MASTER OF PHYSIOTHERAPY

Era University, Lucknow

Course Outline: 2024-2025

EXERCISE PHYSIOLOGY

Paper Code:

Marks: 100 (Theory = 70, Internal Assessment = 30)

Total Work load 40 hours **Total credits = 4 (L- 4, T-0, P-1)**

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

- Acquired the updated knowledge of Physiology and Physical exercise & will be able to interpret the physiological effects of the vital parameters of simple laboratory tests, such as "Stress Test"
- Acquire the skill of using Bicycle – Ergometry & Treadmill for the purpose of General Fitness & Exercise tolerance for Healthy persons.

UNIT 1

NUTRITION: THE BASE FOR HUMAN PERFORMANCE: LECTURE: 12

Carbohydrates, Lipids, Proteins Vitamins, Enzymes and Coenzymes Minerals & Water: Kinds and Sources, Recommended Intake, Role in the Body, Dynamics during Physical Activity, Acid-Base regulation, Buffering, Physiologic buffers, Hydrolysis and Condensation, Energy Transfer During Physical Activity, The ATP–PCR System, The Aerobic System, Respiratory Quotient, Respiratory Exchange Ratio (RER).

Body Composition, Energy Balance, and Weight Control:

Body Composition Assessment, Overweight, Overfatness, and Obesity, The Body Mass Index, Physique, Performance, and Physical Activity, Upper Limit for Fat-Free Body Mass, Health Risks of Excessive Body Fat, Energy Balance: Input Versus Output, Physical Activity, Regular Moderate Physical Activity.

UNIT 2: LECTURE: 14

AEROBIC SYSTEMS OF ENERGY DELIVERY AND UTILIZATION:

Pulmonary Ventilation: Variations from normal breathing patterns, Gas exchange and transport, Concentrations and partial pressures of respired gases, Oxygen and Carbon Dioxide

transport in blood, Regulation of pulmonary ventilation: Ventilatory control & regulation of ventilation during physical activity, Pulmonary ventilation and energy demands during physical activity, Effects of intense physical activity.

The Cardiovascular System: Blood Pressure response to physical activity, Cardiovascular regulation and integration, Intrinsic & Extrinsic regulation of heart rate and circulation, Distribution of blood, Integrative Response during physical activity, Physical activity after cardiac transplantation, Functional capacity of the cardiovascular system, Cardiac Output, Cardiac Output at Rest, Cardiac Output During Physical Activity, Cardiac Output Distribution and Oxygen Transport, Cardiovascular Adjustments to Upper-Body Exercise.

Skeletal Muscle: Chemical and mechanical events during muscle action and relaxation, Muscle fiber type, Fiber type differences among athletic groups.

Neural Control of Human Movement: Nerve Supply to Muscle, Motor Unit Functional Characteristics, Receptors in Muscles, Joints, and Tendons: The Proprioceptors

UNIT 3: **LECTURE: 14**

APPLIED EXERCISE PHYSIOLOGY: ENHANCEMENT OF ENERGY TRANSFER CAPACITY

Exercise Training Principles, Anaerobic & Aerobic System, Factors that affect Aerobic & Anaerobic System, Training Methods, Overtraining, Physical Activity During Pregnancy.

Strength Measurement And Resistance Training: Structural and functional adaptations of Resistance Training, Detraining Effects on Muscle, Measurement of Muscle Strength, Special Aids to Exercise Training and Performances, Physical Activity at Medium and High Altitude, Exercise and Thermal Stress, Thermal Balance, Hypothalamic Temperature Regulation, Physical Activity in The Heat, Maintaining Fluid Balance: Rehydration and Hyperhydration. Physical Activity in the Cold, Cold Acclimatization.

Human Energy Expenditure during Rest and Various Physical Activities:

Energy Expenditure at Rest: Basal and Resting Metabolic Rate, Metabolic Size Concept, Metabolic Rates of Humans: Age and Gender Comparisons.

Energy Expenditure during Physical Activity: Classification of Physical Activities by Energy Expenditure, The Met, Energy Cost of Household, Industrial, and Recreational Activities, Heart Rate to Estimate Energy Expenditure.

