DEPARTMENT OF PHYSIOTHERAPY

MANAV BHARTI UNIVERSITY

PROPOSED SYLLABUS FOR

MASTER OF PHYSIOTHERAPY(ORTHO)

TWO YEARS DEGREE COURSE

TO BE IMPLEMENTED FROM: 2009-2010

COURSES OF STUDY AND SCHEME OF EXAMINATION

NOTE: -

- **Weightage of minor and major tests etc shall be conducted as per policy of the university.**
- **All other rules and regulations for the students of physiotherapy shall be applicable as per ordinance of the Department\ University already in force and\or as amended from time to time.**

MANAV BHARTI UNIVERSITY
MPO:101
(1ST YEAR)
FIRST SEMESTER
Review of human Sciences (Anatomy)

1. Human anatomy

i) Bone/joints (Osteo and Arthrology)
ii) Muscles (Myology)
iii) Nervous and Nervous system
iv) Integumentary System

2 Upper limb and lower limb

i) Bone and joints
ii) Muscles

Various regions:

- Upper limb pectoral, axilla, scapular, arm, forearm, acubital fossa and hand.
- Lower limb-thigh, gluteal region, popliteal fossa, leg and foot

3 Introduction to trunk region

i) Nerve and plexuses
ii) Vascular structures
iii) Various region-
    - Thoracic
    - Lumbar
    - Sacro-coccygeal.

4 Joint structure and function of

i) Vertebral column
ii) Hip joint
iii) K nee joint
iv) Ankle and foot complex
v) Shoulder joint
vi) Elbow joint
vii) Wrist joint
viii) First carpometacarpal joint

Reference books

- Mcminn's Color Atlas of Human Anatomy. / Abrahams, Peter H.
- Cunningham's Manual of Practical Anatomy/by G.J. Romanes
- Clinical Anatomy for medical students. / Snell, Richard S.
- Essential clinical anatomy. / More, Keith L.
- Human anatomy : color atlas and text/ by J.A. Gosling, P.F. Harris, I. Whitmore and P.L.T. Willan
- Human Anatomy :Regional and applied/by B.D.Chaurasia

MANAV BHARTU UNIVERSITY
MPO:102
FIRST SEMESTER
Review of human Sciences (Physiology)

Human Physiology & Nutrition

1) Cardiovascular System

i) Structure and Properties of Heart
ii) Cardiac Cycle
iii) The regulation of Heart's performance/circulation during Exercise
iv) Cardiac Output
v) The Arterial Blood Pressure
vi) The Physiology of Vascular System

2) Respiratory System

i) Ventilation and Control of Ventilation
ii) Alveolar air
iii) Regulation of Breathing/Respiration during Exercise
iv) Pulmonary function test
v) Air Conditioning
vi) Second wind
vii) Oxygen Debt
viii) Breath holding and Scuba Diving, High Pressure Ventilation
ix) Endurance tests

3) Muscle Physiology

vii) Classification of Nerve Injury
viii) Effects of Nerve injury
ix) Structure of Skeletal Muscle
x) Electrical properties of Skeletal Muscle
xi) The Contractile Mechanism
xii) Length-Tension Relationship
xiii) Fast and Slow Muscles
xiv) Skeletal Muscle Metabolism

4) Nervous System

i) Neurons and Neuralgia
ii) Properties of nerve fivers, synapse
iii) Cranial nerves

Reference books

- Principles of exercise physiology. / Axen, Kenneth.
- Physiology of sport and exercise by Wilmore, Jack M
- Textbook of practical physiology. / Ghai, C.L.
- Concise medical physiology. / Chaudhuri, Sujit K.
- Human physiology/by N M Muthayya. / Muthayya, M N.
- Samson Wright's applied physiology. / Keele, Cyril A.
- Textbook of medical physiology. / Guyton, Arthur C
- Textbook of physiology/by A.K. Jain / Jain, A.K.

