THIRUVALLUVAR UNIVERSITY
BACHELOR OF SCIENCE
DEGREE COURSE

B.Sc. NUTRITION, FOOD SERVICE MANAGEnEMENT AND DIETETIcS
UNDER CBCS
(with effect from 2008-2009)

The Course of Study and the Scheme of Examinations

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**Total**: 180 140 3650
Objectives

To enable the students to:

2. To understand the role of micro-organisms in spoilage of various foods.
3. To gain knowledge of micro-organisms in relation to food and food preservation.

UNIT-I


2. General Characteristics of Bacteria, Viruses, Yeast, Moulds, protozoa, Algae.
   a. Bacteria: Bacterial cell, Morphology, Reproduction and function
   b. Viruses: Morphology, Classification, Phages - Life cycle, functions.
   c. Yeast: Morphology - Cell structure multiplication (Budding), functions.
   d. Moulds: Morphology, classification, reproduction of moulds.
   e. Algae: Morphology - Structure and reproduction.
UNIT-II

1. **FOOD AS A SUBSTRATE FOR MICRO-ORGANISM**
   a. Hydrogen ion concentration, Moisture requirement, Nutrient content - inhibitory substances of biological structure / combined effects of factors affecting growth.
   b. Role of micro organism in food microbiology; Economic importance of Moulds, Yeast, Bacteria.

2. **FOOD FERMENTATION**
   A brief knowledge of the preparation of Bread, Malt Beverages, Wine, Distill liquor, Vinegar, Fermented Vegetables and dairy products.

3. **CONTAMINATION OF FOODS**
   Different sources of contamination of plants, animals, sewage, soil, water, air, human being.

4. **FERMENTATION, PUTREFACTION AND DECAY**
   1. Fermentation - aerobic respiration, anaerobic, respiration, products of fermentation.
   2. Part played by micro-organisms in putrefaction and decay.

5. **GENERAL PRINCIPLES UNDERLYING SPOILAGE**
   Chemical changes caused by Microorganism spoilage fitness or unfitness of food for consumption – causes of spoilage – classification of foods based on spoilage – factors affecting – kinds and numbers of micro organism in food; Growth and chemical changes caused by micro organisms.

UNIT-III

**CONTAMINATION AND SPOILAGE OF FOODS**

Principles of food spoilage by microbiological, physical and biological factors - contamination, preservation and spoilage of cereal and cereal products, baked products, Fruits and vegetables and their products, Fleshy food, Milk and Milk products and Fats and oils.
UNIT-IV

MICROBIOLOGY OF FOOD POISONING, FOOD INFECTIONS AND FOOD BORNE DISEASES

1. Microbial food poisoning by Staphylococci, Salmonella and clostridium botulinum (Botulism). Measures to prevent microbial food poisoning.
2. Food infections - Food borne diseases - Dysentery diarrhoea, Typhoid, Cholera.

UNIT-V

PRINCIPLES OF FOOD PRESERVATION

a. Use of high and low temperature. Canning of fruits and vegetables.
b. Preservation of drying, use of chemicals in food preservation. Part played by antibiotics in the preservation of fleshy foods, concept, meaning, principles, significance and limitations of Hazard Analysis and Critical control point. [HACCP]

References

4. R.C.Rubey & D.K. Maheshwari; A Textbook of Microbiology
5. Pelczar J. Michael; Microbiology concepts and Application
12. HOBBS BC and Roberts. D; Food poisoning and food Hygiene. Edward Arnold (A diceision of Hodder and Stoughton), London.
ALLIED I
PAPER I
CHEMISTRY I

UNIT-I
1.1 Extraction of Metals Minerals and Ore difference - Minerals of Iron, Aluminum and Copper - Ore Dressing or concentration of Ore - Types of Ore Dressing Froth Floatation and Magnetic separation.
1.2 Refining of Metals - Types of Refining - Electrolytic, Van Arkel and Zone Refining.
1.3 Extraction of Uranium and Thorium.

UNIT - II
2.1 Cyclo-alkanes preparation properties of Cyclo-hexane -- Bayers strain theory.
2.2 Polarization - Inductive effect, mesomeric effect and steric effect - (Acid and Base strength.)
2.3 Stereo isomerism - Types, Causes of optical activity of (lactic acid) and tartaric acid - Racemisation - Resolution - Geometrical isomerism - maleic and fumaric acid.

UNIT - III
3.1 Chemical Kinetics - Distinction between Order and Molecularity - derivation of First order rate equation - half life period of first order reaction - determination of rate constant of hydrolysis of ester Catalysis - catalyst - auto catalyst - enzyme catalyst - promoters - catalytic poisoning - Active center - Distinction between homogeneous and heterogeneous catalysts - Industrial application of catalysts.
3.3 Photochemistry - Grothus Drapers law, stark einsteines law - quantum yield - photosynthesis, phosphorescence - fluorescence - chemiluminescence’s - photosensitization.
UNIT - IV
4.1 VSEPR Theory - Shapes of Simple Molecules BF₃, PCl₅, SF₆ and XeF₆


4.3 Osmosis - Osmotic pressure - reverse osmosis - desalination of sea water.

UNIT - V

5.2 Crude Oil - Petroleum - Petroleum Refining - Cracking - Applications of Cracking. Naphthalene - Preparations, Properties and uses of Naphthalene - Structure of Naphthalene.