Energy Expenditure During Walking, Jogging, Running, and Swimming, Gross Versus Net Energy Expenditure.

PRACTICALS

Chart preparation for Anaerobic and Aerobic Power Training, Aerobic fitness & physical performance, Clinical Exercise Recommendation for Cancer, Cardiovascular, and Pulmonary Rehabilitation, Factors that modify the expression of Human Strength, Training Muscles to Become Stronger, Comparative Training Responses in Men and Women, Dieting for Weight Control, Factors That Affect Weight Loss, Increased Physical Activity for Weight Control, Weight Loss Recommendations for Wrestlers and Other Power Athletes, Gaining Weight, Exercises Provides Significant Benefits

SUGGESTED READINGS:

1. Therapeutic exercise by Carolyn Kisner
2. Exercise Physiology Book by William D McArdle

PHYSIOTHERAPY & ETHICS

Paper Code:
Marks: 100 (Theory = 70, Internal Assessment = 30)

Total Work load 40 hours **Total credits = 4 (L- 4, T-0)**

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

- Know about all the rules and regulation that have to be follow in practice
- Know how to practice ethically & main ethical issues coming in practice

UNIT 1: ETHICAL RULES OF PROFESSIONAL CONDUCT LECTURE: 13

Ethical principles in health care, Ethical principles related to physiotherapy, Scope of practice, Enforcing standards in health profession-promoting quality care, Professional ethics in research, education and patient care delivery, Informed consent issues, Medical ethics and Economics in clinical decision-making.

Rules of professional conduct: Relationship with patients, health care institutions, colleagues and peers, medical and other professional staff. Confidentiality and Responsibility, Malpractice and negligence, Provision of services and, Advertising. Legal aspects: Consumer protection act, Legal responsibility of physiotherapist for their action in professional context and understanding liability and obligations in case of medico-legal action.

UNIT 2: FUNCTIONS OF PHYSIOTHERAPY ASSOCIATIONS LECTURE: 13

Memorandum, Rules and Regulation, Role of international health agencies. Role of W.C.P.T. and W.H.O. Roles Of Physical Therapist, Physical Therapy Director, Physiotherapy Supervisor, Physiotherapy Assistant, Physiotherapy Aide, Home Health Aide, Volunteer.

UNIT 3: **LECTURE: 14**

HOSPITAL ADMINISTRATION AND PERSONNEL MANAGEMENT

Hospital administration: Hospital as an organization - Functions and types of hospitals, Quality assurance programme in hospitals & medical audit, International quality system. Principles of hospital administration and its applications to Physiotherapy. National health policy and health care system in India. Organization of physiotherapy department: Planning, Space, Manpower, Other basic resources. Organizing meetings, committees, and negotiations.

Personnel management: Personnel performance appraisal system, Quality care delivery from the staff, Material management, Pharmacy, Hospital waste disposal, Quality assurance, Hospital acquired infection, Quality assurance through record review and medical audit. Public relations in hospital and human resource management.

SUGGESTED READINGS:

1. Medical Ethics by C M Francis.
2. George V Lobo – Current Problems in Medical Ethics
3. Consumer Protection Act – 1986, Government of India, New Delhi.
4. Health Services Management, Analysis & Application, Wadsworth Publishing Company

BASIC THERAPEUTIC SCIENCES

Paper Code:

Marks: 100 (Theory = 70, Internal Assessment = 30)

Total Work load 40 hours **Total credits = 4 (L- 4, P-1 T-0)**

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

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

UNIT 1: FUNDAMENTALS OF EXERCISE THERAPY **LECTURE: 13**

General Concepts: Foundational concepts of therapeutic exercise, Concepts of Motor Learning & Types. Principles, Procedures, Indications, Goals, Limitations, Precautions and Contraindications for applying various type of exercise techniques –Active, Passive, Resistance, Concentric and Eccentric, Isokinetic Exercise, Open-Chain and Closed-Chain Exercise. Examination, Upper Extremity, Lower Extremity. Determinants of an exercise program: Intensity, Duration, Frequency, Mode, Reversibility Principle, Exercise Program, Warm-Up Period, Aerobic Exercise Period, Cool-Down Period.