MANAV BHARTU UNIVERSITY
MPO:103
FIRST SEMESTER
Applied physiotherapy

1) Exercise Therapy

i) Assessment techniques: Manual Muscle Testing and Goniometry.
ii) Stretching and Mobilization.
iii) Re-education and Strengthening.
iv) Balance and Co-ordination Ex.
v) Gait Analysis and Training (Both Normal and Pathological Gaits)
vi) Relaxation and soft Tissue Manipulations
vii) Posture
viii) PNF and Neuromuscular Coordination
ix) Hydrotherapy
x) Joint Mobilization

2) Electro-Therapy.

i) General Review of Low, Med and high currents and their modifications like Di-dynamic and Russian Currents etc.
ii) Laser
iii) Ultrasound
iv) Cryotherapy
v) UVR and IRR
vi) Other thermal modalities like SWD. MWD, Hydro Collator, Wax therapy. Fluido-therapy.

Practicals:-

1) Ex. Therapy:

i) Musculo skeletal and Neurological Assessment
ii) Strengthening techniques
iii) Soft tissue stretching and mobilization
iv) Gait analysis and training
v) Postural assessment and re-education
vi) Balance and Coordination
vii) Hydrotherapy.

2) Electrotherapy

A. All types of low and medium frequency currents

- Faradic
- Galvanic
- High Voltage Current
- Di dynamic
- Russian
- Interferential Therapy
- Tens
- Micro currents

B. All types of high frequency currents and modalities

- Cryotherapy
- UVR
- IRR
- LASER
- Other thermalmodalities like Hydro-Collator Waxtherapy, Fluidotherapy.

Reference books

- The principles of exercise therapy / Gardniner, M Dena.
- Therapeutic exercise:foundations and techniques/by
- Carolyn Kisner and Lynn Allen Colby. / Kisner,
- Practical exercise therapy/by Margaret Hollis & Phyl Fletcher-Cook
- Electrotherapy explained : principles and pratice/by John low, Ann Reed and Mary Dyson. / low, John
- Clayton's electrotherapy/ edited by Sheila Kitchen and Sarah Bazin. / Kitchen, Sheila
- Muscles testing and function/by Florence Peterson Kendall (et..al) / Kendall, Florence Peterson
- Therapeutic modalities for physical therapists/by William E. Prentice, William Quillen and Frank Underwood / Prentice, William E.
- Therapeutic exercise moving toward function/by Carrie M. Hall and Lori Thein Brody. / Hall, Carrie M.

MANAV BHARTU UNIVERSITY
MPO:104
FIRST SEMESTER
Applied Biomechanics

1.Fundamental Mechanics

i) Forces; composition and resolution of forces; force systems
ii) Force of gravity and COG
iii) Stability
iv) Reaction forces
v) Friction
vi) Moments
vii) Newton's laws
viii) Equilibrium: static and dynamic
ix) Simple Machines: Levers
x) Work, power and energy
xi) Density and Mass
xii) Segmental dimensions
xiii) Poisson's effect
xiv) Stress and strain
xv) Modulus of rigidity and modulus of elasticity
xvi) Strain energy
xvii) Static and cyclic load behaviors
xviii) Load: Load sharing and load transfer

2. Kinematics

i) Motion: types, location, magnitude and Direction
ii) Angular motion and its various parameters
iii) Linear motion and its various parameters
iv) Projectile motion

3. Muscle Mechanics

i) Structure and composition of muscle
ii) Fiber length and cross-section areas
iii) Mechanical properties

4. Ligament and Tendon Mechanics:

i) Structure, composition and mechanical properties
ii) Cross-sectional area measurement
iii) Muscle tendon properties
iv) Temperature sensitivity
v) Changes in mechanical properties because of aging, exercise and immobilization

vi) Mechanoreceptors
vii) Clinical application

5. Joint Mechanics

i) Joint design
ii) Joint categories
iii) Joint functions: Arthrokinematics, Osteokinematics and kinematics chains
iv) Joint forces, equilibrium and distribution of these forces

6. Joint structure and function of

ix) Vertebral column
x) Hip joint
xi) K nee joint
xii) Ankle and foot complex
xiii) Shoulder joint
xiv) Elbow joint
xv) Wrist joint
xvi) First carpometacarpal joint

6. Gait

i) Gait parameter: kinetic, kinematics, time-space
ii) Pathological gait
iii) Running

