

YEAR: MPT I YEAR

COURSE CODE: 24MPT501

TITLE OF THE COURSE: RESEARCH, ETHICS AND ADMINISTRATION

COURSE OBJECTIVES:

THIS COURSE SERVES TO INTEGRATE THE KNOWLEDGE GAINED BY THE STUDENTS IN RESEARCH AND ADMINISTRATION WITH THE SKILLS GAINED IN RESEARCH METHODOLOGY, BIostatistics AND ETHICS THUS ENABLING THEM TO APPLY THESE IN CLINICAL SITUATIONS.

COURSE OUTCOMES:

THE EXPECTED OUTCOMES OF THIS COURSE FOLLOWING THE PRESCRIBED HOURS OF LECTURES,

- 1). THE STUDENT WILL BE ABLE TO COMPREHEND TOPICS IN THE FIELD OF RESEARCH METHODOLOGY, BIostatistics, ETHICS AND ADMINISTRATION
- 2). THE STUDENT WILL BE ABLE TO APPLY THE KNOWLEDGE OF RESEARCH METHODOLOGY, BIostatistics, ETHICS AND ADMINISTRATION IN PROFESSIONAL PRACTICE, PATIENT CARE AND RESEARCH.
- 3).THE STUDENTS WILL BE ABLE TO HAVE A COMPLETE OVERVIEW ON THE APPLICATION OF HOSPITAL ADMINISTRATION AND INFRASTRUCTURE NEED IN REAL LIFE.
- 4). THE STUDENT WILL BE ABLE TO MAINTAIN CLINICAL RECORDS AS PER THE INTERNATIONAL CLASSIFICATION OF FUNCTIONING DISABILITY AND HEALTH (ICF) GUIDELINES.

UNIT I

1) RESEARCH METHODOLOGY

- Introduction to research: Terminology in research
[defining a research question, review of literature, research process]
- Types of research: Qualitative and quantitative
- Study design: Case study, case series, survey, Delphi process, pilot study, pre and post design, epidemiology study design (longitudinal, cohort, case control, prevalence etc.), repeated measure design, randomized controlled design.
- Sampling design: Sampling techniques (population, sample, sample size determination-based on the study design, sampling methods, sampling errors)

2) BIostatistics

- Introduction to biostatistics: Terminology, definition, application and uses of biostats, frequency distribution.
- Descriptive statistic, measure of central tendency, measure of dispersion and measure of asymmetry.

3) ETHICS

- Ethical issues in physiotherapy practice- clinical, research, academic.
- Scope of physiotherapy in hospital, community and industry

4) ADMINISTRATION

- Administration, legislation, rules and regulation governing physiotherapy practice n- national and international(IAP and WCPT)
- E- medical record system selection (EMR)

UNIT II

1) RESEARCH METHODOLOGY

- Outcome measures: Use of outcome measures in rehab measures, psychometric properties of measurement(reliability, validity, responsiveness, sensitivity, specificity, MCID etc.), Measurement errors.
- Data collection and analysis: Technique of data collection, tools, data processing, interpretation and presentation of data in graphical representation.

2) BIOSTATISTICS

- Hypothesis testing (test of significance, type1 and type 2 error, confidence interval, power analysis.)
- Parametric and non-parametric:T-test, ANOVA, ANCOVA, chi-square, Mann-Whitney U test, Wilcoxon test, Kruskal-Wallis test, Friedman's test and z test.
- Sample size calculation

3) ETHICS

- Education- formal and non-formal, philosophy of health, education, curricular planning.
- Teaching techniques-teaching-learning method to facilitate learning, method for facilitate learning, use of audio-visual aid, clinical teaching.

4) ADMINISTRATION

- History taking, assessment, tests, patient communication, documentation of findings, treatment organization and planning, execution of intervention.
- Models of health information system

UNIT III

1) RESEARCH METHODOLOGY

- Scientific writing: Definition, kind of scientific documentation (research paper, review paper, books, review and meta-analysis, thesis, conference and project reports)

- Presentation and publication of research: step and process, significance of report writing, step in report writing, precaution in writing a research report, oral and poster presentation of research paper in conference, preparation of abstract.
- Critical appraisal of a research.
- Manuscript writing
- Grant proposal writing

2) BIOSTATISTICS

- Correlation and regression.
- Epidemiological measure: Rate, ratio, proportion, incidence, prevalence, relative risk, ratio risk, odd's ratio, professional practice.