5.3 Elements of symmetry - unit cell - crystal lattice - types of cubic lattice - one example for each.
ENVIRONMENTAL STUDIES

(For all UG Degree Courses)

UNIT-I: INTRODUCTION TO ENVIRONMENTAL SCIENCES: NATURAL RESOURCES:

Environmental Sciences - Relevance - Significance - Public awareness - Forest resources - Water resources - Mineral resources - Food resources - conflicts over resource sharing - Exploitation - Land use pattern - Environmental impact - fertilizer - Pesticide Problems - case studies.

UNIT-II: ECOSYSTEM, BIODIVERSITY AND ITS CONSERVATION:

Ecosystem - concept - structure and function - producers, consumers and decomposers - Food chain - Food web - Ecological pyramids - Energy flow - Forest, Grassland, desert and aquatic ecosystem.

Biodiversity - Definition - genetic, species and ecosystem diversity - Values and uses of biodiversity - biodiversity at global, national (India) and local levels - Hotspots, threats to biodiversity - conservation of biodiversity - Insitu & Exsitu.

UNIT-III: ENVIRONMENTAL POLLUTION AND MANAGEMENT


UNIT-IV: SOCIAL ISSUES - HUMAN POPULATION

HIV/AIDS - Role of IT in Environment and Human Health - Women and child welfare - Public awareness - Case studies.

**UNIT-V: FIELD WORK**

Visit to a local area / local polluted site / local simple ecosystem - Report submission

**REFERENCES**


2. RAJAMANNAR, 2004, **ENVIRONEMNTAL STUDIES**, EVR COLLEGE PUB, TRICHY

3. KALAVATHY,S. (ED.) 2004, **ENVIRONMENTAL STUDIES**, BISHOP HEBER COLLEGE PUB., TRICHY
II SEMESTER

PAPER II

HUMAN PHYSIOLOGY

Objectives

1. To enable students to understand the structure and basic physiology of various organs of the body.
2. To obtain better understanding of the principles of Foods and Nutrition through the study of physiology.

UNIT-I : CELL-TISSUES

Introduction to the cell - A typical cell, cell division. Tissues - classification, structure and function of epithelial, muscular and connective tissues.

UNIT-II : TRANSPORT AND MAINTENANCE


b. Heart and circulation: Structure of the heart and blood vessels, origin and conduction of heart beat, cardiac cycle, ECG, blood pressure — definition and factors affecting it.


d. Excretory system: Structure and function of kidney, urine formation, micturition.

UNIT-III : DIGESTIVE SYSTEM AND ITS ACCESSORIES

UNIT-IV: NERVOUS SYSTEM


UNIT-V: ENDOCRINE AND REPRODUCTIVE SYSTEM

a. General structure of male and female reproductive organs, puberty, menstrual cycle.
b. Elementary knowledge - pituitary, thyroid, parathyroid, adrenal glands and islets of langerhans - functions and hypo and hyper activities.

References

A. MICROBIOLOGY

1. Examination of Yeast, moulds, Protozoa and Bacteria.
2. Examination of Unstained Organisms, wet methods and hanging drop preparations.
3. Examination of stained organisms, Siniple Staining and grain method of staining.
4. Common culture media and uses.
5. Purifying water at home – Microorganisms present in water.

B. HUMAN PHYSIOLOGY

1. Microscopic study of different tissues - epithelial, connective, muscular and nervous tissue.
3. Study of anatomy of sheep’s brain, heart and kidney.
4. Microscopic study of blood, WBC, RBC estimation, Hb estimation, bleeding time, clotting time.
5. Blood grouping, blood pressure, histology of artery and vein.
7. Microscopic structure of the reproductive organs and endocrine glands - ovary, uterus, mammary glands, testis, thyroid, pituitary, adrenal.
ALLIED I

PAPER II

CHEMISTRY II

UNIT-I

1.1 **Co-ordination Chemistry:**
Nomenclature of co-ordination compounds - Werner Theory of Co-ordination Compound - Chelation - Functions and structure of Haemoglobin and Chlorophyll.

1.2 **Industrial Chemistry:**
Fertilizers and manures - Bio-fertilizers- Organic Manures and their importance - Role of NPK in plants - preparation and uses of Urea, Ammonium nitrate, potassium nitrate and super phosphate of lime.

1.3 Contents in Match sticks and match box - Industrial making of safety matches. Preparation and uses of chloroform, DDT, gamhexane and Freon.

UNIT-II

2.1 **Carbohydrates:**
Classification - structure of glucose - Properties and uses of starch - uses of Cellulose Nitrate - Cellulose acetate.

2.2 **Amino Acid and Protein:**
Classification of Amino Acids - preparation and properties of Glycine - Classification of Protein based on Physical properties and biological functions

2.3 Primary and Secondary structures of protein (Elementary Treatment only) composition of RNA and DNA and their biological role. Tanning of leather - alum (aluminum tri chloride tanning - vegetable tanning)
UNIT-III

3.1 **Electro Chemistry:**
Specific and equivalent conductivity - their determination - effect of dilution of conductance.

3.2 Kohlraush Law - Determination of dissociation constant of weak Electrolyte using Conductance measurement - Conductometric Titrations

3.3 pH and determination by indicator method - Buffer solutions - Buffer action - Importance of buffer in the living system - Derivation of Henderson equation.

UNIT-IV

4.1 Paints - Pigments - Components of Paint - Requisites of a good paint. Colour and Dyes - Classification based on constitution and application.

4.2 **Vitamins:**
Biological activities and deficiency diseases of Vitamin A, B, C, D, E and K - **Hormones** - Functions of insulin and adrenaline.