Overview of Terms Related To Mobility And Stretching: Alignment and Stabilization, Intensity, Duration, Speed, Frequency, Relaxation Training Flexibility, Hypo mobility,

Contracture & their types. Selective Stretching, Overstretching and Hypermobility, Muscle Guarding and Spasm, Exercise-induced muscle soreness, Joint Effusion & Inflammation. Strength, Power, Endurance, Overload Principle, SAID Principle, Reversibility Principle.

UNIT 2: FUNDAMENTALS OF ELECTROTHERAPY LECTURE: 13

General outline of therapeutic currents (Low, Medium & High Frequency Currents) - Low Frequency Currents: Production & Application of Faradic current, Modified Direct Current (Modified DC/Galvanic Current), Iontophoresis, Transcutaneous Electrical Neuromuscular Stimulation, High Voltage Pulse Galvanic Stimulation, Sinusoidal Currents, Diadynamic Currents, Functional Electrical Stimulation, EMG & its Clinical implications, Biofeedback its Principles. Medium Frequency Currents: Interferential Currents, Russian Currents, Heat Therapy & its Application, Cryotherapy. High Frequency Currents: Properties, Magnetic & Electrostatic Disturbance, SWD, pSWD, Longwave, Microwave, U.S, I.R, U.V, Laser, Traction-Methods, Techniques & Dosage.

UNIT 3: FUNDAMENTALS OF BIOMECHANICS LECTURE: 14

Foundational Concepts: Joint Design, Materials Used in Human Joints, Structure of Connective Tissue, Specific Connective Tissue Structures, General Properties of Connective Tissue, Mechanical Behaviour, Viscoelasticity, Time and Rate-Dependent Properties, Properties of Specific Tissues, Elements of Muscle Structure, Composition of a Muscle Fiber, The Contractile Unit, The Motor Unit, Muscle Structure, Function & Tension, Muscular Connective Tissue, Classification of Muscles, Close and Open chain

Overview to Biomechanics of Human Movement: Overview of Kinetics & Kinematics of Spine and all joints. Analysis & Evaluation of Postures and Abnormal Postures and Gait.

PRACTICALS

Demonstration for : Types and Effects of Stretching, Interventions to Increase Mobility of Soft Tissues, Selective Stretching, Determinants & Special precautions for upper & lower extremity stretching, Grades or Dosage of Movement, Positioning and Stabilization, Treatment Force and Direction of Movement. Initiation and Progression of Treatment, Speed, Rhythm, and Duration of Movements.

Demonstration for : Preparation of apparatus & patient. Applications & Termination of Low, Medium & High Frequency Current Treatment.

Overview for : Kinematics and Kinetics, Rotatory and Translatory Forces and Motion, Shear and Friction Forces, Torque, Equilibrium, Parallel Force Systems, Muscle Forces, Total Muscle

Force Vector, Torque, Changes to Moment Arm of a Force, Moment Arm and Angle of Application of a Force. Lever Systems or Classes of Levers, Muscles in First, Second and Third class lever systems, Perpendicular and Parallel Force Effects.

SUGGESTED READINGS:

1. Therapeutic exercise by Carolyn Kisner
2. Principles of exercise therapy by M. Dena Gardiner
3. Joint Structure & Function by Cynthia Norkins
4. Claytons Electrotherapy by Forster & Plastangs
5. Electrotherapy by Khokher

RESEARCH METHODOLOGY & BIOSTATISTICS

Paper Code:
Marks: 100 (Theory = 70, Internal Assessment = 30)

Total Work load 40 hours **Total credits = 4 (L- 4, T-0)**

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

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

UNIT 1: RESEARCH METHODOLOGY LECTURE: 14

Research – Definition, concept, purpose, approaches, Internet sites for Physiotherapist
Research in Physiotherapy Introduction -Research for Physiotherapist: Why? How? When?
Research Fundamentals -Define measurement, Measurement framework, Scales of measurement, Pilot Study, Types of variables, Reliability & Validity, Drawing Tables, graphs, master chart etc. Writing a Research Proposal, Critiquing a research article-Defining a problem , Review of Literature, Formulating a question, Operational Definition, Inclusion & Exclusion criteria, Forming groups, Data collection & analysis, Results, Interpretation, conclusion, discussion , Informed Consent , Limitations, Research Design-Principle of Designing, Design, instrumentation & analysis for qualitative research, Design, instrumentation & analysis for quasi-experimental research, Design models utilized in Physiotherapy Research Ethics-Importance of Ethics in Research, Main ethical issues in human subjects' research, Main ethical principles that govern research with human subjects, Components of an ethically valid informed consent for research

