BENGALURU CITY UNIVERSITY

SYLLABUS FOR

M.Sc. NUTRITION AND DIETEITCS

(I &II SEMESTER)

2021 – 2022 ONWARDS

SEMESTER I

NUTRITION AND DIETETICS

PAPER I

HUMAN NUTRITION

Code: MSND 101 **Total marks: 100**
Hours: 52 **Theory: 70**
Instructions/week: 04 **IA : 30**

OBJECTIVES

- Enable the students to understand the metabolic role of macro and micro nutrients and their importance in human nutrition.
- Enable the students to translate the knowledge into practical guidelines to meet the nutritional demands of the individual at different ages.

UNIT I 14 hours

- Carbohydrates: Introduction, classification, physiological function, digestion, absorption, metabolic utilization of CHO, artificial sweeteners, glycemic index of food and its uses , glycemic load, modification of carbohydrate intake for specific disorders-lactose intolerance, diabetes mellitus.

- Dietary Fibre- Introduction, types, RDA, components of dietary fibre, Role of dietary fibre in human nutrition.

- Protein**:** classification, functions, requirements and RDA, digestion, absorption and metabolic utilization of protein, quality of protein and Protein deficiency.

- Amino acid-Types, functions, requirements and deficiency

UNIT II 10 hours

- Lipids- Classification, functions, significance of fatty acid, Requirements of total fats and fatty acids, RDA, digestion, absorption, metabolic utilization of fats. Role of lipo protein, cholesterol and triglycerides in health and disease.
- Fatty acid- Types, functions, requirements, food sources and deficiency.

- Omega fats: Classification, role in good health, daily requirements, food sources, fortification of omega fats.

UNIT III **8 hours**

- Water and Electrolytes: Electrolytes and body composition, body water distribution and functions, water balance and its regulations, requirements of water.
- Fluid Imbalance: Dehydration, Oedema, water toxicity.
- Determination of energy value of food, components of energy expenditure- BMR, PAL, RMR, PAR, Thermic control of food intake, Role of hormones in energy requirements for different age groups and energy balance.

UNIT IV **8 hours**

- Macro minerals-Physiological functions,food sources, deficiency and requirements of Calcium,Potassium, Phosphorus, Magnesium, Sodium, Chlorine and Sulphur.
- Micro minerals -Physiological functions, food sources, deficiency and requirements of Iron, Copper, Zinc, Iodine, Fluoride and Manganese.

UNIT V **12 hours**

- Fat soluble vitamins: Physiological functions, food sources, deficiency, interaction with other nutrients and requirements - Vitamin A,D, E and K.
- Water soluble vitamins: Physiological functions, food sources, deficiency and interaction with other nutrients and requirements -Thiamine, Riboflavin, Niacin, Folic acid, Pyridoxine, B12, Biotin, vitamin C and Pantothenic acid.

SEMESTER I

Nutrition and Dietetics

Paper I HUMAN NUTRITION

PRACTICALS

Code: MSND 101P **Total marks: 50**
No. of Weeks: 13 **Practicals : 35**
Hours/week :04 **IA : 15**

OBJECTIVE

- To familiarise students with planning and preparation of recipes with different nutrients.

Unit I

Planning and preparation of protein rich recipes and comparison with reference protein egg white

Unit II

Planning of recipes with low glycemic index and calculate glycemic load

Planning and preparation of recipes rich in soluble fibre and calculate

Unit III

Planning and preparation of recipes with optimal omega fatty acids ratio

Unit IV

Planning and preparation of bio available macro and micro mineral rich recipes (iron and calcium)

Planning and preparation of bio available vitamin rich recipes

UNIT V

Analysis of body composition using body stat apparatus

REFERENCES

1. Text Book of Human Nutrition – Mahtab S. Bamji, N Prahlad Rao, Vinodini Reddy, 2nd edition,Oxford & IBH Publishing Co. Pvt. Ltd.
2. Perspectives in Nutrition – Gordon M. Wardlaw, Margaret Kessel, 5th edition, Mc Graw Hill Publication.
3. Human Nutrition – Geissler & Powers, 11th edition, Elsevier Publications.
4. Normal and Therapeutic Nutrition - Robinson & Lawler, 17th edition, Mac Millan Publishers.
5. Foods – Nutrition and Health – Dr. Vijaya Khader, Kalyani Publishers.
6. Mahan L.K and Ecott- Stump, S.(2000): Krause's Food, Nutrition and Diet Therapy
7. Shils,M.B.Oslon,J.A.Shike, N and Rose, A.C.(Ed).(1999): Modern Nutrition in Health and Disease, 9th Edition, San Williams and Wilkins
8. WHO Technical Report Series
9. Indian Council of Medical Research, Recommended Dietary intake for Indians- Latest Recommendations
10. Advanced Nutrition and Human Metabolism, Sareen S.Gropper, Jack. L.smith, James, L.Groff. Fourth Edition
11. Williams Basic Nutrition and Diet Therapy. Static Nix. 12 th Edition(2005)

Journals

- Nutrition Reviews
- International Journal of Vitamin and Nutrition Research

SEMESTER I

NUTRITION AND DIETETICS

PAPER II

HUMAN PHYSIOLOGY

Code: MSND 102 **Total marks: 100**
Hours: 52 **Theory: 70**
Instructions/week: 04 **IA: 30**

OBJECTIVES

- To enable the students to understand the various systems in the body
- Advance their understanding of some of the relevant issues of human physiology

UNIT I 8 hours

- Basic Tissues-Classification, Structure, Functions, Haematopoiesis, Blood coagulation and blood groups.

UNIT II 10 hours

Nervous System

- Structure of brain and spinal cord – Functions**,** Classification of Nervous system**,** Neurotransmitters**,** Cerebrospinal fluid.
- Afferent and Efferent nerves, Reflex action
- Structure of nerve cell and conduction of nerve impulse
- Blood brain barriers

UNIT III 12 hours

Endocrine System and Immune system

- Endocrine Gland: Structure , functions and secretion of endocrine glands
- Formation and secretion of hormones and control of hormone secretion
- Thyroid Gland: Structure, formation of hormones, functions, hyper and hypothyroidism.
- Pituitary Gland – Structure, secretion of hormones, abnormalities
- Parathyroid Gland – Structure of parathyroid, secretion, functions
- Islets of Langerhans –structure, functions, deficiency

Immune system

- Role of thymus
- Cell mediated and hormonal immunity
- Activation of WBC, production of antibodies and B cells

UNIT IV **12hours**

Digestive System

- Structure, functions of GI secretion, Role of enzymes in digestion, Gut flora, structure and functions of Liver.

Blood and Cardiovascular System

- Structure, functions of heart and blood vessels, Blood Pressure, heart rate, Blood pressure its regulations, Factors affecting BP and heart rate.

- Regulations of cardiac output, Pulmonary, systemic and Portal circulations.

Composition of blood

- Plasma proteins- functions.
- Blood lipids- Chylomicrons, VLDL, HDL, cholesterol and Triglyceride
- Enzymes in blood and blood coagulations.

Respiratory System

- Mechanism of respiration, Structure of respiratory tract, Respiratory rate, Air volume in lung, Respiratory abnormalities.

UNIT V **10 hours**

Excretory and Reproductive System

- Structure, functions of excretory tract
- Urine formation – physiology and composition
- Role of kidney in maintaining water and electrolyte balance
- Testes – structure of testes, function and deficiency
- Ovaries – Structure and functions

SEMESTER I

Nutrition and Dietetics

Paper II- HUMAN PHYSIOLOGY

PRACTICALS

Code: MSND 102P	**Total marks: 50**
No of weeks: 13	**Practicals : 35**
Hours/week: 04	**IA: 15**

OBJECTIVE

- To acquaint the students with principles, techniques and application of different methods of analysis for various components in blood.

Unit I

Determination of blood group and Rh factor

Enumeration of RBC Count

Estimation of haemoglobin

Unit II

Estimation of blood glucose using glucometer

Monitoring of pressure using BP apparatus

Test for physical fitness- flexibility endurance and muscular strength test

Unit III

Pulmonary function test (Spirometry test to assess lung health)

Unit IV

Skin Prick test to diagnose food allergy

Unit V

A visit to a physical fitness / health care centre and preparation of report

REFERENCES

1. Textbook of Medical Physiology – Guyton, 8th edition, HBJ International Edition, WB Sanders.
2. Essentials of Medical Physiology – Anil Baran Singha Mahapatra, 2nd edition, Current Books International.
3. Human Physiology – An Integrated Approach – DU Silverthorne, Prentice Hall.
4. Human Physiology – from cells to system – L Sherwood, 6th edition.
5. Textbook of Biochemistry (for Medical Students) – DM Vasudevan and S Sree Kumari,4th edition, Jaypee Brothers Medical Publishers (P) Ltd., New Delhi
6. Ganong, W.F, (1985) Review of Medical Physiology, 12th edition, Lange Medical Publication
7. Guyton A.C(1985), Function of Human Body, 4th edition, W.B, Sanders Company, Philadelphia
8. Guyton, A.C and Hall, J.B, (1996) Text Book of Medical Physiology, 9th edition, W.B Sanders Company, Prism Books Pvt ltd, Bangalore
9. Jain A.K Text Book of Physiology, vol 1 and II. Avichal Publishing Co New Delhi.

SEMESTER I

NUTRITION AND DIETETICS

PAPER III

NUTRITIONAL BIOCHEMISTRY

Code: MSND 103 **Total marks: 100**
Hours: 52 **Theory: 70**
Instructions/week: 04 **IA: 30**

OBJECTIVES

- Develop knowledge in biochemical aspects of nutrition.
- To know the classification, functions and metabolism of lipids, vitamins, and minerals.

UNIT I 10 hrs

- Thermodynamics: Laws, Application of thermodynamic principles in living system
- Bioenergetics- energy transfer, free energy concept, exergonic and endergonic reactions, High energy compounds
- Mitochondrial Electron Transport chain – Stepwise process
- Schematic representation indicating sites of energy conservation, ATP synthesis, Oxidative Phosphorylation.