4.3 Chromatography - Principles and application of column, paper and thin layer chromatography

UNIT-V

5.1 **Drugs**- Sulpha Drugs - Uses and Mode of action of Sulpha Drugs – Antibiotics - Uses of Penicillin, Chloramphenicaol, streptomycin. Drug abuse and their implication alcohol - LSD

5.2 **Anaesthetics** - General and Local Anaesthetics - Antiseptics - Example and their application. Definition and one example each for analgesics antipyretics, tranquilizers, sedatives, causes for diabetes, cancer and AIDS.

5.3 Electrochemical corrosion and its prevention - fuel cells.
ALLIED PRACTICAL
CHEMISTRY

VOLUMETRIC ANALYSIS

1) Estimation of hydrochloric acid using std. sulphuric acid
2) Estimation of Borax using std sodium carbonate
3) Estimation of sodium hydroxide using std sodium carbonate.
4) Estimation of FeSO₄ using std. Mohr salt Solution.
5) Estimation of Oxalic acid using std FeSO₄
6) Estimation of FAS using Std oxalic acid
7) Estimation of Fe²⁺ using diphenylamine / N phenyl anthranilic acid as indicator.

ORGANIC ANALYSIS:
Reactions of aldehyde (aromatic), carbohydrate, carboxylic acid (mono and dicarboxylic), phenol, aromatic primary amine, amide and diamide. Systematic analysis of organic compounds containing one functional group and characterization by confirmatory tests.
VALUE EDUCATION
(For all UG Degree Courses)

UNIT-I
Value Education - Definition - relevance to present day - Concept of Human Values - self introspection - Self esteem.

UNIT-II
Family values - Components, structure and responsibilities of family - Neutralization of anger - Adjustability - Threats of family life - Status of women in family and society - Caring for needy and elderly - Time allotment for sharing ideas and concerns.

UNIT-III
Ethical values - Professional ethics - Mass media ethics - Advertising ethics - Influence of ethics on family life - psychology of children and youth - Leadership qualities - Personality development.

UNIT-IV
Social values - Faith, service and secularism - Social sense and commitment - Students and Politics - Social awareness, Consumer awareness, Consumer rights and responsibilities - Redressal mechanisms.

UNIT-V
Effect of international affairs on values of life/ Issue of Globalization - Modern warfare - Terrorism. Environmental issues - mutual respect of different cultures, religions and their beliefs.

Reference Books

WEBSITES AND e-LEARNING SOURCES:
www.rkmissiondhe.org/education.html/
www.clallam.org/lifestyle/education.html/
www.sun.com/..edu/progrmws/star.html/
www.infoscouts.com
www.secretofsuccess.com
www.1millionpapers.com
http://militarlyfinance.umuc.edu/education/edu-network.html/
III SEMESTER

PAPER III

FOOD SCIENCE

Objectives

To enable students:

- Obtain knowledge of different food groups and their nutritive value
- Understand the scientific principles underlying food preparation
- Develop skill and techniques in food preparation with conservation of nutrients and palatability using cooking methods generally employed.

UNIT-I

Functions of food in relation to health - classification of foods based on nutrients.
Food groups - Basic Four, Basic Five and Basic Seven.

UNIT-II

Preliminary preparation of foods prior to cooking with special reference to conservation of nutrients and palatability, different methods of cooking on acceptability and nutritive value of foods. Dry methods - frying, broiling, parching, and baking. Moist methods - boiling, stewing, cooking under pressure. Micro-wave cooking - advantages and disadvantages.

UNIT-III: EXPERIMENTAL STUDY OF FOODS


Vegetables and Fruits - Classification, composition and Nutritive value - methods of minimize the loss of nutrients, color, texture, flavor. Browning reaction - changes during cooking.

**UNIT-IV : ANIMAL FOODS**

a. Milk and milk products - Composition and Nutritive value, Principles of milk cookery, Milk protein, coagulation, problems in milk cookery. Effect of cooking and processing on milk

b. Meat - Nutritive values, methods of cooking - Post mortem changes in meat, factors affecting tenderness - organ meat.

c. Fish - Classification, Nutritive value - selection, Methods of cooking


e. Eggs - Structure, composition, Nutritive value, selection - principles of egg cookery - uses of eggs in cookery, methods of cooking eggs.

**UNIT-V**


b. Spices and Condiments - Uses and abuses in Indian cookery.

c. Sugar and Sugar Products - Jaggery - uses in Indian cookery - Stages in sugar, Indian sweets

d. Beverages - Classification, Nutritive value and uses - coffee, tea, cocoa.

**References**


ALLIED II  
PAPER III  

BIOCHEMISTRY I  

UNIT- I : CHEMISTRY OF CARBOHYDRATES.  
Definition and classification of Carbohydrates, Linear and ring form of all monosaccharides (Glucose and Fructose), Physical and chemical properties of carbohydrates, Occurrence, structure, physical and chemical properties of disaccharide (Sucrose and Lactose), polysaccharides (Starch and Cellose).

UNIT- II : CHEMISTRY OF AMINO ACIDS.  

UNIT-III : CHEMISTRY OF PROTEINS  

UNIT-IV: CHEMISTRY OF LIPIDS  

UNIT-V CHEMISTRY OF NUCLEIC ACID  
Definition- Nucleoside, nucleotide and polynucleotide. Double helical structure of DNA and its biological function, structure of RNA: tRNA, mRNA and rRNA- occurrence, chemistry and its biological function, difference between DNA and RNA, Properties - Tm, Hypo and Hyper Chromicity.
BOOKS RECOMMENDED

4. Biochemistry - Dr. Amit Krishna De, S. Chand & Co., Ltd. et al
SKILL BASED SUBJECT I
PAPER I
BAKERY

Objectives:
To enable the students to

- Understand the principles of baking
- Acquire basic knowledge on bakery techniques.

