of pain: Models of pain, Basic molecular biology, neurobiology, stress biology and pain, Peripheral and central pain mechanisms, theory of modulation of pain.
- Properties of nerve fibers, synapse
- Neurotransmitters-their clinical co-relation
- Thermoregulation
- Physiological basis of emotions.
- Tone and its regulation
- Neurophysiology of special senses

**Basic Biomechanics:**

1. Basic concepts definition, description, classification, practical application of force, equilibrium
friction, levers, springs and pulleys.
2. Mechanical properties of connective tissue viscoelasticity, creep and stress relaxation, rate dependent properties, stress and strain curves. Brief mention of specialized tissues Bones, tendons, ligaments, cartilage.
3. Mech. properties of muscular tissue length tension relationship, MB contraction types factor affecting ms function.
4. Biomechanics of Spine
5. Kinetics and kinematic analysis of normal posture.
7. Pathological Gait

References:
- Clinical Anatomy for Medical Students
- Grants – Methods of Anatomy
- Shepherd, Gordon- Synaptic Organization of the brain, 4th Edition
- Kinesiology – Scientific Basis of Human Motion, Brown & Benchmark
- The neural basis of motor control by Black I., Churchill, Living stone 1987
- Biomechanics – A Qualitative approach for studying Human Motion

Research Methodology & Biostatistics

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

Following are the topics to be included:

SECTION I

RESEARCH METHODOLOGY
1. Research in physiotherapy

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

2. Research Fundamentals

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

3. Writing a Research Proposal, Critiquing a research article

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

4. Research Design

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

5. Research Ethics

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

SECTION II
1. Biostatistics

Introduction
Definition
Types
Application in Physiotherapy

2. Data

Definition
Types
Presentation
Collection methods

3. Measures of central value

Arithmetic mean, median, mode. Relation ship between them
Partitioned values- Quatertiles, Deciles, Percentiles
Graphical determination

4. Measures of Dispersion

Range
Mean Deviation
Standard Deviation

5. Normal Distribution Curve

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

6. Correlation analysis

Bivariate distribution:

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

7. Regression analysis

Lines of regression
Calculation of Regression coefficient

8. Sampling

Methods of Sampling
9. Probability (in Brief)

10. Hypothesis Testing

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

11. Parametric & non parametric tests

Chi square test
Mann-Whitney U test
Wilcoxon Signed test
Kruskal-Wallis test
Friedman test
T-test/student T test
Analysis of variance

References:
- Handbook of research Methodology
- Elements of research in Physical Therapy
- An Introduction to biostatistics
- Methods in Biostatistics: Mahajan B.K.
- Methods in Biostatistics: For Medical students and research workers

Neurological Disorders I

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

- Correlate the clinical manifestations to the organ of dysfunction of the nervous system
- To understand the conservative & surgical management of the Neurological conditions as relevant to Physiotherapy.

Section I
Neurological disorders

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

1. Congenital & hereditary Disorders
2. Disorders of cerebral circulation
3. Head Injury
4. Spinal Cord Injury
5. Disorders of Peripheral nerves
6. Disorders of cranial nerves
7. Disorders of muscles

Investigations
Orientation and Introduction, Physical basis, normal result & common abnormal responses, (in brief)
1. Skull X ray
2. Computerized Tomography
3. Magnetic Resonance Imaging
4. Intracranial Pressure monitoring
5. Evoked Potentials
6. EMG/ NCV
7. Lumbar puncture
8. Common Laboratory tests in Neurological disorders

Section II
Neurosurgical disorders

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

References:
- Case book of Neurology, Kay Richard
- Adams & victor’s manual of Neurology, Victor Morris
Physiotherapy Assessment & Goal planning-I

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

- Perform thorough Physiotherapy assessment & list deficiencies
- Design individualized goals for the patient
- Rationalize the outcome of the assessment
- Document systematic, meaningful, accurate written records of the patient

Physiotherapy assessment to be taught for the conditions covered in the subject Neurological Disorders I (Code IECUMPT (N) 103)

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)

References:
- Physical Rehabilitation: Assessment and Treatment by O’Sullivan, F.A. Davis, Philadelphia, 1994
- Early diagnosis and Therapy in Cerebral palsy: Sherzer Altred L
- The neural basis of Motor control by Black I., Churchill, Livingstone, 1987
- Clinical Neurodynamics: Shacklack, Michael
- Technique of Neurological Examination: Stephen L
- Spinal Cord Disease: Diagnosis and management Engler G.L
Neurological Physiotherapy Management- I

Objective:
On completion of the study of this subject the student should be able to
- To formulate a rationalized physiotherapy treatment plan for the patient
- Implement physiotherapy treatment
- Compare & contrast the outcome of various physiotherapy treatment approaches
- Document the status of the patient as written records