UNIT 2: BIOSTATISTICS LECTURE: 13

Biostatistics, Introduction, Definition, Types, Application in Physiotherapy, Data- Definition, Types, Presentation, Collection methods, Measures of central value, Arithmetic mean, median and mode. Relationship between them, Partitioned values- Quatertiles, Deciles, Percentiles, Graphical determination, Measures of Dispersion-Range, Mean Deviation, Standard

Deviation, Normal Distribution Curve -Properties of normal distribution, Standard normal distribution, Transformation of normal random variables, Inverse transformation, Normal approximation of Bioaxial distribution.

UNIT 3: **LECTURE: 13**

Correlation analysis - Bivariate distribution: Scatter Diagram, Coefficient of correlation, Calculation & interpretation of correlational coefficient, T-test, Z-test, P-value, Regression analysis- Lines of regression, Calculation of Regression coefficient, Sampling- Methods of Sampling, Sampling distribution, Standard error, Types I & II error, Probability (in Brief), Hypothesis Testing - Null Hypothesis, Alternative hypothesis, Acceptance & rejection of null Hypothesis, Level of significance, Parametric & non parametric tests - Chi square test, Mann-Whitney U test, Wilcoxon Signed test, Kruskal-Wallis test, Friednam test, T-test/student T test, Analysis of variance

SUGGESTED READINGS:

1. Research methodology- C.R Kothari
2. Research methods- Ram Ahuja
3. Biostatistics P.N Arora

PEDAGOGY IN PHYSIOTHERAPY EDUCATION - 1

Paper Code:
Marks: 100 (Theory = 70, Internal Assessment = 30)

Total Work load 40 hours **Total credits = 4 (L- 4, T-0)**

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

- Understand the Dynamics of teaching & learning
- Plan effective teaching sessions in Physiotherapy

UNIT 1: EDUCATION **LECTURE: 14**

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

UNIT 2: CONCEPT OF TEACHING AND LEARNING **LECTURE: 13**

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

UNIT 3: CURRICULUM **LECTURE: 13**

Meaning and concept, Basis of curriculum formulation, Framing objectives for curriculum, Process of curriculum development and factors involved, Evaluation of curriculum

SUGGESTED READINGS:

1 Developing a Pedagogy of Teacher education: Understanding teaching and learning about Teaching.
2. Handbook of Technological pedagogical content knowledge (TPCK) for educators
3. Language, Culture and community in Teacher education.

SEMESTER – II

ADMINISTRATION & MANAGEMENT

Paper Code:
Marks: 100 (Theory = 70, Internal Assessment = 30)

Total Work load 40 hours **Total credits = 4 (L- 4, T-0)**

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

- Know about all the rules and regulation that have to be follow in practice
- Know how to practice ethically & main ethical issues coming in practice

UNIT 1: INTRODUCTION TO MANAGEMENT LECTURE: 12

Concept of management, Functions of management, Management process – planning, organization, direction, controlling decision making. Personnel management: Staffing Recruitment selection Performance appraisal, Job satisfaction. Total Quality Management: Basics of quality management Quality control & Quality assurance programme in hospitals & medical audit International quality system

UNIT 2: ADMINISTRATION LECTURE: 15

Principles of hospital administration and its applications to Physiotherapy, Nature and scope of administration, How to be an effective administrator, Strategic planning under hospital administration. Planning and organization, Quality management, Planning change – innovation. Financial issues-Budgeting and income generation. Planning and designing supportive services. Planning and designing ancillary and medical services. Financial / Management of a hospital.

UNIT3: HOSPITAL MANAGEMENT LECTURE: 13

Planning and developing a hospital (emphasis on physiotherapy department). Organization of a hospital. Responsibilities and planning under human resource management. Staffing Recruitment selection Performance appraisal, Quality Management, Quality care delivery from:- The staff, Material management, Pharmacy, Hospital waste disposal, Hospital acquired infection, Methods of maintaining records, Quality assurance through record review and medical audit.

