NUTRITION AND PHYSIOTHERAPY VOC125

SEMESTER-I

SUBJECT-1 : NUTRIENTS AND NUTRITION

UNIT- I : CARBOHYDRATES

- Definition. And classification
- Physical and chemical properties
- Sources and biological role
- Deficiency & Excess diseases, other defects of carbohydrate metabolism.
- Nutritional aspects of carbohydrate

UNIT- II : PROTEINS

- Definition and classification
- Amino acids and their classification
- Physical and chemical properties
- Sources and biological role
- Protein deficiency & excess diseases, and inborn errors of protein metabolism.
- Nutritional aspects of proteins

UNIT- III : LIPIDS

- Definition. And classification
- Physical and chemical properties
- Sources and biological role
- Deficiency & Excess diseases, other defects of lipid metabolism.
- Nutritional aspects of lipids

UNIT- IV: MICRO NUTRIENTS

- Vitamins : Definition, classification and sources.
- Absorption & role of vitamins in metabolism.
- Deficiency diseases of vitamins.
- Minerals: Definition, classification and sources.
- Absorption & role of minerals in metabolism.
- Minerals deficiency diseases.

PRACTICAL

(i) Blanching and browning control

(ii) Preparation of fruit preserves (jam, jelly).

(iii) Preparation of vegetable preserves (pickle)

(iv) Tomato processing

(v) Fruit pulping / juice / beverage preparation

(vi) Preparation and standardization of traditional Indian fermented foods

(vii) Bread making - texture. Quantity cookery

(viii) Visit to food processing and preservation unit.

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SUBJECT-2 : NUTRIENTS AND METABOLISM

UNIT- I : CARBOHYDRATE METABOLISM

- Historical approaches to exercise and nutrition
- Overview of digestion, absorption and storage
- Carbohydrate metabolism
- Factors affecting utilization of carbohydrates during exercise
- Effect of training on carbohydrate metabolism
- Carbohydrate supplementation during exercise

UNIT- II : LIPIDS METABOLISM

- Overview of digestion, absorption and storage.
- lipoproteins and phospho-lipoproteins
- Fat as a fuel
- Fatty acid oxidation
- Strategies to improve fatty acid oxidation.
- Physical training
- Overall fat intake

UNIT- III : AMINO ACIDS METABOLISM

- Overview of digestion and absorption.
- Amino acid metabolism, related to exercise
- Protein turnover and exercise
- Protein synthesis – mechanism and control.
- Physical activity and protein requirements
- Utilization of protein
- Protein intake and performance

UNIT- IV: MICRO NUTRIENT METABOLISM

- Role of vitamins
- Effect of fat soluble and water soluble vitamins in the body
- Food sources
- Requirements of vitamins
- Role of minerals and
- Influence of macro and micro minerals
- Food sources
- Requirements of minerals

PRACTICAL

(i) Diet for weight gain and weight loss

(ii) Preparation of therapeutic diets -liquid diet, full fluid, solid and semisolid diet.

(iii) Diet in fever.

(iv) Diet in gastro intestinal diseases

(v) Diet in liver diseases.

(vi) Diet in cardiovascular diseases

(vii) Diet in kidney diseases

(viii) Diet in disease of metabolic disorder such as arthritis, diabetes and gout.

(ix) Diet in cancer

(x) Diet in Aids.

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SUBJECT-3 : LIFE CYCLE NUTRITION

UNIT- I : NUTRITION IN LIFE

- Nutrition during life span :
  - Pregnancy, lactation and infancy
  - Preschool age and school going
  - Adolescents, adults and old age.
- Role of nutrition in Growth and development
- Role of different nutrients at different stages of life.
- Concept of public nutrition - Relationship between health and nutrition
- Nutritional status -methods for assessing nutritional status

UNIT- II : ENERGY METABOLISM

- Energy metabolism
- Basal and resting metabolism –influencing factors.
- Energy pathways
- Role of macro nutrients in energy metabolism
- Role of micro nutrients in energy metabolism.
- Methods to determine energy requirements and expenditure.
- Body fluids and water balance

UNIT- III : DIET PLANNING

- Guidelines for dietary planning
- Determining nutritional needs
- Basic Guidelines for diet planning
- Nutritional status of Indians
- Cultural aspects of dietary planning.
- Diet planning for :
  - Sedentary people
  - Hard worker
  - Normal population.
  - Weights gain and weight loss.

