

**Mahatma Gandhi University**  
of  
**Medical Sciences & Technology, Jaipur**

**Syllabus**

**Master of Physiotherapy (MPT)**  
**Sports**  
(2 Years Postgraduate Degree Course)

**Edition 2020-21**

## **Notice**

1. The University reserves the right to make changes in the Rules/Regulations/ Syllabus/Books/Guidelines/Fees-Structure or any other information at any time without prior notice. The decision of the University shall be binding on all.
2. The Jurisdiction of all court cases shall be Jaipur Bench of Hon'ble Rajasthan High Court only.

**RULES & REGULATIONS**  
**MASTER OF PHYSIOTHERAPY (MPT)**  
**(2 Years Postgraduate Degree Course)**

**SPECIALIZATION (BRANCHES)**

1. MPT in Orthopaedics
2. MPT in Neurology
3. MPT in Cardiopulmonary
4. MPT in Sports

**DURATION OF THE COURSE**

The duration of the Master of Physiotherapy (M.P.T.) Course shall be (2) two continuous academic years on a full time basis in each specialization.

**MPT Part-I (1<sup>st</sup> year)            0-12 months**

**MPT Part-II (2<sup>nd</sup> year)        13-24 months**

**Medium of instruction:** English shall be the medium of instruction.

**OBJECTIVES**

At the end of the completion of Master of Physiotherapy, the Postgraduate will be able to:

1. Apply advanced knowledge of clinical skills in problem solving.
2. Gather and interpret information within a holistic framework pertaining to health.
3. Design, implement and monitor appropriate therapeutic interventions.
4. Apply scientific principles to the concepts of health, illness and disability.
5. Promote health.
6. Appraise the social and political context of health care.
7. Undertake independent research projects.
8. Promote Physiotherapy education.
9. Appraise action and social skills of self and others.

**ELIGIBILITY**

Candidates who have passed B.Sc. (PT) or BPT degree from recognised institutions where the mode of study is a full time program, with minimum 3½ years / 4 ½ years duration in India or abroad as equivalent with not less than 50% of marks in aggregate and have completed 6 months of compulsory rotatory internship in Physiotherapy.

OR

Candidates who have passed BPT through Bridge Course or through Lateral Entry after completing their Diploma in Physiotherapy from recognised institutions where the mode of study is a full time program in India or abroad as equivalent with not less than 50% of marks in aggregate and have completed 6 months of compulsory rotating internship in Physiotherapy.

**INTAKE OF STUDENTS**

The intake of students to the course shall be in accordance with the availability of the Guide. The guide student ratio shall be 1:5.

**REGISTRATION**

A candidate admitted to this course shall register with this University by remitting the prescribed fee along with the application form for registration duly filled in and forwarded to the University through the principal of the college within the stipulated time.

## **ENROLMENT**

Candidates admitted to the Master of Physiotherapy course shall be enrolled with the university by remitting the prescribed fee along with the application form for enrolment duly filled in and forwarded to the university through Principal of the College within stipulated date. Candidate already enrolled with this University need not be enrolled again provided he/she has not taken migration certificate from this University.

## **SYLLABUS**

The curriculum and the scheme of examination for the course shall be as prescribed by the University from time to time.

## **COMMENCEMENT OF THE COURSE**

The Course shall commence from the 1<sup>st</sup> August of every Academic year.

## **CONDUCTION OF THE UNIVERSITY EXAMINATION**

University examination shall be conducted twice in a year; that is Main and Supplementary Examination.

## **ATTENDANCE**

1. No candidate shall be permitted to appear in M.P.T. Part-I/II university examination unless he/she has attended the course for the prescribed period and produces the necessary certificate of attendance and satisfactory conduct from the Principal of the College.
2. A candidate is required to compulsorily attend 75% of the theory classes and also 75% of the practical / or clinical classes held annually in each of the prescribed subject(s) separately, those not fulfilling the above criteria will not be eligible to appear for the university examination in the concerned subject(s).

## **SCHEME OF EXAMINATION**

There shall be Internal Assessment Examinations in Theory as well as Practical at the College level. These shall carry 30% of total marks assigned to Theory as well as Practical Examination.

At the end of every academic year, after completion of the course of study there shall be University Theory & Practical Examination. These shall carry 70% of total marks assigned to Theory as well as Practical Examination.

### **Internal Assessment Examination:**

1. Theory and practical paper(s): 30% of total marks shall be allotted to the Internal Assessment for each subject. Three internal assessment examinations will be held in each subject (Theory and Practical separately) before the commencement of the theory university examination (Main) in each academic year. Every candidate shall be required to obtain at least 40% marks in the aggregate of any best of two out of the three internal assessment tests in each subject. Candidates failing to secure 40% marks in the aggregate of best two internal assessment tests in any subject shall not be allowed to appear in concerned subject(s) in the ensuing university main examination. In case the examination forms have already been filled and submitted in the university, the Principal will detain such students from appearing in the University examination of concerned subject(s). Mode and number of internal assessment tests will be determined at the level of the Principal of the college. The candidates shall be required to obtain at least 40% marks in

each subject in an improvement internal assessment test to qualify and appear in the university forthcoming supplementary examination.

2. A candidate may improve his/her internal assessment marks whenever he/she reappears. In case the candidate does not opt for improvement or doesn't improve, his/her earlier internal assessment marks would be conveyed by the Principal to the university.

### **University Examination:**

1. There shall be two examinations of MPT Part-I & Part-II Course in one academic year, the Main examination and subsequent Supplementary examination.
2. A candidate who has completed a regular course of study prescribed for MPT Part-I for one academic year shall be eligible to appear at MPT Part-I examination.
3. A candidate failing in any number of subjects at the main examination shall be allowed to appear in the failing subjects at the ensuing supplementary examination.
4. A candidate not passing MPT Part-I supplementary examination shall be allowed to clear his/her still un-cleared papers in the ensuing main/supplementary examination(s).
5. A candidate who has not passed even a single subject (theory &/or practical) of MPT Part-I supplementary examination shall not be promoted to MPT Part-II course.
6. A candidate who has passed one or more subject(s) of MPT Part-I main/supplementary examination will be promoted to MPT Part-II course. After completion of regular course of study for one academic year of MPT Part-II course he/she shall be eligible for MPT Part-II examination only after passing all the due papers of MPT Part-I i.e. a candidate shall be eligible to appear for MPT Part-II examination only when all the prescribed papers of MPT Part-I examination have been passed by him/her, even if he/she has attended all the theory and practical classes of MPT Part-II course.
7. A candidate will be permitted to avail any number of attempts to pass all the papers of MPT Part-I and Part-II course but he/she will be required to complete the entire MPT course within four years of his/her admission to MPT Part-I course.

