



# VELS



INSTITUTE OF SCIENCE, TECHNOLOGY & ADVANCED STUDIES (VISTAS)  
(Deemed to be University Estd. u/s 3 of the UGC Act, 1956)  
PALLAVARAM - CHENNAI

ACCREDITED BY **NAAC** WITH '**A**' GRADE  
*Marching Beyond **25** Years Successfully*

## **M.P.T** **Master of Physiotherapy**

**Curriculum and Syllabus**  
**(Based on Choice Based Credit System)**  
**Effective from the Academic year**  
**2019-2020**

**School of Physiotherapy**

## **PROGRAM EDUCATIONAL OBJECTIVES (PEOs)**

- PEO1: To provide students with strong fundamental concepts and also advanced techniques to make them understand about various Physiotherapy approaches.
- PEO2: To enable MPT graduates to attain successful professional careers by applying their therapeutic skills in Physiotherapy treatment & to meet out the challenges in Clinical Arena.
- PEO3: To engage MPT graduates in persistent learning and pursue research for Clinical decision Making & Evidence based practice.

## **PROGRAM OUTCOME**

- PO1: Graduates of the Master of Physiotherapy program will demonstrate communication skills to Work creatively and effectively to uphold the professional standards and relationships with a range of stakeholders like patients, care takers, family members and other clients.
- PO2: Graduates of the Master of Physiotherapy program will demonstrate cognitive and creative skills to Critically evaluate and apply physiotherapy approaches, paradigms and techniques and utilise appropriate, evidence-based skills, techniques and practice in managing and treating people with injury, disability or illness in a range of health care and/or rehabilitation settings.
- PO3: Graduates of the Master of Physiotherapy program will demonstrate technical skills to Integrate the core areas of physiotherapy practice with emphasis on demonstrated mastery of evidence-based practice, clinical skills, clinical reasoning and decision making in order to apply creativity and initiative to new situations in professional practice.
- PO4: Graduates of the Master of Physiotherapy program will demonstrate the broad application of knowledge and skills to solve problems individually and independently justify diagnostic decisions and management strategies on basic of clinical assessment findings.
- PO5: Graduates of the Master of Physiotherapy program will demonstrate technical skills to apply treatment methods and techniques, to address client needs, safely and with appropriate regard to professional and legislative guidelines, standards and requirements.

## **PROGRAMME SPECIFIC OBJECTIVES (PSOs)**

- PSO1: To inculcate the ability in graduates to assess and treat the patient with Advance Physiotherapy techniques.
- PSO2: To enhance problem solving skills in case study through their clinical training.
- PSO3: To apply Evidence based practice approach & Clinical Decision making to improve the Physiotherapy Research.

## BOARD OF STUDIES

S. No	NAME	AFFILIATION	ROLE
1	Dr. P. Senthil Selvam, PhD	Head of the Department, School of Physiotherapy, VISTAS	Chairperson
2	Dr. M.S. Sundaram, PhD	Professor School of Physiotherapy, VISTAS	Internal Member
3	Dr. M. Sandhiya, MPT (Phd)	Professor School of Physiotherapy, VISTAS	Internal Member
4	Dr. Priyakumari, MPT (Phd)	Professor School of Physiotherapy, VISTAS	Internal Member
5	Dr. Jibe George Varghese, MPT (Phd)	Professor & Principal Menakshi College of Physiotherapy, MAHER, Chennai	External Member
6	Dr. C.V. Senthil Kumar, MPT (Phd)	Principal Dr. M.G.R Educational and Research Institute University, Chennai	External Member
7	Dr. R. Sakthivel, MPT	Clinical Therapist Perungudi	Alumni

# M.P.T - Master of Physiotherapy

## CURRICULUM

**Total No. of Credits: 100**

### I Semester

Category	Code	Course	Hours/Week			Credits
			Lecture	Tutorial	Practical	
Core	19MPT001	Basic Sciences – Theory	5	0	0	4
Core	19MPT002	Allied Sciences – Theory	5	0	0	4
Practical	19MPT003	Physical Rehabilitation- Practical	0	0	10	4
Practical	19MPT004	Movement Mechanics – Viva	0	0	5	4
Practical	19MPT005	Clinical Sciences - Viva	0	0	5	4
<b>Total</b>			10	0	20	<b>20</b>

### II Semester

Core	19MPT006	Basic PT Interventions – Theory & Practical	8	0	2	6
Core	19MPT007	Advance Physiotherapeutic Intervention – Theory & Practical	8	0	2	6
Elective	_____	DSE Elective I	5	0	0	4
Elective	_____	Generic Elective I	5	0	0	4
<b>Total</b>			26	0	4	<b>20</b>

### III Semester

Elective	_____	Basic Fundamentals –Theory & Viva	8	0	2	6
Elective	_____	PT Evaluation/ Documentation & Evidence Based Practice- Theory & Practical	8	0	2	6
Elective	_____	DSE Elective II	5	0	0	4
Elective	_____	GE Elective II	5	0	0	4
<b>Total</b>			26	0	4	<b>20</b>



## List of specialty Electives – for III Semester

19BMPT001	Basic fundamentals in Orthopedics
19BMPT002	Basic fundamentals in Neurology
19BMPT003	Basic fundamentals in Cardiopulmonary diseases
19BMPT004	Basic fundamentals in Sports
19BMPT005	Basic fundamentals in Hand Conditions
19BMPT006	Basic fundamentals in Obstetrics & Gynaecology
19BMPT007	Basic fundamentals in Pediatrics

## List of specialty Electives – for III Semester

19PMPT001	PT Evaluation/ Documentation/EBP in Orthopedics
19PMPT002	PT Evaluation/ Documentation/EBP in Neurology
19PMPT003	PT Evaluation/ Documentation/EBP in Cardiopulmonary diseases
19PMPT004	PT Evaluation/ Documentation/EBP in Sports
19PMPT005	PT Evaluation/ Documentation/EBP in Hand Conditions
19BMPT006	PT Evaluation/ Documentation/EBP in Obstetrics & Gynaecology
19BMPT007	PT Evaluation/ Documentation/EBP in Pediatrics

## List of specialty Electives – for IV Semester

19IMPT001	Advance PT Intervention in Orthopedics
19IMPT002	Advance PT Intervention in Neurology
19IMPT003	Advance PT Intervention in Cardiopulmonary diseases
19IMPT004	Advance PT Intervention in Sports
19IMPT005	Advance PT Intervention in Hand Conditions
19IMPT006	Advance PT Intervention in Obstetrics & Gynaecology
19IMPT007	Advance PT Intervention in Pediatrics

## Dissertation – for IV Semester

19DMPT001	Elective Orthopedics
19DMPT002	Elective Neurology
19DMPT003	Elective Cardiopulmonary diseases
19DMPT004	Elective Sports
19DMPT005	Elective Hand Conditions
19DMPT006	Elective Obstetrics & Gynaecology
19DMPT007	Elective Pediatrics

## List of Discipline Specific Elective Courses

19MPT101	Clinical testing
19MPT102	Ergonomics
19MPT103	Food and Nutrition
19MPT104	English for communication
19MPT105	Computer & its application in PT
19MPT106	Biostatistics / Research Methodology
19MPT107	Applied Physics

## Generic Elective Courses

19MPT151	Cardiopulmonary resuscitation
19MPT152	Clinical diagnosis
19MPT153	PT Evaluation
19MPT154	Applied Chemistry
19MPT155	Hospital Management

# **Syllabus**

## **Core Courses**



**Course Objective:**

The objectives of this course is that after 100 hours of lectures & demonstrations, in addition to clinics, the student will be able to understand the basic knowledge about the applied anatomy and applied physiology of various systems of the body, biomechanics & pathomechanics, nutrition, fitness & PT ethics.

**This paper consist of the following 5 modules**

1. Applied Anatomy
2. Applied Physiology
3. Movement Science
4. Exercise Physiology & Nutrition
5. PT Ethics / Education Technology

**Course Outcomes:**

1. This provides a detailed introduction on applied anatomy and applied physiology of different systems of the body
2. This course explains the structure and function, forces that affect motion and the resultant kinematics.
3. This gives better understanding of physiological mechanisms and organ systems that allow humans to engage in physical activity
4. This provides detail lecture on bio mechanics and pathomechanics of each joint.
5. This provides basic guideline to education system, teaching methodology, curriculum framing, guidance and counselling

**UNIT I****APPLIED ANATOMY****20**

1. Cytoskeleton
2. Cardiovascular system
3. Respiratory system
4. Muscular system
5. Urinary system
6. Skin & sense organs
7. Lymphatic system
8. Nervous system
9. Skeletal system
10. Endocrine system
11. Digestive system
12. Reproductive system

**I) THE HEART AND CIRCULATION**

- a) Structure and properties of heart muscles
- b) The action of the heart
- c) Determinants of cardiac performance
- d) Normal E.C.G
- e) Maintenance of blood pressure
- f) Cardiac arrest and heart failure
- g) Outline of lymphatic circulation and pulmonary circulation Cardiovascular compensation for postural and gravitational changes
- h) Hypertension
- i) Edema
- j) Central and peripheral venous pressure

**II) NERVOUS SYSTEM AND MUSCLES**

- a) Outline the structure and function of the central nervous system
- b) Outline the autonomic nervous system
- c) Types of nerve cells, electrical phenomena in nerve cells
- d) Properties of mixed nerves
- e) Reflex action, reciprocal innervations
- f) Degeneration and regeneration of nerves
- g) Control of posture
- h) Outline of voluntary movement
- i) Cutaneous, deep and superficial sensations
- j) Synaptic transmission
- k) Neuromuscular transmission
- l) Properties of muscles, contractile responses, types of contraction, electrical phenomena and tonic reflexes

**III) RESPIRATION**

- a) Mechanics of respiration
- b) Breath sounds
- c) Properties of gases
- d) Exchange of gases
- e) Gas tension in air at sea level, tracheal air, cellular air, mixed air, plasma, arterial blood and mixed venous blood
- f) Lung volume
- g) Magnitude of dead space
- h) Control of bronchial smooth muscle
- i) Lung compliance
- j) Nervous control of respiration
- k) Chemical control of respiration
- l) Voluntary control of respiration
- m) Oxygen and CO<sub>2</sub> transport
- n) Acid - base reactions in blood

- o) Effects of exercise on respiration
- p) Artificial respiration

## **UNIT III**

## **MOVEMENT SCIENCE**

**20**

### **BIOMECHANICS AND PATHOMECHANICS**

#### **1. BASIC MOVEMENT TERMINOLOGY**

- a. Core areas of study – Anatomy functional, Anatomy, Biomechanics, Kinesiology, Linear motion, angular motion, Kinematics, Kinetics, Static and Dynamic.
- b. Anatomical movement description – segmental names, anatomical terms, Movement descriptions – basics and specialized.
- c. Relative systems – relative – Absolute. Planes/ Axis.
- d. Characters of joint movement – Single and multiple joint movements.