UNIT- I

Baking: Introduction, principles of baking, Basic ingredients
Types of wheat flour, wheat flour and their baking quality: Doughs and batters, nutritive values.

Water: role in baking.

UNIT- II

Leaving agents: Definition, physical, chemical and biological leavening agents, role of these in baking.

Sugars: Types of sugars, role in baking.

Fats: Types of fats in baking, role in baking

Milk and Milk products: Role and nutritional contribution in baking

Salt, flavorings and spices: Role in baking.

UNIT-III

Bread: Ingredients, procedures for bread making, types of bread, common defects in bread making, bread improvers.
Cakes: Ingredients, types of cakes, preparation of cakes, causes of variation in cake quality.

UNIT-IV

Biscuits: Ingredients, essentials to get good biscuits, preparation of biscuits, nutritive values.

Pastries: Ingredients, types, nutritive values, essentials in making a good pastry, preparation of pastry

Cookies: Ingredients, types, preparation of sandwiches, nutritive values.

UNIT-V

Icings and filling: Ingredients, types

Sandwiches: Ingredients, types. Preparation of sandwiches, nutritive values

Baking ovens: Side-flue and similar ovens, steam-pipe ovens, hot air ovens, advantages and disadvantages, maintenance of sanitation and hygiene in a bakery unit.

References

1. Vijaya khader, Text book of food science and technology, Indian council of Agricultural Research, New Delhi, 2001
3. Earl R.Palan, Judith A.Studler, preparing for the service industry, An introductory approach, AVI publishing co Ltd, 2000
4. William C practical in baking, 2000
5. Lilian Hiagland Meyer, Food chemistry CBS publishers and Distributors, 2004
NON-MAJOR ELECTIVE I

PAPER I

HEALTH AND FITNESS

Objectives

To enable the students to

- Learn about the terms related to health and fitness
- Comprehend the interaction between fitness and nutrition

UNIT-I:

Health: Concept of Health, changing concepts definitions of health, dimensions of health, concept of well being, spectrum of health, determinants of health, ecology of health, right to health, responsibility for health, indicators of health.

UNIT-II:

Exercise and Health related fitness: Health related fitness, health promotion, physical activity for health benefits.

Sports related fitness: Role of nutrition in sports, nutrition to athletic performance.

UNIT-III:

Body weight and composition for Health and Sports: Ideal body weight, values and limitations of the BMI, composition of the body, Diet during training, prior to competition, during Dietary supplements after competition for sports.

UNIT-IV:


UNIT-V:

Exercise programmes: Resistance exercise training, aerobic exercise, types of exercise, effective for weight contrast, - dieting or exercise, weight reduction programme for young athletes.
REFERENCES:

Objectives

1. To introduce the students to the principle of Human Nutrition.
2. To gain skill in qualitative tests and quantitative estimation of nutrients.

UNIT-I

1. History of Nutrition - Development of Nutrition as a Science - Definition of Nutrition


UNIT-II

1. Energy units - Kilocalories, Megajoules, determination of energy value of foods, using Bomb calorimeter, gross calorific values, Physiological energy, value of foods, relation between oxygen used and calorific value, determination of direct calorimetry.

2. Relation between Respiratory quotient and energy output - Specific dynamic action of food indirect calorimetry - Basal metabolism - definition, determination - benedict Roth basal Metabolism Apparatus - factors affecting BMR - determination of energy metabolism during work - energy requirements for various types of activities, factorial methods for calculation of the daily energy requirements of an adult for varying degrees of physical activity - recommended allowances for calories, energy requirements of adults expressed in terms of Reference man and Reference woman - ICMR committee percent calories supplied by carbohydrates, fats and proteins in average Indian diets - Energy requirements for different age groups.
UNIT-III
1. Lipids - Classification, Composition function - essential fatty acids, deficiency, food sources of EFA, Triglyceride reaction of TGL, saponification, hydrogenation, Rancidity, Function of TGL, Characteristics of animal and vegetable fats, sterols - cholesterol - function, food sources, phospholipids - function, keone bodies - fat requirements - food sources, dietary lipids and their relation to the causation of Atherosclerosis and Ischaemic heart disease.

UNIT-IV
a. Fat soluble vitamins - Vitamin A, D, E and K - function effects of deficiency, sources, requirements, units of measurement and hyper - vitaminosis.
b. Function, effects of deficiency, sources and requirements of water soluble vitamins - ascorbic acid, thiamine, riboflavin and Niacin.
c. Importance of folic acid, Vit B-12, pyridoxine, Biotin and Pantothanic acid to the body.

UNIT-V
1. Distribution in the body, functions, food sources, requirements and effects of deficiency of calcium, phosphorous, Iron and Iodine.
2.
   a. Trace elements in human nutrition - copper, fluorine, zinc - functions, food sources, requirements and effects of deficiency.
   b. Selenium and Vitamin E relationship.
   c. Chromium and glucose tolerance factor.

References


CORE PRACTICAL II

A. I. FOOD SCIENCE
1. Cookery Practicals;
2. Grouping of foods - Discussion on nutritive value
3. Technique in measurement of food stuff - use of standard measuring cups and spoons.
4. Different recipes from cereals, pulses, vegetables, fruits, fleshy foods, egg, milk and milk products.
5. Beverages - preparation of stimulating, nourishing and refreshing beverages
7. Sugar cookery - preparing recipes at different stages of sugar cookery.

