

# B.Sc. Nutrition, Food Service Management and Dietetics: Syllabus (CBCS)

## THIRUVALLUVAR UNIVERSITY

### BACHELOR OF SCIENCE

### B.Sc. NUTRITION, FOOD SERVICE MANAGEMENT AND DIETETICS

#### DEGREE COURSE

#### CBCS PATTERN

(With effect from 2012-2013)

#### The Course of Study and the Scheme of Examinations

S.NO	Part	Study Components		Ins. hrs /week	Credit	Title of the Paper	Maximum Marks		
		Course Title					CIA	Uni. Exam	Total
<b>SEMESTER I</b>									
1	I	Language	Paper-1	6	4	Tamil/Other Languages	25	75	100
2	II	English	Paper-1	6	4	English	25	75	100
3	III	Core Theory	Paper-1	6	6	Microbiology	25	75	100
4	III	Core Practical	Practical	3	0	Microbiology	0	0	0
5	III	ALLIED -1	Paper-1	4	4	Chemistry I	15	60	75
6	III	Allied Practical	Practical	3	0	Chemistry	0	0	0
7	IV	Environ. Studies		2	2	Environmental Studies	10	40	50
				<b>30</b>	<b>20</b>		<b>100</b>	<b>325</b>	<b>425</b>
<b>SEMESTER II</b>									
8	I	Language	Paper-2	6	4	Tamil/Other Languages	25	75	100
9	II	English	Paper-2	4	4	English	25	75	100
10	III	Core Theory	Paper-2	6	5	Human Physiology	25	75	100
11	III	Core Practical	Practical-1	3	3	A. Microbiology B. Human Physiology	40	60	100
12	III	ALLIED-1	Paper-2	4	4	Chemistry II	15	60	75
13	III	Allied Practical	Practical-1	3	2	Chemistry Practical	10	40	50
14	IV	Value Education		2	2	Value Education	10	40	50
15	IV	Soft Skill		2	1	Soft Skill	10	40	50
				<b>30</b>	<b>25</b>		<b>160</b>	<b>465</b>	<b>625</b>

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SEMESTER III							CIA	Uni. Exam	Total
16	I	Language	Paper-3	6	4	Tamil/Other Languages	25	75	100
17	II	English	Paper-3	6	4	English	25	75	100
18	III	Core Theory	Paper-3	3	3	Food Science	25	75	100
19	III	Core Practical	Practical	3	0	Food Science	0	0	0
20	III	ALLIED-2	Paper-3	4	4	Biochemistry I	15	60	75
21	III	Allied Practical	Practical	3	0	Biochemistry	0	0	0
22	IV	Skill based Subject	Paper-1	3	3	Bakery	15	60	75
23	IV	Non-major elective	Paper-1	2	2	Health and fitness	10	40	50
				<b>30</b>	<b>20</b>		<b>115</b>	<b>385</b>	<b>500</b>
SEMESTER IV							CIA	Uni. Exam	Total
24	I	Language	Paper-4	6	4	Tamil/Other Languages	25	75	100
25	II	English	Paper-4	6	4	English	25	75	100
26	III	Core Theory	Paper-4	3	3	Human Nutrition	25	75	100
27	III	Core Practical	Practical	3	3	A. Food Science B. Human Nutrition	40	60	100
28	III	ALLIED-2	Paper-4	4	4	Food Preservation	15	60	75
29	III	Allied Practical-2	Practical-2	3	2	A. Biochemistry B. Food Preservation	10	40	50
30	IV	Skill based Subject	Paper-2	3	3	Development and Marketing Strategy	15	60	75
31	IV	Non-major elective	Paper-2	2	2	Interior Design	10	40	50
				<b>30</b>	<b>25</b>		<b>165</b>	<b>485</b>	<b>650</b>
SEMESTER V							CIA	Uni. Exam	Total
32	III	Core Theory	Paper-5	6	5	Human Development	25	75	100
33	III	Core Theory	Paper-6	6	5	Nutrition Through Life Cycle	25	75	100
34	III	Core Theory	Paper-7	6	5	Community Nutrition	25	75	100
35	III	Core Practical	Practical	3	0	Nutrition through Life Cycle	0	0	0
36	III	Core Practical	Practical	3	0	Community Nutrition	0	0	0
37	III	Elective	Paper-1	3	3	Entrepreneurship Development	25	75	100
38	IV	Skill based Subject	Paper-3	3	3	Pre School Management	15	60	75
				<b>30</b>	<b>21</b>		<b>115</b>	<b>360</b>	<b>475</b>