SUGGESTED READINGS:

1. Medical Ethics by C M Francis.
2. George V Lobo – Current Problems in Medical Ethics

EXERCISE TESTING & PRESCRIPTION

Paper Code:

Marks: 100 (Theory = 70, Internal Assessment = 30)

Total Work load 40 hours **Total credits = 4 (L- 3, T-0, P-2)**

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

- At the end of the course the candidate will -
- Acquired the updated knowledge of Physiology and Physical exercise & will be able to interpret the physiological effects of the vital parameters of simple laboratory tests, such as "Stress Test"
- Acquire the skill of using Bicycle – Ergometry & Treadmill for the purpose of General Fitness & Exercise tolerance for Healthy persons.
- Able to impart knowledge for training the undergraduate student.

UNIT 1: FITNESS TESTING AND INTERPRETATION LECTURE: 12

Benefits and risks associated with physical activity

Public health perspective for current recommendation, Health benefits of improving muscular fitness, Risk associated with physical activity and exercise, Exercise testing and the risk of cardiac events, Risks of cardiac events during cardiac rehabilitation, Prevention of exercise related cardiac events

Exercise pre-participation health screening

Health screening, Risk stratification for patients in cardiac rehabilitation and medical fitness

Pre-Exercise evaluation: Assessment and participation instruction

Health related physical fitness testing and interpretation: Basic Principles and Guidelines**,** Health Fitness Evaluation,Body Composition Assessment**,** Cardio-Respiratory Fitness Testing

UNIT 2: LECTURE: 14

GENERAL CONSIDERATION FOR EXERCISE PRESCRIPTION

Clinical Exercise Testing and Interpretation: Indication, Conducting the test, Interpreting tests General principles of exercise prescription: General consideration, Components of exercise training session, Aerobic exercise – FITT, Muscular fitness – FITT, Flexibility exercise- FITT

Exercise Prescription with Special Consideration: Adolescents Children, Geriatric, Pregnancy

Environmental consideration for exercise prescription: Exercise in High Altitude, Exercise in Hot and Cold Environment

UNIT 3: **LECTURE: 14**

EXERCISE TESTING AND PRESCRIPTION FOR SPECIAL CONDITION

Exercise Prescription for Patients with Specific Disease

Exercise prescription for Cardiac disease – Inpatient and Outpatient Rehabilitation, Heart Failure, Pacemaker, Cardiac Transplantation, Peripheral Artery Disease, Exercise Prescription in Stroke, Exercise Prescription for Pulmonary Diseases – Asthma & COPD

Exercise Prescription for Metabolic Disease

Diabetes mellitus, Hypertension, Obesity

Exercise Testing and Prescription for Population with Chronic Disease and Health Conditions

Arthritis, Multiple sclerosis, Cancer, Cerebral palsy and down syndrome, Parkinson disease, Spinal cord injury, Kidney disease, HIV

PRACTICALS

Health Screening, Health Fitness Evaluation, Body Composition Assessment, Cardio-Respiratory Fitness Testing, Exercise Testing and Prescription of Cardiac Diseases, Metabolic Diseases and Chronic Diseases and Health Conditions.

Recommended books:

1. American College of Sports Medicine (2017). ACSM's Guidelines for Exercise Testing and Prescription, 10th Ed. Philadelphia: Lippincott, Williams & Wilkins.
2. Exercise Testing & Prescription by David C. Neiman, Mc. Graw Hill.
3. Exercise training and exercise prescription for special cases. Theoretical basis and clinical application by James A. Skinner, Lippincott Williams and Wilkins

COMMUNITY BASED REHABILITATION

Paper Code:

Marks: 100 (Theory = 70, Internal Assessment = 30)

Total Work load 40 hours **Total credits = 4 (L- 3, T-2)**

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

- Aware about the community oriented medical programme
- Know the role of Physiotherapy in community based rehabilitation.

