



PG DIPLOMA IN EXERCISE
THERAPY

POST GRADUATE DIPLOMA IN EXERCISE THERAPY

Ordinances

A candidate for the Postgraduate Diploma in Exercise Therapy will pursue his / her studies as Correspondence mode in the Faculty of Allied Health Sciences at Tamil Nadu Physical Education and Sports University, Chennai for one year of study. At the end of the year, examination will be conducted.

Eligibility for Admission:

1. Candidate seeking admission must possess the following basic qualification: -
..... with at least 50% marks from any recognized University / Institute or equivalent or higher degree.
2. The candidate seeking admission to the course shall be medically fit.
3. Every candidate shall pay the fees as prescribed by the authorities at the time of admission.
4. The students admitted to the course shall attend lectures, practical classes as prescribed by the Board of Control.
5. Every candidate shall be required to appear in the written test in various subjects and / or practicals as may be prescribed by the Board of Control.
6. The candidate shall be examined in such theory papers and practical examinations as may be prescribed in the syllabus.
8. The medium of instruction shall be English. The candidate may answer questions in the Examination in English only.
9. All the examination shall be conducted by the examiners appointed on the recommendation of the Board of Studies. The Practical examination will be conducted by Board of Examiners consisting of External Examiner and Internal Examiner.
10. A candidate shall be declared to have passed the examination if he / she obtained not less than 50% of the marks in theory / practical papers separately.

Objectives

The objectives of the examinations in the TNPESU are:

1. To determine the level of competence of exercise therapists in the theory and practice of fitness and wellness.
2. To provide a standard whereby exercise therapists may obtain recognition for their specialized knowledge and skills.

CURRICULUM

| Subject code | Name of the paper | Internal | External | Practical / viva | Total |
|--------------|---|----------|----------|------------------|-------|
| | Anatomy and Physiology | 25 | 75 | - | 100 |
| | Kinesiology, Biomechanics and Sports injuries | 25 | 75 | - | 100 |
| | Principles of Exercise Therapy | 25 | 75 | - | 100 |
| | Practicals | 25 | 75 | 75 | 100 |

PAPER I - ANATOMY & PHYSIOLOGY

Unit I:

Introduction to Anatomy and physiology. Cell: Definition – Structure – Cell Organelles : Nucleus – Cytoplasm – Mitochondria – Endoplasmic Reticulum – Ribosomes – Golgi apparatus – Plasma membrane – Peroxisomes – Lysosomes. Constructional units - cells - tissues - organs – systems. Tissues – Types of tissues – Functions.

Unit II:

Nervous System: Classification of Nervous System: Central nervous system – peripheral Nervous System – Autonomic Nervous System – Structure and Function of brain and spinal cord – Neuron – Reflex Arc – Effects of exercise on nervous system. Special senses – structure and function of Ear, Eye, Taste buds, Olfactory Epithelium.

Musculo skeletal system : Bone – Types of Bone – Functions. Joints – Types of joints – Functions. Muscle – Types of Muscle – Functions – Muscle Tone – Fatigue. Effects of exercise on Musculo skeletal system.

Unit III:

Cardiovascular System – Structure and Functions of heart – Types of Circulation – Conductive system of heart – Cardiac cycle – cardiac output – Blood pressure – pulse – Heart sounds – Blood : Components of blood plasma and its function – cellular components : structure and functions of RBC, WBC and platelets – Blood Coagulation – Blood groups – Effects of exercise on cardiovascular system.

Respiratory System – Respiration – Structure and function of lung – mechanism of breathing – Lung volumes and capacities – Oxygen and carbon dioxide transport – Pleura – Beneficial yogic practice and respiratory system.

Unit IV:

Digestive system : Structure and function of digestive tract – saliva – deglutition – peristalsis – Gastric juice – Bile – villi – Defecation – Effects of exercise on digestive system.

Endocrine System – Endocrine Glands – Hormones – Functions of hormones secreted by pituitary Gland – Thyroid gland – Parathyroid gland – Adrenal gland – pancreas – gonads – pineal gland – thymus. Effects of exercise on endocrine system.