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

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

Physiotherapy management for the conditions covered in the subject Neurological Disorders I (Code MPT (N) 103)

1. Theories of Motor Control
2. Theories of Motor learning

Advanced 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. Wheelchair Prescription
10. Biofeedback
11. Hydrotherapy
12. Relaxation technique
13. Pediatric Neurophysiotherapy
14. Geriatric Neurophysiotherapy
15. Assistive Technologies and its role in Neurorehabilitation
16. Prosthetics and Orthotics in Neurorehabilitation
17. Wheelchair skills- Basic

References:
- Neuro – Rehabilitation: Principles and practice  Taly, A.B.
- Neuroscience for rehabilitation: Cohen, Helen
- Stroke Therapy: Fisher, Marc
- Early diagnosis and therapy in Cerebral Palsy: Scherzer, Alfred L.
- Physiotherapy in Stroke management: Harrison, Marie, N.A.
Objective:
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.

Following are the topics to be included -

Practical Training in the Physiotherapy assessment & treatment for conditions covered in the First year-

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)

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
10. Relaxation technique
11. Wheelchair Prescription
12. Pediatric Neurophysiotherapy
13. Geriatric Neurophysiotherapy
14. Assistive Technologies and its role in Neurorehabilitation
15. Prosthetics and Orthotics in Neurorehabilitation
16. Wheelchair skills- Basic

**Practical Examination-**

- Practical examination will be divided into two parts:
  1) Two long Cases
  2) One short Case

**Course objective:** The student will learn approach to patient, collection of demographic data, art of
history taking and bedside/ OPD/ on-field manners in relation to the patient. The student will be posted in
the department of Physiotherapy & the sports clubs/ organizations/ teams associated with the hospital and
he/ she will do the assessment of the patients visiting the respective destinations.
Students will be taught the basic fundamentals of computer science and information technology, helping
them in carrying out research and penning the dissertation.

Examination

There will be no university examination. The students will be awarded marks on the basis of his/ her
attendance & performance during clinical postings at the destinations attached with institute.

Second Year
Pedagogy in Physiotherapy education

Objective:
On completion of the study of this subject the student should be able to
• Understand the Dynamics of teaching & learning
• Plan effective teaching sessions in Physiotherapy

Following are the topics to be included but not limited to:
1. Education

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

2. Concept of Teaching and Learning

Meaning and scope of Educational Psychology
Meaning and Relationship between teaching and learning
Learning Theories
Dynamics of behavior
Individual differences

3. Curriculum

Meaning and concept
Basis of curriculum formulation
Framing objectives for curriculum
Process of curriculum development and factors involved.
Evaluation of curriculum
4. Method and techniques of teaching

Lecture
Demonstration
Discussion
Seminar
Assignment
Project
Case Study

5. Planning for teaching

Bloom’s taxonomy of instructional objectives
Writing instructional objectives in behavioral terms
Unit planning
Lesson planning

6. Teaching aids

Types of teaching aids
Principles of selection, preparation and use of audio-visual aids

7. Measurement and Evaluation

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

8. Guidance and counseling

Meaning & concepts of guidance and counseling
Principles of guidance and counseling

9. Awareness PROGRAMME

Awareness and guidance to the common people about health and disease

References:
- Developing a Pedagogy of Teacher education: Understanding teaching and learning about teaching.
- Pedagogy and Learning with ICT
- Treatise on Pedagogy
- Choral Pedagogy

Administration, Management & Ethical Issues
Objective:
On completion of the study of this subject the student should be able to

- Understand the basic issues of Management & Administration
- Practice as an informed professional on Legal & ethical issues

SECTION I

Management

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

Personnel management:
Staffing
Recruitment selection
Performance appraisal
Collective bargaining
Job satisfaction

Marketing:
Market segmentation
Channels of distribution
Promotion
Consumer behavior

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

SECTION II

Administration, Legal Ethical Issues

Hospital as an organization - Functions and types of hospitals
Roles of Physical therapist, Physical therapy Director, Physiotherapy supervisor, Physiotherapy assistant, Physiotherapy aide, Home health aide, Volunteer.

Rules of Professional Conduct.
Legal responsibility
Code of ethics
Functions of Physiotherapy associations
Role of the International Health Agencies
Standards of practice for physiotherapists
Liability and obligations in the case of medical legal action
Law of disability & discrimination
Confidentially of the Patient’s status
Consumer protection law, health law, MCI, DCP

References:
- Medical ethics & consumer protection act
- Human Resource Management by NK Singh
- Hospital Administration by Dr. S.L. Goel & Dr. R. Kumar
- Handbook of human resource management
- Managerial accounting for hospital
- Public Power & Administration by Wilenski, Hale & Iremonger

Neurological disorders II

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

- Correlate the clinical manifestations to the organ of dysfunction of the nervous system
- To understand the conservative & surgical management of the Neurological conditions as relevant to physiotherapy.