UNIT II 12 hrs

- pH, physiological relevance, buffers and their biological importance.
- Water as a solvent of life.
- Polysaccharides: Definition, classification and functions of homo and hetero polysaccharides, nutritional significance of polysaccharides.
- Fat: Types and Nutritional significance
- Blood Proteins : Nature and functions
- Enzymes: Charecteristics, classification, functions, clinical significance

UNIT III **10 hrs**

- Metabolism of Carbohydrates: Glycolysis, TCA cycle, HMP shunt and gluconeogenesis, threshold for glucose, glycogen metabolism, impairment of carbohydrate metabolism.
- Metabolism of proteins - General reactions and urea formation.
- Metabolism of Lipids - Role of essential fatty acids and Lipoproteins, Biosynthesis and breakdown of Cholesterol, Beta Oxidation of fatty acids, biosynthesis of fatty acids, disorders of lipid metabolism- Ketosis
- Metabolic Changes during starvation.

UNIT IV **10 hrs**

- Molecular biology : Central Dogma, DNA replication, Transcription and Translation
- Nutrigenomics and human genome project: Definition, concept and theory.
- Mutation : Principle, types, effects, mutagens
- Antioxidant nutrients: Source, principle compounds, protective compounds in foods, inhibition of carcinogen activation.

UNIT V **10 hrs**

- Water Soluble Vitamins-Physiological action, storage, transport, sources, functions and deficiency of: Thiamin, Riboflavin, Vitamin B12, Pantothenic acid, Folic Acid, Pyridoxine, Niacin, Ascorbic acid.
- Fat Soluble Vitamins- Physiological action, transport, utilization, storage, sources, functions and deficiency ofVitamin A, Vitamin D, Vitamin E , Vitamin K
- Minerals - sources, daily requirements, functions, dietary sources and deficiency of calcium, Phosphorus, Iron, Iodine, Fluorine and Zinc, Copper, Manganese, Selenium and Chromium.

- Water - Functions, Distribution, Requirements
- Disturbances in Fluid Balance- Dehydration and Oedema

SEMESTER I

Nutrition and Dietetics

Paper III-NUTRITIONAL BIOCHEMISTRY

PRACTICALS

Code: MSND 103 P **Total marks: 50**
No. of Weeks: 13 **Practicals : 35**
Instructions/week: 04 **IA : 15**

Unit I:

Estimations of Glucose – Benedict's method

Estimation of reducing sugar – DNS Method

Unit II

Estimation of ascorbic acid – Bessey's modified method

Estimation of inorganic phosphate – Fiske Subbarow Method

Unit III

Determination of Iodine value

Determination of saponification value

Unit IV

Estimation of Alanine by Sorenson's Method

Preparation of buffer

Unit IV

Preparation of starch from potatoes

Preparation of casein and lactose from milk

REFERENCES

1. A Textbook of Biochemistry – A V S S Rama Rao, 9th edition, UBS Publisher's Distribution Pvt.Ltd.
2. Nutritional Biochemistry – Tom Brody, 2nd edition, Academic Press
3. Biochemistry – U Satyanarayana, U Chakrapani, Books & Allied (P) Ltd.
4. Textbook of Biochemistry (for Medical Students) – DM Vasudevan and S SreeKumari,4th edition, Jaypee Brothers Medical Publishers (P) Ltd., New Delhi.
5. Textbook of Biochemistry (for Medical Students) – DM Vasudevan and S SreeKumari,4th edition, Jaypee Brothers Medical Publishers (P) Ltd., New Delhi.
6. Textbook of Medical Biochemistry – M N Chatterjee, RanaShinde, 7th edition,Jaypee Brothers.
7. Textbook of Medical Biochemistry – S Ramakrishnan, K G Prasannan, R Rajan,3rd edition,Orient Longman.
8. Command Stumph, Outlines of Biochemistry.
9. Devlin T.M., Biochemistry by Stryer Text book of Biochemistry with clinical correlations.
10. Lehninger, Principles of Biochemistry, by 4th Ed. By Nelson D.L. and Cox.M.M.
11. Murray R.K., Grammer, D.K., Mayer P.A., Rodwell V.W., Harpers, Biochemistry, a lange medical book 26th Ed. Mc. Graw Hill, HealthProfessions Division.
12. West. E.S., Todal, W.R., Mason H.S. and Van Brygen J.T., Text Book of Biochemistry.

SEMESTER I

NUTRITION AND DIETETICS

PAPER IV

FOOD MICROBIOLOGY AND PRESERVATION

Code: MSND 104 **Total marks: 100**
Hours: 52 **Theory: 70**
Instructions/week: 04 **IA: 30**

OBJECTIVE

- To gain knowledge about principles and methods of food Preservation.

UNIT I 9 hours

- Classification of microorganisms, morphology – bacteria, yeast, mould and algae.
- Micro-organisms-Importance in food, intrinsic and extrinsic parameters that affect microbial growth.
- Microbes and growth of microbes, nutrient content, pH, water activity, humidity, temperature, gaseous atmosphere

UNIT II 10 hours

- Food spoilage – Definition, factors influencing food spoilage, types of food spoilage such as microbes, changes in food quality due to spoilage, methods of detection of food spoilage.
- Sources of contaminants – water, air soil, animals and humans. Food-borne diseases. Bacterial food borne diseases, food-borne viral pathogens, food-borne animal parasites, protozoa, mycotoxins – types, health issues caused by mycotoxins.

UNIT III 11 hours

- Spoilage of cereals and cereal products – moulds and ropiness
- Spoilage of fruits and vegetables
- Microbiology of milk and milk products – kinds of microbes, sources of contaminants and control in milk, butter, yogurt, and cottage cheese,spoilage of milk and milk products – ropiness and proteolysis
- Microbiology of egg, poultry, fish and meat – sources of contaminants, Spoilage of fish and other sea food, meat and meat products (aerobic and anaerobic),poultry , eggs and control measures.

- Spoilage of sugar products
- Spoilage of canned products

UNIT IV **12hours**

Methods of food preservation

- Principles of food preservation, methods of food preservation – pasteurization, blanching, canning, drying and dehydration, Use of high temperature, Use of low temperature - slow and quick freezing, freeze drying , microwave heating, hurdle concept, food irradiation- principle effects of irradiation, advantages and disadvantages.
- Control of microorganisms – sterilization, physical agents – light, electricity, heat, chemical agents and filtration.
- Definition of fermentation – benefits of fermentation, types of fermentation, acid fermented and yeast fermented foods, fermented dairy products – yoghurt, cheese, fermented milk, vegetable fermentation, fermented beverages. Indigenous products – idly, dosa, dokla.

UNIT V **10 hrs**

- Food Additives – Definition, antioxidants, chelating agents, food colours, curing agents, emulsifying, stabilizing and anti foaming agents, sequestrants, flour improvers, flavors, anti-caking agents, humectants, leavening agents.
- Preservatives – Definition, classification – Class I and Class I,Use of preservatives, salt, sugar and vinegar.
- Methods of food preservation – cold storage and dry storage
- Method of packaging- list of common packaging materials and their usage with examples.

SEMESTER I

Nutrition and Dietetics

Paper IV - FOOD MICROBIOLOGY & PRESERVATION

PRACTICALS

Code: MSND 104 P **Total marks: 50**
No. of Weeks: 13 **Practicals : 35**
Hours/week: 04 **IA : 15**

OBJECTIVES

- To understand the microorganisms in foods and in relation to health
- To gain knowledge about principles and methods of food preservation.

UNIT I

Identification of microorganism causing spoilage in bread/fruits/vegetables

Role of yeast in bread.

UNIT II

Quality testing for milk and milk products

UNIT III

Identification of class I and class II preservatives and E numbers

UNIT IV

Preparation of jams, jellies and pickles

a. Spread test

b. Test jam for setting point

c. Sensory evaluation

d. Shelf life

UNIT V

Preparation of squash, tomato ketchup and chutneys

a. Sensory evaluation

b. Shelf life

REFERENCES

1. Frazier, We, Food Microbiology, Tata Mc Graw Hill 1978.
2. Food Facts and Principles – ShakuntalaManay, New Age International Publishers.
3. Fruit and Vegetable Preservation – Principles & Practices – R P Srivastava, Sanjeev Kumar. 3rd, edition, international Book Distributing Co., Lucknow
4. Nutritional Science – B. Sri Lakshmi, New Age International Publishers, 2nd edition.
5. Food Science, Chemistry and Experimental Foods – Dr.M.Swaminathan, the Bangalore Printing& Publishing Co. Ltd., Mysore.
6. Food Science – Norman N Potter, Joseph H. Hotchkiss, 5th edition, CBS Publishers &Distributors, New Delhi.
7. Food Hygiene and Sanitation – S Roday, Tata McGraw Hill Publishing Co. Ltd.,3rd reprint.
8. Food Poisoning and Food Hygiene – Hobbs B C and R J Gillbert, 4th edition,English Language, Book Society and Edward Arnold Publishers Ltd.
9. Food Science – Sumati R. Mudambi, Shalini M. Rao, M V Rajagopal, Revised 2nd edition, New Age International Ltd. Publishers.

SEMESTER I

NUTRITION AND DIETETICS

PAPER V

SOFT CORE

RESEARCH METHODS AND BIO STATISTICS

Code: MSND 105 **Total marks: 100**
Hours: 40 **Theory: 70**
Instructions/week: 03 **IA: 30**

OBJECTIVES

- To enable the students to understand the importance of research design.
- To understand the application of statistical techniques for analysis and interpretation.

UNIT I 8 hrs

- Methods of Research- Definition, meaning, objectives, characteristics, criteria of good research, role of need and scope of research in the field of Nutrition Research process – steps in conducting research, selection of topic/ROL and Research/formulate concepts.
- Hypothesis – definition, purposes, types, attributes of sound hypothesis
- Research design, research questions, objectives and assumptions
- Funding agencies for research, Research ethics.

UNIT II 8 hrs

- Tools for Data collection, Primary and secondary methods of data collection, advantages and disadvantages, Different types of questionnaires, rating scales, interview, schedule, observation, inventories, checklist, rating scales, ranking scales, checklists, attitude scale, inventories standardised tests, interviews, observation. Development of tools, estimation of reliability and validity of tools.
- Sampling – Definition, meaning, and importance, characteristic of good sample, limitations and advantages of sampling. Types of Sampling – Probability Sampling – simple, random sample, systematic random sample stratified random sample, cluster, random and non-random samples, random numbers and use.