II EXPERIMENTAL FOODS PRACTICAL
1. Cereals
   Microscopic study of different starches
   a. Methods of combining starch and boiling water
   b. Study of effects of moist heat on starch
   c. Preparation of white sauces and soups
   d. Gluten formation
3. Vegetables - Effect of acids, alkali, covering, steaming and pressure cooking on the different pigments and acceptability of vegetables.
6. Milk cookery - Coagulation of milk protein, paneer, cooking of vegetables in milk
7. Fats and oils - comparison of smoking temperature of some fats and oils
8. Sugar and Jaggery - Different stages of crystallization of sugar
9. General visit to food Industry and Factories.
B. HUMAN NUTRITION

1. Qualitative tests for sugars - glucose, fructose, lactose, maltose and glucose.
2. Qualitative estimation of reducing sugar
3. Qualitative tests for proteins.
4. Qualitative tests for minerals.
5. Quantitative estimation of calcium
7. Quantitative estimation of vitamin C.
8. Demonstration Experiments.
   a. Estimation of total nitrogen in foods [Micro or MacrokJeldahl method]
   b. Lipid extration
   c. Demonstration of iodine value
   d. Estimation of Iron
   e. Qualitative tests for vitamin A
   f. Quantitative estimation of Carotene
ALLIED II
PAPER IV
FOOD PRESERVATION

Objectives
1. To obtain knowledge about food preservation.
2. To help the students to contribute proper utilization of foods and prevent wastes.

UNIT-I
1. Importance of processing - methods of processing cereals (wheat, rice, maize, pulses)
2. Processing of fruits and vegetables, meat, fish, poultry, egg.

UNIT-II
1. Processing of oil seeds, processing of milk and milk products.

UNIT-III
1. Preservation - using sugar, jams and alkalies.

UNIT-IV
Use of low temperature, refrigeration and freezing. Use of high temperature, canning and sterilization. Use of microwaves, recent technologies like ohmic heating membrane technology and extrusion technology.

UNIT-V
1. Food packaging: Food packaging and labeling various packing methods. Recent trends in packaging and labeling.
2. Food marketing and distribution: Food marketing - regulated and co-operative markets, Civil supplies and public distribution system, Improved methods of handling foods.

References

1. Manoranjan Kalia, professor, Dept of Food Science and Nutrition, Himachal Pradesh Agricultural University, Palampur, Himachal Pradesh.
2. Walter A. Mercer, Vice-President, Western Research Laboratory and National Canners Association, Berkeley, California.
ALLIED PRACTICAL

A. BIOCHEMISTRY

1. Qualitative test for carbohydrate - Test for Monosaccharide - Glucose, Fructose.
2. Qualitative test for protein.
3. Qualitative estimation of amino acid - Tryptophan, Tyrosine, Arginine, Cystine, Histidine.

B. FOOD PRESERVATION

1. Preservation of food items by the use of high and low temperatures.
2. Traditional methods of food preservation a) Drying b) Salting c) Changes during drying
3. Preservation of foods by the use of class I and class II Preservatives
4. Use of sorbic acid and sulphurdioxide as an antimicrobial preservatives.
5. Visit to Preservation Unit.
SKILL BASED SUBJECT II

PAPER II

FOOD PRODUCT DEVELOPMENT AND MARKETING STRATEGY

UNIT-I:
Basic principles and concept of food product development, cultural approach to development of dietary pattern of various groups-language, linguistic, regional, religious (ethnic), Factors involved in food habit alteration, availability, importance and role of different research and development departments in food production industry.

UNIT-II:
Steps in product development-material resources based on market demand, standardization methods involved in product development. Portion size and portion control; Calculation of nutritive value and cost of production, shelf life and storage stability evaluation procedure of developed food products.

UNIT-III:
Formulation of new food products for infants, preschool children, adolescents, pregnant and nursing mothers, old age, sports persons, armed sources personnel and therapeutic uses. Selection and training of judges, Development of Score Card and analysis of data, Role of advertisement and Technologies in promotion of new products.

UNIT-IV:
Concept of market and marketing - approaches of study marketing and marketing functions, market structure, marketing efficiency and market integration, Role of Government in promoting agricultural marketing. Market promotion and positioning of food products.
UNIT-V:

Conditions for sale, license and identification and quality processing, conditions for distribution, storage and sanitation, Studying the global market status, Role of export promoting agencies, Economic feasibility of new products.

REFERENCES:

NON-MAJOR ELECTIVE II

PAPER II

INTERIOR DESIGN

Objectives
To enable students to:
1. Gain understanding of the basic are principles
2. Learn to apply colour in the interiors.

UNIT-I
Art in daily living - importance of good taste, objectives of interior design.

UNIT-II
Design - Elements of design - line, shape, size, space, texture, pattern, colour and light, types and characteristics of design, principles of design - Harmony, Balance, Rhythm, proportion, Emphasis.
Colour - Qualities of colour - Hue, value and intensity, colour harmony, developing colour schemes for different rooms.

UNIT-III
Furniture and Furnishings - Selection and arrangement of furniture in different rooms. Different types of furnishing materials - Factors considered in their selection. Floor coverings, curtains, draperies, window treatment.

UNIT-IV
Accessories - selection, use and care of accessories, Types - traditional and modern - art objects, pictures, flower arrangement.
UNIT-V

Lighting - Importance of lighting - principles and types of lighting, Lighting needs for various activities.