7. Bone Mechanics

i) structure and composition of bone
ii) Stress
iii) Strain
iv) Modulus of Rigidity & Modulus of elasticity
v) Mechanical properties of Trabecular system
vi) Mechanical properties of Cortical bone
vii) Bone Remodelling

Practical in Applied Biomechanics:

This course will enable the students to apply their knowledge of biomechanics and ergonomics in practical situation on their patients

i) Evaluation and assessment of joint motion (planes, axes etc)
ii) Evaluation and assessment of posture
iii) Evaluation and assessment of Gait
iv) Practical usage of all examination and assessment devices

Reference books

- Introduction to kinesiology/Hoffman, Shirf
- Kinesiology: the Mechanics & Pathomechanics of human
- Movement/by Carol A. Oatis. / Oatis, Carol A.
- Joint Structure and Function Cynthia Norkins
- Joint Structure and Function: a comprehensive analysis./Levangie, Pamela K
- Clinical biomechanics of the lower extrmities/by Ronald L. Valmassy. / Valmassy, Ronald L.
- Fundamentals of Biomechanics, Orkaya, N
- Ergonomics for Therapists: Karen Jacobs Carl M. Bettencourt
- Handbook of Human Factors and Ergonomics: Gavriel Salvendy
- Ergonomics: How to Design for Ease and Efficiency: K.H.E. Kroemer, H.B. Kroemer, K.E. Kroemer-Elbert
- Ergonomics, Work, and Health: Pheasant, Stephen
- A Guide to Human Factors and Ergonomics: Martin Helander

MANAV BHARTU UNIVERSITY
MPO:105
FIRST SEMESTER
Biostatistics and Research Methodology

Research Methodology

i) How to read and critique research
ii) Introduction to research: Framework, levels of measurement, variables
iii) Basic research concepts: Validity and reliability
iv) Design instrumentation and analysis of qualitative research
v) Design instrumentation and analysis of Quantitative research
vi) How to write a research proposal
vii) The use and protection of human and animal subjects.

1) Biostatistics

i) Introduction:
Description and interferential statistics
Methods of collection, classification, Tabulation and presentation of data
ii) Central Tendency:
Mean, Median, Mode and Standard deviation.
iii) Co-relation and Regression
Karl Pearson's co-relation method
Rank co-relation method
Regression and co efficients
Sampling and hypothesis and testing
Data collection
Types of sampling
Tests
iv) Probability, Binomial distribution, poison distribution, Normal distribution,
v) One way ANOVA, Two Way ANOVA
vi) Test of significance (t, chi square, f, z)
vii). Non parametric tests
viii) Simple statistical analysis using available software.

Reference books

- Research methods in physical activity: Thomas, J
- Statistical applications for health information management: Osborn, CE
- Clinical research for health professionals: a user-friendly Guide: Batavia, Mitchell.
- Clinical audit in physiotherapy: from theory into practice. / Barnard, Sue.
- Practical research: a guide for therapists. / French, Sally
- Rehabilitation Research: Principles and Applications: Elizabeth Domholdt
- Methods in biostatistics for medical students and research workers. Mahajan, B.K.
- Manual of biostatistics: Baride, JP
- Medical biostatistics: Indrayan, A

Course No.	Subject	Title	Teaching Hours /Week	
			L – T – P	Credits
MPO 106	Seminars/ Case Presentations	PC		

Seminar

These will serve as platform for students to integrate various components of patient management and debate contentious issues on the efficacy of physiotherapy techniques. Students will give presentations on topic provided to them

Course No.	Subject	Title	Teaching Hours /Week	
			L – T – P	Credits
MPO 107	Clinical Training			

Clinical Training

Students will engage in clinical training in hospital based medical and physiotherapy departments/ settings to enhance their clinical skills and apply contemporary knowledge gained during teaching sessions.