#### **2. SKELETAL CONSIDERATION OF MOVEMENT**

- a. Functions of skeletal system
- b. Types of bones
- c. Bio mechanical characteristics of bones: Bone tissue, architecture of bone, strength and stiffness of bone
- d. Types of load, Bony articulations
- e. Types of joins and its descriptions such as diarthrodial or synovial etc.

#### **3. MUSCULAR CONSIDERATION FOR MOVEMENT**

- a. Structure of muscle, Physical organization of muscle, Fiber organization, Fiber type, Muscle attachment.
- b. Functional characteristics of muscles, muscle fiber potential. Functions of Muscles, Role of Muscle, Mechanical components in the muscle, Net muscle action. Factors influencing muscle force. Angle of attachment of muscle. Length – tension relationship, force velocity relationship, stretch shortening cycle, one and two joint muscle. Extra and intrafusal muscle fibers, Action potential, evoke potential ,kinetic potential, Tongue, Power strength & Endurance.

#### **4. NEUROLOGICAL CONSIDERATIONS FOR MOVEMENT**

- a. General organization of nervous system
- b. Motor neurons
- c. Structure of the motor neuron
- d. Motor unit
- e. Functional characteristics of motor unit
- f. Measurement of motor unit activities
- g. Sensory neurons, Functions of neural control, Reflex arc, myotonic, proprio spinal and supra spinal reflexes, sensory receptors- muscle spindle – nuclear chain fibers. Gamma and fusimotor. Innervations Golgi tendon organ (GTO) joint receptors.

## 5. FUNCTIONAL ANATOMY:

Classification of joints (Natural, Anatomical & Kinesiological)

- a. Upper extremity
- b. Lower extremity
- c. The trunk (spine)

### Upper Limb

Shoulder Joint

- a. Gleno humeral
  - b. Scapulo thoracic
  - c. Acromioclavicular
  - d. Sterno - clavicular
  - e. Dynamic & static stability
  - f. Scapulo humeral rhythm
  - g. Elevators & Depressors of shoulder girdle
- } Joint type, movement

Elbow joint

- a. Types motion, axis of motion, mechanism & muscle producing movement.

Radioulnar joint

- a. Type, motion, axis of motion muscles producing movement

Wrist joint

- a. Type, motion, axis of motion
- b. Mechanism of extension, radial deviation
- c. Lumbrical mechanism
- d. Interossei mechanism
- e. Flexor, extensor mechanism
- f. CMC, MCP, IPS – type, motion & mechanism
- g. Prehension activities

### Lower limb

Hip joint

- a. Type, axis of motion
- b. Pelvic & femoral motion
- c. Unilateral, bilateral stance – stability & weight distribution
- d. Reduction of forces using canes
- e. Muscles producing movement

## Knee joint

- a. Type, axis of motion
- b. Movement of Tibiofemoral & patellafemoral joint
- c. Muscles producing movements

## Ankle joint

Types of axis of motion arthro & osteokinematics

- a. Subtalar joint
- b. Transverse joint
- c. Tarsal joint
- d. MTP joint
- e. IP joint
- f. Plantar arches & their functions

## Trunk

- a. Vertebral column – structure of function & different types of vertebrae
- b. Ribs – structure of function of various joints involved in thoracic cage
- c. Types of movements taking place during respiration

## 6. PATHOMECHANICS & PATHOKINETICS OF PARALYTIC DISABILITIES

- a. Joints of Upper extremity
- b. Joints of Lower extremity. The trunk (spine)

## Upper limb

### Shoulder joint

Paralysis of trapezius, Serratus anterior, Rhomboids deltoid, supraspinatus, sub clavius, pectoralis major & Latissimus dorsi

- a. Operation for paralysis of trapezius, serratus - anterior & deltoid

### Elbow joint

- a. Paralysis of elbow extensions, flexors
- b. Methods of transposition of forearm muscle
- c. Substitution by triceps
- d. Nurse maids elbow, students elbow
- e. Cubitus varus, valgus

### Wrist joint

- a. Paralysis of finger flexor, extensors, lumbricals, interossei
- b. Implantation of flexors & extensors
- c. Arthrodesis of wrist with tendon transplantation
- d. Trigger finger
- e. De Quervain's tenosynovitis

- f. Mallet finger
- g. Claw finger

#### Hip

- a. Coxa vara, coxa valga, dysplasia of hip joint pelvic obliquity
- b. Paralysis of hip abduction, adductors, extensors flexors, internal & external rotators
- c. Reconstructive procedure of paralysed hip joint – paralytic conditions, shelving operation
- d. Substitution of abductors

#### Knee

- a. Genu valgum, genu varum, recurvatum
- b. Tibial torsion
- c. Patella alta & Baja
- d. Lateral dislocation of patella
- e. Paralysis of extensors, flexors
- f. Fasciodesis , Tenodesis, Osteoplastic arthodesis
- g. Reconstruction of paralytic genu valgus
- h. Reconstruction of flexor contracture

#### Ankle & Foot

- a. Pronated foot
- b. Pes planus
- c. Pes cavus
- d. Paralysis of dorsiflexors, Plantorflexors, invertors, evertors, intrinsic muscles of foot
- e. Transplantation of muscles for paralysis

#### Trunk

- a. Paralysis of neck, trunk flexors, extensors lat flexors & Rotators
- b. Disc prolapse
- c. Spondylosis, Spondylitis , spondylolysthesis
- d. Scoliosis
- e. Kyphosis
- f. Lordosis
- g. Hemivertebra
- h. Pigeon chest
- i. Barrel chest

### **UNIT IV                      EXERCISE PHYSIOLOGY & NUTRITION**

**20**

#### 1. Nutrition – the basis for human performance

- a. Carbohydrates
- b. Lipids & Proteins
- c. Vitamins
- d. Minerals and water
- e. Optimal Nutrition for exercise.

2. Energy for physical activity –
  - a. Energy Value of food
  - b. Introduction to energy transfer, energy, transfer in the body phosphate bond energy, energy released from food
  - c. Energy transfer and exercise
  - d. Measurement of human energy expenditure
  - e. Human energy expenditure during rest and physical activity
  - f. Energy expenditure during walking, jogging running and swimming
3. System of energy delivery and utilization: the cardiovascular system cardiovascular regulation and integration functional capacity of cardiovascular system.
4. Dynamics of pulmonary ventilation: Regulation of pulmonary ventilation, pulmonary ventilation during exercise, acid – base regulation.
5. Enhancement of energy capacity
  - a. Training anaerobic and aerobic power
  - b. Muscular strength Training muscles to become stronger strength measurements and resistance training, structural and functional adaptation to resistance training
  - c. Special aids to exercise training and performance
6. Exercise performance and environmental stress
  - a. Exercise at medium and high altitude
  - b. Exercise and thermal stress – Mechanism of thermoregulation. Thermoregulation and environmental stress during exercise
  - c. Sport diving
7. Body composition assessment, physique. Performance, and physical activity, overweight, Obesity and weight control.
8. Exercise in aging and disease prevention.
9. Physical Activity in healthy aging
  - a. Physical activity in the population
  - b. Aging and physiologic function
  - c. Physical activity, health and longevity
  - d. Coronary heart disease.
10. Clinical Exercise physiology for cancer, obesity HT, Diabetes

**UNIT V                      PT ETHICS / PT EDUCATION TECHNOLOGY                      20**

1.     Educational aims.  
         Agencies of Education.  
         Current issues and trends in education.
2.     Concepts of teaching and learning.  
         Theories of teaching.

Relationship between teaching and learning.  
Psychology of Education.

3. Physiotherapy Curriculum.  
Committee, development, types, current trends and curriculum planning.
4. Principles and methods of teaching.  
Strategies of teaching.  
Organizations, writing lesson plans.  
  
A V Aids.
5. Measurement and evaluation.  
Meaning, Process, Standard and Nonstandard Tests.
6. Guidance and counseling. For students and faculty.
7. Faculty development for PT services.

## **P T ETHICS**

### **PT Ethical Issues**

- a. Ethical Rules of IAP and WCPT.
- b. Rules & Regulations of IAP.
- c. Objective of IAP.
- d. documentation

### **Physiotherapy and Law / Medico legal aspects**

- a. Medico-legal aspects of physical therapy.
- b. Liability.
- c. Negligence.
- d. Malpractice.
- e. Licensure.

**Total Hours:100**

### **Textbooks:**

1. Guyton, Text book of Physiology Elsevier, 4 Ed, 2000
2. Tora Tora , Textbook of Anatomy & Physiology, Churchill Livingstone, 3 Ed, 2004
3. Chatterjee, Text Book of Physiology. JP, 2 Ed, 2001



## References:

1. Grays Anatomy, mosby, 2Ed, 1994
2. Derek, Anatomy, Palpation and surface Marking, Elsevier, 4Ed, 1997
3. Sieg, Illustrated essentials of musculoskeletal anatomy, CBS, 2Ed, 1995
4. Nigel, Anatomy and human movement , MCGH, 4 Ed, 2000
5. T.S. Ranganathan , Textbook of anatomy, JP, 3 Ed, 1999
6. Palastanga , Anatomy and human Movement JAYPEE, 2 Ed, 2003
7. Cynthia. C.Norkin, Pamela , K.Levengle Joint structure & function, ELBS, 4 Ed, 2004
8. Axen, Illustrated Principal of exercise physiology, CBS, 1 Ed, 2000
9. Katch, Exercise physiology energy nutrition and human performance ELSEVIER, 4Ed, 2006
10. Frank, Exercise Physiology for health care professionals, mosby, 4 Ed, 1999
11. Power, Exercise Physiology.ELBS, 2 Ed, 2001
12. U. Sathyanarayana, Essentials of Biochemistry –Book and Allied (P) Ltd, Kolkatta.1 Ed, 2002
13. S.D.Seth, Text Book of Pharmacology, Churchill Livingstone.2 Ed, 2005
14. K.D.Tripathi, Essentials of Medical Pharmacology, JayPee Brothers 4 Ed, 2009



- 2) Population & samples
- 3) Sampling distribution
- 4) Sampling methods
- 5) Surveys in research

#### **IV Vital & Health statistics**

- 1) Uses of vital & health statistics in practice of PT
- 2) Sources & methods of collection & recording
- 3) Interpretation of commonly used vital & health statistics & estimate population using arithmetic progression method

#### **V Research Methodology**

##### **I. Introduction**

Importance of research in physiotherapy.

Ethics in physiotherapy research.

Introduction to the conceptual, empirical, interpretative, quantitative and qualitative research.

##### **II. Conceptual Phase**

Formulation of the problem.

Concepts and variables.

Literature review.

Hypothesis.

##### **III. Empirical/Conducting Phase**

Research design.

Brief overview of qualitative and quantitative approaches.

Population and samples

Collection of data.

Research data and analysis.

##### **IV. Interpretative Phase**

Discussion and conclusions.

Interpreting qualitative results.

##### **V. Criticizing published results**

Need for criticizing results.

Guidelines for criticizing results.