### **Paper Setter/Examiner:**

1. All the examiners, paper setters, Theory examination answer books evaluators, Internal and External Examiners for Practical examinations shall be appointed by the President of the University.
2. Qualification of the Paper setter / Examiner: Masters degree (MPT) with 3 years of full time teaching experience from recognized university.
3. Examiner / Paper setter: Paper setter can be an examiner

### **Duration, Distribution of marks and Pattern of Question papers**

1. The question paper shall cover the entire syllabus of the subject.
2. Each subject (Theory & Practical) shall carry 30% marks for internal assessment and 70% marks for the University examination.
3. Duration of Examination: Each written paper of University examination of 70 marks shall be of 3 hours duration.
4. Pattern of question papers :

All questions shall be required to be attempted. There may be internal choice(s) in the questions :

### **Paper carrying 70 Marks :**

Long answer (essay type) questions (2 out of 4)	2x15= 30
Short answer questions (4 out of 6)	4x10= 40

### **Practical (including Viva)**

There will be internal assessment examinations spread over the academic year at the College level and University examination at the end of the academic year. These shall be related to assessments, investigations and physiotherapy management. Internal assessment examinations shall carry 30% and the University examination shall carry 70% of total marks assigned to practical including viva-voce.

Mode	Long case assessment, Short case, written, Demonstration, Investigations & Viva
Duration	Up to 120 minutes per candidate
Examiner	02 (One internal and one external from the panel of Examiners from University)

### **DISSERTATION**

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 results of such a work shall be submitted in the form of dissertation.

The dissertation is aimed to train a graduate 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 shall submit to the Registrar of university in the prescribed Performa, a synopsis containing particulars of proposed dissertation work within 6 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 i.e. the Head of the Department and the Principal of the College. Before submitting the synopsis, it shall be ensured by the Principal of the College that it has been cleared by the Ethics Committee. The university will register the dissertation topic. No change in the dissertation topic or guide shall be made without prior approval of the university.

Guide will be only a facilitator, advisor of the concept and responsible in correctly directing the candidate in the methodology and not responsible for the outcome and results.

The dissertation should be written under the following headings.

1. Introduction
2. Aims or objectives of study
3. Review of literature
4. Material and methods
5. Results
6. Discussion
7. Conclusion
8. References
9. Appendices

The written text of dissertation shall not be less than 50 pages and shall not exceed 100 pages excluding references, tables, questionnaires and other annexures. It should be neatly typed in double line spacing on one side of paper (A4 size, 8.27" x 11.69") and bound properly. Spiral binding should be avoided. The Guide, Head of the Department and Principal of the College shall certify the dissertation.

- I. Three copies of dissertation thus prepared shall be signed by the candidate and the guide and then submitted for evaluation to the Principal of the college, one month before the commencement of final theory paper University examination.
- II. The dissertation shall be examined by minimum of two examiners one Internal and one External.
- III. Evaluation of the dissertation would be done jointly by the external and internal examiners, who will be appointed by the President of University.
- IV. The examiners appointed for the practical can also evaluate dissertation and take viva-voce based on the dissertation of the candidate to assessing depth of knowledge, logical reasoning, confidence & oral communication skill. Special emphasis shall be given to dissertation work during the MPT Part-II course.
- V. A candidate will be required to secure minimum 50% marks to pass viva-voce examination of dissertation.
- VI. Even if the candidate fails in the Theory/Practical University Examination his / her dissertation marks shall still be carried over to the subsequent examinations.

### **Guide**

Criteria for recognition of MPT teacher / guide:

1. Guide should be at least Assistant Professor having qualification of M.Sc. (PT)/ MPT in the concern subject/ Specialty.
2. The guide student ratio should be 1:5

### **Change of Guide**

In the event of registered guide leaving the college for any reason or in the event of death of guide, guide may be changed with prior permission from the University.

### **CRITERIA FOR PASS**

1. In order to pass an examination a candidate must secure 50% marks in each theory subject (inclusive of internal assessment) and practical (inclusive of internal assessment) & viva-voce separately. In case of Section A & Section B of a Paper, students will have to secure 50% marks combined to pass the paper.
2. To pass MPT Part-II examination, a candidate will also be required to secure minimum 50% marks in dissertation & its viva-voce examination.

### **GRACE MARKS**

No grace marks will be awarded in University Postgraduate examinations including Master of Physiotherapy.

### **REVALUATION/SCRUTINY**

Revaluation of answer books is not permissible. Scrutiny of marks in any number of papers/subjects shall be permissible as per University Rules.

### **MIGRATION/TRANSFER OF CANDIDATES**

Migration/transfer of a candidate from another recognized University to this University or vice versa shall not be considered.

### **VACATION**

The Principal of the College may declare vacation in an academic year to the students as per the academic calendar

## TEACHING SCHEDULE

### MPT Part – I (1 Year) Common to all branches

S. No.	Course Code	Subject	Teaching Hours	
			Theory	Practical
1	MPT-6010	Review of Human Sciences and Biomechanics	100	50
2	MPT-6020	Physical & functional diagnosis	100	50
3	MPT-6030	Research Methodology& Biostatistics	100	50
4	MPT-6040	Practical	--	100
	MPT-7010	Seminars on Clinical issues (Non University Examination)	100	--
7	Clinical Practice		--	1100
<b>Total</b>			<b>400</b>	<b>1350</b>
<b>Total Hours 400+1350=1750</b>				

### MPT Part – II (1 Year)

S. No.	Course Code	Subject	Teaching Hours	
			Theory	Practical
1	MPT-6210	Administration, Management and Ethical Issues (Common to all branches)	100	--
2	MPT-6220	Sports Fundamentals	100	50
3	MPT-6230	Sports Physiotherapy and Recent Advances	100	50
4	MPT-6240	Practical	--	100
5	MPT-7020	Dissertation	200	--
6	Clinical Practice		--	1100
<b>Total hours</b>			<b>500</b>	<b>1300</b>
<b>Total Hours 500+1300=1800</b>				
<b>Grand Total:- 1750+1800=3550 Hours</b>				

### Distribution of Marks

#### MPT Part-I

S. No.	Course Code	Subjects	Theory/ Practical		Total
			M.M. Annual	M.M. Internal assessment	
1.	MPT-6010	Review of Human Sciences and Biomechanics	70	30	100
2.	MPT-6020	Physical & functional diagnosis	70	30	100
3.	MPT-6030	Research Methodology& Biostatistics	70	30	100
4.	MPT-6040	Practical	70	30	100
5.	MPT-7010	Seminars on Clinical issues (Non University Examination)	100	--	100
<b>Total Marks</b>					<b>500</b>



**MPT Part-II**

<b>S. No.</b>	<b>Course Code</b>	<b>Subjects</b>	<b>Theory/ Practical</b>		<b>Total</b>
			<b>M.M. Annual</b>	<b>M.M. Internal assessment</b>	
1.	MPT-6210	Administration, Management and Ethical Issues	70	30	100
2.	MPT-6220	Sports Fundamentals	70	30	100
3.	MPT-6230	Sports Physiotherapy and Recent Advances	70	30	100
4.	MPT-6240	Practical	70	30	100
5.	MPT-7020	Dissertation	200	--	200
		<b>Total Marks</b>			<b>600</b>

**Grand Total:-500+600=1100 Marks**

## **SYLLABUS**

### **MPT Prat-I Paper-I : Review of Human Sciences and Biomechanics (6010)**

#### **COURSE OBJECTIVE**

1. Applied anatomy & Physiology for supportive specialization.
2. Normal functional anatomy & Physiology for Analysis between normal & abnormal.
3. Subject support : Diagnosis & related mechanics.
4. On completion of the study of this subject the student should be able to
5. Comprehend the structure & function of parts of the Musculoskeletal, nervous and cardiothoracic systems in relevance to Physiotherapy
6. Correlate the knowledge gained, in understanding the Musculoskeletal, nervous and cardiothoracic systems dysfunction.