3) ETHICS

- Principal of management, planning, organization, budget, policy process and quality assurance.
- Exercise prescription for health and fitness.

4) ADMINISTRATION

- Documentation of rehabilitation, assessment and management... international classification of functioning, disability and health format (ICF).
- Current scenario of EMR

References:

1. Research Methodology .Methods and Techniques C.R. Kothari New Age International Publishers.2nd edition 2008
2. Research Methods for clinical therapists by Hicks Carlyne, Churchill
3. Research Methodology for health professionals by Goyal, Jaypee
4. Methods in Biostatistics By Mahajan, B.K Jaypee
5. Principles & practice of Biostatistics By Dixit ,J.V Bhanot
6. Ethics in Rehabilitation A Clinical Perspective By Barbara L. Kornblau, Ann Burkhardt · 2012
7. Physical Therapy Ethics By Donald L. Gabard, Mike W. Martin · 2011
8. Physical Therapy Administration and Management By Robert J. Hickok · 1982
9. Writing SOAP Notes With Patient/client Management Formats By Ginge Kettenbach · 2004

10. Physical Therapy Documentation: From Examination to Outcome By Mia Erickson, Ralph Ultzman 2008

11. Dutton's Introduction to Physical Therapy and Patient Skills, Second Edition By Mark Dutton · 2020

Question Paper pattern for University Exams –

Long Essay Answers (Answer all 2 questions): $2 \times 20 = 40$ marks

Short Essay Answers (Answer all 4 questions): $4 \times 10 = 40$ marks

COURSE CODE : 24MPT502

TITLE OF THE COURSE : APPLIED PHYSIOLOGY & BIOMECHANICS

COURSE OBJECTIVES:

THIS COURSE SERVES TO INTEGRATE THE KNOWLEDGE GAINED BY THE STUDENTS IN CLINICAL KINESIOLOGY AND BIOMECHANICS, EXERCISE PHYSIOLOGY AND ELECTRO PHYSIOLOGY WITH THE SKILLS GAINED IN BASIC SUBJECTS SUCH AS EXERCISE THERAPY AND ELECTRO THERAPY AND BIOMECHANICS THUS ENABLING THEM TO APPLY THESE IN CLINICAL SITUATIONS.

COURSE OUTCOMES:

THE EXPECTED OUTCOMES OF THIS COURSE FOLLOWING THE PRESCRIBED HOURS OF LECTURES,

- 1). THE STUDENT WILL BE ABLE TO COMPREHEND TOPICS IN THE FIELD OF CLINICAL KINESIOLOGY AND BIOMECHANICS, EXERCISE PHYSIOLOGY AND ELECTRO PHYSIOLOGY.
- 2). THE STUDENT WILL BE ABLE TO CLINICALLY APPLY THE KNOWLEDGE OF KINESIOLOGY, EXERCISE THERAPY TECHNIQUES AND PROTOCOLS AND ELECTRO THERAPY MODALITIES.
- 3).THE STUDENTS WILL BE ABLE TO HAVE A COMPLETE OVERVIEW ON THE ASSESSMENT AND APPLICATION OF DIFFERENT TREATMENT APPROACHES IN VARIOUS CONDITIONS OF ALL ELECTIVES OF PHYSIOTHERAPY
- 4). THE STUDENTS WILL BE ABLE TO MAINTAIN CLINICAL RECORDS AS PER THE INTERNATIONAL CLASSIFICATION OF FUNCTIONING DISABILITY AND HEALTH (ICF) GUIDELINES.

BIOMECHANICS AND CLINICAL KINESIOLOGY:

1. Normal & Applied Biomechanics & pathomechanics and clinical application, Arthokinematics , Osteokinematics degenerative changes in weight bearing joint & compensatory actions ; joint stability & mechanics

- Musculoskeletal structure
- Upper extremity
- Lower extremity
- Vertebral column
- Thorax & chest wall (ventilation & circulation)
- TMJ

2. Kinetic and kinematic analysis of body balance, equilibrium, integrated function

(Gait, posture and ADL).