##### **VI. Writing research for publication**

Guidelines for writing results.

Recent trend in research

#### **UNIT II**

#### **MANAGEMENT/ADMINISTRATION/MARKETING**

**20**

##### **Management studies for Physiotherapy**

1. Definition – Branches of management- Principles of health sector management.
2. General principles of management: Theories of management.

3. Management studies related to local health care organization management & structure-planning delivery with quality assurance & funding of service delivery – information technology – Time management –career development in physiotherapy - preparing for 1<sup>st</sup> job etc.,
4. Personnel management: Policies and procedures. Basic concepts and theories.
5. Resource and quality management: planning with change and coping with change.
6. Performance analysis – physical structure / reporting system (man power / status / function/ quantity & quality of services / turn over – cost benefit – revenue contribution.
7. Administration – principles – based on the Goal & functions – at large hospital set up domiciliary services / private clinic / academic.
8. Methods of maintaining records
9. Financial issues including budget and income generation.
10. Principles of an organizational chart
11. Organization of a department: Planning, space, manpower, materials and basic Requirements and recruitment, policies and procedures.
12. Infrastructure in various departmental / segmental

### **P T Department Management**

- a. Policies and procedures.
- b. Recruitment.
- c. Department Planning
- d. Principles of practice

## **UNIT – III**

## **BIO-CHEMISTRY**

**20**

### **I. Energy Source**

Carbohydrates.  
Fats.  
Proteins.

### **II. Enzymes**

Specificity and factors affecting enzyme activity, intracellular and extracellular enzymes, clinical significance of alkaline phosphatase, acid phosphatase, cholinesterase and creatine phosphokinase.

### **III. Metabolic pathways related to carbohydrate lipid and protein metabolism**

Disorders of metabolism and related bio-chemical changes.

### **IV. Bio-chemical changes during muscle contraction**

### **V. PH**

Controlling factors and bio-chemical analysis.

### **VI. Physical stress and lactate levels**

**PATHOLOGY**

- A. Introduction: Concepts of disease, classifications of lesions.
- B. Bacterial, viral and parasitic infections a general outline.
- C. Inflammation and repair, Degeneration, necrosis and gangrene.
- D. Haemorrhage, shock, embolism, thrombosis.
- E. Tuberculosis, leprosy, typhoid.
- F. Deficiency diseases.
- G. Tumours: Aetiology & spread. Common tumour.
- H. Blood: Anaemia, Heart and blood vessels, Common congenital anomalies, Rheumatic & coronary heart diseases.
- I. Respiratory system: Pneumonias, Bronchiectasis, Emphysema, Chronic bronchitis, Asthma.
- J. Bone and joints: Autoimmune disease, Septic arthritis, Osteomyelitis.
- K. Skin: Leprosy.
- L. Urinary system.
- M. Central nervous system: CNS infections, vascular disorders.
- N. Rheumatoid Arthritis.
- O. Scleroderma and Psoriasis.
- P. Diseases of muscle including Poliomyelitis, Myopathies.
- Q. Volkmann's ischemia.

**MICROBIOLOGY**

- A. Introduction and history of microbiology.
- B. General lectures on micro-organisms:
  - 1. Classification.
  - 2. Shape and arrangement.
  - 3. Special characteristics - spores, capsules, enzymes, motility, reproduction.
    - a. Disinfection and antiseptics.
    - b. Sterilisation and asepsis.
    - c. Antibacterial agents - fundamental aspect. Susceptibility test
- C. Immunity - natural and acquired.
  - 1. Infection - source of infection.
    - portals of entry,
    - spread of infection
  - 2. Non- specific immunity
  - 3. Allergy and hypersensitivity.
  - 4. Outline of common pathogenic bacteria and the diseases produced by them.

**Treatment and prevention:**

- a. Respiratory tract infections.
- b. Meningitis.
- c. Enteric infections.
- d. Anaerobic infections
- e. Urinary tract infections.
- f. Leprosy, tuberculosis and miscellaneous infections.
- g. Wound infections.

- h. Sexually transmitted diseases.
  - i. Hospital acquired infections.
- D. Pathogenic Yeasts and fungi.
- E. Virology -Virus infections, with special mention of Hepatitis, Poliomyelitis & Rabies.

## UNIT V

## PHARMACOLOGY

20

Introduce the students to basic pharmacology of various common medication used and its effects on patients and during physiotherapy.

- A. Terminology
- B. Classification of drugs
- C. Factors influencing the dosage of drugs and its actions.
- D. Drug Allergy
- E. Principles of drug administration and routes.
- F. Definition, action, indications, contra - indications, adverse reactions of the following:
  - 1) Anti-inflammatory
  - 2) Anti-epileptic
  - 3) Sedatives, Hypnotics, Tranquilizers
  - 4) Muscle relaxants
  - 5) Alcohol
  - 6) Pulmonary effects of general anaesthetic agents
  - 7) Mucolytic agents
  - 8) Local anaesthetic agents
  - 9) Narcotic Steroids
  - 10) Vasodilators
  - 11) Insulin and oral hypoglycemic agents
  - 12) Antibiotics – Bactericidal, Bacteriostatic
  - 13) Chemotherapeutic drugs in leprosy and tuberculosis.

### Evaluation

**Total Hours:100**

### Textbooks:

1. Poddar S., Introduction to Research in Health Sciences, Churchill Livingstone, 3<sup>rd</sup> edition, 1988
2. Currier D.P., Elements of Research in physical therapy, Williams & Wilkins, Baltimore, 3<sup>rd</sup> edition 1990
3. Sundar Rao & Richard, An introduction to biostatistics, JP, 2<sup>nd</sup> edition, 2008
4. Elaine Lynne, Management in Health Care, Macmillan Publisher, 3<sup>rd</sup> Edition,2000.
5. Willam A. Reinke, Health Planning for Effective Management, Oxford University Press, 1<sup>st</sup>Edition, 1996

**References:**

1. Ashok Neeraja, Nursing Education, JP, 3<sup>rd</sup>Edition, 2011
2. Madhavan Nair, Education Methods, Jaypee, 4<sup>th</sup>Edition, 2009
3. Carolin Hicks, Research for physiotherapist, Mosby, 2<sup>nd</sup>Edition, 2006
4. Barbara, Statistical methods for healthcare research, Churchill Livingstone, 1<sup>st</sup>Edition, 1995
5. Barlene: Documenting functional outcomes in physical therapy., McGrawhill, 4<sup>th</sup>Edition, 1999

**Course Objective:**

After 200 hours of clinical practice, students should be able to

- i) Explain the concepts and principles of various Rehabilitation approaches.
- ii) Demonstrate assessment of patients using various Principles.
- iii) Analyze the patient's problems and come to a clinical diagnosis.

**Course Outcomes:**

1. One can understand about the significance & importance of history taking.
2. The clear understanding of orthopaedic rehabilitation can be attained
3. The clear understanding about the knowledge of cardiac rehabilitation can be attained
4. The clear understanding of pulmonary rehabilitation can be attained
5. The clear understanding of neurological rehabilitation can be attained

**UNIT I INTRODUCTION 40**

1. Assessment and treatment planning
2. Value of patient care
3. Significance of history taking
4. Importance of physical rehabilitation in community

**UNIT II ORTHOPAEDIC REHABILITATION 40**

1. Musculoskeletal assessment
2. Gait analysis
3. Perambulation and gait training
4. Rehabilitation management in arthritis
5. Amputation management

**UNIT III CARDIO AND PULMONARY REHABILITATION 40**

1. Cardio respiratory assessment
2. Exercise prescription
3. Pulmonary rehabilitation
4. Community based rehabilitation for pulmonary diseases patients
5. Vital signs



**UNIT IV      NEURO LOGICAL REHABILITATION**

**40**

1. Neuro assessment
2. Stroke
3. Spinal cord injury
4. Assessment and intervention strategies for cognition and perceptual dysfunction for neuro patients

**UNIT V      GERIATRICS AND OBG**

**40**

1. Role of physiotherapy in women health and OBG
2. Significance of exercise prenatal, antenatal and postnatal stages
3. Common gynecological problems
4. Geriatric rehabilitation

**Evaluation**

**Total Hours: 200**

**Text books:**

1. Janet H carr, a motor re leaning programme for stroke, aspen publishers, 2<sup>nd</sup>, 1987
2. Berta bobath, adult hemiplegia, butterworth Heinemann, 3<sup>rd</sup> ed, 1990.

**Reference:**

1. David J. magee, orthopeadic physical assessment, saunders , 5<sup>th</sup> ed, 2008.

**Course Objective:**

After 100 hours of clinical practice, students should be able to explain & demonstrate functional anatomy, biomechanics, pathomechanics & gait pattern of various clinical conditions

**Course Outcomes:**

1. One can understand about the kinetics & kinematics of body
2. The functional anatomy of upper extremity, lower extremity trunk can be well understood
3. The biomechanical knowledge of various – musculoskeletal system can be understood
4. The pathomechanics of upper limb lower limb & trunk can be well known
5. The gait & its determinants can be very well understood

<b>UNIT I</b>	<b>INTRODUCTION</b>	<b>20</b>
	<ol style="list-style-type: none"> <li>1. Kinetics</li> <li>2. Kinematics</li> <li>3. Planes and axis</li> <li>4. Linear and angular motion</li> <li>5. Classification of joints</li> </ol>	
<b>UNIT II</b>	<b>FUNCTIONAL ANATOMY</b>	<b>20</b>
	<ol style="list-style-type: none"> <li>1. Upper extremity</li> <li>2. Lower extremity</li> <li>3. Trunk</li> </ol>	
<b>UNIT III</b>	<b>BIO MECHANICS</b>	<b>20</b>
	<ol style="list-style-type: none"> <li>1. Bio-mechanical characteristics of bone, soft tissue, articulation etc</li> <li>2. Trabecular system</li> <li>3. Muscular consideration of movement</li> <li>4. Neurological consideration of movement</li> </ol>	
<b>UNIT IV</b>	<b>PATHOMECHANICS</b>	<b>20</b>
	<ol style="list-style-type: none"> <li>1. Pathokinetics of upper limb</li> <li>2. Pathokinetics of lower limb</li> <li>3. Pathokinetics of trunk</li> </ol>	

1. Determinants of gait
2. Gait cycle
3. Locomotive training and aids
4. Pathological gait

**Evaluation**

**Total Hours: 100**

**Text books:**

1. Janet H carr, a motor re leaning programme for stroke, aspen publishers, 2<sup>nd</sup> , 1987
2. Berta bobath, adult hemiplegia, butterworth Heinemann, 3<sup>rd</sup> ed, 1990.