PRACTICALS

1. Evaluation of design
2. Preparation of color chart and various color schemes.
3. Arranging various areas applying all the art principles
4. Application of design principles in
   a. Preparation of greeting card, poster and a wall hanging
   b. Flower arrangement.
   c. Window treatment

Reference

V SEMESTER

PAPER V

HUMAN DEVELOPMENT

Objectives

1. To understand development aspects (both normal and exceptional) from conception to old age as they can be guided effectively.
2. To have complete knowledge about the behavior pattern of the individual and various factors influencing them.

UNIT-I

a. The concept of development and growth - principles governing growth and development, developmental tasks of different stages.

b. Stages of Life span - conception, infancy, Early childhood, Late childhood, adolescence, adulthood, middle age and old age.

UNIT-II


c. Labor - sign of labor, stages of labor - types of birth, multiple pregnancy.

d. Post-natal care, prevention of gynecological complications.

e. Adjustment of the newborn to temperature, breathing, feeding and elimination.

UNIT-III

a. Infancy (Birth to 2 years) - Development - physical and motor, social, emotional, cognitive and language, Minor ailments.

b. Effect of stimulation - care of infants, feeding, toilet training, bathing, clothing, sleeping and immunization, prevention of accidents, importance of mothering and emotional growth. Importance of psychological needs.
UNIT- IV

a. Early childhood (preschool stage 2 - 6 years) - Physical and motor development, emotional, social, cognitive and language development, creativity, importance of play, importance of family relationship, behavior problems - causes and treatment.

b. Importance of preschool education.

c. Late childhood (Elementary school period 6 - 12 years) - Developments - physical, social, emotional, cognitive and language. Sex Education.

d. Children with special needs - identification and rehabilitation.

UNIT-V


b. Adulthood (18 - 60 years) - Characteristics and developmental tasks. All aspects of development and vocational development.

c. Old age (60 years and above) - Physical and psychological changes, problems of the aged, family attitude towards the aged, place of the aged in Indian society.

PRACTICALS AND RELATED EXPERIENCES

1. Assessment of the creativity of preschool children
2. Sociometric study on adolescents
3. Study on qualities preferred by the adolescents in their life partner.
4. Study on problem of the aged.
5. Study on mentally retarded children, blind, deaf and dumb.

References

2. Parikh, S; Sudarshan, R. Human Development and Structural Adjustment, UNPP, Delhi, 1993.


PAPER VI
NUTRITION THROUGH LIFE CYCLE

Objectives
To understand the Nutritional needs from birth to adult and old age.

UNIT-I : RECOMMENDED ALLOWANCES
RDA for Indian basis for requirement, computation of allowance based on energy expenditure, components of energy expenditure. General concepts about growth and development through different stages of life.

UNIT-II
Nutrition in Infancy, Preschool and School going age :


b. School going age - Physical development, Nutritional status of school children, school lunch program, factors to be considered in planning a menu, food habits and nutritional requirement, packed lunch.

UNIT-III
Nutrition during Adolescence and Adults:


UNIT-IV : NUTRITION IN PREGNANCY
UNIT-V

1. **Geriatric Nutrition**


2. **Infancy**


**Reference**


PAPER VII

COMMUNITY NUTRITION

Objectives

To enable the students to:

1. Understand the malnutrition problems and prevalence in India
2. Gain knowledge on the national effort in combating malnutrition
3. Appreciate the national and international contributor towards national improvement in alleviating nutrition problems.

UNIT-I

Nutrition and National Development Malnutrition - Etiology, symptoms, Prevalence of malnutrition - Under nutrition and Over nutrition, balance between food and population growth.

UNIT-II

Nutritional problems confronting our country - PEM - Prevalence, classification - Kwashiorkar and Marasmus - etiology, symptoms, pathological changes, biochemical changes, Anaemia - Prevalence, etiology, symptoms, prophylaxis programmes.

IDD - Etiology, Prevalence, symptoms, prophylaxis
Fluorosis - Etiology, prevalence, symptoms
Vitamin A deficiency - Etiology, prevalence, symptoms, prophylaxis.

UNIT-III

UNIT-IV
Role of National and International organizations - ICDS, Noon Meal Programme, FAO, WHO, UNICEF, CARE, ICMR, ICAR, CSIR, NIN, CFTRI, National Nutrition Policy, NGO.

UNIT-V

Reference
2. Challenges in Rural Development - Senha H.K, Discovery publishing.
ELECTIVE I

PAPER I

ENTREPRENEURSHIP MANAGEMENT

OBJECTIVES

To enable the students to

- Learn the qualities of an entrepreneur.
- Understand the process and procedures of setting up of an enterprise.
- Develop management skills for entrepreneurship.

UNIT-I:

Entrepreneurship definition, need, scope and characteristics of entrepreneurship.

Intrinsic and extrinsic factors - contributing to entrepreneurship development - qualities of an entrepreneur.

UNIT-II:

Enterprise and entrepreneurs guidelines to start an enterprise, favourable factors to start an enterprise. Barrier in setting up an enterprise. Problems faced by women entrepreneurs.

UNIT-III:

Marketing - market surveys, product selection, criteria for principles of product selection and development - sales management - sales promotion - pricing of a product.

UNIT-IV:

UNIT-V:

Personnel management - Principles and Techniques of managing employees in all enterprise performance appraisal.

REFERENCES:

SKILL BASED SUBJECT III

PAPER III

PRE SCHOOL MANAGEMENT

OBJECTIVES

- To train the students in organizing and administration of a preschool for children below 6 years of age.
- To develop in the students knowledge and understanding of the methods, equipments and materials required for early childhood education.
- To develop in them the skills in handling the equipment and materials used for various activities of a preschool.