GAIT:

- Gait parameters : Kinetic and kinematic , time space
- Pathological gait
- Running

- Stair climbing changes in gait following varies surgeries / diseases / disorders

3. Ergonomic approach to

- lifting and handling
- work space and environment
- patient position, body mechanics
- Job design
- In home (household related)
- Child care (paedatric conditions) and transfer techniques.

EXERCISE PHYSIOLOGY:

1. Energy sources, production, expenditure and transfer at rest and various physical activities.
2. Response and adaptation of various systems to exercise and training (aerobic, anaerobic and flexibility).
3. Aerobic and anaerobic exercises – principles of training, factors affecting aerobic and anaerobic training and response, types of training, overtraining, de-training, DOMS, specific aids to enhance performance and conditioning.
4. Environmental influence on exercise and performance – high and low altitude and hypoxia, hypobaric and hyperbaric, hot and cold environment, thermoregulation, dehydration and rehydration, acclimatization.
5. Fatigue – classification, physiology and assessment.
6. Consideration of age and gender in exercise and training.
7. Nutrition – recommended intake, role in exercise, supplementary nutrition and Deficiencies for MSK disorders, sports , cardio , neurological conditions.
8. Body composition and diet – assessment of body composition, obesity and weight control.

ELECTRO PHYSIOLOGY:

1. Anatomy and physiology of peripheral nerve, muscle, and NMJ.
2. Electrical properties of muscle and nerve.
3. Introduction for neuro muscular electrical stimulation.
4. Classification, components and electro physiological assessment.
5. Electrical stimulation and its effects on various systems & Muscle plasticity in

response to electrical stimulation.

6. Clinical Electro Physiological Testing

7. Safety consideration in electro therapy

References:

1. Manual Therapy Master Classes: Vertebral Column: Beeton K.S
2. Manual Therapy Master Classes:The Peripheral Joints: Beeton K.S
3. Electrotherapy Explained Principles And Practice: John Low Ann Reed
4. Electrodiagnosis In Diseases Of Nerves And Muscles: Jan Kimura
5. Chronic Pain Management for Physical Therapists by Wittink, H/ Michel, T.H
6. Myofascial pain and Fibromyalgia Trigger point Management by Rachlin, E. S./Rachlin, I. S.
7. Kinesiology : the mechanics and pathomechanics of human movement - Oatis, C.A
- 8.Gait analysis : theory and application - Rebecca Craik and Carol A Oatis
9. Clinical biomechanics of spine – White A.A and Panjabi – J.B. Lippincot, Philadelphia
10. Electromyography In Clinical Practice By Michael J. Aminoff, 3rd Edition (Churchill Livingstone)
11. Electrodiagnosis in Diseases of Nerve and Muscle: Principles and Practice by Jun Kimura
12. ACSM’s guidelines for exercise testing and prescription – Whaley
13. ACSM’s foundations of strength training and conditioning- Ratames Nicholos
14. Exercise physiology fitness and sports nutrition – B.Srilakshmi
15. Advancing Dietetics and clinical nutrition – Anne Payne

Question Paper pattern for University Exams –

Long Essay Answers (Answer all 2 questions): $2 \times 20 = 40$ marks

Short Essay Answers (Answer all 4 questions): $4 \times 10 = 40$ marks

COURSE CODE: 24MPT503

24MPT572

TITLE OF THE COURSE: FUNCTIONAL DIAGNOSIS AND THERAPEUTICS

FUNCTIONAL DIAGNOSIS AND THERAPEUTICS – PRACTICAL

COURSE OBJECTIVES:

THE "FUNCTIONAL DIAGNOSIS AND THERAPEUTICS" COURSE AIMS TO TEACH STUDENTS HOW TO USE FUNCTIONAL DIAGNOSIS TECHNIQUES FOR ACCURATE ASSESSMENT AND TREATMENT PLANNING, FOSTERING CRITICAL THINKING AND EVIDENCE-BASED PRACTICE. IT ENCOURAGES INNOVATIVE APPROACHES, COLLABORATION, AND A PATIENT-CENTERED APPROACH, EMPHASIZING ETHICAL CONSIDERATIONS AND INTEGRITY IN PATIENT CARE.