**Reference:**

1. David J. magee, orthopedic physical assessment, saunders , 5<sup>th</sup> ed, 2008.

**Course Objective:**

After 100 hours of clinical practice, students should be able to explain & demonstrate biochemistry, pathology, microbiology & pharmacology involved in various clinical conditions

**Course Outcomes:**

1. The energy source can be well understood
2. The biochemical analysis & standard levels can be known
3. The knowledge of pathology related to various condition can be gained
4. The allergic & immunity for various agents can be well understood
5. The pharmacology for various conditions diseases can be understood

**UNIT I INTRODUCTION 20**

1. Introduction and energy source
2. General outline of infection
3. Common terminologies used in pharmacology
4. Introduction of microbiology

**UNIT I BIOCHEMISTRY 20**

1. Food and nutrition
2. Enzymes
3. Metabolic pathways
4. Biochemical analysis
5. Physical stress and lactate levels

**UNIT III PATHOLOGY 20**

1. Inflammation and repair
2. Deficiency diseases
3. Autoimmune diseases
4. COPD

**UNIT IV MICROBIOLOGY 20**

1. Dysfunction and antiseptic
2. Sterilization
3. Allergy and hyper sensitivity
4. Immunity

1. Classification of drugs
2. Drug allergy
3. Routes of drug administration
4. Indication, contraindication and adverse effects of drugs

**Evaluation**

**Total Hours: 100**

**Text books:**

1. Janet H carr, a motor re leaning programme for stroke, aspen publishers,2<sup>nd</sup> , 1987
2. Berta bobath, adult hemiplegia, butterworth Heinemann, 3<sup>rd</sup> ed, 1990.

**Reference:**

1. David J. magee, orthopeadic physical assessment, saunders ,5<sup>th</sup> ed, 2008.

**Course objective:**

The objectives of this course is that after 200 hours of lectures & demonstrations, in addition to clinics, the student will be able to understand the basic knowledge about kinesiotherapeutics, ergonomics, electrotherapy, community rehabilitation & condition related to OBG.

**Basic Physiotherapeutic Intervention**

This paper consists of 5 modules

1. Kinesiotherapeutics
2. Ergonomics
3. Electrotherapeutics
4. Community Based Rehabilitation
5. OBG

**Course Outcomes:**

1. Implementation of various therapeutic approaches and manual techniques. Designs an exercise program to recover correct posture and activities.
2. Multiple levels of ergonomic consulting, workstation assessment, pre employment screening and functional capacity evaluation is assessed for an individual or in a group.
3. The student will be able to intervene appropriate electrotherapeutic modalities.
4. The students will be able to improve the self esteem and quality of life of the people in the community.
5. To assess, evaluate and formulates the PT management for various obstetrics and gynecological conditions.

**UNIT I****KINESIOTHERAPEUTICS****40**

Introduction, definitions, principles and basics in exercise therapy

1. Therapeutic techniques, active exercises, passive movements, relaxation, coordination exercises, suspension, PRE, Massage, Stretching – active and passive, PNF
2. Various equipments in exercise therapy and its applications
3. Hydrotherapy – uses, principles, types
4. Therabands – types, application
5. Swiss ball
6. Muscle energy techniques
7. Cardiolates
8. Plyometrics
9. Posture and Gait
10. Gait lab analysis
11. Mobility aids

Introduction to Ergonomics, definition, area and scope of ergonomics

1. Environmental factors
2. Work care spectrum and role of PT
3. Job analysis, job site analysis, job task analysis
4. Pre employment screening, exit assessment
5. Work hardening
6. Education and education programme
7. Documentation
8. Practical ergonomics for different sections of the society.
9. Functional assessment for worker: Working class labour, hard labour, very hard labour, Chair class, Executive class and Bureaucratic class.
10. Explain the scope of Ergonomics in Modern Industrial society.

**1. INTRODUCTION TO PHYSICAL AGENTS:**

- a. Definition, Categories, History of Physical Agents.
- b. History of physical agents in Rehabilitation.
- c. Effects of Physical Agents.

**2. a. SHORTWAVE DIATHERMY:**

- a. Physics, biophysical and biomechanical effects of SWD, therapeutic effects of SWD, indications, dangers, precautions, application of inductothermy.
- b. Pulsed SWD: Biological effects, indications, contraindications and techniques of application, advantages and disadvantages.

**b. LONG WAVE DIATHERMY**

**3. MICROWAVE DIATHERMY:**

- a. Physics of MWD.
- b. Biophysical, biomechanical, therapeutic effects of MWD.
- c. Dosage, indications and contraindications.
- d. Techniques of MWD.
- e. Dangers, precautions, methods of application, advantages and disadvantages.
- f. Pulsed MWD.

**4. ULTRASONIC THERAPY:**

- a. Medical frequencies of ultrasound, production of ultrasound, physical phenomenon of ultrasound.
- b. Pulsed ultrasound.
- c. Physiological effects of ultrasonic energy.
- d. Indications, contraindications, dangers, coupling media, dosage, methods of application, techniques of application.
- e. Techniques of application in contact method, sub aquatic method users.

## **5. INFRA RED RADIATIONS:**

- a. Physical apparatus for infra-red heating, physiological effects, indications, contraindications.
- b. Techniques of application.
- c. Advantages & disadvantages.

## **6. IONTOPHORESIS**

- a. Direct currents.
- b. Strength of the solution, common drugs in usage today, apparatus used.
- c. Indications, contraindications.
- d. Dosage methods: in contact, sub aquatic, iontophoresis technique – treatment of hyperhidrosis, calcific tendonitis, allergic vasomotor rhinitis.
- e. Side effects, contraindications, techniques.

## **7. FARADIC STIMULATION**

- a. Faradic type currents.
- b. Physiological effects, indications, contraindications.
- c. Faradic stimulation in weak pelvic floor muscles, Bell's palsy, reduction of limb oedema, disuse atrophy and reduction of arches of foot.

## **8. DIDYNAMIC CURRENTS:**

- a. Physiological effects, indications, contraindications, methods of application, dosage.

## **9. INTERFERENTIAL THERAPY:**

- a. Interferential currents, Rebox, Russian Currents
- b. Physics of IFT.
- c. Physiological effects and uses of IFT.

## **10. TENS:**

- a. Principles of TENS.
- b. Physiology and modulation of pain
- c. Physiological effects, therapeutic effects of TENS.
- d. Obstetrical TENS, cancer pain & TENS, TENS for non-healing fractures.

## **11. LASER THERAPY:**

- a. Cold LASER production, physical characteristics, physiological effects, dosage, pain control.
- b. Indications, contraindications.
- c. Trigger points.

## **12. CRYOTHERAPY:**

- a. Cold packs, ice bags, ice massage, ice towels, compressive cryotherapy, vapocoolant sprays.
- b. Therapeutic effects of cryotherapy, uses in sports medicine, spasticity.

## **13. PARAFFIN WAX :**

- a. Method of application – immersion, brushing, equipments requires.
- b. Physiological effects, therapeutic uses, benefits of the therapy.



## **14. SHOCK WAVE DIATHERMY**

- Principles and uses

## **15. HOT PACKS:**

- a. Hydro collator packs, temperature maintenance, physiological effects, methods of application, uses, advantages and disadvantages.

## **16. CONTRAST BATH:**

- a. Equipment used method of application, indications, contraindications, physiological effects and therapeutic uses.

## **17. TRACTION:**

- a. Types of spinal traction – continuous, intermittent, manual, auto traction, gravity lumbar traction.
- b. Indications for spinal traction.
- c. Contraindications, effects of traction, mechanical lumbar traction technique, cervical traction technique.

## **18. MECHANICAL EXTERNAL COMPRESSION:**

- a. Causes of edema, pathophysiology of edema, types of edema.
- b. Methods of external compression – taping, intermittent compression, elastic support bandaging, gradient support, massage, exercise.
- c. Physiological effects, therapeutic uses.
- d. Patient education.

## **19. HVPGS**

## **UNIT IV**

## **COMMUNITY BASED PHYSIOTHERAPY**

**40**

1. Psycho – social and socio-economical aspects of community health development
2. Population studies and epidemiological implications of Impairment and Handicap and
3. Disability, health statistics.
4. Health administration - management concept as applied to physiotherapy.
5. Health and fitness, Environmental health physiotherapy as a drugless system. Public
6. health education methods and appropriate media, Communications and Interactions.
7. Community based rehabilitation.
8. Nutrition and diet.
9. Child-care – prevention and social medicine.
10. Immunization programmes – malnutrition and early detection of disabling conditions and Intervention.
11. Maternal care Antenatal and Postnatal physiotherapy
12. Educated children, postnatal complications and prevention of postural defects, fitness Programme.
13. Industrial physiotherapy – prevention of injuries, physiological restoration, rehabilitation in industrial injuries.

14. Care of the aged, geriatric physiotherapy, life span yoga.
15. Psychosomatic approaches in management of stress disorders.
16. Changes in life style to reduce risk factors for disability, Drug dependence and iatrogenic disorders.

## **UNIT V**

## **PHYSIOTHERAPY IN OBG**

**40**

1. Anatomy & Physiology of female reproductive organs
2. Puberty & Menarche.
3. Physiological changes during pregnancy.
4. Labour & its complication.
5. Antenatal & Postnatal care.
6. Modalities in OBG.
7. Relaxation techniques in prenatal education.
8. Exercise in pregnancy.
9. Pregnancy discomforts & Management.
10. Post menopause problem & its Management.
11. Gynaecological disorder & its PT Management
  - a) Infective conditions
  - b) Back ache & abdominal pain
  - c) Displacement & Genital prolapse
12. Post operative care in gynecological surgery.
13. Urinary dysfunction – Physiotherapy management.
14. Lymph oedema & Role of Physiotherapy.

### **Evaluation**

**Total Hours:200**

### **Textbooks:**

1. Jennings ,Medical Electronics Applications , ELSEVIER, 1 Ed, 2012
2. Deirdre M.Walsh, Tens clinical application & related therapy , mosby, 3 Ed, 2009
3. Michelle Cameron , Physical agents in rehabilitation CBS, 2 Ed, 2001
4. Margaret Polden & Jill Mantle , Physiotherapy in Obstetrics and Gynecology , mosby, 2 Ed, 2004

### **References:**

1. Cynthia Norkin, Biomechanics of Human Joints, ELBS, 5<sup>th</sup> Ed, 2010.
2. Kapand Ji, Biomechanics of Human Joints. Elsevier, 6<sup>th</sup> Ed, 2010
3. Brunstorms, Clinical Kinesiology, CBS, 3<sup>rd</sup> Ed, 2007

4. Frankel Nordin, Biomechanics of Joints MCGH, 1 Ed, 1995
5. John low & Ann reed, Electrotherapy explained principles, Churchill Livingstone, 4 Ed, 2003
6. Roger.M.Nelson, Clinical electrotherapy, CBS, 2 Ed, 2001
7. Sheila Kirchen, Claytons electrotherapy, Elsevier, 1 Ed. 2009
8. Joseph Khan, Principles & Practice of Electrotherapy, Mosby, 1 Ed, 1997
9. Susan.L.Michlorirz , Thermal agents in Rehabilitation, Mosby, 3 Ed, 2001
10. G.David Baxter, Laser (therapeutic) theory & Practice, CBS, 2 Ed, 2008

**Course Objectives:**

The objectives of this course is that after 200 hours of lectures & demonstrations, in addition to clinics, the student will be able to understand about electro physiology & diagnosis, medical imaging, manual techniques and current trends in pilates.