Unit V

Excretory System : Nephron – Structure and functions of kidney – Concept of Urine formation – Skin structure and function – Temperature regulation – Effects of exercise on excretory system.

Reproductive System – Male reproductive system – Female Reproductive system – Spermatogenesis – Oogenesis – Menstrual cycle – Effects of exercise on reproductive system.

Reference:

1. Anthony & Kothoff: Text Book of anatomy and Psychology C.V.Mosby & Co.,
2. Astran Pond K. Rodahl.1986. "Text book of work physiology "New York : Mc.Graw– hill.
3. Evelyn C. Pearce (1986) Anatomy to Physiology fro Nurses. Sixteenth edition Oxford University Press Calcutta.
4. Edward L. Fox, Donald K. Mathews (1981) the Physiology Basis of physical Education and Athletics. CBS College publishing. Third Edition.
5. Essential Of physical Education
6. William E.Prentice, (1988) Rehabilitation Techniques in sports medicine, second edition Health south rehabilitation corporation , Brimingham, Alabama
7. W.C.Brown Devries , (1986) Physiology of exercise for physical education and athletics , Dubuque, iowa
8. Rasch P.(1989) Kinesiology and applied anatomy . Philadelphia , Lea & Febiger.

PAPER II - KINESIOLOGY, BIOMECHANICS and SPORTS INJURIES

Unit I:

Definition and meaning of kinesiology - aims and objective of kinesiology - need and importance of knowledge of kinesiology for the exercise therapist - functions and classification of human skeleton - articulations structure and classification - structure and functions of muscles - movements around the joints – two joint muscles - angle of pull.

Unit II :

Muscles of upper extremity - the shoulder region - trapezius – pectoralis major - deltoid - biceps brachii - triceps - teres major - latissimus dorsi – supraspinatus and infra-spinatus.

Muscles of the elbow - brachialis - brachio- radialis - anconeus.

Muscles of the lower extremity – Muscles of hip joint - sartorius – hamstring group - Biceps femoris, semi membranous, semi tendinosus - gluteus maximus, gluteus minimus, gluteus medius. Knee joint muscles : quadriceps group - rectus femoris, vastus medialis, vastus lateralis and vastus intermedialis. Muscles of the ankle joint : Gastrocnemius, soleus, tibialis posterior and tibialis anterior. Muscles of the trunk : Rectus abdominis, internal oblique, external oblique, transverse abdominis and erector spine.

Unit III :

Motion - type of motion, Distance and speed, Displacement and velocity, Acceleration, Angular distance and Angular displacement, Angular Speed, Angular Velocity, Angular Acceleration, Inertia, mass, weight - Newton's Laws of motion - Units in linear and angular motion - Force and its characteristics, Classification of force system, Composition and resolution of forces - Friction, impact - elasticity - Principles of Lever - Gravity, Methods of finding centre of gravity - Principles of Equilibrium.

Unit IV:

Sports injuries – Types of Injuries – Definition, Causes, Clinical Features, Management and Prevention of Soft Tissue Injuries : Skin Injuries – Muscle injuries – Sprain – contusion – Tendon injuries – Bursitis. Bone injuries : Fracture – Subluxation –Dislocation. Head Injuries – Spine injuries.

UNIT - V

Medical Issues in Sports – Contraindications to participation in sports – Collapsed or unconscious Athlete : Cardiac and Respiratory problems – Female athletic injuries : Athletic Amenorrhoea – Female Athletic Triad – Environmental Injuries : Heat related injuries – Heat

stroke – Heat exhaustion – Heat Cramp – Heat Stress – Cold related injuries – Frostbite – Hypothermia – Altitude Sickness.

References:

1. Brower, Marion. R " Efficiency of human movement. Philadelphin. W.B.Saundersco,1996.
2. Cooper, John, M. and R.B. class coul kinesiology st louis. C.V. Mosby C.,1963.
3. Wells, Kathorine F and kadhryn lulten, kinesiology scientific basis of human motion (6th ed) philadelphin, saunder college.
4. Darren L. Johnson, Scott D. Mair (2006) Clinical Sports Medicine, (1st edition) Mosby inc.
5. McMahon, Patrick J(2007) Current Diagnosis & Treatment in Sports Medicine (Ist Edition), Mcgraw-Hill.