COURSE OUTCOMES:

THE EXPECTED OUTCOMES OF THIS COURSE FOLLOWING THE PRESCRIBED HOURS OF LECTURES,

- 1). STUDENTS WILL DEMONSTRATE PROFICIENCY IN UTILIZING FUNCTIONAL DIAGNOSIS TECHNIQUES TO ACCURATELY ASSESS PATIENT CONDITIONS AND DEVELOP COMPREHENSIVE TREATMENT PLANS.
- 2). STUDENTS WILL DEMONSTRATE PROFICIENCY IN UTILIZING FUNCTIONAL DIAGNOSIS TECHNIQUES TO ACCURATELY ASSESS PATIENT CONDITIONS AND DEVELOP COMPREHENSIVE TREATMENT PLANS.
- 3). STUDENTS WILL EFFECTIVELY COLLABORATE WITH PEERS FROM DIVERSE BACKGROUNDS IN DEVELOPING INTERDISCIPLINARY TREATMENT PLANS FOR COMPLEX PATIENT CASES.
- 4). STUDENTS WILL DEMONSTRATE A COMMITMENT TO SURPASSING PATIENT EXPECTATIONS BY PROVIDING TAILORED CARE THAT ADDRESSES INDIVIDUAL NEEDS AND PREFERENCES.
- 5). STUDENTS WILL ADHERE TO THE HIGHEST MORAL AND ETHICAL STANDARDS IN PATIENT CARE, DEMONSTRATING INTEGRITY, PROFESSIONALISM, AND COMPASSION THROUGHOUT

THEIR INTERACTIONS IN FUNCTIONAL DIAGNOSIS AND THERAPY INTERVENTIONS.

1. Understanding Movement: Comprehensive Clinical Examination and Assessment movement dysfunction including Gait.

- a) Principles of Clinical Examination
- b) Assessment of Gait
- c) Clinical Tests for Movement Dysfunction
- d) Specialized Assessments
- e) Interpretation and Differential Diagnosis

2. Developmental screening, motor learning, motor control assessment.

- a) Introduction to Motor Development.
- b) Developmental Screening
- c) Motor Learning in Children
- d) Motor Control Assessment
- e) Interdisciplinary Approach to Assessment
- f) Intervention and Support

3. Principles of pathological investigations and imaging techniques related to neuromuscular skeletal and cardiopulmonary disorders with interpretation.

Interpretation of various investigations:

- a) Radiological (X-rays, CT scan, MRI).
- b) Routine Biochemical investigations (ABG, blood, CSF, etc).
- c) Electro-diagnostic (EMG, NCV, SDC etc) findings.
- d) PFT analysis.

4. Basic Concepts of Anthropometry:

- a) Definition of Anthropometry
- b) Tools for Measurement
- c) Body Size
- d) Determination of Body Shape
- e) Tissues Composing the Body
- f) Human Variation

g) Methods in Body composition analysis

5. Health related physical fitness assessment.

a) Introduction to Physical Fitness Assessment

b) Components of Health- Related Physical Fitness

c) Assessment Methods and Techniques

d) Interpretation of Results

e) Application in Exercise Prescription and Health Promotion

6. General assessment for orthopaedic, neurological and cardiopulmonary conditions.

Assessment of orthopaedic movement dysfunction:

a) General orthopaedic examination, Muscle strength, Power, Endurance, Flexibility, Limb-length discrepancy, Limb girth, Pelvic inclination, Goniometry, Trick movements, End-feel, Special Tests, Altered Posture & Gait –Functional analysis as per ICF norms.

b) Physical examination of joints in normal and patho – mechanical conditions.