**Advanced Physiotherapeutic Intervention**

This paper consists of 5 Modules

1. Electro Physiology
2. Electro Diagnosis
3. Basics of Medical Imaging
4. Manual Techniques
5. Pilates

**Course Outcomes:**

1. Knowledge about ECG, Echocardiogram, and Doppler studies gained.
2. Knowledge about clinical application of EMG and NCV gained.
3. Knowledge about various radiological imaging studies gained
4. Knowledge about manual techniques of joint mobilization and procedure of application gained.
5. Knowledge about Pilates, its concepts and application gained.

**UNIT I**

**ELECTRO PHYSIOLOGY**

**40**

**Excitable Tissues – Nerve:**

- a. Excitation and conduction.
- b. Measurement of electrical events.
- c. Ionic basis of excitation and conduction
- d. Physiologic basis of nerve conduction tests – their reliability and access.

**1. Excitable Tissues – Muscle:**

- a. Skeletal muscle:
  1. Electrical phenomena & ionic fluxes.
  2. Contractile responses.
  3. Physiological basis of ECG.
  4. Normal & abnormal ECG.

b. Smooth Muscle:

1. Electrical properties.
2. Electrical events at synapse, chemical transmission of synaptic activity.
3. Electrical and ionic events in receptors.

**2. Clinical Neurophysiology:**

1. History of Clinical Neurophysiology: Introduction to electro diagnostic signals and their measurements.
2. Nerve Conduction Study:
  - a. Principles of nerve conduction study.
  - b. Median nerve.
  - c. Ulnar nerve.
  - d. Radial nerve.
  - e. Brachial plexus.
  - f. Cervical radiculopathy.
  - g. Lumbar plexus.
  - h. Lumbosacral radiculopathy.
  - i. Anomalous innervations of the extremities.
  - j. Nerve conduction of non-limb nerves.
  - k. Late responses.
  - l. Autonomic nervous system testing.

**UNIT II**

**ELECTRO DIAGNOSIS**

**40**

**1. EMG:**

- a. Introduction to EMG.
- b. Technique of EMG.

**2. Clinical Application of EMG and NCV:**

- a. EMG findings in neurological disorders.
- b. EMG & NCV studies in polyneuropathy.
- c. Repetitive Nerve Stimulation.
- d. Single fiber and macro EMG.
- e. Visual evoked potential.
- f. Brainstem auditory evoked potential.
- g. Somatosensory evoked potential.
- h. Motor evoked potential.

**3. Electroencephalogram.**

Principle & physiological basis.

**4. Echo cardiogram & Doppler studies.**

**RADIOLOGY, RADIO DIAGNOSTICS & SONOGRAPHY**

1. Introduction to Radiography: Radio Imaging and Radio Diagnostic:
  - a. Dimension in radiography.
  - b. Radio density.
  - c. A roentgen.
  - d. Analysis of image.
  - e. Positioning, viewing of radiograph, film markers.
  - f. Image quality factors: radiographic density, contrast, distortion, recorded results.
  
2. Common Imaging Studies:
  - a. X Ray – spinal, skull, peripheral.
  - b. Conventional topography.
  - c. Computed tomography (CT).
  - d. Contrast enhanced radiography.
  - e. Radio nucleide scan.
  - f. Magnetic resonance Imaging with Spectroscopy.
  - g. PET.
  - h. Myelography.
  - i. Nuclear Imaging.
  - j. Pneumo encephalogram.
  - k. EEG.
  - l. Ultrasonogram.
  - m. ECG & Doppler studies.
  - n. MUGA – Nuclear Test.

**UNIT IV****MANUAL TECHNIQUES****40**

1. Introduction:
  - a. Definition of terms
  - b. Clinical reasoning process in manipulation therapy
  
2. Peripheral Joint Mobilization
  - a. Basic concept of joint motion – Arthrokinematics
  - b. Indication for joint mobilization
  - c. Limitation of joint mobilization
  - d. Contraindication and precaution
  - e. Procedures for applying passive joint mobilization
  - f. Mobilization with movement, principles and practice
  - g. Peripheral Joint mobilization technique.

**UNIT V****PILATES****40**

- a. History
- b. Anatomy
- c. core stabilization

- d. concepts
- e. principles
- f. mat workouts
- g. machine workouts
- h. demonstration

**Evaluation**

**Total Hours:200**

**Textbooks:**

1. Joseph Arodgold M.D. .,Electro diagnosis of Neuro muscular disease, Mosby, 2<sup>nd</sup> Ed, 2007
2. ShinJ.oh, Clinical electrography case studies JP,2<sup>nd</sup> Ed, 2009

**References:**

1. Cyriax, Massage, Mc Graw Hill. 1 Ed, 2002
2. Rudolph Kessler., Management of common musculoskeletal problem , Mosby, 3<sup>rd</sup> Ed, 2002
3. Carolyn Kiseener , Therapeutic exercise - Elsevier, 4<sup>th</sup> Ed, 2011
4. James A. Gould, Orthopaedic and sports physical therapy - CBCS, 2<sup>nd</sup> Ed, 2001

# **ELECTIVE COURSES**



### Course Objectives

The objectives of this course is that after 200 hours of lectures & demonstrations, in addition to clinics, the student will be able to understand about patho mechanics of human joint, clinical sports conditions and pharmacology in sports conditions.

### Course Outcomes:

- 1) Students will be able to identify the types, levels of sports injuries and their management.
- 2) Students will have a wide knowledge about Bio mechanics and Pathomechanics of sports injuries and flexibility exercises.
- 3) Students will know about to running and throwing injuries
- 4) Students will be able to insist about different types of sports injuries in upper limb and lower limb
- 5) Students will know about doping and sports physiotherapy

### UNIT I

40

**ANATOMY, PHYSIOLOGY & PATHOMECHANICS** – Psychological factors of sports injuries · Physiological factors of sports injuries – Type of injuries, Reaction to injury, Response of joint structures to injury, Effects of immobilization, Effects of remobilization, Inflammatory and healing process, micro trauma, stress reactions · Rules & regulations of sports, sport specific injuries · Pathomechanics of sport injuries · Physical demand in different sports · Flexibility exercises.

### UNIT II

40

**NEUROPHYSIOLOGY** – Physiological effects of stretching & mobilizations prior to the participation in sports · Types of exercises and their physiological effects related to sports · Biomechanics of sports and its relationship to joint injuries · Uses & application of biomechanics of different sport events (like throwing mechanics, swimming mechanics) · Aquatic: Physical properties of water, Physiological effects of water immersion and its therapeutic values · Embryological development of musculoskeletal system · Osteology: Structure of bone, ossification of bones, Skull bones, Facial bones, Bones of Upper Extremity, Lower Extremity, Pelvis, Vertebral column, Ribs · Myology: Structure of muscle, Types of muscle, Muscle fibres, origin, insertion, action, nerve supply of Muscles of Face, Upper

Extremity, Lower Extremity, and Trunk • Arthrology: Structure of joint, types of joints, detailed structure and formation of all the joints. Neurobiology of joint • Neurology: Peripheral Nerves: Dermatomes and Myotomes • Physiology: Joint physiology [Movements]. Muscle physiology. Pathomechanics of Fractures, deformed joints.

### **UNIT III**

**40**

#### **CLINICAL CONDITIONS**

Student is expected to learn common causes, mechanism, pathophysiology, signs, symptoms, medical and surgical treatments of following sports related injuries and also should know the recent advances in the surgical, medical management of sport related injuries.

- 1) Epiphyseal injuries – Classification, complications and prognosis of epiphyseal injuries, Osgood Schlatter’s disease, traction epiphysitis, tendinitis at the insertion of patellar tendon, complete avulsion of the epiphysis of the tibial tubercle, shoulder, Contributing risk factors – intrinsic factors, and extrinsic factors.
- 2) Shoulder Girdle injuries – injuries to the sternoclavicular joint – sprains, dislocations, Scapulothoracic joint lesions, acromoclavicular joint sprains, anterior dislocations of glenohumeral joint, recurrent anterior dislocations of shoulder, posterior dislocation of shoulder, thoracic outlet syndrome. Painful Arc syndrome, rotator cuff injuries, impingement syndromes, Glenoid labrum lesions.
- 3) Elbow Joint injuries – Olecranon bursitis, Valgus, extension overload in elbow, Ulnar nerve lesions, Ulnar and Radial collateral ligament sprains, Contusions and strains, Dislocations, Osteochondritis dissecans, Little Leagues elbow, problems resulting from throwing, medial lesions, lateral lesions, posterior lesions.
- 4) Elbow injuries from Tennis – Epicondylitis – Incidence, pathology and mechanism of injury.
- 5) Wrist and Hand Injuries – Colle’s fracture, Scaphoid fracture, Gamekeeper’s Thumb, DIP joint fracture and dislocation, Jersey finger, Boutonniere deformity, Pseudo boutonniere deformity, fractures of the metacarpals, Bennett’s fracture, mallet finger, Dequervain’s tenosynovitis of the thumb, Bowler’s thumb, handler palsy, Hamate fracture, Ganglion cysts, Trigger finger, Carpal tunnel syndrome.

Thigh Injuries – Contusions to the quadriceps, strain of the quadriceps musculature, acute strain of the hamstring group, complete rupture of the patellar tendon.

- 1) Knee Injuries – Knee ligament injuries - first-degree sprain, second-degree sprain, third-degree sprain, anterior and posterior cruciate tears, anteriolateral instability meniscal-lesion, Articular cartilage lesions, Patello femoral dysfunction.
- 2) Injuries of the Patella – Patella fracture – acute-dislocation, recurrent dislocation, subluxation and spontaneous reduction of a dislocated patella, Osteochondritis Dissecans, Jumper's knee.
- 3) Injuries to lower leg, ankle and foot – Tibiofibular synostosis, rupture of the gastrocnemius, Tennis leg, total rupture of the Achilles tendon, partial rupture of Achilles tendon, tendinopathies – Achilles tendinitis, anterior tibialis tendonitis, Peroneal tendonitis. Posterior tibialis tendonitis, Flexor hallucis longus tendinitis, Flexor digitorum longus tendonitis. Compartmental compression syndromes, Heel bruise, Os trigonum injury, Calcaneal apophysitis, Tarsometatarsal injuries. Tarsal tunnel syndrome, cuboids syndrome, metatarsal stress fracture, Inter-digital neuroma(Morton's neuroma), Stair Climbers transient paraesthesia, Turf toe, sesamoiditis.
- 5) Injuries to the Ankle – Syndesmotic ankle sprain, Inversion sprains, eversion sprains, dorsiflexion sprains, tarsal tunnel syndrome, stress fracture of the metatarsal, corns and calluses, blisters, ingrown toenails, peroneal tendon subluxation.
- 6) Injuries to the low back – Postural syndrome, Dysfunction syndrome, Derangement syndrome, Spondylolisthesis.

