

NUTRITION AND PHYSIOTHERAPY

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.



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.



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/milletts
- (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

REFERENCE :

- Bamji, M.S., Rao, P.N., Reddy, V (Eds) (2003): Textbook of Human Nutrition, Oxford and IBH Publishing Co. Pvt. Ltd., New Delhi.*
- Beaton, G.H. and Bengoa, J.M. (Eds) (2000): Textbook of Human Nutrition, Oxford and IBH Publishing Co. Pvt. Ltd., New Delhi.*
- Crampton E.W. and L. E. Lloyd (1915), 'Fundamentals of Nutrition', San Francisco W. H. Freeman*
- Davidson S.R, Passmore and IF. Brock (1986), 'Human Nutrition and Dietetics' London Churchill, Livingstone*
- Distributor .*
- Geooge J. Banwart 'Basic Food Microbiology', Delhi, CBS Publishers and distributors.*
- James M. Jay 'Modern Food Microbiology' New Delhi, CBS Publishers and distributors.*
- Lehninger A. L. (1990) 'Principles of Biochemistry' New Delhi - CBS Publisher and*
- Lubert Stryer 'Biochemistry'*
- Meyer 'Food Chemistry' New Delhi, C. B. S. Publications & distributors.*
- Owen, A.Y. and Frackle, R.T., (2002): Nutrition in the Community. The Art of Delivering Services, 2nd Edition Times Mirror/Mosby.*
- Part, K. (2000): Part's Textbook of Preventive and Social Medicine, 18th Edition, M/s. Banarasidas Bhanot, Jablpur.*
- Potter N. N. (1987), 'Food Science, New Delhi, CBS Publication and Distributor.*
- Syed etal (1997), , Experimental Methods in Food Engineering', New Delhi, CBS*
- Yadav S. 'Food Chemistry' New Delhi, Anmol Publications Pvt. Ltd.*



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.



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

A handwritten signature in blue ink, consisting of a stylized 'S' followed by a horizontal line.

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.

REFERENCES :

- Freddie, H.F. & David, A.S. (2001). Sports Injuries: Mechanism, Prevention & Treatment. Lippincott Williams and Wilkins, London*
- Forster, A and Palastanga, N. (2005). 8th ed. Clayton's Electrotherapy. C.B.S. Publishers and Distributors, New Delhi.*
- Madden, C.& Netter, F. (2010) Netter's Sports Medicine. Philadelphia, PA: Saunders/Elsevier. ISBN-10: 1416049223. ISBN-13: 978-1416049227*
- Pande, P.K. and Gupta, L.C. (1987). Outlines of Sports Medicine. Jaypee Brothers, New Delhi*
- Roy, Steven and Irvin, Richard (1983). Sports Medicine: Prevention, Evaluation, Management and Rehabilitation. Prentice Hall, INC Englewood Cliffs, New Jersey*
- Wood, E.C. and Becker, P.D. (1981). Beard's Massage. W.B. Saunders Company, Philadelphia.*
- Zachazewski, J.E. et. Al (1996). Athletic Injuries and Rehabilitation. W.B. Saunders Company, Philadelphia.*