MANAV BAHRTI UNIVERSITY
MPO:201
SECOND SEMESTER
Review of basic sciences (Pathology)

1.General Pathology (cell injury, inflammation, Repair, immune system)

A. <u>Nervous System</u>

i) Infection
- Meningitis
- Encephalitis

ii) Vascular Disease
- Ischemic encephalopathy
- Cerebral infarction
- Intracranial infarction
- Intracranial hemorrhage

iii) Degenerative disease
- Alzheimer's' disease
- Huntington's disease
- Parkinson's disease
- Motor neuron disease

iv) Demyelinating disease
- Multiple sclerosis

B. <u>Musculoskeletal System</u>

i) Bones
- Hereditary and metabolic diseases (Osteoporosis, rickets, osteomalacia, osteitis fibrosa cystica, renal osteodystrophy)
- Infections (Osteomyelitis and tuberculosis)

ii) Joints
- Degenerative joint disease
- Bursitis

iii) Skeletal muscles
- Muscle atrophy
- Myositis
- Muscular dystrophy
- Myasthenia gravis

C. Cardiovascular system

i) Rheumatic heart disease
ii) Myocardial infarction
iii) Atherosclerosis
iv) Congenital heart diseases

Reference books

- Textbook of Pathology. / Mohan, Harsh.
- Pathology illustrated/ by Peter S. Macfarlane, Robin Reid and Robin Callander / Mcfarlane, Peter S.
- Pathology: implications for the physical therapists/by Catherine Cavallaro DGoodmann and Williams G. Boissonn
- Pathology, quick review, Harsh.

MANAV BAHRTI UNIVERSITY
MPO:201
SECOND SEMESTER
Review of basic sciences (Pharmacology)

i) Drugs used in pain
ii) Local anesthetics
iii) Steroids
iv) Muscle relaxants
v) Drugs acting upon Central and Autonomic nervous system
vi) Topically acting upon Cardio Respiratory system
vii) Drugs acting upon Musculoskeletal system
viii) Cardio-vascular System:
ix) Therapeutic agents (classification, effects on cardio-vascular system, uses & adverse
x) reactions)
xi) Drugs used in cardiac failure, hypertension & arrhythmias and interaction with
xii) physical therapy
xiii) Drug therapy in vascular disease & ischaemia and interaction with physical therapy
xiv) Respiratory system:
xv) Therapeutic agents - uses, side effects and interaction with physical therapy
xvi) Diabetes mellitus:
xvii) Drug therapy and its interaction with physical therapy

Reference books

- Essential of medical pharmacology/by K.D. Tripathi
- Pharmacology drug actions & reactions
- Blueprints notes & cases: pharmacology,
- Textbook of pharmacology, Seth, SD

MANAV BAHRTI UNIVERSITY
MPO:202
SECOND SEMESTER
Advanced Physiotherapy

1. **Manual Therapy:** Introduction, History, Basic Classification, Assessment for manipulation, discussion in brief about the concepts of mobilization. Like Maitland, Mulligan, Kaltenborn mobilization of nerves.

2 **Muscle Energy techniques and positional stretch:** The basic concept and application of these techniques.

3. **Positional Release Therapy:** The basic concept and Application of these techniques.

4. **Myofascial Release:** Concept and application

5. **Biofeed back.**

6. **Nerve Conduction Studies and Electromyography:** normal, abnormal action potentials, its recording protocols analysis, application

<u>Advanced Physiotherapy (practical)</u>

(1) Demonstration of following Manual Therapy Lack. To their specialization field:-

- Maitland
- Mulligan
- Nerve Mobilization

(2) Outline and Practical knowledge of

- Muscle Energy Technique
- Positional Stretch
- Myofascial release etc

Reference books

- Electrotherapy explained : principles and practice/by John low, Ann Reed and Mary Dyson. / low, John
- Clayton's electrotherapy/ edited by Sheila Kitchen and Sarah Bazin. / Kitchen, Sheila
- Positional release techniques, Deig, D
- Muscle energy techniques, Chaitow, L

MANAV BAHRTI UNIVERSITY
MPO:203
SECOND SEMESTER
Professional Development & Ethics

1. Concepts of Teaching and Learning

i) Meaning and Scope of Educational Psychology
ii) Meaning and Relationship between Teaching and Learning
i) Learning Theories
ii) Dynamics of Behavior
iii) Individual Differences

2. Curriculum

i) Meaning and Concepts
ii) Basis of Curriculum Formulation Development
iii) Framing Objectives for Curriculum
iv) Process of Curriculum Development and Factors Affecting Curriculum Development
v) Evaluation of Curriculum

3 Method and Techniques of Teaching

i) Lecture, Demonstration, Discussion, Seminar, Assignment, Project and Case Study.