Injuries to the Running Athlete – Causes of over use injuries – Common running induced injuries to the lower back – Common running induced injuries to the hip – Iliotibial tract pain. Trochanteric Bursitis, stress fracture of femoral neck. Slipped capital femoral epiphysis, vague hip pain.

Common running related injuries to the knee – Medial Patellar pains, Pes anserine bursitis, patellar tendonitis, retro patellar pain, lateral patellar pain, lateral knee pain, biceps femoral tendinitis.

Common running related injuries to the lower leg – Tibial stress relation, stress fracture, medial tibial stress syndrome, compartment syndrome – Anterior, posterior lateral, fibular stress reaction and stress fracture, retro calcaneal bursitis, medial arch pain, plantar fasciitis.

Swimming Injuries – ‘Swimmer’s Shoulder, anterior subluxation of the Glenohumeral Joint, Breast stroker’s injury.

Role of drugs in physiotherapy

Doping / Pro acting

## **Evaluation**

**Total Hours: 200**

### **Textbooks:**

1. James a Gould, orthopaedics and sports physical therapy, jp, 3ED, 1997
2. Das, a text book of sports medicine, JP, 1 ED, 2006

### **References:**

1. Mcardal, Exercise Physiology , ELBS, 5Ed, 2011
2. Steven roy, Sports medicine, mosby, 4 ed, 1988

**Course Objectives:**

The objectives of this course is that after 240 hours of lectures & demonstrations, in addition to clinics, the student will be able to understand about PT assessment, Diagnosis and evidence based practice related to various sports conditions.

**Course Outcomes:**

1. The students will have a good idea about emergency sports assessment
2. They will a be familiar in pre – participation evaluation
3. Students will be able to assess the various systems in the a pre – preparation to the sports
4. Students will know about the throwing mechanism and plyometrics
5. Students will be having a sound knowledge about well balanced diet and pre – event nutrition

**UNIT I**

**40**

**Emergency Sports Assessment**

Pre-event Preparation.

**Primary Assessment** – Level of Consciousness, Establishing the airway, Assessment for Bleeding, Fluid loss and Shock, Pupil Check, Assessment for spinal cord injury, Assessment for Head Injury, Assessment for Movement, Positioning the patient, Injury severity.

**UNIT II**

**40**

**Secondary Assessment**

Pre-participation Evaluation, Objectives of the Evaluation, Setting of the Examination.

**UNIT III**

**40**

**Pre-participation History**

Examination – Eye Examination, Musculoskeletal Examination and Convulsive Disorders, Pulmonary Examination, Urogenital Examination, Gastrointestinal examination, Dermatological Examination, Examination for Heat Disorders.

## **General Medical Problems**

Dental Examination, Neurological Examination, Cardiovascular Examination,  
Application of isokinetics in testing.

**UNIT IV** **40**

### **Plyometrics,**

Calesthenic exercises, circuit training, throwing mechanism & injuries

**UNIT V** **40**

### **Nutrition & Athlete**

Well balanced diet, Pre-event nutrition, Carbohydrate loading diet, increase & decrease  
weight

**Total Hours: 200**

### **Textbooks:**

1. Das, a text book of sports medicine, JP, 1 ED, 2006.
2. Dey, a text book of sports and exercise physiology JP, 1 ED, 2012.

### **References:**

1. James a Gold, orthoppaedics and sports physical therapy, JP, 3ED, 1997.
2. Christopher Norris, sports injuries and management, mc graw hill, 3 ed, 1999.

**Course Objectives:**

The objectives of this course is that after 200 hours of lectures & demonstrations, in addition to clinics, the student will be able to understand about current and latest intervention used for various sports conditions.

**Course Outcomes:**

1. Students will know about how to prevent athletic injuries
2. Students will be able to identify the general conditioning principles
3. They will have broad idea about the application of proper protective & supportive devices like taping & wrapping techniques
4. Students will be able to do the emergency sports management and all kind of sports injuries management
5. Students will be able to treat the all running related injuries & swimming injuries.

**UNIT I****50**

- a. Prevention of Athletic Injuries — skeletal muscle – Type 1 and Type 2 fibres, General conditioning principle – strength, power, muscular endurance, flexibility, anaerobic metabolism.
- b. Warm-up period – warm up schedule, stretching, proprioceptive neuromuscular facilitation techniques.
- c. Protective and supportive equipment – protective equipment: Supportive devices, motion limiting devices.
- d. Treatment of Athletic injuries.
- e. Taping and wrapping techniques.
- f. Emergency care and Athletic first-aid – cardiopulmonary emergencies, ABC of resuscitation, Heimlick maneuver Shock Injuries: - Internal injuries, Head and neck injuries, fractures, dislocations.
- g. Injury first-aid – ICE or Cold application, compression, elevation, gait instruction, stretcher and wheel chair uses.

- a. Physiotherapeutic interventions for relief of pain – Therapeutic modalities and procedures – General principles of therapeutic modalities Hydrotherapy, shortwave diathermy, Microwave diathermy, Ultrasound. Iontophoresis, Phonophoresis, TENS, Cryotherapy, Cold Spray, Contrast Bath, Paraffin Wax Bath, Ultraviolet radiation, Massage - Indication, contraindication, therapeutic and physiologic effects, treatment techniques.
- b. Fitness training related to specific sports – Manipulative Therapy, Principles, Concept, Indications and Contraindications, Applications.
- c. Injuries Rehabilitation – Goals of rehabilitation, types of exercises – isometric exercise, isotonic exercise, special forms of exercise, manual resistance. Proprioceptive Neuromuscular facilitation, surgical tubing, circuit training, sport-specific skills.
- d. Application of isokinetics in Athletic Rehabilitation.

## UNIT III

- a. Epiphyseal Injuries, Osgood Schlatter's disease, traction, epiphysitis, tendinitis at the insertion of patellar tendon, complete avulsion of the epiphysis of the tibial tubercle shoulder, contributing risk factors, intrinsic factors, extrinsic factors.
- b. Shoulder Girdle Injuries: Injuries to the sternoclavicular joint – sprains, dislocations, Scapulothoracic joint lesion, acromioclavicular joint sprains, anterior dislocation of glenohumeral joint, recurrent anterior dislocations of the shoulder, posterior dislocation of the shoulder, thoracic outlet syndrome. Painful arc syndrome, rotator cuff injuries, Impingement syndromes, Glenoid Labrum lesions.
- c. Elbow joint Injuries: Olecranon bursitis, Valgus, extension overload in elbow, Ulnar nerve lesions, Ulnar and Radial collateral ligament sprains, Contusions and strains, Dislocations, Osteochondritis dissecans, Little Leaguers elbow, problems resulting from throwing, medial lesions, lateral lesions, posterior lesions.
- d. Elbow injuries from Tennis – Epicondylitis – Incidence, pathology and mechanism of injury.
- e. Wrist and Hand Injuries – Colle's fracture, Scaphoid fracture, Gamekeeper's Thumb, DIP joint fracture and dislocation, Jersey finger, Boutonniere deformity,



Pseudo boutonniere deformity, fractures of the metacarpals, Bennett's fracture, mallet finger, Dequervain's tenosynovitis of the thumb, Bowler's thumb, Handler palsy, Hamate fracture, Ganglion cysts, Trigger finger, Carpal tunnel syndrome.

#### UNIT IV

50

- a. Thigh Injuries – Contusions to the quadriceps, strain of the quadriceps musculature, acute strain of the hamstring group, complete rupture of the patellar tendon.
- b. Knee Injuries – Knee ligament injuries first-degree sprain, second-degree sprain, third-degree sprain, anterior and posterior cruciate tears, anteriolateral instability meniscal-lesion, Articular cartilage lesions, Patello femoral dysfunction.
- c. Injuries of the Patella – Patella fracture, acute-dislocation, recurrent dislocation, subluxation and spontaneous reduction of a dislocated patella, Osteochondritis Dissecans, Jumper's knee.
- d. Injuries to lower leg, ankle and foot – Tibiofibular synostosis, rupture of the gastrocnemius, Tennis leg, total rupture of the Achilles tendon, partial rupture of Achilles tendon, tendinopathies – Achilles tendonitis, anterior tibialis tendonitis, Peroneal tendonitis. Posterior tibialis tendonitis, Flexor hallucis longus tendinitis, flexor digitorum longus tendonitis. Compartmental compression syndromes, Heel bruise, Os trigonum injury, Calcaneal apophysitis, Tarsometatarsal injuries. Tarsal tunnel syndrome, cuboids syndrome, metatarsal stress fracture, inter-digital neuroma(Morton's neuromas), Stair Climbers transient parasthesia, Turf toe, sesmoitidis.
- e. Injuries to the Ankle – Syndesmotoc ankle sprain, Inversion sprains, eversion sprains, dorsiflexion sprains, tarsal tunnel syndrome, stress fracture of the metatarsal, corns and calluses, blisters, ingrown toenails, peroneal tendon subluxation.
- f. Injuries to the low back – Postural syndrome, Dysfunction syndrome, Derangement syndrome, Spondylolisthesis.
- g. Injuries to the Running Athlete – Causes of over use injuries – Common running induced injuries to the lower back – Common running induced injuries to the hip

- Iliotibial tract pain. Trochanteric Bursitis, stress fracture of femoral neck. Slipped capital femoral epiphysis, vague hip pain.

## UNIT V

50

- Common running related injuries to the knee – Medial Patellar pains, Pes anserine bursitis, patellar tendinitis, retro patellar pain, lateral patellar pain, lateral knee pain, biceps femoral tendonitis.
- Common running related injuries to the lower leg – Tibial stress relation, stress fracture, medial tibial stress syndrome, compartment syndrome – Anterior, posterior, lateral, fibular stress reaction and stress fracture, retro calcaneal bursitis medial arch pain, plantar fasciitis.
- Swimming Injuries – ‘Swimmer’s Shoulder’ anterior subluxation of the Glenohumeral Joint, Breast stroker’s injury.
- Thermal injuries – heat injuries & prevention, healing syndrome, heat cramps, heat fatigue heat ,stroke
- Old injuries - Apart from the above, students should know the pre and post operative rehabilitation used in sports physiotherapy.

### Evaluation

**Total Hours: 250**

### Textbooks:

- James a Gould, orthoppaedics and sports physical therapy, jp, 3ED, 1997
- Das, a text book of sports medicine, JP, 1 ED, 2006

### References:

- Mcardal, Exercise Physiology , ELBS, 5Ed, 2011
- Steven roy, Sports medicine, mosby, 4 ed, 1988

### Course Objectives

This dissertation of clinical study / review of literature is designed to develop the aptitude among students towards further reading and selecting references and present a written dissertation, or conduct a comparative study of the value / efficacy of a physiotherapy procedure in selective group of patients and normal subjects or justify the chosen procedure.