UNIT-I:

Early childhood education - need, importance and objectives of early childhood education, different types of preschools.

UNIT-II:

Curriculum and programme - principles, long and short term planning. Daily programme, importance of various activities - informal talk, songs, stories, dramatization, science experiences, creative activities play activities, field trips, functions and celebrations. Readiness programme - general readiness, reading, writing and arithmetic readiness.

Food needs and requirements for children - importance, planning and conducting feeding programmes in a preschool.

UNIT-III:

Requisites of a preschool - preschool building - site and location. Plan of a preschool, space allotment for indoor and outdoor play. Space for routine activities and office work. Furniture and equipment, principles of selections, equipment for various development, care and use of play equipment, equipment needed for various preschools, indigenous play equipment.

UNIT-IV:

Personnel - teaching and non-teaching - selection of staff and other personnel. Academic qualification, personality characteristics, functioning of personnel.
UNIT-V:
Management of schools - budgeting, administration, records maintenance. Home-school relationship - need and scope, methods.

PRACTICALS:
1. Visit to different types of preschools to observe the methods, equipment and materials.
2. Preparing equipment and materials for various activities of a preschool.
3. Designing and preparation of case profile and other information of a preschool child and cumulative records.
4. Planning the programme and participating in a preschool for a week.

REFERENCES:
1. Read K.C., The Nursing School. The Human Relationship Laboratory, Delhi, IB Publishing Co.
VI SEMESTER
PAPER VI
FOOD SERVICE MANAGEMENT

Objectives
Understand the basic principles of management in food services units.
Accept responsibilities in catering establishment and hospitals.
Become conscientious caterer and food service administrator.
Develop skills in setting up food service units.
Understand the concept and principles of resource management.
To create an awareness of the renewable source of energy.

UNIT-I
FOOD SERVICE INDUSTRY
Types of catering - history of development - commercial - Hotel, Motel, Restaurant, Cafeteria and Chain hotels.
Welfare - Hospital, School lunch, Residential establishment and Industrial catering.
Transport - Air, Rail, Sea and Space, Miscellaneous - Contract and outdoor.

UNIT-II
PHYSICAL PLANT
a. Place of art in every day life - Importance of good taste - objectives of Interior design. Design elements - types of design - principles of design - Harmony, Proportion, balance rhythm and emphasis.
b. Layer of food service units - Planning of areas as work units with relevant spacing.
UNIT-III
QUANTITY FOOD PURCHASE
Standards for selection of fresh food. substitutes in the form of convenience or ready prepared food purchase and storage.

a. Quantity food preparation: Menu planning - Indian and Western - standardization and standardized recepies portion control. Effective use of left over.
b. Quantity Food Service: Types - their objectives, styles of service - Waiter of waitress service, counter service - snack bar, buffet service, Banquet and Vending.

UNIT-IV
1. PRINCIPLES OF RESOURCE MANAGEMENT
Definition, Management Process - planning, controlling evaluating goals, values and standards.
Decision making: concepts, types of decisions, steps in decision making, methods of resolving conflicts.
Resource Management - Classification, characteristics, factors affecting the use of resources.
Management of time, energy and money - Time management - Time norms, plans and time management.
Energy management - Fatigue - types and causes of fatigue - principles and techniques Mundel’s class of changes - work simplification. Personal management, recruitment and selection. Induction, training - Supervision and Dismissal of employees - Legal controls - Labor policies and welfare measures.
Money management: Types of income - management process applicable to money - planning, controlling and evaluating - the use of income - elements of buymanship. Cost control, food cost, labor overheads and projects.

2. SANITATION AND SAFETY
Sanitation of plant, kitchen, hygiene, personal hygiene, garbage disposal pest control - Health and safety at work, causes and types of accidents, accordance and applications.
UNIT-V

The computer in catering: Use of computer for the control of stock, recipes and menus.

References

Objectives
To enable students:
1. To obtain knowledge on role of diet in disease conditions.
2. To gain experience in planning, preparing and serving therapeutic diet.

UNIT-I
1. Principles of diet therapy - Routine Hospital diets - special feeding methods - Tube feeding, parental nutrition.
2. The Dietitian - Clarification - Responsibilities in Indian context - Diet counseling - Registered dietitian.

UNIT-II
1. Etiology, symptoms and modification of diet in gastro intestinal disease, peptic ulcer - diarrhea and constipation.

UNIT-III
2. Prevalence, types, etiology, symptoms, diagnosis and treatment of metabolic disorder - Diabetes mellitus.

UNIT-IV
1. Etiology, symptoms and modification of diet in disease of kidney - glomerulo nephrites, nephritic syndrome, acute and chronic renal failure, dialysis - urinary calculi.
UNIT-V

1. Etiology, symptoms and modification of diet in febrile conditions - Typhoid, Tuberculosis.

2. Etiology, symptoms and modification of diet in obesity and underweight.

References

Journals


2. India Journal of Nutrition and Dietetics - Avinashilingam Institute for Home Science and High Education Coimbatore.
CORE PRACTICAL III

A. NUTRITION THROUGH LIFE CYCLE

1. Menu planning and food Exchange list
2. Nutritional and food requirements to meet the needs of the following.
   a. Infant and children
   b. School children
   c. Adolescent
   d. Adult
   e. Old people
   f. Athletes
3. Nutritional and food requirements to meet the special needs of a) Expectant women b) Lactating women.