4 Planning for Teaching

i) Bloom's Taxonomy of Instructional Objectives, Writing Instructional
ii) Unit planning and Lesson planning

5 Teaching Aides

i) Types of Teaching Aids
ii) Principles of Selection, Preparation & Use of Audio-Visual aids.

6 Measurement and Evaluation

i) Nature of Educational Measurement: Meaning, Process and Types of Tests
ii) Construction of an Achievement Test and its Analysis Standardized Test
iii) Introduction of some Standardized tools, Important Tests of Intelligence, Aptitude Personality.
iv) Continuous and Comprehensive Evaluation

7. Guidance and Counseling

i) Meaning and Concepts of Guidance and Counseling
ii) Principles
iii) Guidance and Counseling Services for Students and Faculty members
iv) Faculty Development and Development of Personnel for physiotherapy Services

8. Clinical education

i) Awareness and guidance to the common people about health diseases and available professional services
ii) Patient education
iii) Education of the practitioners

9. Functions of management
10. Management process: planning, organization, direction, controlling, and decision-making.
11. Personal management: staffing, recruitment selection performance appraisal, collective bargaining, discipline, and job satisfaction.
12. Quantitative methods of management: relevance of statistical and/ or techniques in management.
13. Marketing: marketing segmentation, marketing research production, planning pricing, and channels of distribution, promotion, consumer behavior and licenser.
14. Total Quality Management: basis of quality management, quality assurance program in hospitals, medical audit and international quality system.
15. Hospital as an organization: functions and types of hospitals selected, clinical supportive and ancillary staff of the hospital, emergency department, nursing, physical medicine and rehabilitation, clinical laboratory, pharmacy and dietary department.
16. Roles of Physiotherapy Director, Physiotherapy Supervisor, Physiotherapy Assistant, Physiotherapy, Occupational therapist, Home Health Aide and Volunteer.
17. Direct acre and referral relationships and confidentiality
18. Physiotherapy: Definition and Development
19. Implications and conformation to the Rules of Professional Conduct
20. Legal responsibility for their actions in the professional context and understanding the Physiotherapist's liability and obligations in the case of medico-legal action
21. Code of Ethics: wider knowledge of ethics relating to current social and medical policy in the provision of health care.
22. Function of relevant professional associations education body and trade union

Reference books

- Fox pro 2.5 made simple for DOS & Windows, Taxali, RK
- Computers and commonsense, Hunt, R & Shelly, J
- Social problems in India, Ahuja, R
- Health studies: an introduction, Naidoo,

- An introduction to Sociology/by Vidya Bhushan and D.R. Sachdeva. / Bhushan,Vidya.

Course No.	Subject	Title	Teaching Hours /Week	
			L – T – P	Credits
MPO 204	**Seminars/ Case Presentations**	**PC**		

Seminars/ Case Presentations

These will serve as platform for students to integrate various components of patient management and debate contentious issues on the efficacy of physiotherapy techniques. Students will give presentations on topic provided to them

Course No.	Subject	Title	Teaching Hours /Week	
			L – T – P	Credits
MPO 205	**Clinical Training**			

Clinical Training

Students will engage in clinical training in hospital based medical and physiotherapy departments/ settings to enhance their clinical skills and apply contemporary knowledge gained during teaching sessions.

MANAV BAHRTI UNIVERSITY
MPO:301
THIRD SEMESTER
Medical and Surgical Management
Of Musculoskeletal Conditions

Unit-I **General Orthopedics**

1. **Infection Disorders of the bones and joints**
2. **Metabolic Disorders of the bones and joints**
3. **Congenital Disorders of the bones and joints**
4. **Inflammation of the bones and joints**
5. **Degeneration of the bones and joints**
6. **Developmental of the bones and joints**
7. **Connective tissue disorders**
8. **Neuromuscular disorders**
9. **Tumors of bones**
10. **Complex Regional Pain Syndrome**

Unit-II **Traumatology (Fractures, Subluxations, Dislocations and Soft tissue injury)**

1. **Trauma of the upper limb**
2. **Trauma of the lower limb**
3. **Trauma of the lower spine**
4. **Peripheral Nerve Injuries**