UNIT III **8 hrs**

- Non-probability – purposive samples, incidental samples, judgment samples, convenience sampling, quota samples, volunteer sampling, snowball and incidental. Sampling and non-sampling errors, general consideration in the determination of sample size.
- Survey – meaning, advantages and limitations, types
- Report Writing- Reporting – methods of reporting, technical reports, research publications – citation, index, impact factor. Writing Thesis – Thesis definition, parts, steps in writing, writing research proposals
- Research abstract – definition, guidelines in writing abstract.

UNIT IV **8 hrs**

- Classification and Tabulation
- Measures of central tendency-mean, median and mode, their relative advantages and disadvantages
- Measures of dispersion: Mean deviation, standard deviation
- Correlation and Regression- Correlation and its interpretation. Product Moment and Rank order Correlation, Coefficient Regression Equation and its interpretations, use for prediction.
- Probability-Rules of probability and its application Distribution- Normal, binomial- their properties, importance of these distributions in statistical studies. Skewness and kurtosis

UNIT V **8 hrs**

- Coefficient of variation, percentile
- Types of correlation, coefficient of correlation and its interpretation
- Contingency tables, Chi-square test
- Elements of testing a statistical Hypothesis- formulation of the problem, definition of type I and II errors. Level of significance, t test , Z test, F test
- Design of experiment- Analysis of Variance
- Non Parametric Inference: sign Mann-Whitney and X^2 test (as goodness of fit and independence of attributes in 2x2 and r x c contingency tables)
- Soft ware packages for statistical analysis
- Coding of data, editing and cleaning of data
- Data interpretation, presentation of result

REFERENCES

1. Statistical Methods (2002), – S P Gupta, Sultan Chand and Sons Publishers, New Delhi.
2. Research Methodology – methods and techniques (2002), – C R Kothari, Wiley Eastern Limited, Madras.
3. Methodology of research in Social science – O.R. Krishnaswami and M. Ranganatham, revised edition, , Himalaya Publishing house ltd, 2015.
4. Shanthi, P., Sophia and Bharathi(2000), Computer oriented statistical methods/probability and statistics, charulatha publications, second edition.
5. Pillai, R.S.N and Bagavathi, V.(2001), Statistics, Chand and company limited.
6. Research Methodology (Concepts, Methods, Techniques and SPSS)-Dr.
7. Priri R. Majhi, Dr.Prafull K. Khatua, II Edition, Himalaya Publishing House, Pvt. Ltd. 2015.
8. A Handbook of Methodology of Research – Dr.Rajammal P Devadas and Dr. K Kulandaveil, Sri Ramakrishna Mission, Coimbatore.

II SEMESTER

NUTRITION AND DIETETICS

PAPER I

FOOD SCIENCE

Code: MSND 201 **Total marks: 100**
Hours: 52 **Theory: 70**
Instructions/week: 04 **IA: 30**

OBJECTIVES

- To provide an understanding of composition of food
- To familiarize students with changes occurring in various food stuffs as a result of processing and cooking
- Study the effect of food in cooking
- To familiarise on the recent advancement in food science

UNIT I 10hrs

Introduction and Sensory Evaluation

- Introduction to Food Science as a Discipline
- Concept of food
- Properties of food- Physical properties[Definitions and properties of Solution, Boiling point, Freezing point, Bound and Free water, Osmotic Pressure, Acids and bases in food, Colloids- sols ,gels, emulsions, foams, suspensions]
- Applications of Colloidal Chemistry in food preparations

Sensory Evaluation

- Definition
- Introduction to Quality Attributes of Food
- Gustation - the Sense of Taste
- Types of tests- Subjective and Objective tests
- Selection of panel of Judge
- Preparation of samples
- Culinary skills, Culinary applications in food industry and product development

UNIT II **12 hrs**

Cereals and Millets

- Structure, Composition and Nutritive value - Cereals and Millets
- Starch – gelatinization, factors affecting gelatinization, starch gel, retrogradation, and syneresis
- Cereal protein – gluten, factors affecting gluten formation
- Nutrient changes during different treatment methods of cereal grains
- Role of natural leavening agents.
- Characteristics and functional properties of native and modified starches
- Flour – Types, properties, quality and tests for flour quality, role of ingredients and preparation of bread.

Pulses and Legumes

- Pulses - Composition, nutritive value, toxic constituents physical & chemical properties of pulses, pulse cookery.
- Decortication
- Soaking and germination of pulses
- Fermentation of pulses
- Roasting and Puffing
- Effect of cooking treatments on the nutrient composition, quality and quantity of legumes

UNIT III **10 hrs**

Fruits and Vegetables

- Composition, texture and flavour components-terpenoids, flavonoids, Sulphur compounds and other volatile flavor compounds
- Pigments – Water insoluble and Water soluble pigments and factors affecting plant pigments in cooking: acid, alkali, metals, heat
- Changes during cooking and processing
- Browning reaction and preventive measures
- Post harvest changes and storage methods
- Enzymatic browning and its prevention
- Physio – chemical changes in Fruits and Vegetables- ripening and textural changes.

Spices and Beverages

- Composition, flavouring extract, and medicinal value.
- Classification and nutritive value, Preparation of milk based beverages.

UNIT IV **10 hrs**

Fats and Oils

- Sources, physical and chemical properties
- Reactions of fats - Rancidity and Polymerization
- Functional properties of fat and oils
- Interesterification of fats
- Fat replacers
- Factors affecting amount of fat absorbed during cooking

Nuts and Oilseeds

- Nuts and oil seeds – composition and nutritive value
- Role of nuts and oil seeds in cookery.
- Oil extraction and by- products

Sugar Cookery

- Principles and stages of sugar cookery
- Solubility of solution
- Caramalization, Crystallization and factors affecting it
- Non enzymatic browning
- Functionality and their Role in Food Industry
- Sweeteners

UNIT V **10hrs**

Milk and Milk Products

- Composition, physical and chemical properties, nutritive value
- Factors affecting coagulation of milk protein.
- Processing of milk and types of processed milk
- Fermented [Cheese, yogurt]and Unfermented products [ice cream and khoa]
- Milk products – Composition, classification and processing

Animal foods

- Meat-Structure and composition, changes during meat cooking, post mortem changes in meat, muscle proteins, tenderizing and curing of meat, storage
- Poultry- Composition, poultry processing, storage, changes during cooking

- Fish-composition and nutritional importance, types, Selection and characteristics of fresh fish and methods of cooking.
- Egg-structure, composition, quality testing, grading, processing, storage, changes during cooking.

Methods of Food Processing

- Introduction, Methods of Food Processing, production, harvesting and handling of fresh foods, primary processing of cereals, pulses and oilseeds.

SEMESTER II

Nutrition and Dietetics

Paper I FOOD SCIENCE

PRACTICALS

Code: MSND 201P **Total marks: 50**
No. of Weeks: 13 **Practicals : 35**
Instructions/week: 04 **IA : 15**

OBJECTIVE

- To familiarize students with changes occurring in various food stuffs as a result of processing and cooking.

Unit I

- Sensory Evaluation of recipes – Hedonic rating scale, Paired comparison test
- Gelatinization and factors affecting gelatinization
- Factors affecting gluten formation – gluten test, effect of kneading and added substances in chapathi
- Starch--microscopic examination

Unit II

- Pulses – Effect of various methods of cooking
- Testing pectin strength in fruits and vegetable extracts.
- Study of factors affecting texture and pigments of vegetables
- Enzymatic browning in fruits [factors affecting and prevention]

Unit III

- Egg– Preparation of stable emulsion- Mayonnaise, permanent and temporary emulsions
- Assessing egg quality
- Prevention of ferrous sulphide formation

Unit IV

- Test for checking rancidity of oils
- Smoking point

Unit V

- Stages of Sugar cookery ,Any two recipes
- Use of different leavening agents in food preparation
- Chemical leavening agents – preparation of cakes using egg white and whole egg, slow and fast acting baking powder

REFERENCES

1. Food Science – Norman N Potter, Joseph H. Hotchkiss, 5th edition, CBS Publishers & Distributors, New Delhi.
2. Food Facts and Principles – ShakuntalaManay, New Age International Publishers.
3. Food Science – B Sri Lakshmi, New Age International Publishers.
4. Fruit and Vegetable Preservation – Principles & Practices – R P Srivastava, Sanjeev Kumar. 3rdedition, international Book Distributing Co., Lucknow.
5. Food Science, Chemistry and Experimental Foods – Dr.M.Swaminathan, The Bangalore Printing& Publishing Co. Ltd., Mysore
6. Gaman, P.M. and Sherrington, K.B. (1996), The science of food, oxford, Butterworth – Heinemann.
7. Meyer, Lilian H. Ed. (1987), Food chemistry. Indian Ed. CBS Publishers and Distributors.

SEMESTER II

NUTRITION AND DIETETICS

PAPER II

NUTRITION THROUGH LIFECYCLE

Code: MSND 202 **Total marks: 100**
Hours: 52 **Theory: 70**
Instructions/week: 04 **IA: 30**

OBJECTIVES

- To enable the students to understand the role of nutrition in different stages of lifecycle.
- To understand the interrelationship between nutrition, growth and development

UNIT I 10hrs

- Concept of food groups, RDA for Indians, meal planning, principles and factors.
- Nutrition in pregnancy – stages of gestation, maternal physiological adjustments, nutritional requirements, nutritional deficiencies and complications of pregnancy and its management.

UNIT II 14 hrs

- Nutrition in lactation – Physiological adjustments during lactation, nutritional requirements, physiology of milk production, composition of breast milk, importance of breast feeding, cholestrum, complementary foods, special foods during lactation, dietary guidelines.
- Nutrition in Infancy - Growth and development during infancy, immunization schedule, types of milk and their use in infant feeding, breast feeding Vs bottle feeding, complementary foods, dietary guidelines during infancy, problems in weaning.

UNIT III 12 hrs

- Preschool Nutrition - Growth and development, nutritional needs of preschool, dietary guidelines, nutritional problems in preschool children – PEM, Obesity.
- Nutrition during Childhood –Growth and development, nutritional requirements, dietary guidelines, importance of breakfast and packed lunch, nutritional problems – obesity and under nutrition, iron deficiency, dental carries.