Every candidate shall submit to the Registrar of the university in the prescribed proforma, a synopsis containing particulars of proposed dissertation work within 4 months from the date of commencement of the course on or before the dates notified by the university. The synopsis shall be sent through the proper channel (Duly approved by the guide, HOD, Principal and Ethical committee) such synopsis will be reviewed and the university will register the dissertation topic. The dissertation is aimed to train a postgraduate student in research methods and techniques. It includes identification of a problem, formulation of a hypothesis, search and review of literature getting acquainted with recent advances, designing of a research study, collection of data, critical analysis, and comparison of results and drawing conclusions. Every candidate pursuing MPT degree course is required to carry out work on a selected research project under the guidance of a recognized postgraduate teacher. The result of such a work shall be submitted in the form of dissertation. Any change in the dissertation topic or guide shall be informed to the authorities of this university for its approval. No change in the dissertation topic or guide shall be made within nine months for commencement of university examination.

The printed text of dissertation should not be less than 50 pages/2500 words and shall not exceed 75 pages excluding references, tables, questionnaires and other annexure. It should be neatly typed in double line spacing (Font 12, times New Roman) on one side of paper (A4 size, 8.27" X 11.69") and hard bound properly (No spiral binding). Four copies of dissertation thus prepared shall be submitted to the Controller of the Examination, three months before final examination on or before the dates notified by the university duly certified by the guide, head of the department and head of the institution.

A candidate who has submitted his/her dissertation once is not required to submit a fresh dissertation if he/she reappears for the examination in the same branch on the subsequent occasion, provided the dissertation has been accepted by the examiners

**Total Hours: 250**

## **Discipline specific electives**

**Course objective**

The objective of this course is that after 100 hours of lectures & demonstrations, the student will be able to understand the knowledge about importance of special test and its implication to various conditions / problems / diseases.

**Course Outcomes:**

1. To understand the concept of clinical testing and its significance
2. To be wellversed in implications and significance of special tests
3. To be wellversed in special tests of upperlimb joints
4. To understand the special tests of spinal joints
5. To clearly explain the special tests of lowerlimb joints

**UNIT I** **20**

**Clinical test and its Significance**

1. Introduction to clinical tests
- 2.Importance of clinical testing

**UNIT II** **20**

**Implications of Special Tests**

1. Special test of need
2. Implication and Significance of Special Tests

**UNIT III** **20**

**Upper Limb Joints**

- Special test of upper limb joints
  - Shoulder Joint
  - Elbow Joint
  - Wrist Joint

**UNIT IV** **20**

**Spinal Joints**

- Special test of spinal Joints
  - Cervical Joint

- Thoracic Joint
- Lumbar Joint

## **UNIT V**

**20**

### **Lower Limb Joints**

Special tests of lower limb joints

- Hip Joint
- Knee Joint
- Ankle Joint

**Total Hours: 100**

#### **Textbook:**

1. MC Rae , Clinical orthopaedic examination – ELBS, 2 Ed, 2003

#### **Reference:**

1. David Magee , Orthopaedic physical assessment , MC GrawHill, 3Ed, 2005

**Course objective:**

The objective of this course is that after 100 hours of lectures & demonstrations, the student will be able to understand the knowledge about ergonomics issues, evaluation and safe practice standards.

**Course Outcomes:**

1. Student should have understood the different types of work nature and its impact towards the human body.
2. Student should have understood how to perform the ergonomic evaluation & should also be aware of mandatory questions which needed to be asked related to the profession.
3. Student should also be aware of pre examination procedures and examination for a person before appointing them in to the work.
4. Student should be aware to perform a workplace assessment for all the profession & should have understood about all nature of work how it affects the normal system, body mechanics, and psychological level of the person.
5. Student should be able to differentiate the work nature of software and hardware professionals.

**UNIT I**

**20**

**Introduction**

1. History of ergonomics
2. Need of ergonomics
3. Domains in ergonomics

**UNIT II**

**20**

**Ergonomic Assessment**

1. Ergonomic cycle
2. Evaluation of ergonomic issues
3. Assessment tools
4. Exit assessment



**UNIT III** **20**

**Job analysis**

1. Requirement of job
2. Profile and candidate selection
3. Pre employment screening

**UNIT IV** **20**

**Analysis**

1. Job site analysis
2. Job task analysis
3. Avenues and benefits of ergonomics
4. Work hardening

**UNIT V** **20**

**Current Trends in Ergonomics**

1. Software in ergonomics
2. Regulatory bodies
3. Professionals in ergonomics
4. Legal issues and insurance policies

**Total Hours: 100**

**Textbook:**

1. Salvendry , Handbook of Human Factors and Ergonomics, Mosby, 1Ed, 2012

**Reference:**

1. Valevie, J Berg rice ergonomics in health care & rehabilitation, butter worth, 1998.

## Discipline Specific Elective –III

19MPT103

FOOD AND NUTRITION

5 0 0 4

### Course objective:

The objective of this course is that after 100 hours of L,D,P the student shall be able to understand the basic knowledge about Diet, balanced diet, metabolism, malnutrition, under-nutrition, overnutrition, deficiency disease.

### Course Outcomes:

1. Become familiar about the nutritive values of food.
2. Explain about the food sources from which we obtain vitamins.
3. Become familiar with various compositions of food.
4. Become familiar with different cooking methodologies.
5. Explain thoroughly about the advantages and disadvantages of various convenience foods.

### UNIT I SOURCES OF FOOD 20

- 1) Nutritive value of foods,
- 2) Food Sources from which Key vitamins are derived

### UNIT II DIGESTIVE SYSTEM 20

1. Digestion and absorption –Digestion at each stage of the digestive system
2. Dietary guidelines- Factors affecting food requirements. Planning and serving of family meals. Meals for all ages and occupations.

### UNIT III COMPOSITION OF FOOD 20

Composition and value of the main foods in the diet -  
Milk, meat, fish, cheese, margarine and butter  
cereals (wheat, rice, maize, millets, oats)  
fruits and vegetables

### UNIT IV PROCESSING OF FOOD 20

1. Cooking of food -Transfer of heat by conduction, convection and radiation.
2. Principles involved in the different methods of cooking – boiling, stewing, grilling, baking, roasting, frying, steaming, pressure cooking, cooking in a microwave oven.

1. Convenience foods- Foods partly or totally prepared by a food manufacturer – dehydrated, tinned, frozen, ready to eat. Intelligent use of these foods.
2. Advantages and disadvantages.

**Total Hours:100**

**Text Book:**

1. Agarwal, Textbook of human nutrition, JP, 1 Ed, 2014

**Reference:**

1. Kenneth F. Kiple, Kriemhild Coneè Ornelas, The Cambridge world history of food, Cambridge University Press, 1st ed, 2000

## Discipline specific elective IV

19MPT104

ENGLISH FOR COMMUNICATION

5 0 0 4

### Course Objective:

At the end of 100 hours of lectures the student will be able to:

1. Speak fluently, intelligibly and appropriately to teachers, Colleagues, Doctors, Patients and friends at the college, Hospital and hostel etc. about academic or (occupational) areas of interest.
2. Develop flexibility in reading; improve speed and rate of comprehension while tackling textbooks or reference material.
3. Write official letters to the warden, principal and other officials in the bank, post office etc.
4. Write reports about patients care.
5. Overcome the common errors in pronunciation and grammatical and idiomatic usage.

### Course Outcomes:

1. Become fluent in speaking and enhance the ability to communicate effectively with colleagues, doctors, patients etc.
2. Well versed with comprehension skills and vocabulary enhancement.
3. Become familiar with writing various official letters, writing patients reports and summarise scientific sessions.
4. Understand about the grammatical and idiomatic usages.
5. Well versed with various methods of teaching by involving in group activities, role plays etc.

## UNIT I SPOKEN COMMUNICATION

20

1. Learning to read the phonetic symbols
  1. Stress
  2. Intonation
  3. Rhythm
  4. Commonly mispronounced words
  5. Correct pronunciation of important commonly used words in clinical practice
  6. Note taking in lecture classes

## UNIT II

## VOCABULARY AND READING

20

1. Special features of English vocabulary
  1. Common errors in choice of word
  2. Semi technical vocabulary
  3. Collecting material from library on scientific topics
  4. Comprehensive exercises





Computer packages  
MS Office  
MS word  
MS Excel  
MS PowerPoint  
Advantages and uses.

## UNIT V

## COMPUTER NETWORKS &amp; GRAPHICS

20

Introduction to computer networks – Definition LAN, WAN advantage of Internet – worldwide web.

Computer Graphics: Definition – display devices – graphical input and output devices – multimedia – definition and application – computer applications in physiotherapy and clinical studies.

**PRACTICALS**

Exercises based on the following are to be dealt:

1. Computer operating systems like UNIX, MS-DOS etc.
2. Simple program In C.
3. MS-Office (MS-Word, MS-Excel, MS-Access, MS-PowerPoint)

**Evaluation****Total Hours: 100****Text Books:**

1. C.Nellai Karunan, MS Office, CBS,4<sup>th</sup> Ed, 2006
2. Hunt N and Shelly J., Computers and commonsense, Prentice - hall of India New Delhi,2011

**References:**

1. E.Balaguruswamy – Programming in ANSI –C Tata Mc.Graw Hill-1997
2. Byron Gottfield – Programming with C, Prentice - hall of India,2<sup>nd</sup> Ed, 2000
3. Popst and Perrum, computer aided drug design, Academic press New york.1999
4. Writh, systematic programming- an introduction, Prentice Pub,3<sup>rd</sup> Ed,2005
5. Tanen Baum, Computer networks,2 Ed, 2012
6. Rajaraman ,Computer Graphics, Mc Graw Hill, 6 Ed, 2009

**Discipline specific elective -VI**

**19MPT106**

**BIostatistics / RESEARCH METHODOLOGY**

**5 0 0 4**

**Course Objective**

The objective of this course is after 100 hours of lectures the student should be able to have basic knowledge on Research Methodology and Bio Statistics.

**Course Outcomes:**

1. The student will be able to implement hypothesis testing
2. Important concepts relating to research design and measurements and scaling techniques.
3. To analyze experimental and observational study
4. Processing and analyzing data
5. To implement and calculate frequency distribution.

**UNIT I INTRODUCTION TO BIostatistics 20**

1. Introduction to Biostatistics
2. Frequency distribution
3. Measures of central tendency
4. Measures of dispersion

**UNIT II STATISTICAL TOOL 20**

1. Probability
2. Correlation & regression
3. Statistical inference

**UNIT III COMMUNITY AND HOSPITAL STATISTICS 20**

1. Vital statistics
2. Health statistics

**UNIT IV RESEARCH METHODOLOGY 20**

1. Introduction to research methodology
2. Steps in research process

**UNIT V RESEARCH REPORT 20**

1. Writing research report
2. Pilot Study



## **Evaluation**

**Total Hours:100**

### **TextBook:**

1. B.L Agarwal, Basic statistics , New Age International Publication.2012

### **Reference:**

1. Sundarrao, Introduction to biostatistics and Research Methodology, CBS, 1Ed, 2002

## Discipline Specific Elective -VII

19MPT107

APPLIED PHYSICS

5 0 0 4

### Course objective:

The objective of this course is that after 100 hours of L,D,P the student shall be able to understand the basic knowledge about the forces acting in human body, gravity, electricity and magnetism.