UNIT- IV: DIET AND HEALTH

- Diet planning for Special cases
- Body composition Methods of study
- Nutritional disorders and their effect body composition.
- Nutritional concerns and prevention of nutrition related disorders
  - Obesity – underweight
  - Deficiency condition
  - Excess disease related to nutrients
  - Allergies
  - Eating disorders
- Nutritional intervention and diet modification-diet prescription
- Modifications of the normal diet.

PRACTICAL

(i) Adulteration of various food samples
(ii) Test for assessment of purity of water
(iii) Test for assessment of quality of milk and milk products
(iv) Test for assessment of quality of cereals/millets
(v) Test for assessment of quality of pulses
(vi) Test for assessment of quality of fats and oils
(vii) Test for assessment of quality of meat/fish products
(viii) Test for assessment of quality of canned/bottle fruits and vegetables
(ix) Test for assessment of quality of baked foods

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SCHEME OF EXAMINATION FOR NUTRITION AND PHYSIOTHERAPY

SEMESTER-II

PART-A : THEORY COURSES								
Paper No.	Code	Courses	Summative Evaluation	Formative Evaluation	Minimum Marks	Maximum Marks	Credits	
							L	P
I	NP/II/A/01	Introduction to Physiotherapy (Theory) Practical/Viva-Voce	60	20 20	50	100	05	01
II	NP/II/A/02	Therapeutic Modalities (Theory) Practical/Viva-Voce	60	20 20	50	100	05	01
III	NP/II/A/03	Injuries and Rehabilitation (Theory) Practical/Viva-Voce	60	20 20	50	100	05	01
IV	NP/II/A/04	INTERNSHIP	100	100	100	200	10 (NTCC)*	
TOTAL			**280**	**220**	**250**	**500**	**28**	

*** Non Teaching Credit Course**

NUTRITION AND PHYSIOTHERAPY

SEMESTER-II

SUBJECT-1 : INTRODUCTION TO PHYSIOTHERAPY

UNIT-I : INTRODUCTION TO PHYSIOTHERAPY

- History of physiotherapy
- Ethical principles related to physiotherapy
- Scope of practice in physiotherapy, Medical ethics
- Physiotherapy as a profession
- Relationship with patients
- Relationship with health care institutions

UNIT-II : INTRODUCTION TO ANATOMY

- Basic terms and terminology
- Musculo-skeletal, vascular, cardiopulmonary system
- Connective tissue & its modification, tendons, membranes, special connective tissue.
- Bone structure, blood supply, growth, ossification, and classification.
- Muscle classification, structure and functional aspect.
- Joints – classification, structures of joints, movements, range, limiting factors, stability, blood supply, nerve supply, dislocations and applied anatomy

UNIT-III : POSTURAL DEFECTS

- Common Postural Defects of Antero-Posterior Plane of Spine; their causes and corrective exercises :
  - Kyphosis
  - Lordosis
  - Kypho-Lordosis
  - Flat Back
  - Scoliosis
- Common Postural Defects of Lower Extremities, their causes and corrective exercises :
  - Knock-knee
  - Bow-legs
  - Flat-Foot

UNIT-IV : INTRODUCTION TO INJURIES

- Injuries : Types; Traumatic, Overuse
- General Factors Causing Injuries
- Role of a trained personnel in the management of Injuries
- Complications of Incomplete Treatment
- Most common Injuries (their introduction, general immediate and long term treatment) :
  - Sprain
  - Strain
  - Contusion
  - Dislocation
  - Fracture

PRACTICAL

(i) Identification and description of all anatomical structures.

(ii) The learning of Anatomy is by demonstration only through dissected parts, slides, models, charts, etc.

(iii) Demonstration of dissected parts (upper extremity, lower extremity, thoracic &abdominal viscera, face and brain).

(iv) Demonstration of skeleton- articulated and disarticulated.

(v) During the training more emphasis will be given on the study of bones, muscles,

(vi) joints, nerve supply of the limbs and arteries of limbs.

(vii) Surface anatomy:
- Surface land mark-bony, muscular and ligamentous.
- Surface anatomy of major nerves, arteries of the limbs.

(viii) Points of palpation of nerves and blood vessels.