UNIT 1: INTRODUCTION TO CBR **LECTURE: 14**

Introduction to Community Based Rehabilitation: Definition, Concept of CBR, Need for CBR, Objectives of CBR, Scope of CBR, Difference between Institution based and Community based Rehabilitation, Members of CBR team, Models of CBR

CBR and Empowerment: W.H.O.'s policies about rural health Care, Concept of primary/tertiary health centers-District Hospitals etc., Role of P.T in vocational rehabilitation in C.B.R. of physically handicapped person, Role of family members in the rehabilitation of a physically handicapped

CBR and Types of Evaluation: Difference between Impairment, Handicap and Disability, Disability Evaluation, Causes of Disability, Types of Disability, Prevention of Disability,

Rehabilitation Services in India: Types, Definition of Community, Multiplicity of Communities & Community based Approach, Community initiated versus community oriented programme, Community participation and mobilization.

UNIT 2: CBR PROGRAMMES **LECTURE: 14**

Planning and management of CBR Programmes, CBR Programme Planning and Management, Ownership and Governance, Decentralization and CBR, Management of CBR, Programme, Community participation

Role of Government in CBR: Laws, Policies, Programmes, Human Rights Policy, Legal aspects of rehabilitation, PWD act

Role of Social work in CBR: Definition of social work, Methods of social work, History of social work, Role of social worker in rehabilitation.

Role of voluntary Organizations in CBR: Charitable Organizations, Voluntary health agencies National level and International NGO's, Multilateral and Bilateral agencies. International Health Organizations: WHO, UNICEF, UNDP, UNFPA, FAO, ILO, World bank, USAID, SIDA, DANIDA, Rockfeller, Ford foundation, CARE, RED CROSS.

UNIT 3: **LECTURE: 12**

SCREENING AND REHABILITATION OF PEDIATRICS DISORDERS

National District Level Rehabilitation Programme: Primary rehabilitation unit, District rehabilitation center, Primary Health center, Village rehabilitation worker, Anganwadi worker.

Role of Physiotherapy in CBR: Screening for disabilities, Prescribing exercise programmes, Prescribing and devising low cost locally available assistive aids, Modifications physical and architectural barriers for disabled, Strategies to improve ADL

Extension services and mobile units: Introduction, Need, Camp approach.

Vocational training in rehabilitation: Introduction, Need, Vocational evaluation, Vocational rehabilitation services.

PRACTICALS

Disability Evaluation, Vocational Evaluation, Health Screening, Camp Visits, Modification of Architectural Barriers, Prescription of Exercise Program

SUGGESTED READINGS:

1. Textbook of rehabilitation – Sunder
2. Rehabilitation Medicine by Howard A Rusk.
3. Rehabilitation Medicine by Joel A De Lisa.

BIOMECHANICS AND CLINICAL KINESIOLOGY

Paper Code:
Marks: 100 (Theory = 70, Internal Assessment = 30)

Total Work load 40 hours **Total credits = 4 (L- 4, P-1 T-0)**

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

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

UNIT 1: JOINT FUNCTION: UPPER EXTREMITY LECTURE: 14

Shoulder Complex – SC, AC, ST, GH - Articulating Surfaces, Motions, Stability, Stress Tolerance, Resting Position & Motions of the Scapula, Static & Dynamic Stabilization. Integrated Functions: ST and GH Contributions, SC and AC Contributions

Elbow Complex: Functions - Humeroulnar and Humeroradial Articulations. Functions: Superior and Inferior Radioulnar Articulations, Functional Activities Relationship to the Hand and Wrist

Wrist and Hand Complex: Wrist Complex: Radiocarpal & Midcarpal - Functions of the Radiocarpal and Midcarpal Joints, Wrist Instability. **Hand Complex**: Functions of the CMC, MCP, IP Joints of the Fingers, Palmar Arches, Extensor Mechanism, Functions of the CMC, MCP and IP Joints of the Thumb, Prehension

UNIT-2: JOINT FUNCTION: LOWER EXTREMITY LECTURE: 12

Hip Joint: Function of the Hip Joint: Motion of the Femur on the Acetabulum Motion of the Pelvis on the Femur, Coordinated Motions of the Femur, Pelvis, and Lumbar Spine, Bilateral Stance & Unilateral Stance, Compensatory Lateral Lean of the Trunk, Use of a Cane Ipsilaterally & Contralaterally, Adjustment of a Carried Load