### Course Outcomes:

1. Students will know about the human body functions applied by the force gravity
2. Recognize how observation, experiment & theory work together to continue to expand the frontiers of knowledge of the physical universe
3. Analyze interpret and evaluate scientific hypotheses and theories , laws using rigorous methods
4. Students can understand the basic scientific principles, theories & laws as was as an awareness of the changing nature of science
5. Students aid gain knowledge about the current elasticity to differentiate the mode of transmission

### UNIT – I

### INTRODUCTION

20

1. Forces in human body
2. Gravity, LOG, COG
3. Levers of the body
4. Anatomical pulleys
5. Body torque
6. Types of motion, Planes of motion, Axis, Direction and quality of motion

### UNIT – II

### MUSCLES

20

1. Elasticity- Hook's law.
2. Stress / strain curve
3. Angle of pull & the mechanical efficiency of muscle
4. Types of muscle work

### UNIT – III

### HYDROTHERAPY AND HEAT

20

1. Laws of hydrotherapy & its application
2. Heat & its application

**UNIT – IV****ELECTRICITY****20**

1. Static electricity
2. Current electricity
3. Working & importance of current in clinical practice
4. Electro Magnetic spectrum

**UNIT – V****MAGNETISM****20**

1. Definition
2. Properties of magnets
3. Electromagnetic induction
4. Magnetic forces and field

**Text Books:**

1. Claytons , Electrotherapy Explained – CBS, 9 Ed, 2013
2. John Low and Anee Reed , Electrotherapy Explained –, Butterworth Heinmann pub, 1Ed, 2000

**Reference:**

1. Dena Gardiner, Principles of Exercise therapy, Bell and Hymes, 4<sup>th</sup> Ed, 1981.

## **Generic Electives**

**Generic elective I**

**19MPT151**

**CARDIOPULMONARY RESUSCITATION**

**5 0 0 4**

**Course objective:**

Upon successful completion of 100 hrs the student will be able to apply first aid and perform cardiopulmonary resuscitation (CPR).

**Course Outcomes:**

1. To be wellversed in defining CPR and understand the Principles of CPR
2. To be wellversed in checking and positioning the victims
3. To clearly explain the procedures in CPR
4. To understand the concept of signals of a heart attack
5. To clearly explainthe concept of Adult, Child and infant CPR

**UNIT I INTRODUCTION TO CPR 20**

1. Definition of CPR
2. Health concerns as it relates to performing Community CPR or First Aid.

**UNIT II PRINCIPLES OF CPR 20**

1. Check, Call, and Care techniques.
2. Good Samaritan Laws and getting permission from victims.

**UNIT III INDICATIONS FOR CPR 20**

1. Checking an unconscious victim.
2. Positioning victims.

**UNIT IV PROCEDURES IN CPR 20**

1. Steps in determining care of a victim. Examples: rescue breathing, CPR, etc.
2. Matt work on all skills related to Community CPR.

1. Signals of a heart attack.
2. Adult, child, and infant CPR.

**Total Hours:100****Textbook:**

1. Chandra, Handbook of Interventional Cardiology, JP, 1 Ed, 2015

**Reference:**

1. Davidson, A Text Book of Medicine, Churchill Livingstone, 21 st Ed, 2010.

## Generic Elective – II

19MPT153

CLINICAL DIAGNOSIS

5 0 0 4

### Course objective:

The objective of this course is that after 100 hours of L,D,P the student shall be able to understand the basic knowledge about Clinical diagnosing Ortho, Neuro and Cardio-respiratory Conditions.

### Course Outcomes:

1. To understand the concept of clinical diagnosis and its significance
2. To be well versed in clinical assessment and diagnosis in musculoskeletal conditions
3. The students gain the knowledge of assessment and diagnosis in cardio respiratory conditions
4. To be well versed in sports injury assessment and diagnosis
5. More knowledge about obstetrics and gynecological diseases assessment and diagnosis

### **UNIT I            CLINICAL DIAGNOSIS OF ORTHOPAEDIC CONDITIONS            20**

1. Fracture
2. Congenital disorders
3. Deformities
4. Trauma & injury
5. Orthopedic disabilities arising due to neurological conditions

### **UNIT II            CLINICAL DIAGNOSIS OF NEUROLOGICAL CONDITIONS            20**

1. Stroke
2. Brain tumours
3. Psychiatric disorders
4. Cerebellar dysfunction
5. Epilepsy
6. Demyelinating disorders

### **UNIT III            CLINICAL DIAGNOSIS OF CARDIAC CONDITIONS            20**

1. Congenital heart diseases
2. Circulatory disorders
3. Arrhythmias
4. Cardiomegaly

**UNIT IV                      CLINICAL DIAGNOSIS OF RESPIRATORY CONDITIONS    20**

1. Abnormal breathing patterns
2. COPD
3. Occupational lung diseases
4. TB & Tumours

**UNIT V                      CLINICAL DIAGNOSIS OF OBG CONDITIONS                      20**

1. Prolapse of uterus
2. Hernia
3. Mastectomy
4. Antenatal complications
5. Post natal complications

**Total Hours:100**

**Text Book:**

1. Davidson, A Text Book of Medicine, Churchill Livingstone, 21 st Ed, 2010.

**Reference:**

1. Magee, Textbook of orthopaedics, ELBS, 7Ed, 2002



**Course objective:**

The objective of this course is that after 60 hours of lectures & demonstrations, the student will be able to understand the knowledge about Physiotherapy evaluation of various conditions including orthopaedics, neurology, cardio respiratory, sports and Hand conditions.

**Course Outcomes:**

1. To understand the importance of evaluation and screening
2. To be wellversed in PT evaluation in orthopaedic conditions
3. To understand PT evaluation in cardio-pulmonary conditions
4. To be wellversed in PT evaluation in Neurological conditions
5. To clearly explain the concept of PT evaluation in sports and Hand conditions.

<b>UNIT- I</b>	<b>INTRODUCTION</b>	<b>20</b>
	<ol style="list-style-type: none"><li>1. Importance of evaluation</li><li>2. Importance of screening</li><li>3. Clinical decision making</li><li>4. Methods of evaluation</li><li>5. General evaluation formats</li></ol>	
<b>UNIT – II</b>	<b>ORTHOPEDIC EVALUATION</b>	<b>20</b>
	<ol style="list-style-type: none"><li>1. PT Evaluation in orthopedic conditions</li><li>2. Range of motion</li><li>3. Limb length measurement</li><li>4. End feels</li></ol>	
<b>UNIT – III</b>	<b>CARDIOPULMONARY EVALUATION</b>	<b>20</b>
	<ol style="list-style-type: none"><li>1. PT Evaluation in Cardiopulmonary conditions</li><li>2. Normal &amp; abnormal heart sounds</li><li>3. ECG waveforms – normal &amp; abnormal</li><li>4. Auscultation techniques</li></ol>	

**UNIT – IV****NEUROLOGICAL EVALUATION****20**

1. PT Evaluation in Neurology conditions
2. Myotomes
3. Dermatomes
4. Reflex testing
5. Tone assessment

**UNIT – V****SPORTS AND HAND EVALUATION****20**

1. PT Evaluation in Sports & Hand conditions
2. Common sports injuries
3. Hand function
4. Ergonomic measures

**Total Hours:100****Text Books:**

1. David Magee , Orthopaedic physical assessment , MCgH, 3Ed, 2005
2. Frown Felter, Cardiopulmonary evaluation, ELBS, 2 Ed, 1997

**Reference:**

1. Lindsay ,Neurology Assessment – Mosby, 3 Ed, 2009
2. David , Sports Injuries assessment and Rehab – CBS, 1 Ed, 2004

**Course objective:**

The objective of this course is that after 100 hours of L,D,P the student shall be able to understand the basic knowledge about the ATP production, energy source & body and other biochemical activity / changes that occur in our body.

**Course Outcomes:**

1. Student will know about the energy source that invalid in human body
2. Student will know about the acidic reaction & mechanism
3. They will know about the metabolism of the body and how the process occur
4. Student will know about the nutrition and the deficiency
5. Student will know about the clinical tester to identify the internal function of the organs

**UNIT – I**

**INTRODUCTION**

**20**

1. Energy source of body
2. Carbohydrates
3. Protein
4. Fat

**UNIT – II**

**ENERGY SYSTEMS**

**20**

1. ATP Production
2. Aerobic & Anaerobic Metabolism
3. Lactic acid production
4. Lactic acid clearance mechanism

**UNIT – III**

**METABOLISM**

**20**

1. Protein metabolism – Digestion, absorption, Urea cycle
2. Carbohydrate metabolism
3. Fat metabolism

**UNIT – IV**

**NUTRITION**

**20**

1. Composition of food
2. Balanced diet
3. Nutritional deficiency disorders
4. Major dietary constituent & their importance

1. Metabolic equivalence
2. Types of energy expenditure
3. Liver function test
4. Renal function test
5. Lipid profile in serum

**Total Hours:100**

**Text Book:**

1. B.E. Deb, Basics in Bio chemistry – JP, 2Ed, 1997

**Reference:**

1. Chatterjee, Text book of medical biochemistry, JP, 8 Ed, 2012

**Course objective:**

Students can explore public policy, community relations, human resource management, hospital finance, fundraising, physician relations and collective bargaining after completing 100 hrs of lecture.

**Course Outcomes:**

1. To understand the concepts and type of principles of management
2. To clearly explain the research methods for management
3. To be wellversed in Hospital Architecture, planning and Design
4. To understand the concept of materials management
5. To be wellversed in Ethics and laws in Hospital management

**UNIT I                    PRINCIPLES OF MANAGEMENT                    20**

1. Principles of Management
2. Organizational Behaviour

**UNIT II                    TYPES OF MANAGEMENT                    20**

1. Accounting and Finance for Managers
2. Marketing Management
3. Human Resource Management
4. Quantitative Techniques for Management

**UNIT III                    IMPORTANCE OF MANAGEMENT                    20**

1. Research Methods for Management
2. Corporate Communication
3. Operations Management

**UNIT IV                    HOSPITAL MANAGEMENT                    20**

1. Hospital Architecture, Planning And Design
2. Materials Management
3. Hospital Operation – I (Patient Care)
4. Hospital Operation – II (Supportive Services)

1. Bio-Sciences & Epidemiology
2. Hospital Information System
3. Health Laws & Policies
4. Hospital Environment and Ethics

**Total Hours:100**

**Textbook:**

1. Wallace J. Hopp , Hospital Operations: Principles of High Efficiency Health Care, Pearson higher education Publication, 2<sup>nd</sup> Ed,2012

**Reference:**

1. Goyal & Sharma,Hospital Administration and Human Resource Management, PHI Publisher,2013