UNIT IV **10 hrs**

- Nutrition in Adolescence- Nutritional requirements during growth and development during adolescence, dietary guidelines, fast foods and its impact, nutritional problems – anaemia, eating disorders, malnutrition, teenage pregnancy.
- Nutrition in Adults - Nutritional requirements, dietary guidelines, physiology, social and psychological changes, pre and post menopausal change in women, importance of weight management, nutritional concerns – obesity, diabetes, hypertension, cardiovascular diseases.

UNIT V **8 hrs**

Geriatric Nutrition

- Nutritional requirements, dietary guidelines; physiological, socioeconomic and psychological factors and its effect on dietary intake, nutritional problems – malnutrition – obesity and under nutrition, diabetes mellitus, hypertension, osteoporosis, anaemia, rheumatism.

SEMESTER II

Nutrition and Dietetics

Paper II NUTRIITON THROUGH LIFE CYCLE

PRACTICALS

Code: HSND 202 P **Total marks: 50**
No. of Weeks: 13 **Theory: 35**
Instructions/week: 04 **IA: 15**

OBJECTIVE

- To impart learning on menu planning strategy, analysis of nutrient intake and sufficiency of food intake.

UNIT I

Planning and preparation of diet for pregnant and lactating mothers.

UNIT II

Planning and preparation of complimentary foods

UNIT III

Planning and preparation of nutrient dense recipes for pre-schoolers

Planning and preparation of packed lunch for school going children

UNIT IV

Planning and preparation of menu for adolescence

UNIT V

Menu planning for adulthood

Menu planning for old age.

REFERENCES

1. Vinodhini Reddy, Prahlad Rao, Govinth sastry and Kashinath (1993), NutritionTrends in India, NIN, Hydrabad.
2. Shills, E.M., Olson, A.J and Shike, Lea and Febiger, Modem Nutrition in health anddisease.
3. Srilakshmi, B (2003), Dietetics, New age International Pvt. Ltd.
4. Srilakshmi, B (2003), Nutrition science, New age International Pvt. Ltd.
5. Summerfied (Liane, M), Nutrition, Exercise and Behaviour: An integrated approachto weight management.
6. Indian Council of Medical Research, Recommended Dietary intakes for Indians Latest Recommendations
7. Food, Nutrition and Diet Therapy (2003)– Kathleen Mahan & Krause, Sylvia Escott Stump.

JOURNALS

1. Nutrition Reviews
2. Journal of Nutrition
3. American Journal of Clinical Nutrition
4. British Journal of Clinical Nutrition
5. European Journal of Clinical Nutrition

SEMESTER II

NUTRITION AND DIETETICS

PAPER III

PUBLIC HEALTH NUTRITION

Code: MSND 203	**Total marks: 100**
Hours: 52	**Theory: 70**
Instructions/week: 04	**IA: 30**

OBJECTIVES

- To enable the student to learn about the community diet programmes
- To learn the policies and improve nutritional status

UNIT I **8 hours**

- Concept of community nutrition – Relationship between health and nutrition, role of nutritionist in health care. Etiological factors leading to malnutrition, synergism between malnutrition and infections, consequences of malnutrition and measures to overcome
- Prevalence of common nutritional problems – PEM, Vitamin A deficiency, anemia, iodine deficiency diseases and fluorosis.

UNIT II **10 hours**

- Nutritional status – Assessment– Anthropometry, Biochemical and clinical assessment, Dietary assessment- family dietary survey, assessment of dietary intake of individuals, institutional diet survey and food balance sheet.Vital statistics, mortality rates and morbidity rates (infant mortality rate).

UNIT III **10 hours**

- Nutrition education to the community – meaning, nature and importance, qualities of community workers and training of nutrition education programs, methods of education, when to teach, whom to teach, principles of planning, executing and evaluating nutrition education programmes, problems of nutrition education. Epidemiology of communicable diseases – factors responsible for the spread of communicable diseases, mode of transmission – chicken pox, typhoid fever, malaria, filariasis.

UNIT IV **12 hours**

- Nutrition intervention programmes in India – Genesis, objectives and operation - National anaemia control, prophylaxis programme, National goiter control programme, Vitamin A prophylaxis programme, school lunch programme.
- National Nutrition Policy - Aims, tools, implementation at national level, impact of national policy on food security, nutrition programmes – Integrated Child Development Services (ICDS), Mid-day meal programmes.

UNIT V **12 hours**

Public health, hygiene and sanitation:

- Immunization – importance of immunization, food adulteration, Food Adulteration Act, waste management.
- Organization concerned with Food and Nutrition –
  National: ICMR, NIN, CFTRI, NIPCCD, DFRL
  International: FAO, WHO, UNICEF, World Bank.

SEMESTER II

Nutrition and Dietetics

Paper III PUBLIC HEALTH NUTRITION

PRACTICALS

Code: MSND 203 P	**Total marks: 50**
No of Weeks: 13	**Practicals: 35**
Hours/week: 04	**IA: 15**

OBJECTIVE

To develop audio visual aids and nutrition programs to impart education to the community.

UNIT I

Preparation of Audio Visual Aids – Charts, Posters, and Power point

UNIT II

Standardization of cups/vessels for diet survey

Planning of recipes for nutritional deficiencies - Vitamin A, iron and folic acid.

UNIT III

Preparation of low-cost recipes for PEM.

UNIT IV

Nutritional assessment for adolescents – Anthropometric measurements, Clinical examination and Diet survey.

UNIT V

Nutrition education program for any age group using aids.

REFERENCES

1. Jelliff D.B. Assessment of Nutritional Status of the Community WHO Geneva 1996.
2. Mishra R.C. Health and Nutrition Education A.P.H. Publishing Corporation – 2005
3. Park A. Text book on Preventive and Social Medicine XIX Edition 2007
4. Singh K.V. Health and Family Welfare in India vista International Publishing House – 2005, Publishing Co. Pvt. Ltd. New Delhi
5. National Family Health Survey Series.
6. Owen, A.Y. and Frackle, R.T., 2002; Nutrition in the Community. The Art of Delivering Services, 2nd Edition, Times Mirror/Mosby
7. Part, k. (2000) – Parts Textbook of Preventive and Social Medicine, 18th Edition, M/S Banarasidas Bhanot, Jabalpur
8. Beaton, G.H. and Bengoa, J.M. (Eds.) (2000) – Textbook of Human Nutrition, Oxford IBH Publishing Co. Pvt. Ltd. New Delhi
9. Bamji, M.D., Rao, P.N., Reddy, V (Eds) (2003) – Textbook of Human Nutrition, Oxford and IBH Publishing Co. Pvt. Ltd., New Delhi.

JOURNALS

1. Journal of Nutrition Education
2. WHO Chronicle, WHO Geneva
3. Journal of Nutrition, Society for Nutrition Education, Berccley
4. Proceedings for Nutrition Society of India, New Delhi.

SEMESTER II

NUTRITION AND DIETETICS

PAPER IV

FOOD SAFETY

Code: MSND 204	**Total marks: 100**
Hours: 52	**Theory: 70**
Instructions/week: 04	**IA: 30**

OBJECTIVES

- Understand basics of food safety and quality assurance.
- To make students understand the importance of personal hygiene and Environmental Sanitation.

UNIT I **10 hrs**

- Basics of food safety: Factors contributing to physical, chemical and biological contamination in food chain, prevention and control of food borne hazards, definition and regulation of food sanitation, sources of contamination, basic rules regarding personal hygiene-food handlers, cleaning compounds, sanitation methods, waste disposal strategy (solid and liquid waste) and pest control

- Food Safety Assessment, The importance of food safety, Food safety management procedures, Terms relating to quality, management and organization Terms relating to process and product, characteristics and conformity, Terms relating to documentation, examination and audit.

UNIT II **10 hrs**

- Food Laws and Standards in India - Food Safety and Standards Act, 2006, The food safety and standards regulations (FSSR,2011): Licensing and

Registrations, FSS Rules and Regulations, Agricultural Produce Act, 1937 (Grading and Marketing), Bureau of Indian Standards relevant to food safety , Legal Metrology Act, International Food Control Systems/ Laws, Regulations and Standards, Guidelines with regard to Food Safety: CODEX.

UNIT III **10 hrs**

- FSAAI- Genesis and evolution of FSSAI, structure and functions of food authority, initiatives of FSSAI- promoting safe and wholesome foods (eat right India), food fortification, SNF, clean street food hub, training and capacity building, role of state food authorities, FoSTaC, food safety on wheels .
- Recent advances in packaging and labelling requirements, safety issues in food packaging materials, regulations related to nutraceuticals and foods for special dietary uses, provisions on organic food and non specified food/food ingredients.

UNIT IV **12hrs**

- Understanding food hazard, food borne illnesses, water and sanitation, GHP, GAP, HACCP,VACCP,TACCP food allergies, food intolerance, food adulteration-Definition, common adulterants, simple detection techniques, Effects of food adulteration, types of adulteration and recent trends in food adulteration, prevention of food adulteration, detect adulterations with rapid test (DART), food testing and rapid detection methods.
- Laws governing food service institutions -food laws, labour laws, laws concerning hygiene and safety, environmental hygiene and sanitation-Hygiene in food, food plant hygiene, safety handling, personal hygiene, procedure followed in food service establishment to prevent accidents, facilities and benefits to workers in each establishment, Management of food waste and water waste.

UNIT V **10 hrs**

- Food Safety and Quality Assurance: quality control of raw materials, in – process food control, quality control of finished products, quality assurance of therapeutic, functional, nutraceutical and novel foods.
- Food quality management: structures, policies and responsibilities: Quality benefits, quality control department and its responsibilities Quality control department interrelations with research and product development, production, and marketing departments.

SEMESTER II

Nutrition and Dietetics

Paper IV FOOD SAFETY

PRACTICALS

Code: MSND 204P **Total marks: 50**
No. of Weeks: 13 **Practicals : 35**
Instructions/week: 04 **IA : 15**

OBJECTIVE

Enable students to understand the basics of food safety and hygiene

UNIT I

Basic rapid test for adulterants in food

Unit II

To compare the surface and core temperature of food products

UNIT III

Case studies on food safety

UNIT IV

Visit to food companies to understand the safety measures followed in their work area.