#### **Unit 1 : Human Anatomy**

1. Out line of general anatomy.
2. Introduction to upper limb & lower limb.
  - a) Bones & Joints
  - b) Muscles.
  - c) Nerves, roots, plexus.
  - d) Pectoral, Axilla, Scapular, Arm, Forearm, Cubital fossa, Hand.
  - e) Vascular structure.
  - f) Thigh, Gluteal region, popliteal fossa.
  - g) Leg, foot.
3. Introduction of thoracic bones & Joints.
4. Introduction of vertebral column.
  - a) Cervical, thoracic, lumbar, sacral spine
  - b) Anatomy of spinal cord.
5. Introduction of Head & Neck :
  - a) Neck : Side of neck; Back of neck; Triangle of neck.
  - b) Temporomandibular joint
6. Introduction of Brain & Spinal Cord
  - a) Meninges, CSF.
  - b) Blood supply of brain & spinal cord.
  - c) Outline of ventricles.
  - d) Outline of brain stem.

#### **Unit II : Human Physiology**

1. Cardiovascular system
  - a) Structure & Properties of heart
  - b) Cardiac Cycle
  - c) The regulation of heart's performance.
  - d) Cardiac output.
  - e) The arterial blood pressure
  - f) The physiology of vascular system.
  - g) Lymphatic circulation
2. Respiratory system
  - a) Functional anatomy

- b) Ventilation & control of ventilation
  - c) Alveolar air
  - d) Regulation of the breathing.
  - e) Pulmonary function test.
3. Nervous system
- a) Elementary neuroanatomy
  - b) Neurons & Neuroglia
  - c) Properties of nerve fibres, synapse
  - d) Spinal cord
  - e) Cerebral cortex
  - f) Pyramidal & extra-pyramidal system
  - g) The cerebellum
  - h) Automatic nervous systems
  - i) Cerebrospinal fluid
  - j) Cranial nerves.

### **Unit-III:- Biomechanics**

#### **1. Kinematics**

Types of motion (accessory and joint play of axial and peripheral skeletal) Location of motion (instantaneous axis of movement, shifting axis of movement)

- a) Magnitude of motion (factors determining it)
- b) Direction of motion
- c) Angular motion and its various parameters
- d) Linear motion and its various parameters
- e) Projectile motions

#### **2. Kinetics**

- a) Definition of forces
- b) Force vectors (composition, resolution, magnitude)
- c) Naming of Force (gravity and anti-gravity force, GRF (Ground reaction Force of gravity and Centre of Gravity
- d) Stability
- e) Reaction forces
- f) Equilibrium & BALANCE
- g) Linear forces system
- h) Friction and its various parameters
- i) Parallel force systems
- j) Concurrent force systems
- k) Work power and energy
- l) Moment arms of force & its application
- m) Force components
- n) Equilibrium of force

#### **3. Mechanical energy, work and power**

- a) Definitions
- b) Positive and Negative work of muscles
- c) Muscle mechanical power
- d) Causes of inefficient movement
  - Co-contractions
  - Isometric contraction against gravity jerky movement

- Energy generation at one joint and absorption at another
- Energy flow and Energy system used by the body
- Energy storage

#### 4. **Muscle Mechanics**

Structure and composition of muscle. Physiology of musculoskeletal systems Fiber length and cross section area

- a) Mechanical properties of various muscles.
- b) EMG changes during fatigue and contraction.
- c) Changes in mechanical and physiological properties because of ageing, exercise and immobilization, dystrophies and pathological conditions.

#### 5. **Ligament & Tendon mechanics**

- a) Structure and composition
- b) Mechanical properties and physiological properties.
- c) Cross sectional area measurements
- d) Muscle tendon properties
- e) Temperature sensitivity
- f) Changes in physical and mechanical properties because of aging, exercise and Immobilization and position Mechanoreceptors, its types, distribution with respect to joint, structure and function.
- g) Clinical applications

#### 6. **Joint mechanics**

- a) Joint design
- b) Joint categories
- c) Joint function
  - Arthrokinematics
  - Osteokinematics
  - Kinematic chains Open  
Closed

Joint forces, equilibrium and distribution of these forces  
Degenerative changes in weight bearing joints and compensatory actions  
Joint stability and its mechanics  
Clinical applications

#### 7. **Kinematics and Kinetics Concepts of following joints**

- a) **Upper Extremity:**
  - Scapulo-shoulder Joint
  - Elbow Joint
  - Wrist Joint & Hand
- b) **Lower Extremity:**
  - Hip & pelvis
  - Knee joint
  - Patello femoral joint
  - Ankle and foot

#### 8 **Biomechanics of vertebral column**

## 9 Posture:

- a) Anatomical aspects of posture
- b) Types of Posture
- c) Assessment of Posture
- d) Factors affecting posture
- e) Postural deviation

## 10. Gait

- a) Normal Gait and its determinants
- b) Gait parameter
  - Kinetic
  - Kinematics
  - Time-SpacePathological gait with emphasis on polio, cerebral palsy, dystrophies, hemi paresis, Para paresis
- c) Running
- d) Stair climbing
- e) Changes in gait following various surgeries/ diseases/ disorders.
  - Basic wheelchair skills and assessment training.
  - Transfer skill training

## REFERENCES:

S. No.	Title
1	Synopsis of Surgical Anatomy
2	Gray's Anatomy-
3	Grants – Methods of Anatomy
4	Clinical Anatomy for Medical Students
5	Textbook of Medical Physiology
6	Pathologic Basis of Diseases
7	The Pharmacological basis of Therapeutics
8	Pathology implications for Physical Therapists
9	Hutchinsons – Clinical Methods of Medicine
10	Outline of Orthopedics
11	Outline of Fractures
12	Tureks – Orthopedics
13	Text Book of Radiology
14	The Pharmacological basis of Therapeutics
15	Pharmacology and Pharmacotherapeutics
16	Davidsons – Principles and Practice of Medicine
17	Systems of Orthopedics
18	Clinical Kinesiology
19	Kinesiology – Scientific Basis of Human Motion, Brown & Benchmark
20	Kinesiology and Applied Anatomy,
21	Biomechanics of Spine
22	Physiology of Joints
23	Clinical Neurophysiology.
24	The Biomechanics of Sports Techniques,