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

Section I
Neurological disorders

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

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

Section II
Neurosurgical disorders

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

References:
- Physical Medicine and Rehabilitation Secrets by O’Young
- Adams & victor’s manual of Neurology
- Electro diagnosis in diseases of nerve and muscles by Kimuraj J., F.A. Davis, Philadelphia
- Motor Neuron Disease Kund, Ralph W
- Neurobehavioural disorders: Vinken P.J.
- Neurological Disorders: Course and Treatment: Brandt, Thomas

Physiotherapy Assessment & Goal planning –II

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

- Perform thorough Physiotherapy assessment & list deficiencies
- Design individualized goals for the patient
- Rationalize the outcome of the assessment
- Document systematic, meaningful, accurate written records of the patient

Physiotherapy assessment to be taught for the conditions covered in the subject Neurological Disorders II (Code IECUMPT (N) 203) -

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

References:
- Physical Medicine and Rehabilitation by Brammer
- Differential diagnosis in Physical therapy, 1995 by Goodman
- Neurological rehabilitation: Taly A.B.
- Neuro – Rehabilitation by Farber, W.B. Saunders
- Technique of Neurological Examination: Stephen L
Neurological Physiotherapy Management - II

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

- To formulate a rationalized treatment plan for the patient
- Implement physiotherapy treatment
- Compare & contrast the outcome of various treatment approaches
- Document the status to the patient as written records

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

a. Physiotherapy management for the conditions covered in the subject Neurological Disorders II (Code IECUMPT (N) 203)

b. Advanced Treatment approaches

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

References:
- Functional Neurorehabilitation: Berner, Julie
- Motor control theory and practice: Shumway- cook & Anne
- Stroke Rehabilitation By Laidler, Capman And Hall, London, 1986
- Rehabilitation of the Spne: liebensor, Craiq
- Electro diagnosis in diseases of nerves

Neurological Physiotherapy Assessment & Management (Practical)

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

- Perform a through physiotherapy assessment & plan an individualized goals for neurological Conditions covered in the second year.
- Apply Effective physiotherapy treatment techniques, compare & contrast the efficacy of different treatment approaches
- Communicate the status to the patient with other rehabilitation team members & patient’s attendants

Practical Training in the Physiotherapy assessment & treatment for conditions covered in the
second year.

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

Advanced Treatment approaches

- Neural Mobilization
- Balance & Coordination training
- Vestibular training
- Cognitive and Perceptual disorders
- Communication Disorders
- Learning Disorders
- Environmental modifications
- Group exercises
- Physiotherapy in home setting

CLINICS, SYMPOSIA, PRESENTATION & COMPUTER FUNDAMENTALS

Course objective: The student will learn approach to patient, collection of demographic data, art of history taking and bedside/ OPD/ on-field manners in relation to the patient. The student will be posted in the department of Physiotherapy & the sports clubs/ organizations/ teams associated with the hospital and he/ she will do the assessment of the patients visiting the respective destinations.

Students will be taught the basic fundamentals of computer science and information technology, helping them in carrying out research and penning the dissertation.

Examination

There will be no university examination. The students will be awarded marks on the basis of his/ her attendance & performance during clinical postings at the destinations attached with institute.
**Dissertation**

Student will select a topic in his/her area of interest, in consultation with a supervisor/Guide qualified for the purpose as recommended by the council/University, and carry out an independent dissertation, which will involve making research proposal, conduct of the work as per the documented methodology, statistical analysis, dissertation writing. The work will build on the knowledge acquired through study of research methodology and Biostatistics. Each candidate shall submit three type written copies of a dissertation and it should be submitted well in advance before the date of written, oral, clinical and practical examination, Acceptance of the dissertation by the examiners should be a pre-condition to sit in the annual examination.

Evaluation of the dissertation will be done by the examiner (s) appointed by Vice Chancellor of the University.

**RECOMMENDED JOURNALS**

1. Clinical Kinesiology
2. Physical Therapy (APTA, America)
3. Journal of Indian Association of Physiotherapy
4. Journal of Rehabilitation Research and Development
5. Archives of Physical Medicine and Rehabilitation
6. Journal of Pediatric Orthopaedics
7. Physiotherapy (CSP, London)
8. Pediatric Physical Therapy
10. Physiotherapy (Canada).
11. Journal of neurological Sciences
12. Physiotherapy Theory and Practice
13. Journal of Biomechanics
15. American Journal of Sports Exercises

The list of recommended books and journals are suggestions and must be taken as a helpful guide for reading. Students are encouraged to refer to other books and study material and not to limit themselves to the study material listed above.