

EXERCISE THERAPY

Subject Title	: EXERCISE THERAPY
Duration	: 13 – 24 Months
Total Hours	: 240
Theory	: 90 Hrs
Practical	: 150 Hrs
Total Hours / Week	: 8 Hrs
Lecture	: 2 Hours / Week
Practicals	: 5 Hours / Week
Seminars / Tutorials	: 1 Hour / Week
Method of Assessment	: Written, Oral, Practical

Course Description

In this course, the students will learn the principles and effects of exercise as a therapeutic modality and will learn the techniques in the restoration of physical functions.

Theory

1. Introduction to Exercise Therapy [3 Hours]

The aims of Exercise Therapy, The techniques of Exercise Therapy, Approach to patient's problems, Assessment of patient's condition – Measurements of Vital parameters, Starting Positions – Fundamental positions & derived Positions, Planning of Treatment 2. Methods of Testing [15 Hours]

- a) Functional tests
- b) Measurement of Joint range: ROM-Definition, Normal ROM for all peripheral joints & spine, Goniometer-parts, types, principles, uses., Limitations of goniometry, Techniques for measurement of ROM for all peripheral joints
- c) Tests for neuromuscular efficiency ✓
 - Electrical tests
 - Manual Muscle Testing: Introduction to MMT, Principles & Aims, Indications & Limitations,
 - Techniques of MMT for group & individual muscles : Techniques of MMT for upper limb / Techniques of MMT for lower limb / Techniques of MMT for spine
 - Anthropometric Measurements: Muscle girth – biceps, triceps, forearm, quadriceps, calf
 - Static power Test
 - Dynamic power Test
 - Endurance test
 - Speed test

d) Tests for Co-ordination

e) Tests for sensation

f) Pulmonary Function tests

g) Measurement of Limb Length: true limb length, apparent limb length, segmental limb length

h) Measurement of the angle of Pelvic Inclination

3. Relaxation [4 Hours] ✓

Definitions: Muscle Tone, Postural tone, Voluntary Movement, Degrees of relaxation, Pathological tension in muscle, Stress mechanics, types of stresses, Effects of stress on the body mechanism, Indications of relaxation, Methods & techniques of relaxation-Principles & uses: General, Local, Jacobson's, Mitchel's, additional methods.

4. Passive Movements [4 Hours] ✓

Causes of immobility, Classification of Passive movements, Specific definitions related to passive movements, Principles of giving passive movements, Indications, contraindications, effects of uses , Techniques of giving passive movements.

5. Active Movements [6 hours] ✓

Definition of strength, power & work, endurance, muscle actions.

Physiology of muscle performance: structure of skeletal muscle, chemical & mechanical events during contraction & relaxation, muscle fiber type, motor unit, force gradation.

Causes of decreased muscle performance

Physiologic adaptation to training: Strength & Power, Endurance.

Types of active movements

Free exercise: Classification, principles, techniques, indications, contraindications, effects and uses

Active Assisted Exercise: principles, techniques, indications, contraindications, effects and uses

Assisted-Resisted Exercise: principles, techniques, indications, contraindications, effects and uses

Resisted Exercise: Definition, principles, indications, contraindications, precautions & techniques, effects and uses

Types of resisted exercises: Manual and Mechanical resistance exercise, Isometric exercise,

Dynamic exercise: Concentric and Eccentric, Dynamic exercise: Constant versus variable resistance, Isokinetic exercise, Open-Chain and Closed-Chain exercise.

Specific exercise regimens

Isotonic: de Lormes, Oxford, MacQueen, Circuit weight training

Isometric: BRIME (Brief Resisted Isometric Exercise), Multiple Angle Isometrics

Isokinetic regimens

6. Proprioceptive Neuromuscular Facilitation [6 Hours]

Definitions & goals

Basic neurophysiologic principles of PNF: Muscular activity, Diagonals patterns of movement: upper limb, lower limb Procedure: components of PNF

Techniques of facilitation

Mobility: Contract relax, Hold relax, Rhythmic initiation

Strengthening: Slow reversals, repeated contractions, timing for emphasis, rhythmic stabilization

Stability: Alternating isometric, rhythmic stabilization

Skill: timing for emphasis, resisted progression

Endurance: slow reversals, agonist reversal

7. Suspension Therapy [6 Hours] ✓

Definition, principles, equipments & accessories, Indications & contraindications, Benefits of suspension therapy

Types of suspension therapy: axial, vertical, pendular

Techniques of suspension therapy for upper limb

Techniques of suspension therapy for lower limb

8. Functional Re-education [4 hours] ✓

Lying to sitting: Activities on the Mat/Bed, Movement and stability at floor level; Sitting activities and gait; Lowerlimb and Upperlimb activities.