25	Biomechanics – A Qualitative approach for studying Human Motion
26	Joint Structure and Function - A Comprehensive Analysis -
27	Analysis of Sports Motion: Anatomic and Biomechanics perspectives
28	Basic Biomechanics in Sports and Orthopedic Therapy
29	Biomechanics of Sports
30	Muscle alive
31	Basic Biomechanics of Muscular Skeletal System
32	Introduction to Sports biomechanics

**MODEL PAPER**

**MPT Part-I  
(6010)**

**Revi.Of Huma.Sci.en.and Biomec.-I**

Master of Physiotherapy

**(Orthopaedis/Neurology/Cardiopulmonary/Sports)**

Part-I (Main) Examination Month, Year

Paper-I

**Review of Human Sciences and Biomechanics**

Time: Three Hour

Maximum Marks : 70

Attempt **all** Questions

**Long Answer Questions (Attempt any Two out of four)**

- |     |  |    |
|-----|--|----|
| Q1. | Arthrokinematics and osteokinematics of hip joint. Discuss about angle of inclination and torsional angle. | 15 |
| Q2. | Discuss the kinematics and kinetics of gait. Discuss five pathological gaits                               | 15 |
| Q3. | Write down the basic anatomy and physiology of cardiovascular system.                                      | 15 |
| Q4. | Write down the basic anatomy and physiology of nervous system system.                                      | 15 |

**Short Answer Questions (Attempt any Four out of Six)**

- |      |   |    |
|------|---|----|
| Q5.  | What are the mechanical properties of various muscles | 10 |
| Q6.  | Explain projectile motions with examples              | 10 |
| Q7.  | EMG changes during fatigue and contraction            | 10 |
| Q8.  | Bio-mechanical properties of bone                     | 10 |
| Q9.  | Kinematics and kinetics of glenohumeral joint         | 10 |
| Q10. | Describe equilibrium & balance                        | 10 |

## **MPT Prat-I Paper -II : Physical & Functional Diagnosis (6020)**

### **COURSE OBJECTIVE:**

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

1. Perform thorough Physiotherapy assessment & list deficiencies
  2. Design individualized goals for the patient
  3. Rationalize the outcome of the assessment
  4. Document systematic, meaningful, accurate written records of the patient
- Clinical Decision Making - Planning Effective Treatment. Collection and documentation of data. Analysis of data and identifying the problems. Setting goals, Formulation and implementation of treatment plan including evaluation of treatment outcome. Clinical decision making models. Foundation for clinical decision making
  - Review of General assessment – patients history, observation, palpation, examination
  - Vital Signs. Identification of reasons for monitoring vital signs; importance of monitoring vital signs; common techniques of monitoring vital signs; identification and analysis of normal values with that of abnormal values.
  - Pain assessment and scales for evaluation in acute and chronic pain
  - Anthropometric and other measurements. Limb Length, Girth Measurement, ROM, tone, Muscle length.
  - Evaluation Methods, Special tests used in Musculoskeletal, Neurological and Cardiopulmonary disorders.
  - Reflex testing
  - Postural assessment methods and common deviations from the normal
  - Gait Analysis. Overview of normal gait analysis : kinetic and kinematic analysis; the reliability and validity of gait analysis; Description of some of the most commonly used types of observational gait analysis; Advantages and disadvantages of kinematic qualitative and kinematic quantitative gait analysis.
  - Gait Training. Pre ambulation programme; assistive devices and gait patterns.
  - Evaluation and management of amputee; overview of amputation surgery which includes concepts, pre operative, post operative, pre fitting, post fitting physiotherapy. Prosthetic assessment and management: Prosthetic assessment including dynamic and static checkouts, components with recent advancements and management.
  - Orthotic Evaluation and Management. Types of orthosis; footwear modifications; lower limb orthoses, components.
  - Spinal Orthosis: Types and components; Physiotherapy management including orthotic gait analysis and gait training.
  - Wheel Chair: Components of wheel chair; assessment of wheel chair; measurement for wheel chair; features of sports wheel chair.
  - Bio-feed back: Principles of bio-feed back in physiotherapy; limitations; electromyographic feed back for motor relearning; Equipment and technical specifications. Kinematic feed back: Standing feedback; kinetic feed back; New concepts of bio-feed back.
  - Sensory evaluation and assessment : Purposes of sensory evaluation and assessment; classification and function of receptor mechanisms, involving the perception of sensation; identification of spinal pathways that mediate sensation; guidelines for completing sensory evaluation; description for testing protocol for assessment of each sensory modality.
  - Cranial nerve testing.



- Assessment of Higher mental functions
- Coordination evaluation and assessment: Purpose; common coordination defects associated with lesions of cerebellum, basal ganglia and dorsal columns. Testing procedures: Non-equilibrium coordination test; equilibrium coordination tests.
- Assessment of cognitive, perceptual dysfunctions and vestibular dysfunction.
- Neurodevelopmental screening, motor learning. Motor assessment, Balance assessment and scales for assessment. Balance Outcome measures and their administration.
- Motor control assessment: Purposes and components, identification and description of CNS control mechanism associated with motor control mechanism, description of common motor control defects with specific procedures and tests used to assess motor control defects, the factors which influence the result of motor control assessment.
- Functional evaluation : The concepts of health status impairment; functional limitations; disability and handicap; definition of functional activity and the purposes and components of the functional assessment; selection of activity and roles for an individual based on his or her capabilities and functional limitations, various forms of functional tests; physical function test and multi dimensional functional assessment instrument, identification of instrument for testing function; various scoring methods used in functional assessment; reliability and validity of various functional assessment. physical Disability evaluation in detail .ICF classification
- Pulmonary function tests.
- Methods of Kinetic and kinematic investigation for joints.
- Physical fitness assessment.- Agility, speed, flexibility, endurance, strength.
- Evaluation of aging
- Auscultation.
- ECG, Echo cardiography, cardiac catheterization, Radionuclide scanning, stress testing, ABG, Labs, Holter monitoring etc.) CT scan, MRI, NCV, EMG

## REFERENCES:

Sr.No.	Title
1	Rehabilitation of people with Spinal cord injury
2	Essentials of in patient rehabilitation
3	Physical Rehabilitation: Assessment and Treatment by O'Sullivan, F.A. Davis, Philadelphia , 1994
4	Orthopaedic physical assessment by Magee
5	Physical therapy of the low back
6	Practical evidence based physiotherapy
7	Differential diagnosis and physical therapy by Goodman
8	Orthopaedic Rehabilitation by Brokman
9	Orthopaedic taping, wrapping, bracing & padding
10	Textbook of Rehabilitation by Sunder
11	Physiotherapy and growing child by Burns
12	Essential of Orthopaedic for physiotherapists by Ebnezar
13	Physical therapy of the low back by Twomey, Churchill, Livingstone, London 1995
14	Myofascial and pain dysfunction by Travell, Villimans and Wilkins, Baltimore 1983
15	Orthopaedic Physical therapy by Donatteli, London Churchill Livingstone
16	Mobilization of the extremity joints by Kaltensbore, Harper and Row