UNIT V

Examination of labeling information on food products

REFERENCES

1. The training manual for Food Safety Regulators. Vol.II- Food Safety regulations and food safety management. (2011) Food safety and Standards Authority of India. New Delhi.

2. Bryan, F.L. (2007) Hazard Analysis Critical Control Point Evaluations A Guide toIdentifying Hazards and Assessing Risks Associated with Food Preparation and Storage.World Health Organization, Geneva.
3. Mortimre, S., and Wallace, C., (2005) HACCP: A practical approach, 2nd Ed, Aspen Publication.
4. Gould, W.A and Gould, R.W. (2005) Total Quality Assurance for the Food Industries, CTI Publications Inc. Baltimore.
5. Pomeraz, Y. and MeLoari, C.E. (2008) Food Analysis: Theory and Practice, CBS publishers and Distributor, New Delhi.
6. Food Hygiene and Sanitation – S Roday, Tata McGraw Hill Publishing Co. Ltd.,3rd reprint.
7. Food Poisoning and Food Hygiene – Hobbs B C and R J Gillbert, 4th edition,English Language Book Society and Edward Arnold Publishers Ltd.
8. Food Contamination and Safety – VanishaNambiar.

SEMESTER II

NUTRITION AND DIETETICS

SOFT CORE

PAPER V

FUNCTIONAL FOODS AND NUTRACEUTICALS

Code: MSND 205 **Total marks: 100**
Hours: 40 **Theory: 70**
Instructions/week: 03 **IA: 30**

OBJECTIVES

- To be aware of the growing importance of nutraceuticals and functional foods
- To familiarize students with the recent advances in nutraceuticals.
- To impart knowledge on the health benefits of nutraceuticals and functional foods.

UNIT I 8 hrs

- Nutraceuticals: Introduction, definition, classification of nutraceuticals based on chemical nature and mechanism of action,
- Phytochemicals: Definition, mode of action, classification of Phytochemicals. Phytochemicals as nutraceuticals- Isoprenoids, polyphenolics, glucocyanovates, phytosterols, dietary fiber, their potential health benefits.
- Scope involved in the health care industry. Concept of nutraceuticals through traditional food and medicine.

UNIT II **8hrs**

- Organizational models for nutraceuticals-Food source – Plant: Soya, olive oil, plant steroid, tea, grape vine, garlic, capsicum, dietary fibre and other fruits. Animal: Milk and milk products, meat, fish. Microbial probiotics.
- Mechanism of action – Anticancer, positive influence on blood lipid profile, antioxidation, anti inflammatory
- Applications of nutraceuticals with specific examples in reference to general health

UNIT III **8 hrs**

- Functional foods – Evolution and Definition of functional foods, review of the history of functional foods
- Health benefits of functional foods and future promises in Indian diet
- Development of biomarkers to indicate efficacy of functional ingredients
- Safety and regulatory aspects of functional foods
- Dietary fibre, oligosaccharides, resistance starch, omega fatty acids as functional foods.

UNIT IV **10 hrs**

- Instant foods and formulas, supplement soups, herbal and functional food beverages
- Significance and relevance of nutraceuticals in the management of disease and disorders – CVD, cancer, diabetes, obesity, osteoarthritis, immune enhancement, endurance and mood disorders.
- Animal products and microbes (prebiotics and probiotics) as nutraceuticals

- Probiotics – Definition, types, health benefits of probiotics in gastrointestinal health, cancer, and other diseases, recent advances in probiotics, challenges and regulatory issues related to probiotics.
- Prebiotics – Definition, types, health benefits of prebiotics, recent advances in prebiotics.

UNIT V **6 hrs**

- Antioxidant: Definition and Mechanism of action, Formation of Free Radicals, classification of antioxidants- endogenous and exogenous. Role of endogenous antioxidants- Super Oxide Dismutase (SOD), Peroxidases- Glutathione Peroxidase in protecting cells. Role of Exogenous antioxidants- Retinol, ß –carotene, Ascorbic acid and Tocopherol in prevention of Cancer, CVD, Ageing and Inflammation.

REFERENCES

1. Functional Foods Concept to Product (2000), Gibson GR & Williams CM
2. Functional Foods: Designer Foods, Phrama Foods (2004) - Goldberg I
3. Dietary supplements: Toxicology and clinical Pharmacology – Cuppj and Tracy TS, Humana Press 2003.
4. Mary, K. Schmidl and Theodre, P. Labuza (2000), Essentials of Functional Foods,Culinary and hospitality industry publication services
5. Israel Goldberg (2001), Functional foods, pharma foods, Nutraceuticals, Culinary and hospitality industry publication services.
6. Robert easy Wildman (2001), Handbook of Nutraceuticals and functional foods, culinary and hospitality industry publication services.

SEMESTER III

NUTRITION AND DIETETICS

CLINICAL NUTRITION AND DIETETICS – 1

Code: MSND 301	**Total marks: 100**
Hours: 52	**Theory: 70**
Instructions/week: 04	**IA: 30**

Objectives:

To enable students to:

- Understand the modifications in nutrients and dietary requirements for therapeutic conditions.
- To gain knowledge and provide appropriate nutritional care for treatment of various diseases.

UNIT I **10 hrs**

- Assessment of patient needs based on interpretation of patient data – clinical, biochemical and personal.
- Definition and history of dietetics, dietetics in modern health care management, Types and role of a dietitian and team approach in patient care.

UNIT II12 hrs

- Febrile conditions – metabolic changes during fever, short duration – Typhoid and Influenza, intermittent duration – Malaria, long term – Tuberculosis, pathophysiology and Dietary Management.
- Drug and nutrient interaction – Types of drugs-antibiotics, analgesics, antihistamines.
- Effect of drugs on food intake
- Effect of drugs on metabolism, digestion and absorption, it's effect on nutritional status, Drug dosage and efficacy.
- Effect of food during drug therapy

UNIT III **10 hrs**

- Hepatic disorders(Viral hepatitis – types – A, B, C), Fatty liver – types , cirrhosis, hepatic coma, Wilson's disease- etiology, pathophysiology, symptoms, diagnosis, dietary management.

- Gall bladder- functions and components of bile, cholecystitis,cholelithiasis- etiology, pathophysiology, symptoms, diagnosis and dietary management.

UNIT IV **10 hrs**

- Energy Imbalance – obesity – Definition, components of body weight, types, etiology, assessment, regulation of body weight, complications. Underweight – Definition, etiology, assessment, health risk,dietary management and complications.Importance of weight management, exercise, behavior modification, functional consequences of energy deficiency.
- Food intolerance and allergy – Food allergens, test for allergy – skin test, elimination test, dietary management

UNIT V **10 hrs**

- Disease of Pancreas (acute pancreatitis, chronic pancreatitis)– etiology, pathophysiology, symptoms, diagnosis, and dietary management.
- Diabetes Mellitus – types, metabolic changes, etiology, symptoms, diagnosis, complications, treatment, exercise, drugs and insulin, dietary management – role of fibre, glycemic index, artificial sweeteners and sugars substitutes.
- COPD,PCOD – etiology, patho physiology, symptoms and Medical Nutrition Therapy

NUTRITION AND DIETETICS

CLINICAL NUTRITION AND DIETETICS – 1

Code: MSND 301 P **Total marks: 50**
No. of Weeks: 13 **Practicals: 35**
Instructions/week: 04 **IA: 15**

UNIT I

Planning and preparation of low calorie and high fibre diet for Obesity and high calorie high protein diet for underweight

UNIT II

Planning and preparation of diet for viral hepatitis

UNIT III

Planning and preparation oflactose and gluten free recipes

UNIT IV

Case studies and presentation on COPD/PCOD

UNIT V

Planning and preparation of diet for Diabetes

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REFERENCES:

1. Modern Nutrition in health and Disease, 10th edition by Maurice E.Shils
2. Alfred H.Katz, Prevention and Health, the Haworth, press, New York 1999
3. Krause Food and Nutrition Care Process,15thedition
4. Sareen S, 2005 Advanced Nutrition and human metabolism, 7th edition, 2016, USAIAPEN,BAPEN webseries
5. International Life Science Institute Present Knowledge in Nutrition- latest edition 2012
6. Achayya,K.T.,(2001) A historical Dictionary of Indian Foods, Oxford Publishing Co
7. Antia, F.P. and Philip A. Clinical Dietetics and Nutrition, 4th Ed,2002.
8. Bamji, M.S. Rao, P.N. and Reddy (2019,) Text book of Human Nutrition,4th edition, Oxford and IBH publishing housing.
9. Garrow, J.S. and James WPT. Human Nutrition and Dietetics, 10thEd.
10. Williams, S.R., Essentials of Nutrition and Diet Therapy, 12th Ed. Jones Mirror College Publishing, 2018.
11. Sharon Rady Rolfs and Ellie Whitley,(2018), Understanding Normal and Clinical Nutrition, 11 th edition,2018.

SEMESTER III

NUTRITION AND DIETETICS

NUTRITION IN FITNESS AND SPORTS

Code: MSND 302	**Total marks: 100**
Hours: 52	**Theory: 70**
Instructions/week: 04	**IA: 30**

OBJECTIVES

- To understand special nutritional requirements for physical fitness and sports
- To understandthe role of physical activity – management of health.

UNIT I 10 hrs

• Introduction to physical fitness – definition and components of physical fitness, body composition changes through lifecycle, types of exercises, holistic approach in the management of fitness and health- diet, exercise, yoga and meditation.

UNIT II 10 hrs

• Nutrition, exercise, physical fitness and health – their interrelationship, factors affecting physical work capacity and work efficiency. Mobilization of fuel stores during exercise. Importance of CHO loads, shifts in CHO and fat metabolism.

UNIT III 10 hrs

• Physiological changes during physical activity– CVS, respiratory system, muscular system. Types of exercise and its impact on fitness, muscle fatigue – prevention and recovery. Effect of training on heart and lung performance. Exercise guidelines in diabetes, osteoporosis and hypertension. Fatigue during exercise and its management.