The Knee: Tibiofemoral Joint Kinematics, Patellofemoral Joint - Joint Congruence, Motions of the Patella Patellofemoral Joint Stress, Frontal Plane Patellofemoral Joint Stability
The Ankle and Foot Complex: Function - Ankle Joint, Subtalar Joint, Transverse Tarsal Joint, Tarsometatarsal Joint, Metatarsophalangeal Joint, Function of the Arches

UNIT-3: INTEGRATED FUNCTION **LECTURE: 14**

Vertebral Column: Kinematics & Kinetics - Cervical Region, Thoracic Region, Lumbar Region, Sacral Region, Intervertebral Disks
Posture: Static and Dynamic Postures & Control, Kinetics and Kinematics of Posture, Analysis of Standing Posture, Analysis of Sitting Posture, Analysis of Lying Posture
Gait: Kinematics & Kinetics, Kinematics and Kinetics of the Trunk and Upper Extremities, Stair and Running Gaits, Abnormal Gait

PRACTICALS

Identification of Joint Axis, Identification of Articulating Surfaces, Identification of Specific Biomechanical Dysfunctions of Major Articulations of Upper and Lower Extremity

SUGGESTED READINGS:

1. Joint Structure & Function - Cynthia Norkins
2. Basic Biomechanics Explained – John Low & Ann Reed
3. Basic biomechanics of the musculoskeletal system – Margareta Nordin & Victor H. Frankel

PEDAGOGY IN PHYSIOTHERAPY EDUCATION - II

Paper Code:
Marks: 100 (Theory = 70, Internal Assessment = 30)

Total Work load 40 hours **Total credits = 4 (L- 4, T-0)**

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

UNIT-1: TEACHING METHODOLOGY & TEACHING AIDS **LECTURE: 13**

Aims, Philosophy and Trend and Issues in education including – Aims, agencies, formal and in-formal education, philosophies of education (past, present & future), Role of education philosophy, Current issues and trends in education, Methods of teaching- Lecture, Demonstration, micro teaching, Discussion, Seminar, Assignment, Project, Case study. Planning for teaching- Bloom's taxonomy of instructional objectives, Writing instructional

objectives I behavioral terms, Unit planning, Lesson planning. Teaching Aids- Types of teaching aids, Principles of selection, preparation and use of audio-visual aids

UNIT-2: MEASUREMENT AND EVALUATION LECTURE: 14

Concept & Types of Measurement and Evaluation, Functions & Methods of Measurement, Characteristics of Evaluation, Types of Measuring Scales, Need for Measurement and Evaluation in Education, Placement, Diagnostic, Formative and Summative Evaluation, Specification of Objectives Steps in the Process of Evaluation. Standardized Tests Classification & its Characteristics, Psychological Testing in the Area of Intelligences, Attitude and Personality tests, Examination System: Current Strategies, Statistics in Measurement and Evaluation - Statistical Treatment of Data, Frequency Distribution and Graphic Representation of Data, Measures of Central Tendency and Variability, Co-efficient of Correlation, Percentile and Percentile Rank, Normal Probability Curve, Derived Scores (Z-score, Standard Score and T-score)

UNIT-3: CONTINUOUS AND COMPREHENSIVE EVALUATION LECTURE: 13

Concept of Continuous Comprehensive Evaluation(CCE), Need, Nature, Purposes for CCE, Evaluation for Holistic Development of Children, Scholastic and Co-Scholastic Assessment, Tools for Assessing Student Performance in Scholastic Area, Miscellaneous Tools of Assessment, Tools for Assessing Co-Scholastic Aspects, Recording the Students Results, Reporting and Need of Reporting Results to Students, Parents and other Stakeholders, Awareness programmes

SUGGESTED READINGS:

1. Developing a Pedagogy of Teacher education: Understanding Teaching and Learning about Teaching.
2. Handbook of Technological Pedagogical Content Knowledge (TPCK) for Educators
3. Language, Culture and community in Teacher Education.
4. Ebel, R.L. *Essentials of Educational Measurement.* New Jersey: Englewoo