**MODEL PAPER**

**MPT Part-I  
(6020)**

**Physi.&Func. Diagno.-II**

Master of Physiotherapy

**(Orthopaedis/Neurology/Cardiopulmonary/Sports)**

Part-I (Main) Examination Month, Year

Paper-II

**Physical Functional Diagnosis**

Time: Three Hour

Maximum Marks :70

Attempt **all** Questions

**Long Answer Questions (Attempt any Two out of four)**

- |     |  |    |
|-----|--|----|
| Q1  | Write down the basic SOAP assessment for Neuromusculoskeletal disorders  | 15 |
| Q2. | Write in detail about exercise testing and exercise prescription of ischaemic Heart Disease ?                    | 15 |
| Q3. | Define pain. Discuss various functional scales for evaluation of pain.   | 15 |
| Q4. | Discuss EMG & NCV report reading and analysis ? Also give brief introduction about various parameters of these ? | 15 |

**Short Answer Questions (Attempt any Four out of Six)**

- |      |  |    |
|------|--|----|
| Q5.  | Pulmonary Function Tests                                     | 10 |
| Q6.  | ICF Classification of disability                             | 10 |
| Q7.  | Functional scales for assessment of balance                  | 10 |
| Q8.  | GCS for comatose patient                                     | 10 |
| Q9.  | Methods of limb length testing and its clinical significance | 10 |
| Q10. | Disability evaluation of upper limb                          | 10 |

## **MPT Prat-I Paper-III : Research Methodology and Biostatistics (6030)**

### **COURSE OBJECTIVE:**

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

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

### **Section-A Research Methodology**

#### **Introduction**

1. Terminology in research, Ethical issues in research, Research process
2. Review of literature.
  - Importance, sources & steps in reviewing the literature.
3. Research design
  - Type of research – qualitative & quantitative.
  - Experimental & non experimental, survey – advantages & disadvantages
4. Research process
  - Research question, Aim & objectives, Assumptions, Limitations & Delimitations, Variables
  - Hypothesis – formation & testing.
5. Sampling
  - Sampling technique
  - Population, sample,
  - Sample size & determination
  - Sampling methods
  - Sampling error
6. Data collection and analysis
  - Data sources, technique of data collection, tools
  - Reliability & validity
  - Process of data collection
  - Pilot study-method, need
7. Interpretation & presentation of data
  - Quantitative & qualitative analysis
  - Graphical representation of data
  - Conclusion & discussion
8. Writing a dissertation, research paper
9. Critical appraisal of research
10. Presentation and Publication of research – Steps and process.

### **Section –B BIOSTATISTICS**

1. Biostatistics
  - Introduction
  - Definition
  - Types
  - Application in Physiotherapy
2. Data

- Definition
  - Types
  - Presentation
  - Collection methods
3. **Measures of central value**
    - Arithmetic mean, median, mode. Relationship between them
    - Graphical determination
  4. Measures of Dispersion
    - Range
    - Mean Deviation
    - Standard Deviation
  5. Normal Distribution Curve
    - Properties of normal distribution
    - Standard normal distribution
    - Transformation of normal random variables.
  6. Correlation analysis
    - Bivariate distribution
    - Scatter Diagram
    - Coefficient of correlation
    - Calculation & interpretation of correlation coefficient
    - T-test, Z-test, P-value
  7. Regression analysis
    - Lines of regression
    - Calculation of Regression coefficient
  8. Sampling
    - Methods of Sampling
    - Sampling distribution
    - Standard error
    - Types I & II error
  9. Probability (in Brief)
  10. Hypothesis Testing
    - Null Hypothesis
    - Alternative hypothesis
    - Acceptance & rejection of null Hypothesis
    - Level of significance
  11. Parametric & non Parametric tests
    - Chi square test
    - Mann-Whitney U test
    - Wilcoxon Signed test
    - Kruskal-Wallis test
    - Friednam test
    - T-test/student T test
    - Analysis of variance

**REFERENCES:**

<b>S.No.</b>	<b>Title</b>
1	Research methods for clinical therapist: Carolyn M Hicks
2	Research for physiotherapists
3	Handbook of research Method
4	Introduction to research in Health Sciences
5	Elements of research in Physical Therapy
6	Physical Therapy Research
7	Methods in Biostatistics: For Medical students and research workers
8	An Introduction to biostatistics

**PRACTICAL/VIVA (6240)**

Long case assessment & Short case assessment including application of above Physiotherapeutic techniques in the Treatment of all conditions studied in MPT part-I

Mode Long case assessment, Short case, written, Demonstration, Investigations & Viva

Duration Upto 120 minutes per candidate

Examiner 02 (One internal and one external from the panel of examiners from University)

**MODEL PAPER**

**MPT Part-I  
(6030)**

**Res. Meth. & Bio.Stat.-III**

Master of Physiotherapy

**(Orthopaedis/Neurology/Cardiopulmonary/Sports)**

Part-I (Main) Examination Month, Year

Paper-III

**Research Methodology & Biostatistics**

Time: Three Hour

Maximum Marks :70

Attempt **all** Questions

**Long Answer Questions (Attempt any Two out of four)**

- Q1 Define and describe validity and its types in research and add a note on reliability. 15
- Q2. Describe experimental research. How many types of experimental research designs are there? Describe any experimental research designs with example from physiotherapy 15
- Q3. Discuss in detail about types of data, their presentation and their collection methods. 15
- Q4. What is sampling ? Explain random sampling methods in detail with suitable examples. 15

**Short Answer Questions (Attempt any Four out of Six)**

- Q5. Describe the various components of ethically informed consent for physiotherapy research 10
- Q6. Enumerate the principle of research design. Describe the difference between qualitative and quantitative research. 10
- Q7. Short Note:- (2X5) = 10
- a. Informed consent
  - b. Ethics in research
- Q8. Describe standard deviation 10
- Q9. Describe mean and value 10
- Q10. Short note:- (2X5) =10
- a. Type I & II error
  - b. Bivariate distribution

## **SEMINARS ON CLINICAL ISSUES**

**Course code 7010**

### **Course objective:**

These will serve as a platform for students to integrate components of patient management. Students will give presentations on topics provide to them. The students will engage in clinical practice in the Dept of Sports Physiotherapy. To enhance their clinical skills and apply theoretical knowledge gained during teaching sessions. There will be no university examination. The students will be awarded marks on the basis of their attendance & performance during clinical postings and seminar.