UNIT IV **10 hrs**

- Nutritional requirements for sports person. Importance of micronutrients for exercise. Exercise induced oxidative stress and role of antioxidants.
- Fluid balance in sports – importance and prevention of dehydration.
- Sports drink – hypo, iso and hypertonic drink for hydration/energy, recovery drink.
- Macronutrient supplements- Pure Protein (Caesein, egg albumin, soyaprotein,protein bars)

UNIT V **12 hrs**

- Sport specific requirement of nutrients – pregame and postgame regime, special nutrients for female athletes.
- Chronic dieting and eating disorders, sports anemia, Role of nutrition in stress, fracture and injury. Nutrition education to athletes and coach.

NUTRITION AND DIETETICS

NUTRITION IN FITNESS AND SPORTS PRACTICALS

Code: HSND 402 P **Total marks: 50**
No. of Weeks: 13 **Practicals: 35**
Instructions/week: 4 **IA : 15**

UNIT I

Body composition analysis for sports personnel

UNIT II

Market Survey on nutritional supplements for sports personnel

UNIT III

Endurance test for athletes

Preparation of sports beverage

UNIT IV

Plan a counseling session for sports person and present a case study

UNIT V

Plan pre and post game meal/recipes

REFERENCES

1. Bamji S.M.,RaoNP and Reddy V.2019, Text book of Human Nutrition, Oxford and IBH publishing C. New Delhi, 4th edition.
2. Fink H.H.,Mikesky E.A and Burgoon A.L.2015, Practical Applications in sports Nutrition, 4th edition, rded.Jones and BarlettLearning.USA.
3. Burke Louse and Deakin Vicky(2012),4th Edition, Clinical sports Nutrition.
4. Ira Wolinsky(Ed)(1998): Nutrition in Exercise and Spots,3rd Edition,CRC Press.
5. Mahan, L.K &Ecott- Stump, S.(2010): Krause's Food, Nutrition and Diet Therapy
6. Shils, M.E., Olson,J.A., Shike,N. and Ross, A.C(Ed)(2014): Modern Nutrition in Health & Disease,9th Edition, Williams& Wilkins.
7. Mc Ardle, W.Katch, F. and Katch, V,(2014) Exercise Physiology. Nutrition and Human Performance, Williams and Wilkins,Philadelphia.

8. Gibney J.M. Macdonald A.I and Roche M.H.2003. Nutrition and Metabolism. Blackwell publishing.

9. Nutrition for Health, Fitness and Sports, Eight edition, by Melvin Williams,2012, McGraw-Hill.

10. Dan Bernard,O.T, (2011), Advanced Sports Nutrition, 2nd edition, Paper back.

SEMESTER III

NUTRITION AND DIETETICS

NUTRITION AND DIET COUNSELLING

Code: MSND 303	**Total marks: 100**
Hours: 52	**Theory: 70**
Instructions/week: 04	**IA: 30**

OBJECTIVES:

- To familiarize students with the principles and methods of counseling
- To use appropriate methods for counseling

UNIT I **10 hrs**

- Diet Counseling – Definition, meaning, significance and types
- Goals of counseling – individual, group and family
- Counseling-materials required for counseling – models, charts, posters, AV aids, communication process in counseling, problems in counseling.
- Role of dietitian-roles and responsibilities, dietary diagnoses and dietary prescription.
- Nutrition Counseling, steps and procedures, team work, nutrition care plan.

UNIT II **10 hrs**

- Nutritional Assessment: Anthropometric, Biochemical, Clinical and Dietary Assessment, Counseling, documentation, SOAP (Subjective, Objective, Assessment, Planning), MUST (MalnutritionUniversalScreening Tool), MNT (Medical Nutrition Therapy),

- Introduction to health psychology, factors affecting health behavior (social, cognition models of health,Personality factors, Interpersonal communication, Group dynamics).

UNIT III **10 hrs**

- Diet counseling at hospital and community level, role of counseling in hospitals, counseling in a community, organizing health camps and patient feedback at hospitals and at community level.

- Assessment Component- methods of interview: verbal and non-verbal techniques, counseling models – data analysis (dietary, biological and environment).

UNIT IV **10 hrs**

- Nature and goals of counseling, principles of counseling, characteristic of a good counselor, ethical principles of counseling, planning and designing of counseling plans, classification, objectives, client care plan and co-ordination, evaluation component – measuring the success of performance of client and evaluating the counseling process.

UNIT V **12 hrs**

- Principles of behavioral change, health promotion and health education strategies. Counseling skills, listening skills, responding, intervention, rapport building, creating an effective counselor environment.
- Patient education and counseling for diseases, mother and child care, adolescence, sports persons, children with disabilities, patient followup/home visits.

NUTRITION AND DIET COUNSELING

PRACTICALS

Code: MSND303 P **Total marks: 50**
No. of weeks: 13 **Practicals: 35**
Instructions/week: 04 **IA: 15**

UNIT I

Planningandpreparation of audiovisual aids for counselling sessions on life style diseases.

UNIT II

To conductdiet counselling sessions for lower social economic group

UNIT III

Conduct diet and nutrition counselling for obese and underweight clients

UNIT IV

Plan counselling session for health promotion

UNIT V

A visit to a multi-specialty dietary department

REFERENCES

1. Gibson, R.L., Mitchell, M.H, (2008), Introduction to counselling and guidance (6 Ed)
2. Gelso, C.J.,Fretz, B.R, (2001),Counselling Psychology, Bangalore, Prism Books Pvt Ltd.
3. Sharma, T.C., (2022), Modern Methods of Guidance and Counseling, New Delhi, sarup& sons.
4. Beena and Parweshwaran- Invitation to Psychology, Neel Kamal Publications.
5. Mahan, L.K &Ecott- Stump, S., (2000): Krause's Food, Nutrition and Diet Therapy, 10th Edition.
6. Shils, M.E., Olson,J.A., Shike,N. and Ross, A.C(Ed)(1999): Modern Nutrition in Health & Disease,9th Edition, Williams& Wilkins.

7. Bamji.,S.M.,Rao,N. P.,Reddy,V.,(2019),Text book of Human Nutrition, Oxford and IBH publishing C. New Delhi.
8. Kathleen Bauer,(2020),Nutrition counselling and Education Skill Development,4th Edition.

III SEMESTER

NUTRITION AND DIETETICS

OPEN ELECTIVE

NUTRITION FOR HEALTHY LIFESTYLE

Code: MSND 304 **Total marks: 100**
Hours: 52 **Theory: 70**
Instructions/week: 04 **IA: 30**

OBJECTIVES

1. To enable the students to understand the role of nutrition in management of health
2. Understand the role of physical activity in management of health.

UNIT I 10 hrs

- Introduction to Nutrition
- Define - Nutrition, Malnutrition and Health
- Functions of food, food groups and balanced diet and recommended dietary allowances,
- Principles and steps in meal planning.

UNIT II 10 hrs

- Methods of cooking - boiling, steaming, pressure cooking, frying, baking and solar cooking -advantages and disadvantages
- Fortification- Definition, commonly fortified foods.

UNIT III 12 hrs

- Macronutrients (Carbohydrates, Protein and Fat)-functions, sources and deficiency.
- Micronutrients (vitamins and Minerals)

- Fat soluble vitamins, water soluble vitamins, Iron, folic acid and calcium - functions, sources and deficiency.

UNIT IV **10 hrs**

- Nutrition through Lifecycle
- Nutritional Requirements and dietary guidelines during adulthood, pregnancy, lactation (Breast feeding and bottle feeding), infancy (complementary feeding), preschool, adolescence and old age.

UNIT V **10 hrs**

- Role of physical activity, importance of diet and fluids during exercise.
- Definition -nutraceuticals, prebiotics, probiotics and dietary supplements.
- Role of functional foods in health

REFERENCES

1. Srilakshmi, B (2003), Nutrition science, New age International Pvt. Ltd.
2. Summerfied (Liane, M), Nutrition, Exercise and Behaviour: An integrated approachto weight management.
3. Food, Nutrition and Diet Therapy (2003)– Kathleen Mahan& Krause, Sylvia Escott Stump.
4. Text Book of Human Nutrition – Mahtab S. Bamji, N Prahlad Rao, Vinodini Reddy, 2nd edition,Oxford& IBH Publishing Co. Pvt. Ltd.
5. Perspectives in Nutrition – Gordon M. Wardlaw, Margaret Kessel, 5th edition, Mc Graw Hill Publication.
6. Human Nutrition – Geissler& Powers, 11th edition, Elsevier Publications.
7. Normal and Therapeutic Nutrition - Robinson & Lawler, 17th edition, Mac Millan Publishers.
8. Mary, K. Schmidl and Theodre, P. Labuza (2000), Essentials of Functional Foods,Culinary and hospitality industry publication services
9. Israel Goldberg, (2001), Functional foods, pharma foods, Nutraceuticals, Culinary and hospitality industry publication services.

III SEMESTER

NUTRITION AND DIETETICS

HOSPITAL INTERNSHIP –PRACTICAL

Code: MSND 305 P **Total marks: 50**

1. Internship in hospital for four weeks
2. Students to document five case studies during the period of internship
3. A report on the functioning of the dietary department
4. Counseling for patients – report
5. Report

IV SEMESTER

NUTRITION AND DIETETICS

CLINICAL NUTRITION AND DIETEICS II

Code: MSND401	**Total marks: 100**
Hours: 52	**Theory: 70**
Instructions/week: 04	**IA: 30**

OBJECTIVES:

- To impart indepth knowledge regarding diet, life style in acute and chronic diseases.
- To learn the effect of various diseases on nutritional status, and nutrient and dietary requirements.

UNIT I **8 hours**

- Diseases associated with Gastro Intestinal Tract (GIT)- Pathophysiology, Etiology, symptoms and Medical Nutrition Therapy – Peptic ulcer, Gastritis, Flatulence, diarrhoea, constipation, Malabsorption syndrome, Crohn's disease and Ulcerative colitis, Irritable Bowel Syndrome, Steatorrhea, Gluten sensitivity, Lactose intolerance.