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SUBJECT-2 : THERAPEUTIC MODALITIES

UNIT-I : INTRODUCTION TO THERAPEUTIC MODALITIES

- Introduction, therapeutic effects and uses, and technique of application of following therapeutic modalities:
  - Ice
  - Infrared radiation
  - Hot-moist therapy
  - Wax-bath
  - Contrast Bath
- Short wave Diathermy, Ultra sound Therapy, Transcutaneous Nerve Stimulation, LASER Therapy

UNIT-II : INTRODUCTION TO THERAPEUTIC EXERCISE

- Therapeutic Exercises : Definition, General Goals and Scope
- Classification and Therapeutic Application of:
  - Active Exercise (Free, Assisted, Resisted Exercise)
  - Passive Exercise (Relaxed, Forced Passive Exercise)
- Muscle Strengthening
- General causes of muscle weakness
- Principles of muscle strengthening
- Mobilization of Joint:
  - General factors causing limitation of Joint-mobility
  - General mobilizing methods for a stiff joint

UNIT-III : THERAPEUTIC MASSAGE

- Massage : Introduction and Definition.
- Effects of Massage: Physical, Physiological and Psychological.
- General contraindications of Massage
- General approach to Massage application
- Role of Massage in Sports Competitions
- Classification of Massage Techniques.

UNIT-IV : TECHNIQUE AND APPLICATION OF MASSAGE

- Introduction, Technique of Application, Effects and uses of following Massage Techniques:
  - Superficial Stroking
  - Effleurage
  - Kneading
  - Petrissage
  - Friction
  - Percussion
  - Vibratory Technique

PRACTICAL

(i) Starting positions and derived positions
(ii) Range of motion (PROM, AROM, AAROM) exercises to all joints
(iii) Measurement of joint range using goniometer
(iv) General and local Relaxation techniques
(v) Suspension exercise to all major joints
(vi) Massage – upper limb, lower limb, back, face
(vii) Manual muscle testing of individual muscles
(viii) Coordination exercises, balancing exercises

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SUBJECT-3 : INJURIES AND REHABILITATION

UNIT-I : SPECIFIC INJURIES OF UPPER EXTREMITY

- Head & face – maxillofacial injuries, helmet compression syndrome
- Shoulder – instability, rotator cuff injury, biceps tendonitis and rupture, pectoralis, major rupture, scapular dyskinesis and acromio-clavicular joint injuries,
- Elbow – tennis elbow, golfer's elbow, Wrist and hand – carpal tunnel syndrome, gamekeeper's thumb.

UNIT-II : SPECIFIC INJURIES OF LOWER EXTREMITY

- Spine– PIVD, Kissing spine, cervical whiplash injuries, facet joint syndrome, SI joint dysfunction, Hip – muscle strain, piriformis syndrome, ITB syndrome, osteitis pubis,
- Knee– menisci, cruciate, collateral, osteochondritis, chondromalacia patellae, biceps femoris tendonitis, swimmers knee, patello-femoral pain syndrome,
- Leg & ankle – shin splint, achillis tendonitis & rupture, TA bursitis, ankle sprain, plantar fascitis, turf toe syndrome,

UNIT-III : INJURY PREVENTION

- Principles of injury prevention.
- Principles of training & Rehabilitation in injuries.
- Passive movements–definition, classification, indications, contra indications, advantages, limitations, techniques - emphasize PROM to upper, lower, neck and trunk muscles
- Active movements - definition, classification, indications, contra indications, advantages, limitations, techniques - emphasize active movements to upper, lower, and neck and trunk muscles

UNIT-IV : REHABILITATION AND THERAPEUTIC EXERCISE

- Joint Mobilization : Definition – Mobilization, Manipulation, indications, limitations, contraindications and precautions, applications of Mobilization technique to various joints.
- Principles of Maitland, Mulligan and Meckzi joint Manipulation techniques.
- Resisted exercise:
  - Definition – strength, power, endurance. Guiding principle of resisted exercise
  - Isometric Exercise
  - Isokinetic Exercise
  - Dynamic Exercise - Concentric and Eccentric, Constant and Variable Resistance
  - Progressive Resistance Exercise - de Lormes, Oxford, MacQueen, Circuit Weight Training
  - Plyometric Training—Stretch-Shortening Drills

PRACTICAL

(i) Joint Mobilisation to individual joint
(ii) Stretching of individual and group muscles
(iii) Resisted exercises to individual and group muscles,
(iv) open and closed kinematic exercises
(v) Goniometry – measurement of joint ROM
(vi) Identify Muscle work of various movements in body at different angle.
(vii) Identify normal and abnormal posture.
(viii) Normal gait with it parameters and identify abnormal gait with the problems in it.

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