Unit-III **Orthopedic Surgeries:-**

1. **Osteotomy**
2. **Arthrodesis**
3. **Arthroplasty**
4. **Tendon transfers, repairs and grafting**
5. **Nerve Suturing**
6. **Soft tissue release**
7. **Spinal Stabilization**
8. **Spinal fusion**
9. **Discetomy**
10. **Laminectomy**
11. **Reattachment of limbs**
12. **Illizarou's technique**
13. **Meniisectomy**

Unit-IV **Amputation**

1. **Types, Level and Procedure**
2. **Preoperative, operative and prosthetic mgt.**
3. **Prevention and treatment of complication**

Reference books

Pediatric orthopaedics: core knowledge in orthopaedics./ Dormans, John P
Clinical orthopaedic examination. / Mcrae, Ronald
Apley's system of orthopaedics and fractures./ Solomon, Louis
Fractures of the upper extremity. / Ziran, Bruce H. ed.
Musculoskeletal disorders in the workplace: principles and practice. / Nordin, Margareta.
The orthopaedic physical examination. / Reider, Bruce
Orthopedic physical assessment: Magee, DJ
Essentials of orthopaedics for physiotherapists: Ebnezar, J
The orthopaedic physical exam: Reider, B
Chiropractic care of the older patient. / Gleberzon, Brian J. ed.
Orthopaedics Principles of basic and clinical science: Bronner, F & Warrell, RV
Burnsides working with older adults group process and techniques: Haight, B

MANAV BAHRTI UNIVERSITY
MPO:302
THIRD SEMESTER
Vertebral Disorders and Rehabilitation

Unit-I: **Review of anatomy and biomechanics of Vertebral column.**

Unit-II: **Congenital disorders of vertebral column & vertebral deformities.**

Unit-III **Inflammatory disorders of vertebrae, vertebral joints, soft tissues.**

Unit-IV: **Disease of the vertebral joints, segmental instability.**

Unit-V: **Disorders of structural changes, changes of alignment of bone, joint of Vertebral column**

Unit-VI: **Low Back pain, pain in vertebral column & stiffness Disorders.**

Unit-VII: **Regional:- Cervical**
Lumber
Thoracic
Sacral, etc.

1. **Soft tissue injuries, tightness, structutral changes**
2. **Bone injuries(fractures & dislocation of spine)**
3. **Pelvic injuries.**

Unit-VIII **:** **Spinal cord injuries**

1. **Types, classifications.**
2. **Pathology**
3. **Level**
4. **Examination**
5. **Management & rehabilitation**
6. **Orthopaedic surgeries**
7. **Bio engineering appliances & support devices**
8. **Pre & post operative rehabilitation**

PRACTICALS

Related to assessments, investigations and physiotherapy management of all the above conditions.

Reference books

Neck and arm pain/by Rene Cailliet. / Calliet, Rene
ABC spinal cord injury/by David Grundy and Andrew Swain. / Grundy, David .
Orthopedic physical assessment. / Magee, David J.
Measurement of joint motion: A guide to Goniometry. Norkin, Cynthia C.

MANAV BAHRTI UNIVERSITY
MPO:303
THIRD SEMESTER
Hand Rehabilitation

Unit-1

Functions of hand as motor and sensory organ with advanced bio and patho mechanics of hand. Classification of hand injuries and principles of hand Rehabilitation (Functional and Vocational Training)

Unit-II

a) Tendon injuries b) Nerve injuries c) Crush injuries

Incision and their effects on later rehabilitation, fractures, joint injuries and correction of Deformities.

Unit-III

a) Phantom hand pain
b) Spastic hand
c) Rheumatoid hand
d) Hand in hansen's disease
e) Reflex sympathetic dystrophy

Unit-IV

a) Phantom hand pain
b) Prosthetic hand
c) Orthosis for hand and their uses.

PRACTICALS

Related to assessments, investigations and physiotherapy management of all the above conditions.