B. COMMUNITY NUTRITION

1. Conduct of Socio-economic survey.
2. Conduct of Diet survey
3. Conduct of Clinical Examination
CORE PRACTICAL IV

A. FOOD SERVICE MANAGEMENT

1. Visit to well-organised food services units
2. Hostel Commercial Industrial Hospital Transport.
3. Table setting and service-appraising and drawing silver cutlery and crockery
   Folding of Napkins – Laying of table cloth, table mats – Arrangement of cover
   and table – appointment according to the menu – serving food at the table
   clearing of the table.
4. Standardisation any 3 selected quantity recipes and their preparation. Calculation
   of nutritive value, yield of cost per serving — size of serving.
5. Quantity Cookery: Preparation of South Indian, North Indian and Western menu
   for 25 members.
6. Organising, preparing and serving one special meals for 50 members.

B. DIETETICS

Planning and preparing of diets for the following conditions / stages.

1. Clear fluid, full fluid and soft diet.
3. Diet in obesity and under weight.
5. Diet in ulcer, diarrohea and constipation.
6. Diet in hepatitis and cirrhosis of liver.
7. Diet in diabetes mellitus with and without insulin.
8. Diet in Nephritis and Nephrosis
9. Visit to the dietary department of hospital.
OBJECTIVES

To enable students

- To gain knowledge on food safety and food laws.
- To study about quality control and common food standards.

UNIT-I:

**Quality Control:** Objectives, Importance, functions of quality control, stages of quality control in food industry.

**Food Quality Assurance:** Design of company quality assurance program, Microbiological concerns.

Managing quality in supply chain and marketing of food products.

UNIT-II:

**Government Regulations In Quality Control:** FAO/WHO codex Alimentarius commission, PFA, AGMARK, BIS, FPO, fair average quality (FAQ) specification for food grains, ISO 9000 series.

**HACCP:** Background, current status, structured approach, principles, benefits and limitation.

Consumer Protection Act (CPA)
UNIT-III:

Food Standards: Cereals and products - bread, biscuits, cakes products.

Fruits Products: Jam, juices, squashes, ketchup, sauce.

Oils and Fats: Coconut oil, groundnut oil, palm oil, sunflower oil, vanaspati.

Milk and Products: Skimmed milk powder, partly skimmed milk powder, condensed sweetened milk. Other products - coffee, tea, sugar, honey, toffees.

UNIT-IV:

Food Safety: Meaning of food safety

Importance of Food: Quality and safety for developing countries.

Patent: Definition, requirements, patent law in India, administrator, need for patent system, advantages, precautions to be taken by applicants, patent procedures, non-patenable.

Food Hazards: Physical, Chemical, Biological hazards associated with food types. Effect of processing and storage on microbial safety.

UNIT-V:

Food Adulterator: Adulteration of food - common adulterants and tests detect common adulterants.

REFERENCES:

4. BIS standards.
OBJECTIVES

To enable students

- The understand the need for food packaging and the recent packaging materials and labeling.
- Learn and gain knowledge on food packaging and applications during transportation.

UNIT-I:

Food Packaging: Definition, functions of packaging materials for different foods, characteristics of packaging material. Food packages – bags, pouches, wrappers, tetra packs.

UNIT-II:

Packaging Materials: Introduction, purpose, requirements, types of containers.

Modern Packaging Materials and Forms: Glass containers, metal cans, composite containers, aerosol containers, rigid plastic packages, semirigid packaging, flexible packaging.

UNIT-III:


Biodegradable packaging material - biopolymer based edible firm.
UNIT-IV:
Packages of dehydrated products. Orientation, metallization, co-extrusion of multilayer films, stretch, package forms and techniques. Aspectic packaging, retortable containers, modified and controlled atmosphere packaging, skin, strirk and cling film packaging, micro-ovenable containers, other package forms and components of plastics.

UNIT-V:
Packaging of Finished Goods: Weighing, filling, scaling, wrapping, cartooning, labeling, marking and trapping.

Labeling: Standards, purpose, description types of labels, labeling regulation barcode, nutrition labeling, health claims, mandatory labeling provision.

REFERENCES:
7. NIIR. Food Packaging Technology hand book, Delhi.
SKILL BASED SUBJECT IV

PAPER IV

CHILD GUIDANCE AND COUNSELING

Objectives

To enable students to:

- provide necessary theoretical background to the field of child guidance.
- acquaint them about the needs of guidance and counseling at various stages of development.
- give practical experience in the methods of investigation and in the application of the technique of guidance and counseling to such children and their family members.
- equip the students with necessary skills required for their prospective jobs as child counselors in child guidance clinics, pediatric departments, school counselors, or family counselors in family welfare organizations.

UNIT-I

Historical Background to the child guidance movement and services.

UNIT-II

Meaning of counseling and guidance
Need and scope of counseling and guidance
Principles of counseling and guidance of the children, Adolescents and adults at Home, school community. Role of counsellor, qualification and qualities of a counsellor.
UNIT-III
Role of tests in counseling and guidance - Diagnostic Methods, Interview and case study - psychological test - situation and observational techniques (play etc). recording of Electrophysiological correlates like (ECG etc.)

UNIT-IV : TECHNIQUES OF COUNSELING
Direct and Indirect counseling, methods of Management of Children in child guidance clinic - Techniques of individual management - play technique - psychochoma and group therapy - psychotherapy, Behavioral therapy and Behavior modification - Remedial and family therapy and Parent counseling - use of drugs in the treatment of behavior problems - Techniques and follow up procedures.

UNIT-V : AREAS OF COUNSELING
Emotionally disturbed
Physically Handicapped
Socially Maladjusted
Mentally Retarded
Gifted
Children with severe Behavior problems
Blind deaf and dumb - Educational, special approaches.

References

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