UNIT II **12hrs**

- Nutritional management of renal diseases – etiology, pathophysiology, symptoms and medical nutrition therapy in renal disorders- Acute and chronic glomerulonephritis, Nephrosis, Acute renal failure, Chronic renal failure, Renal calculi
- Types and principles of dialysis
- Kidney transplant

UNIT III **10 hrs**

- Diseases of cardiovascular system – etiology, risk factors, symptoms and dietary management of hypertension, arthrosclerosis, congestive heart disease, ischemic heart disease.
- Hyperlipidemia – brief review of lipoproteins and their metabolism, blood lipid profile and dietary lipids.

UNIT IV **12 hrs**

- Diseases of nervous system - Nutritional management in dysphagia, epilepsy, hyperkinetic behavior syndrome.
- Musculoskeletal System- Etiology and dietary treatment in arthritis and osteoporosis.
- Nutritional management of physiological stress and wound healing.
- Dietary management for trauma, sepsis.

UNIT V **10 hrs**

- Nutrition in Gout – etiology, symptoms and dietary management.
- Nutrition in cancer – Etiology, eating problems in cancer, cancer therapy and dietary management.
- Burns- Stages of burns, metabolic changes, Nutritional management
- Surgery-Physiological response, metabolic consequences, stages of convalescence, dietary management.
- HIV infection and AIDS - Epidemiology, transmission of HIV, clinical manifestation, dietary management and control.

NUTRITION AND DIETETICS

CLINICAL NUTRITION AND DIETETICS –II

PRACTICALS

Code: HSND 401 P **Total marks: 50**
No. of Weeks: 13 **Practicals: 35**
Instructions /week: 4 **IA : 15**

UNIT I

Planning and preparation of diet for acute glomerularnephritis

UNIT II

Planning and preparation of diet for hypertension

Planning of diet for Atherosclerosis

UNIT III

Case studies and presentation on Nephrotic syndrome

UNIT IV

Planning of diet in Gout

UNIT V

Planning of diet for burns

Planning of pre and post operative diets

REFERENCES:

1. Modern Nutrition in health and Disease, 10th edition by Maurice E.Shils
2. Alfred H.Katz, Prevention and Health, the Haworth, press, New York 1999
3. Krause Food and Nutrition Care Process,14 th edition
4. Sareen S, 2005 Advanced Nutrition in human metabolism, 4 th edition, USA
5. IAPEN,BAPEN webseries
6. International Life Science Institute Present Knowledge in Nutrition- latest edition
7. Achayya,K.T.,(1998) A historical Dictionary of Indian Foods, Oxford Publishing Co
8. Antia, F.P. and Philip A. Clinical Dietetics and Nutrition, 4thEd.

9. Bamji, M.S. Rao, P.N. and Reddy. Text book of Human Nutrition. 1996. Oxford and IBH publishing housing.
10. Garrow, J.S. and James WPT. Human Nutrition and Dietetics, 9Ed.
11. Williams, S.R. Nutrition and Diet Therapy, 6thEd. Jones Mirror College, Publishing.
12. Sharon Rady Rolfs and Ellie Whitley,(2018), Understanding Normal and Clinical Nutrition, 11 th edition,2018.

SEMESTER IV

NUTRITION AND DIETETICS

NUTRITION IN CRITICAL CARE

Code: HSND 402	**Total marks: 100**
Hours: 52	**Theory: 70**
Instructions/week: 04	**IA: 30**

OBJECTIVES:

- To understand the physiology and special nutritional requirements of the critically ill.
- To know about special nutritional support techniques and feeding formulation to meet their nutritional needs.

UNIT I **8 hrs**

- Hospital diets – clear fluid diet, full fluid diet, bland and soft diet, normal diet, special diets.
- Enteral nutrition for critically ill patients, nutritional requirements, indication/complications, routes and administration.
- Types of enteral formulas, complications.

UNIT II **12 hrs**

- Parenteral nutrition in critically ill patients, nutritional requirements, routes and administration.
- Parenteral formulas, calculation of the feed, commercial formulas available in the market, significance and advantages and disadvantages of commercial formulas,home madefeeds,Oral nutritional supplements.
- Refeeding syndrome, complications of parenteral therapyand enteral therapy, rehabilitation diets,and palliative care.

UNIT III **10 hrs**

- Critically ill patients –Importance of nutrition in trauma, stress, sepsis, nutritional assessment, choice of nutrients.
- Nutrients for immunity, and role of prebiotics and probiotics (fibre) in critical illness.
- Nutrition support in patients with cancer.

UNIT IV **12 hrs**

- Nutritional assessment and nutritional intervention of HIV patients
- Nutritional consideration in critically ill patients, organ transplantation, multiple organ failure.Feeding critically ill obese patients.

UNIT V **10 hrs**

Nutritional Support in Special conditions (critically ill)-

- Pediatrics- Nutritional assessment, Nutritional Requirements, Nutritional Intervention
- Nutritional support in burns.

REFERENCES

1. Modern Nutrition in health and Disease, 10th edition by Maurice E.Shils
2. Alfred H.Katz, Prevention and Health, the Haworth, press, New York 1999
3. Krause Food and Nutrition Care Process,15 th edition
4. Sareen S, 2005 Advanced Nutrition and human metabolism, 7th edition, 2016, USAIAPEN,BAPEN webseries
5. International Life Science Institute Present Knowledge in Nutrition- latest edition 2012
6. Achayya,K.T.,(2001) A historical Dictionary of Indian Foods, Oxford Publishing Co
7. Antia, F.P. and Philip A. Clinical Dietetics and Nutrition, 4th Ed, 2002.
8. Bamji, M.S. Rao, P.N. and Reddy (2019,) Text book of Human Nutrition, 4th edition, Oxford and IBH publishing housing.
9. Garrow, J.S. and James WPT. Human Nutrition and Dietetics, 10th Ed.

10. Williams, S.R., Essentials of Nutrition and Diet Therapy, 12th Ed. Jones Mirror College Publishing, 2018.
11. Sharon Rady Rolfs and Ellie Whitley,(2018), Understanding Normal and Clinical Nutrition, 11 th edition,2018.

SEMESTER IV

NUTRITION AND DIETETICS

a. FOOD SERVICE MANAGEMENT

Code: MSND 403 **Total marks: 100**
Hours: 52 **Theory: 70**
Instructions/week: 04 **IA: 30**

OBJECTIVES

- To gain knowledge on requirements and management of various food service establishments.
- To know the types of food cost involved and the methods to control them.
- To know the types and variety of foods available in the market
- To learn to purchase, receive and store different foods.

UNIT I **10 hours**

Management of Food Service Establishments

- Managing, Planning, Organizing, Directing, Coordinating, Controlling and Evaluating
- Tools of management – Tangible and Intangible tools
- Management of resources – Natural environment, Work environment
- Principles of Management of food service establishment

Type of food service establishment:

- Commercial, Non Commercial Service, Street – mobile food unit.
- Temporary food service establishment, vending machine, food court, High risk food

UNIT II **10 hours**

Organisation of Space and Equipment in Food Service Establishment

- Kitchen Space – Size and types, Developing kitchen plan, Work simplification
- Features to be considered in kitchen designing
- Storage Space – Types of storage

- Factors to be considered while planning storage spaces
- Service Area – Location
- Structural designing and planning storage spaces
- Equipment – Classification of equipment
- Selection of equipment, designing , installation and operation, purchase, care and maintenance of equipment

UNIT III **12 hours**

Food Management

- Characteristic of food – Types of food, quality and quantity,Sensory quality and nutritional quality
- Food purchasing – Importance, types – open market, formal, negotiated and wholesale
- Receiving and Food storage – Delivery methods, General guidelines for storing perishable and non perishable foods
- Menu Planning – Importance of menu planning, types of menus – Al a carte, tabled'hote and combination

Food service- Style of service-Self service and vending, tray service, waiter-waitress service, portable meal

Delivery and Service of Foods:

- Food service systems : Conventional, Commissary , ready prepared, assembly service
- Clearing and winding up after service, Customer relations

UNIT IV **10 hours**

Food Purchasing, Selection and Storage

- Food Purchase- Food purchasing procedure, Selection of foods, purchasing methods
- Important points to be observed for various food commodities
- Importance of sanitary procedures while preparing, cooking and holding of foods.

Food Storage:

- General Guidelines for Storage of food - Dry Storage, Refrigerated Storage, Freezer Storage , Importance of pest control

UNIT V **10 hours**

Standardisation of Food and Patent Regulations and Financial management

- Steps involved in formulation and standardization of recipes, significance of food standardization. Patent laws- Definition, Evolution of IPR, Patent rights in India
- Food product labeling - purpose

Financial management:

- Component of cost, Behavior of cost, Concept of contribution and breakeven

Cost control:

- Importance of cost control, Factors affecting losses, Methods of controlling food cost and labour cost

REFERENCES

1. Sethi M and Mahan S (Revised 2nd edition, 2007)). Catering Management, An Integrated
   Approach. New Age International (P) Ltd
2. Andrews S (2009) Food and beverage service : Training Manual 2nd edition. New Delhi Tata McGraw Hill.
3. Bessie Brooks West and Levelle Wood MS (1988). Food Service in Institutions (6th ed.). John MacMillan Publishing Co., New York
4. Harris N (1984) Meal management (6th ed.). New York : Mac Millan.
5. Wailey BH (1986) Production management handbook. U.K. : Gower Publishing.
6. Kotas R (1981). Accounting in hotel and catering industry. publisher- Thomson Learning; 4th Revised edition edition (Jun 1981)
7. Fuller J and Thomas S (2006). Modern Restaurant Service, Amazon
8. Kotler P and Keller K (2008). Marketing Management (13th ed.). Prentice Hall, USA.

SEMESTER IV

NUTRITION AND DIETETICS

b. NUTRITION IN EMERGENCIES

Code: MSND 402	**Total marks: 100**
Hours: 52	**Theory: 70**
Instructions/week: 04	**IA: 30**

OBJECTIVES

- Familiarize students with various natural emergencies and disasters
- Understand the impact on nutrition and health status and special nutritional arising out of these situations
- Understand strategies for nutritional rehabilitation management of the health of emergency affected populations.