Reference books

Cahs's textbook of orthopaedics and rehumatology for physiotherapists: Downie, PA
Physical rehabilitation in arthritis: Walker, JM & heleura, A
Hand therapy principles and practice: Salter, M & Chishire, L

Hand fractures repair reconstruction & rehabilitation: Freeland, A

MANAV BAHRTI UNIVERSITY
MPO:304
THIRD SEMESTER
Assessment and physiotherapy and
Management of musculoskeletal conditions

1. Orthopedic Assessment

- **i) Patient History**
- **ii) Observation**
- **iv) Examination-Active and Passive Movements, functional**
- **v) Assessment, Special Tests, Reflexes and Cutaneous Distribution, Joint Play Movements Palpation**
- **vi) Gait-Definitions, Gait Cycle, Abnormal Gait patterns**
- **vii) Posture-Normal and Abnormal, Spinal Deformities**
- **viii) Disability Evaluation**
- **ix) Assessment of Amputees**
- **x) Examinations and assessment of geriatric patient**

2.Regional Examination with Special Emphasis on Special Tests:

- **xi) Head and Face**
- **xii) Cervical spine**
- **xiii) Shoulder**
- **xiv) Elbow**
- **xv) Forearm, Wrist and Hand**
- **xvi) Thoracic Spine**
- **xvii) Lumber Spine**
- **xviii) Pelvis**
- **xix) Hip**
- **xx) Knee**
- **xxi) Lower Leg, Ankle and foot**

2.Orthopedic Diagnosis (for practical purposes only)

- **i) Biomechanical measurements-Limbs and Spine**
- **ii) Haematology and Serology**
- **iii) Biopsy**
- **iv) Plain Radiography**
- **v) Contrast Radiography**
- **vi) Myelography**
- **vii) Radioactive Scanning**
- **viii) Discography**
- **ix) Tomography**
- **x) Magnetic Resonance Imaging**

xi) **Arthroscopy**
xii) **Electromyography, Nerve Conduction Velocity, Strength Duration Curve**
xiii) **BMO-Bone Densiometry-Ultrasound densitometer and Dual Energy X-ray Absorptiometry (DEXA)**

Reference books

Orthotics in rehabilitaion: splinting the hand and body / McKee, Pat
Physiotherapy in orthopaedics: a problem-solving approach./ Atkinson, Karen.
Examination of musculoskeletal injuries: Shultz, SJ
Clinical orthopaedic rehabilitation. / Brotzman, S. Brent
Orthopedic physical therapy: Donatelli, RA & Wooden, MJ
Joint structure and function: a comprehensive analysis: Levangie, PK & Norkin, CC
Essentials of orthopedics & applied physiotherapy: Joshi, J & Kotwal, P

Course No.	Subject	Title	Teaching Hours /Week	
			L – T – P	Credits
MPO 305	PRACTCAL (Musculoskeletal disorder, clinical\viva voce)	PC		

Related to assessments, investigations and physiotherapy management of all the above conditions.

Course No.	Subject	Title	Teaching Hours /Week	
			L – T – P	Credits
MPO 306	Seminars/ Case Presentations	PC		

These will serve as platform for students to integrate various components of patient management and debate contentious issues on the efficacy of physiotherapy techniques. Students will give presentations on topic provided to them

Course No.	Subject	Title	Teaching Hours /Week	
			L – T – P	Credits
MPO 307	Clinical Training			

Clinical Training

Students will engage in clinical training in hospital based medical and physiotherapy departments/ settings to enhance their clinical skills and apply contemporary knowledge gained during teaching sessions.

MANAV BAHRTI UNIVERSITY
MPO:401
FOURTH SEMESTER

Course No.	Subject	Title	Teaching Hours /Week	
			L – T – P	Credits
MPO 401	**DISSERTATION PROJECT WORK (Based on clinical\ case presentation including viva voce)**	**PC**		

As part of their requirement for the Master Degree the student is required to undertake a research study under the guidance of Guide and Co-guide. Research study must be selected only from the chosen specialization i.e. Musculoskeletal Conditions or Sports Injuries or Neurological Conditions or Cardio thoracic Conditions and to be studied on patients or normal individuals. Students have to undergo a dissertation viva-voce by examining committee.

Course No.	Subject	Title	Teaching Hours /Week	
			L – T – P	Credits
MPO 402	**SEMINAR**	**PC**		