Assessment of neuro-muscular dysfunction:

a) General neurological examination, Higher functions, Cranial nerves, Altered muscle strength, Power, Balance, Endurance, Tone, Spasticity, Inco-ordination, Abnormal deep & superficial reflexes, Myotomes, Dermatomes, Voluntary control testing, Abnormal movements, Neural control of bladder, Nerve entrapments, Gait and Functional evaluation as per ICF norms.

b) Posture and alignment: Biomechanical and neural factors.

Assessment of cardio-pulmonary dysfunction:

a) Chest expansion, Abnormal breath sounds, Quality of life questionnaires, Borg scale,

b) Principles of exercise tolerance test – Assessment of vital parameters in simple functional test, 6 minutes' walk test, 12-minute walk test, Shuttle walk test, Canadian step test, Treadmill test, Symptom limited test, Breath holding test, PFT, Spirometry, Peak flowmetry, Theoretical bases of Bruce's protocol, Astrand Protocol & Step test.

7. Pain (assessment, modulation and management of pain)

a) Assessment of Pain and Symptoms: Sources of Pain, Types of Pain, Comparison of Systemic Versus Musculoskeletal Pain, Patterns, Characteristics of Viscerogenic Pain,

b) Screening for Emotional and Psychologic Overlay,

c) Pain modulation using electrotherapy

8. Basics of electrophysiological testing and diagnosis FG test SD curve, NCV, EMG, ECG, Evoked potentials.

a) Introduction to Electrophysiological Testing

- b) F-wave and H-reflex
- c) Nerve Conduction Velocity (NCV) Testing
- d) Electromyography (EMG)
- e) Electrocardiography (ECG)
- f) Evoked Potentials
- g) Integration and Interpretation

9. Physical disability evaluation and diagnosis:

- A) Definition and Types of Physical Disabilities
- B) Evaluation Process
- C) Common Causes of Physical Disabilities
- D) Psychosocial Considerations
- E) Diagnostic Challenges and Considerations
- F) Multidisciplinary Approach to Diagnosis

10. Evaluation and theories of aging:

- a) Introduction to Aging
- b) Biological Evaluation of Aging
- c) Theories of Aging
- d) Psychosocial Evaluation of Aging
- e) Functional Assessment in Aging
- f) Interventions and Implications

References:

1. Evidence-Based Medicine: How to Practice and Teach EBM, 2nd Edition: By David L. Sackett, Sharon E. Straus, W. Scott Richardson, William Rosenberg, and R. Brian Haynes, Churchill Livingstone, 2000
2. Rob Herbert, Gro Jamtvedt, Kåre Birger Hagen, Judy Mead. Practical Evidence- Based Physiotherapy (Second Edition), Churchill Livingstone, 2011, ISBN 9780702042706
3. Exercise Physiology Nutrition, Energy, and Human Performance. 8th Edition. William D. McArdle PhD, Frank I. Katch , Victor L. Katch. Lippincott Williams & Wilkins. ISBN/ISSN: 9781451191554
4. Magee DJ. Orthopedic Physical Assessment. Elsevier Health Sciences; 2014.
5. Donatelli RA, Wooden MJ. Orthopaedic Physical Therapy. Elsevier health sciences; 2009.

6. Hislop H, Avers D, Brown M. Daniels and Worthingham & muscle Testing: Techniques of manual examination and performance testing. Elsevier Health Sciences; 2013
7. McKinnis LN. Fundamentals of musculoskeletal imaging. FA Davis; 2013.
8. Greenspan A, Beltran J. Orthopaedic Imaging: A practical approach. Lippincott Williams & Wilkins; 2020.
9. O'Sullivan SB, Schmitz TJ. Physical rehabilitation, vol. 5. Philadelphia: FA Davis Company. 2006.
10. McCarty DJ, Koopman WJ. Arthritis and allied conditions: a textbook of rheumatology. Philadelphia: Lea & Febiger; 1993.
11. American College of Sports Medicine. ACSM's resource manual for guidelines for exercise testing and prescription. Lippincott Williams & Wilkins; 2012.

Question Paper pattern for University Exams –

Long Essay Answers (Answer all 2 questions):	2 × 20 = 40 marks
Short Essay Answers (Answer all 6 questions):	6 × 10 = 60 marks