## **MPT Part– II Paper-I : Administration, Management and Ethical Issues (6210)**

### **OBJECTIVE:**

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

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

### **Management:**

1. Introduction
  - Evolution of management
  - Functions of management
  - Management process – planning, organization, direction, controlling decision making
2. Personnel management:
  - Staffing
  - Recruitment selection
  - Performance appraisal
  - Collective bargaining
  - Job satisfaction
3. Marketing:
  - Market segmentation
  - Channels of distribution
  - Promotion
  - Consumer behavior
4. Physical Therapy & Law :  
Medicolegal aspect of physical therapy, liability, negligence eco practice licensure, workmen compension. Maintaining the medical Register.
5. Physiotherapy Department Management.
  1. Policies and procedures.
  2. Recruitment, interview, probation, salary, hours of working, leave facilities, retirement, referred policy.
  3. Maintenance of records, equipments, statistics.
  4. Planning, design construction, expansion plan.
6. Physiotherapy Education Technology
  - Aims, philosophy and trends and issues:-
    - a) Educational aims.
    - b) Agencies of education.
    - c) Formal and informal education
    - d) Major philosophies of education (naturalism, idealism, profemation, realism).Physiotherapy of education in India (past, present and future) current issues and trends in educations.
  - Concepts of teaching and learning.
    - a) Theories of teaching
    - b) Relationship between teaching and learning.
    - (c) Psychology of education.
    - d) Dynamics of behaviour, motivational process of learning perception, individual differences, intelligence personality.
  - Curriculum :
    - a) Curriculum committee.



- b) Development of a curriculum for physiotherapy.
  - c) Types of curriculum.
  - d) Placing, courses placement, time allotment.
  - e) Correlation of theory and practice.
  - f) Hospital and community areas for clinical instructions.
  - g) Clinical assignments.
  - Principles and methods of teaching :
    - a) Strategies of teaching.
    - b) Planning of teaching.
    - c) Organisation, writing lesson plan.
    - d) A.V. aids.
    - e) Teaching methods – socialized teaching methods.
  - Measurement and evaluation.
    - a) Natures of measurement of Educations, meaning, process personnel standardized. Non standardized.
    - b) Standardized tools, important tests of intelligences, aptitude, instrument, personality, achievements and status scale.
    - c) Programme evaluation
    - d) Cumulative evaluation
  - Guidance and counseling :
    - a) Philosophy, principles and concepts, guidance and counseling services.
    - b) Faculty development and development of personnel for physiotherapy services.
7. Administration, Legal Ethical Issues
- Hospital as an organization - Functions and types of hospitals
  - Roles of Physical therapist, Physical therapy Director, Physiotherapy
  - Supervisor, Physiotherapy assistant, Physiotherapy aide, Home health aide, Volunteer.
  - Rules of Professional Conduct.
  - Legal responsibility
  - Code of ethics
  - Functions of Physiotherapy associations/councils
  - Role of the International Health Agencies
  - Standards of practice for physiotherapists
  - Liability and obligations in the case of medical legal action
  - Law of disability & discrimination
  - Confidentiality of the Patient's status
8. Consumer protection law, health law

## REFERENCES

S.No.	Title
1	Human Resource Management by NK Singh
2	Organizational Behaviour by Archana Tyagi
3	Public Power & Administration by Wilenski, Hale & Iremonger
4	Physical Therapy Administration & Management by Hickik Robert J
5	Management Principles for physiotherapists by Nosse Lorry J.
6	Managerial accounting for hospital
7	Hospital: planning, design & management
8	Medical ethics & consumer protection act

9	Health economics in development
10	Marketing Management by T.N. Chhabra & S.K. Grover
11	Hospital Administration by Dr. S.L. Goel & Dr. R. Kumar
12	Principles and Practice of Management by LM Prasad
13	Quality Management by Bedi
14	Handbook of human resource management
15	Personnel /Human Resource Management by Decenzo Robbins

**MODEL PAPER**

**MPT Part-II  
(6210)**

**Adm. Manag. Ethics-I**

Master of Physiotherapy

**(Orthopaedis/Neurology/Cardiopulmonary/Sports)**

Part-II (Main) Examination Month, Year

Paper-I

**Administration, Management and Ethical Issues**

Time: Three Hour

Maximum Marks :70

Attempt **all** Questions

**Long Answer Questions (Attempt any Two out of four)**

- Q1. Write in detail about the legal ethical issues in hospital and legal responsibility of physical therapist. 15
- Q2. Describe about evolution of management Also write about management process 15
- Q3. What is performance appraisal? How it is done? Also write briefly about job satisfaction. 15
- Q4. Describe Physiotherapy Department including Policies, Recruitment, equipment's and records Management 15

**Short Answer Questions (Attempt any Four out of Six)**

- Q5. Code of ethics 10
- Q6. Briefly explain the role of the international health agencies 10
- Q7. Standards of practice for physiotherapists 10
- Q8. Briefly explain the functions and types hospitals 10
- Q9. What is Standards of practice for physiotherapists and Liability and obligations in the case of medical legal action 10
- Q10. Give in detail about Physiotherapy associations/councils in India and write a short note on WCPT and its Functions 10

## **MPT Part– II Paper-II : Sports Fundamentals (6220)**

### **Section 1: Nutrition in Sports**

1. Food : The ultimate drug
  - a) Energy requirement
  - b) Weight Loss & Weight Gain
  - c) Carbohydrate Requirement & Glycemic Index
  - d) Carbohydrate: Needs of Strength & Endurance Athletes
  - e) Pre & Post Exercise Carbohydrate Intake
  - f) Protein requirement and needs of Athlete
  - g) Fats requirement and needs of Athlete
2. Water and Electrolyte Loss and Replacement in Exercise
3. Nutritional Ergogenic Aids and Supplements
4. Pre competition Meal and Carbohydrate Loading
5. Sports Specific Nutrition: Sprinting, Distance Running, Cycling, Swimming, Weight Lifting & Power Sport and team.

### **Section 2: Sports Specific Biomechanics**

1. Biomechanics of rowing, throwing, swimming, jumping and landing, running and other sports.

### **Section 3 Sports Psychology**

1. History and current status of Sports Psychology.
2. Pre-competitive anxiety.
  - a. Source of PCA
  - b. Effect of PCA on performance
3. Mental imagery
4. Relaxation Training:- Definition, Types of relaxation trainings, Progressive muscle relaxation, Breathing exercises.

### **Section 4: Rehabilitation and Therapeutic Exercises**

1. Define Rehabilitation, Goals and Objectives of Rehabilitation in Sports, Clinical Evaluation phases of rehabilitation. (multidisciplinary approach)
2. Pre Rehabilitation
3. Definition, details of effects and uses of therapeutic exercises.
  - a. Dynamic Exercises
  - b. Plyometric training
  - c. Isokinetic Exercises
  - d. Kinetic chain exercises
  - e. Agility training
  - f. Circuit training

### **Section 5: Functional Bandages and Orthotic Aids & Protective Equipment in Sports**

History and uses of functional bandages, classification according to the time of application, types of bandages, Bandaging techniques and bandaging material, Indications, contraindications, Taping Techniques , athletic shoes and modifications, common orthotic aid and protective equipments in Sports.