9. Aerobic Exercise [4 Hours] ✓

Definition and key terms; Physiological response to aerobic exercise, Examination and evaluation of aerobic capacity – Exercise Testing, Determinants of an Exercise Program, The Exercise Program, Normal and abnormal response to acute aerobic exercise, Physiological changes that occur with training, Application of Principles of an Aerobic conditioning program for patients – types and phases of aerobic training.

✓ 10. Stretching [3 Hours]

Definition of terms related to stretching; Tissue response towards immobilization and elongation, Determinants of stretching exercise, Effects of stretching, Inhibition and relaxation procedures, Precautions and contraindications of stretching, Techniques of stretching.

✓ 11. Manual Therapy & Peripheral Joint Mobilization [5 Hours]

Schools of Manual Therapy, Principles, Grades, Indications and Contraindications, Effects and Uses – Maitland, Kaltenborn, Mulligan

Biomechanical basis for mobilization, Effects of joint mobilisation, Indications and contraindications, Grades of mobilization, Principles of mobilization, Techniques of mobilization for upper limb, lower limb, Precautions.

✓ 12. Balance [4 Hours]

Definition

Physiology of balance: contributions of sensory systems, processing sensory information, generating motor output

Components of balance (sensory, musculoskeletal, biomechanical)

Causes of impaired balance, Examination & evaluation of impaired balance, Activities for treating impaired balance: mode, posture, movement, Precautions & contraindications, Types Balance retraining

✓ 13. Co-ordination Exercise [4 Hours]

Anatomy & Physiology of cerebellum with its pathways

Definitions: Co-ordination, Inco-ordination

Causes for Inco-ordination, Test for co-ordination: equilibrium test, non equilibrium test

Principles of co-ordination exercise

Frenkel's Exercise: uses of Frenkel's exercise, technique of Frenkel's exercise, progression, home exercise.

✓ 14. Posture [3 Hours] ✓

Definition, Active and Inactive Postures, Postural Mechanism, Patterns of Posture, Principles of re-education: corrective methods and techniques, Patient education.

✓ 15. Walking Aids [3 hours]

Types: Crutches, Canes, Frames; Principles and training with walking aids

16. Massage [4 Hours] ✓

History and Classification of Massage Technique

Principles, Indications and Contraindications

Technique of Massage Manipulations

Physiological and Therapeutic Uses of Specific Manipulations

✓ 17. Hydrotherapy [3 Hours]

Definitions, Goals and Indications, Precautions and Contraindications, Properties of water, Use of special equipments, techniques, Effects and uses, merits and demerits

✓ 18. Individual and Group Exercises [3 Hours]

Advantages and Disadvantages, Organisation of Group exercises, Recreational Activities and Sports

19. Introduction to Yoga [5 Hours]

Asanas – Principles and elements;

Pranayamas – Principles, Methods and Techniques

Practicals

The students of exercise therapy are to be trained in Practical Laboratory work for all the topics discussed in theory. The student must be able to evaluate and apply judiciously the different methods of exercise therapy techniques on the patients. They must be able to

1. Demonstrate the technique of measuring using goniometry
2. Demonstrate muscle strength using the principles and technique of MMT
3. Demonstrate the techniques for muscle strengthening based on MMT grading
4. Demonstrate the PNF techniques
5. Demonstrate exercises for training co-ordination – Frenkel's exercise
6. Demonstrate the techniques of massage manipulations
7. Demonstrate techniques for functional re-education
8. Assess and train for using walking aids
9. Demonstrate mobilization of individual joint regions
10. Demonstrate to use the technique of suspension therapy for mobilizing and strengthening joints and muscles
11. Demonstrate the techniques for muscle stretching
12. Assess and evaluate posture and gait
13. Demonstrate to apply the technique of passive movements
14. Demonstrate various techniques of Active movements
15. Demonstrate techniques of strengthening muscles using resisted exercises
16. Demonstrate techniques for measuring limb length and body circumference.

Recommended Textbooks

1. *Therapeutic exercise* by Barbara Bandy
2. *Therapeutic exercise* by Carolyn Kisner
3. *Principles of exercise therapy* by M.Dena Gardiner
4. *Practical Exercise therapy* by Hollis Margaret
5. *Therapeutic exercise* by Sydney Litch
6. *Therapeutic exercise* by Hall & Brody
7. *Therapeutic exercise* by Basmajian
8. *Physical Rehabilitation* by o'Sullivan.
9. *Therapeutic massage* by Sinha
10. *Principles of muscle testing* by Hislop.