PAPER III - PRINCIPLES OF EXERCISE THERAPY

Unit I:

Aims and principles of therapeutic exercise – Potential benefits of regular exercise - Pre-Participation health screening - role of exercise in the modern society – Exercise Rehabilitation – Principles of Therapeutic exercise – Rehabilitation goals – Range of Motion – Flexibility – Muscle Performance (Strength & Endurance) – Exercise Contraindications and Precautions – Functional Rehabilitation goals : Power – Speed – Agility – Co-ordination – Criteria for returning to sports.

Unit II:

Muscle weakness - Causes of muscle weakness - Prevention of disuse atrophy - Principles of treatment to increase muscle strength and function - Types of movement - active movement - classification (free exercise, assisted exercise, assisted - resisted exercise and resisted exercise) - passive movements – classification : relaxed passive movement -passive manual mobilization techniques.

Unit III:

Factors affecting the joint range of motion - prevention of stiffness - methods of joint mobilization - Testing for tightness and contracture of soft-tissue structures - Joint flexibility :Factors influencing joint flexibility - Techniques for increasing flexibility: Active and Passive stretching-Ballistic Stretching –PNF Stretching – Isometric Stretching – Dynamic Stretching

Unit IV:

Technique of strengthening the muscles - Types of muscle work - range of muscle work - Types of exercise used to strengthen muscles : resistance exercise programme for the muscles of the foot (invertors and evertors) - muscles of the ankle (Plantar flexors and dorsiflexors) - muscles of knee (flexor and extensors) - muscles of the hip (hip extensors, flexors, abductors, adductors, medial rotators, lateral rotators) - muscles of the trunk - muscles of the extensors and flexors of the spine - muscles of the shoulder girdle - shoulder Joint (flexors, extensors, abductors, adductors and rotators) - muscles of the elbow (flexors and extensors) - muscles of the Forearm (supinators and pronators) - muscles of the wrist (extensors and flexors) - muscles of the head and neck.

Unit V:

Posture: meaning and values of good posture - causes of poor posture –posture examination -
New York state posture test - iowa state posture test - proper use of body in sitting standing,
lifting, pushing and walking.

References:

1. Christopher M. Norris (1993) Sports injuries Diagnosis and Management for physiotherapists.
2. Jeff Ray K. Riffer(1985) Sports and Recreational injuries
3. Dr. R. G. Venkata Reddy(2005). Sports injuries prevention and control.
4. David Hpesrin(1999) Third Edition. The Injured Athlete.
5. Vivian Grisogono, John Murray (1984) sports injuries A self –help guide.
6. Kisner and Colby: Therapeutic Exercises – Foundations and Techniques, F.A.Davis.
7. Basmajian John V.: Therapeutic Exercise, Williams & Wilkins.
8. Dvir: Isokinetics: Muscle Testing, Clinical Applications, W.B.Saunders
9. Lephart Sm. (1993)Functional Rehabilitation , Baltimore. Wiliams & wilkins Pub.

PRACTICALS

UNIT I :

Fitness Evaluation: physical activity attitude assessment – assessing Health – disease - Risk factors – nutritional analysis of various diet.

UNIT II :

Muscular analysis of Fundamental Movements – Walking, Running, Throwing.

UNIT III :

Evaluating Flexibility – planning and logging stretch exercises – Active and passive stretching techniques for important muscles of body.

UNIT IV :

Evaluating muscle strength – Evaluating muscular endurance – planning and logging muscle fitness exercises - free weights or resistance machines and calisthenics care of the back and neck

UNIT V :

Practice of Active and Passive movements of all the joints of the body.

References:

1. Batman P. and Van Capelle M.(1995) The Exercise Guide to Resistance training . FITAU publications. Australia.
2. Fleck S.J.and Kraemer W.J. (1997) Designing Resistance Training Programs. Second Edition. Human Kinetics,
3. Dick, Frank W. (1980) sports Training Principles. London Lepus Books