1. Protective Equipments:

- a) Principles of protective equipment
- b) Protective Equipment for: Head & Face, Upper & Lower Extremity.

**Section 6: Emergency Medical Planning and cover for Sports Events**

1. Primary and secondary emergency assessment, emergency plan.
2. Moving the injured participant. Cardio Pulmonary Resuscitation; Shock management, Causes of Collapse and Treatment of collapsed athlete
3. Management of Cardiac arrest, Acute asthma, Epilepsy, Drowning, Burn, Medical management of mass participation. Heatstroke and Heat illness.
4. Internal and External bleeding,
5. Severe head injury
6. The athlete with spinal injury
7. Splinting, Stretcher use-Handling and transfer
8. Chest injuries
9. Abdominal injuries
10. Injuries to the extremities

**MODEL PAPER**

**MPT Part-II  
(6220)**

**Spor. Fund.-II**

Master of Physiotherapy (**Sports**)  
Part-II (Main) Examination Month, Year  
Paper-II

**Sports Fundamentals**

Time: Three Hour  
Maximum Marks :70

Attempt **all** Questions

**Long Answer Questions (Attempt any Two out of four)**

- Q1. Explain in detail the injury assessment of a Football Goal keeper who was hit by the ball and injured his face and head. 15
- Q2. Explain in detail the injury assessment of a cyclist who had just collapsed after a span of 30 kms of cycling under humid temperature. 15
- Q3. Describe in detail about the physiological responses and adaptations to exercise in Musculoskeletal system. 15
- Q4. Describe in detail about the phases of throwing and throwing injuries in sports. 15

**Short Answer Questions (Attempt any Four out of Six)**

- Q5. Carbohydrate loading response. 10
- Q6. Examination of an athlete who had sprained his lower trunk. 10
- Q7. Psychosocial wellness. 10
- Q8. Warming up and cooling down. 10
- Q9. PCA and its effects 10
- Q10. Ergogenic aids and Supplements in sports 10

## **MPT Part– II Paper-III : Sports Physiotherapy and Recent Advances (6230)**

### **LEARNING OBJECTIVES**

On successful completion of this unit, it is expected that students will be able to:

1. Elicit and interpret clinical signs and symptoms of diseases commonly seen in musculoskeletal and sports medicine & interpret clinical tests and special investigations commonly used in the diagnosis of conditions typically seen in musculoskeletal and sports medicine.
2. Generate a primary diagnosis and a list of differential diagnoses consistent with typical presentations common musculoskeletal and sports medicine.
3. Identify normal & pathological anatomy on diagnostic images.
4. Explain the medical management of various conditions typically presented in sports physiotherapy practice.
5. Discuss how the serious and common disorders and the specialized areas of medical practice (musculoskeletal and sports medicine) may impact on sports physiotherapy practice.

### **Section 1: Traumatology its management**

1. Causes & Mechanism of Sports Injuries, Prevention of Sports Injuries.
2. On field Assessment
3. Common acute and overuse injuries of:
  - a) Shoulder girdle, Arm, Elbow, Forearm, Wrist & hand
  - b) Pelvis, hip, thigh, knee, leg, ankle & foot
  - c) Spine
  - d) Head
  - e) Injuries to Athletes in various age groups

### **Section 2: Sports specific injuries**

1. Special emphasis on the specific risk factor, nature of sports, kind of medical intervention anticipated and prevention with respect to individual sports.
  - a) Individual events: Field & Track
  - b) Team events: Hockey, Cricket, Football
  - c) Contact and Non-contact sports
  - d) Water sports

### **Section 3: Miscellaneous conditions**

1. Diagnosis and management of skin conditions of Athletes, Bacterial infections, Fungal infections, Viral infections, boils and cellulitis.
2. Female Specific problems 1. Sports Amenorrhea. 2. Injury to female reproductive tract. 3. Menstrual Synchrony. 4. Exercise and pregnancy. 5. Eating disorders in athletes.
3. Geriatric disorder 1. Older Athletes 2. Osteoarthritis and other geriatric conditions.

### **Section 4: Segmental Stabilization Concepts of Spine**

1. Muscle function in spinal stabilization
2. Contribution of various muscles to spinal stabilization
3. Local Muscle dysfunction in Low back pain
4. Principles of clinical management of deep muscle system for segmental stabilization

### **Section 5: Manual Therapy**

1. Introduction to Manual therapy techniques, Joint Mobilization, Neural mobilization, Trigger point therapy and Muscle energy techniques, Taping, MFR, Dry Needling.

**PRACTICAL/VIVA**

Long case assessment & Short case assessment including application of above Physiotherapeutic techniques in the Treatment of all conditions studied in MPT part-II

Mode            Long case assessment, Short case, written,  
                      Demonstration, Investigations & Viva

Duration        Upto 120 minutes per candidate

Examiner        02 (One internal and one external from the panel of examiners from  
                      University)



**MODEL PAPER**

**MPT Part-II  
(6230)**

**Spor. Physio. & Rec.Adv.-III**

**Master of Physiotherapy (Sports)**

Part-II (Main) Examination Month, Year

Paper-III

**Sports Physiotherapy and Recent Advances**

Time: Three Hour

Maximum Marks :70

Attempt **all** Questions

**Long Answer Questions (Attempt any Two out of four)**

- Q1. Explain in detail about the common running injuries in and around the Knee joint. 15
- Q2. Describe in detail the whole body protocol, conditioning exercises and preventive exercises in training a fast bowler in cricket. 15
- Q3. Define Rehabilitation, Goals and Objectives of Rehabilitation in Sports, Clinical. Evaluation phases of rehabilitation 15
- Q4. Various training methods in sports. 15

**Short Answer Questions (Attempt any Four out of Six)**

- Q5. Taping protocol for sprinters 10
- Q6. Describe three functional tests that can be used to decide return to sport after anterior 10
- Q7. Various skin conditions in sports and their management. 10
- Q8. Segmental stabilization of spine 10
- Q9. Common injuries in track and field events and their management 10
- Q10. **Cruciate** ligament injury 10

## **DISSERTATION**

### **Course code MPT 7020**

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

### Selection of Elective Courses during MPT course duration

Every student has to select any one elective subject out of four elective subjects mentioned below at the beginning of the academic year during his/her MPT course duration. The Examination of these subjects shall be conducted at the college level.