UNIT I 12 hrs

- Definition of disaster
- Classification of disasters

Natural disasters

- Water and climate – cyclone, flood, tornado, Hurricane, flood, drought, tidal wave, Tsunami
- Earth related – Earth quake, volcanoes, landslides and Avalanches
- Risk and Disaster Management with software applications

Manmade disasters

- Nuclear Explosions and War
- Accidents, mine flooding and stampede

UNIT II 10 hrs

Disaster Management

- Nutrition Management during disaster, Immediate rescue and first aid including physiological aid, Organization and Nutritional surveillance and Individual screening, Supply of food, Assessment of food needs in emergency situations, Food distribution strategy- define and reaching the vulnerable group, Mass and supplementary feeding, Therapeutic feeding.

UNIT III **12 hours**

- Assessment of food nutritional relief, local foods in rehabilitation, organizations for mass feeding food distribution, transportation and storage, feeding centers, Sanitation and hygiene.
- Nutritional support system in relief and rehabilitation, surveillance of nutritional status in emergency relief situations such as flood, cyclone, earthquake, drought, war etc.

UNIT IV **8 hrs**

- Control of communicable diseases – Surveillance and Treatment
- Causes of malnutrition in emergency situation
- Major and specific deficiencies in disasters and treatment

UNIT V **10 hrs**

- Global warming – Challenges for food security in India
- Water – Safe water supply
- Sanitation and Hygiene,Role of immunization and Sanitation

REFERENCES

1. Goyet, Fish V, Seaman, J and Geijact (1978).The management of nutritional emergencies in large populations WHO, Geneva

2. Refuge Nutrition Information System (RNIS) Newsletters UNACC/SCN subcommittee on Nutition

3. Beradley, A Woodruff and Arabella Duffield (July 2000) Assessment of Nutritional status in emergency affected populations. Adolescents special supplement, UNACC.SCN sun committee on nutrition.

4. Young H, Means C (1998) Acceptabilty and use of cereal – based foods in refugee camps. Oxfain Working paper, Oxfam publishing Oxygen, U.K

5. UNHCR (1999) UNHCR Hand books of emergencies 2nd edition Geneva UNHCR.

6. WHO website for emergencies

SEMESTER IV

NUTRITION AND DIETETICS

c. MATERNAL AND CHILD NUTRITION

Code: MSND 403 **Total marks: 100**
Hours: 52 **Theory: 70**
Instructions/week: 04 **IA: 30**

OBJECTIVE

- To enable the students to understand the role of nutrition during pregnancy lactation and infancy.
- Get acquainted in the growth and developmental changes from conception till adolescence

UNIT I **10 hrs**

- Importance of maternal nutrition- Meaning and objectives of maternal and child health.
- Health problems of mother and child in India
- Current Scenario of maternal and child nutrition in India. Vital statistics related with mother and child.
- Nutritional aspects of embryogenesis

UNIT II **10 hrs**

- Physiological and psychological changes during pregnancy
- Importance of prenatal and postnatal nutrition
- Management and importance of antenatal care
- Complications of pregnancy
- AIDS during pregnency

UNIT III **10 hrs**

- Physiology and Endocrinology of lactation
- Composition of human milk
- Lactation amenorrhea and effects of lactose feeding on maternal health
- Factors affecting breast feeding
- Breast Feeding Vs Bottle feeding

- Guidelines in infant feeding and complimentary feeding

UNIT IV **10 hrs**

- Growth and development during infancy, Immunization schedule
- Nutritional requirements of infants
- Preterm, low birth weight infants, implications for feeding and management
- Weaning and principles in preparing complimentary food supplements
- Nutritional management in diarrhoea and lactose intolerance

UNIT V **12 hrs**

- Maternal and child Malnutrition: etiology and management of under nutrition and over nutrition.
- Nutritional challenges and nutrition for children with special needs
- Maternal and child health programs in India
- Supplementary feeding programs- Midday Meal Program and ICDS

REFERENCES

1. Bamji, M.S. Rao, P.N. and Reddy. Text book of Human Nutrition. 1996. Oxford and IBH publishing housing.
2. Mahan, L.K &Ecott- Stump, S.(2000): Krause's Food, Nutrition and Diet Therapy
3. Park A. Text book on Preventive and Social Medicine XIX Edition 2007.
4. Whitney. E.R. and S.R Kolfes (2002) Understanding Nutrition 9 ed.Wadsworth Thomson Learning,Australia.
5. Thompson, L.U. (1993) Potential Health Benefits and problems associatedwithantinutrients in foods. Food Research International. 26; 134 – 149.
6. Gibson, G.R. and M.B. Roberfroil (1999) ColoricMirobio, Nutrition andhealth, Kluwer Academic Publishers

IV SEMESTER

NUTRITION AND DIETETICS

PAEDIATRIC AND GERIATRIC NUTRITION

Code: MSND 404 **Total marks: 100**
Hours: 52 **Theory: 70**
Instructions/week: 04 **IA: 30**

OBJECTIVES:

- Understand the growth, development and nutritional requirements of children
- Get an insight and knowledge on inborn errors of metabolism and pediatric critical care.
- Understand the theoretical frame work in the study of ageing,
- Impart effective interventions for care of the elderly.

UNIT I **8 hrs**

- Normal growth in children – formulae for average weight and height in children (birth to 12 years).
- Factors affecting normal growth in children – milestones
- Nutritional requirements of children and dietary guidelines.

UNIT II **10 hrs**

- Dietary management in gastrointestinal tract, liver and kidney diseases
- Nutritional support in diarrhoealdisease:Acute diarrhea – nutritional management, Oral Rehydration Therapy (ORT), fluid and electrolyte therapy, persistantdiarrhoea – pathogenesis and dietary management.
- Constipation - dietary management
- Dietary management in Irritable Bowel Syndrome (IBD), Crohn's disease, Ulcerative colitis-
- Renal diseases – dietary management in nephrotic syndrome, acute renal failure and chronic renal failure.

UNIT III **12 hrs**

- Cardiovascular diseases- Congenital heart disease – etiology, factors affecting growth and Nutritional management.
- Juvenile diabetes - Medical nutrition therapy, nutritional requirement, insulin regime, exercise.
- Nutrition for children with special needs-Allergies, common food allergens(milk, egg, soy, fish and peanuts)and intolerance,
- Diagnosis, treatment and dietary management -skin, respiratory tract, GI tract.

UNIT IV **10 hrs**

- Definition of ageing, senescence, old age or aged people,

Gerontology and geriatric nutrition.

- Introduction to geriatric care- concept of gerontology
- Ageing - Biology of ageing
- Physiological,psychological and biochemical changes during old age
- Dietetics of Geriatric care- Nutritional requirement and general dietary guidelines for elderly, food requirement, dietary modification.

UNIT V **12 hrs**

- Major nutritional and health problems during old age-osteoporosis,

obesity, neurological dysfunction, Anaemia, Malnutrition and constipation, Infection and Immunity, Degenerative disorders in elderly-Dementia, Alzheimer, Parkinson's disease

- Disorders of GIT
- Disorders of Pancrease – Senile Diabetes
- Infection of Respiratory system

NUTRITION AND DIETETICS

PAEDIATRIC AND GERIATRIC NUTRITION

Code: MSND 404P **Total marks: 50**
Hours: 13 **Practicals: 35**
Instructions/week: 04 **IA: 15**

UNIT I

Assessment of Anthropometric Measurement using Growth Charts for SAM and MAM Children

UNIT II

Planning of diet for Diarrhoea/ARI

UNIT III

Planning and preparation of Nutrient Dense recipes for children/elderly

UNIT IV

Survey on nutritional assessment of paediatric/geriatric population using various tools

UNIT V

Planning and preparation of diet for constipation in elderly

REFERENCES

1. Madhu Sharma, Pediatric Nutrition in Health and Disease, 1st edition, Jaypee Brothers MedicalPublishers (P) Ltd., New Delhi, 2013
2. K. E. Elizabeth, Fundamentals of Pediatrics, 2nd Edition, Paras Publishers, Hyderabad, 2002
3. Suraj Gupta (Ed), Recent advances in Pediatrics – Nutrition, Growth and Development, SpecialVolume 20, Jaypee Brothers Medical Publishers (P) Ltd, New Delhi, 2010.
4. Clinical Dietetics Manual- Indian Dietetic Association, 2011
5. Bali,P.A(2001) care of the Elderly in India. Changing configurations, Indian Institute ofAdvancedstudy,shimla.
6. HSUJENG Handbook of Geriatric Nutrition

7. John E Morley and David R, (2007), Thomas Geriatric Nutrition.
8. Suraj Gupte (2012), Pediatric Nutrition
9. Mehra,S.R., and Sharma S.R., (2018), Maternal and child Nutrition

IV SEMESTER

NUTRITION AND DIETETICS

DISSERTATION AND VIVA VOCE

Code: MSND 405 **Total Marks: 100**
Viva voce 30 marks **Dissertation: 70**

- Topic of dissertation to be chosen from any broad area of Nutrition and Dietetics. It should be started at the end of the third semester and should be completed at the end of fourth semester.

The dissertation project should include:

1. Abstract
2. Introduction
3. Objectives of the Study
4. Review of Literature
5. Materials and Method
6. Results and Discussion
7. Summary and Conclusion
8. References

- Project work to be carried individually.
- Project to be allotted at the beginning of the third semester to facilitate students to carry out during semester break.
- Faculty members of the respective colleges /departments should serve as guides.
- The copy of the dissertation to be submitted to the University for Evaluation.
- Evaluation of dissertation has to be done by external examiner appointed by the University for 100 marks.
- The project viva voce examination will be held at the Bishop Cotton Women's Christian College, Department of Nutrition and Dietetics by one external examiner and one Internal examiner for 30 marks (PPT – 10 marks, Presenttaion-10 marks, viva voce-10 marks).

JOURNAL REFERENCES

- Indian Journal of Nutrition and Dietetics
- Journal of food and nutrition research
- Critical Reviews in Food Science and nutrition
- Annual Review of Nutrition journal
- Advances in Nutrition
- Journal of Food Science and biotechnology (springer)
- Journal of nutrition health and Ageing
- European Journal of Nutrition
- European Journal of Nutrition
- International food Research Journals
- Clinical Nutrition Journal
- International journal of Food Science and Nutrition
- International Food Research Journal
- Aquatic Food Product Technology
- Elsevier's Nutrition Journals
- Journal of Human Nutrition and Dietetics
- American journal of clinical Nutrition
- Journal of Academy of Nutrition and Dietetics