Sr. No.	Subject	Teaching hours		
		Theory	Practical	Total
1	Diagnostic Radiology	20	30	50
2	Clinical Nutrition	35	15	50
3	Yoga	25	25	50
4	Constitution of India	50	-	50

### Distribution of marks

Sr. No.	Subject	Marks Distribution		
		Theory	Internal Assessment	Total
1	Diagnostic Radiology	70	30	100
2	Clinical Nutrition	70	30	100
3	Yoga	70	30	100
4	Constitution of India	70	30	100

A candidate can appear in the elective subject examinations to be conducted at the college level before the University examinations at the end of MPT-I year or MPT-II year. Only such candidates shall be eligible to fill University examination form of MPT- II year (final year) who have passed their elective subject. It shall be mandatory to obtain 50% marks in the aggregate of prescribed total marks (i.e. 50 out of 100) to pass the elective subjects. Marks of all such candidates who have passed their elective subject shall be sent in the following format by the Principal of the college to the University while sending their examination forms of MPT-II year (final year) :

<b>S. No.</b>	<b>University Roll No.</b>	<b>Name of the student</b>	<b>Father's Name</b>	<b>Name of elective subject</b>	<b>Marks obtained</b>	<b>Result</b>
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Those candidates who do not pass their elective subjects shall not be eligible to submit their MPT-II year (final year) University examination form and accordingly they will not be permitted to appear in the University examination of MPT-II year (final year) of the course.

Marks obtained by the candidates in their elective subject shall be mentioned separately in the marks sheets of the University examinations. These marks shall not be counted for preparing the merit list.

**NOTE:-** These four Elective courses will be included in the Curriculam of MPT from the academic year 2020-2021 onwards.

## **Elective Course -1**

### **“DIAGNOSTIC RADIOLOGY”**

Theory Hours: 20

Practical Hours:30

**Total Hours: 50**

At the end of the course, the candidate will be able to:

- A.** explain different aspects of diagnosis and intervention in radiology.
- B.** explain use of imaging techniques like X Rays, ultra sonography, CT scan, MRI and
- C.** interventional radiology.
- D.** explain technical aspects of clinical radiology and applied radiology and post
- E.** treatment follow up in disease.
- F.** interpret radiological reports of X Rays, ultra sonography, CT scan, MRI related to
- G.** musculoskeletal system, neurological system and cardiorespiratory system.

#### **Unit-I**

Radiological studies in musculoskeletal, neurological, cardiovascular and respiratory conditions.

#### **Unit-II**

Basic principles of X-rays, instrumentation, observations related to musculoskeletal, neurological and cardiovascular and respiratory conditions

#### **Unit-III**

Ultrasonography- Principles, instrumentation, observations in vascular disorders,

gynecological conditions, recent advances in musculoskeletal ultrasonograph.

#### **Unit-IV**

CT scan and MRI- Principles, instrumentation and observations related to musculoskeletal, neurological and cardiovascular and respiratory conditions.

#### **Unit-V**

Interventional Radiology

#### **Unit-VI**

**Practical:** Observation and interpretation of radiological investigations related to musculoskeletal, neurological and cardiovascular and respiratory conditions.

#### **Reference Books:**

1. Diagnostic and Interventional Radiology- Thomas J. Vogl, Wolfgang Reith, Ernst J. Rummeny.
2. Learning Radiology- William Herring.
3. Vascular and Interventional Radiology- Karim Valj
4. Textbook of Radiology and Imaging- David Sutton.

## **Elective Course -2**

### **CLINICAL NUTRITION**

Theory Hours: 35

Practical Hours: 15

**Total Hours: 50**

#### **COURSE OBJECTIVE:**

The objective of this course is that after 30 hours of L, D, P the student shall be able to understand the basic knowledge about Diet, balanced diet, metabolism, malnutrition, under nutrition, over nutrition, deficiency disease.

#### **COURSE OUTCOME:**

- (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) Well versed with digestion at each stages of digestive system.
- (5) Become familiar with different cooking methodologies.
- (6) Know and explain about food preparations by food manufacturer.
- (7) Explain thoroughly about the advantages and disadvantages of various convenience foods.

#### **UNIT ISOURCES OF FOOD**

1. Nutritive value of foods,
2. Food Sources from which key vitamins are derived

## **UNIT II DIGESTIVE SYSTEM**

- (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**

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

## **UNIT IV PROCESSING OF FOOD**

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.

## **FOOD PREPARATION**

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

### **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.



## **Elective Course -3**

### **YOGA**

Theory Hours: 25

Practical Hours: 25

**Total Hours: 50**

#### **COURSE OBJECTIVE:**

The objective of this course is that after 30 hours of lectures & demonstrations, the student will be able to understand the basic concepts about Asanas and its effects, therapeutics effects of Yoga

#### **COURSE OUTCOME:**

1. Demonstrate the introduction and principles of yoga.
2. Knowledge of history of yoga and yoga in modern India.
3. Outline of yoga background and importance of yoga in modern world.
4. Learning the types and forms of Asanas and description of physiological effect of yoga.
5. Understanding the role of yoga in Occupational Therapy

#### **UNIT-I Introduction to Yoga**

1. Introduction to Yoga
2. Principles of Yoga

#### **UNIT- II Patanjali**

1. History of Yoga
2. Yoga in Ancient and Modern India

#### **UNIT- III Folds of Yoga**

1. Types & Forms of Yoga
2. Asanas & its physiological effects

#### **UNIT- IV Yogic Science**

1. Scientific background of Yoga
2. Yoga in modern world

#### **UNIT -V Advantages of Yoga**

1. Physiological Effects of Yoga
2. Therapeutic Uses of Yoga

#### **Textbook:**

- 1) BKS Iyengar, Light of Yoga, JP, 1st Ed, 2012.

#### **Reference:**

1. PayalGidwaniTiwari, Body Gaurders, CBS, 2nd Ed, 2009

## **Elective Course -4**

### **CONSTITUTION OF INDIA**

Theory Hours: 50

**Total Hours: 50**

#### **Unit-I:**

Meaning of the term 'Constitution'. Making of the Indian Constitution 1946- 1950.

#### **Unit-II:**

The democratic institutions created by the constitution Bicameral system of Legislature at the Centre and in the States.

#### **Unit-III:**

Fundamental Rights and Duties their content and significance.

#### **Unit – IV:**

Directive Principles of States Policies the need to balance Fundamental Rights with Directive Principles.

#### **Unit – V:**

Special Rights created in the Constitution for: Dalits, Backwards, Women and Children and the Religious and Linguistic Minorities.

**Unit-VI:**

Doctrine of Separation of Powers legislative, Executive and Judicial and their functioning in India.

**Unit – VII:**

The Election Commission and State Public Service commissions.

**Unit – VIII:**

Method of amending the Constitution.

**Unit – IX:**

Enforcing rights through Writs:

**Unit – X:**

Constitution and Sustainable Development in India.

**Reference Books:**

- a) J. C. Johari: The Constitution of India- A Politico-Legal Study-Sterling Publication, Pvt. Ltd. New Delhi.
- b) J. N. Pandey: Constitution Law of India, Allahbad, Central Law Agency, 1998.
- c) Granville Austin: The Indian Constitution – Corner Stone of a Nation-Oxford, New Delhi, 2000.