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SEMESTER VI						CIA	Uni. Exam	Total	
39	III	Core Theory	Paper-8	5	5	Nutrition Policies and Nutrition Delivery Mechanisms	25	75	100
40	III	Core Theory	Paper-9	5	4	Food Service Management	25	75	100
41	III	Core Theory	Paper-10	5	4	Dietetics	25	75	100
42	III	Core Practical	Practical-3	3	3	A. Nutrition through Life Cycle Community B. Nutrition	40	60	100
43	III	Core Practical	Practical-4	3	3	A. Food Service Management B. Dietetics	40	60	100
44	III	Elective	Paper-2	3	3	Food Quality Control	25	75	100
45	III	Elective	Paper-3	3	3	Food Packaging	25	75	100
46	IV	Skill based Subject	Paper-4	3	3	Child Guidance and Counseling	15	60	75
47	V	Extension Activities		0	1		50	0	50
				<b>30</b>	<b>29</b>		<b>270</b>	<b>555</b>	<b>825</b>

Part	Subject	Papers	Credit	Total credits	Marks	Total marks
Part I	Languages	4	4	16	100	400
Part II	English	4	4	16	100	400
Part III	Allied (Odd Sem)	2	4	8	75	150
	Allied (Even Sem)	2	4	8	75	150
	Allied -Prac(Even Sem)	2	2	4	50	100
	Electives	3	3	9	100	300
	Core	10	(3-7)	45	100	1000
	Core Practical	4	3	12	100	400
Part IV	Env. Science	1	2	2	50	50
	Soft skill)	1	1	1	50	50
	Value Education	1	2	2	50	50
	Lang. & Others/NME	2	2	4	50	100
	Skill Based	4	3	12	75	300
Part V	Extension	1	1	1	50	50
	<b>Total</b>	<b>41</b>		<b>140</b>		<b>3500</b>

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**DEGREE COURSE**

**SYLLABUS**

**UNDER CBCS PATTERN**

**(With effect from 2012-2013)**

**SEMESTER I**

**PAPER – 1**

**MICROBIOLOGY**

**Objectives:**

To enable the students to:

1. Gain knowledge of the role of micro-organisms in health and disease.
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**

1. History of Microbiology - Proof of Biogenesis Germ theory and of fermentation - development of laboratory - Technique to study micro -organisms - pure Culture - isolation - Cultivation, preservation, Technique - Kochs postulates.
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.
- f. Protozoa: Morphology, reproduction, motility and classification. Destruction of Microorganism - Sterilization, pasteurization, and disinfection.

## **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**

- a. Fermentation - aerobic respiration, anaerobic, respiration, products of fermentation.
- b. Part played by micro-organisms in putrefaction and decay.

### **1. 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**

1. Use of high and low temperature. Canning of fruits and vegetables.
2. 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:**

1. Joshua. A.K. Microbiology - India printing works, Madras - 1971.
2. Carpenter, Microbiology - W.B. Saunders Co., London.
3. Salie. A.J. Fundamental principles of Bacteriology - MCGraw Hill Book Co.,
4. R.C.Rubey & D.K. Maheshwari; A Textbook of Microbiology
5. Pelczar J. Michael; Microbiology concepts and Application
6. Ananthanarayan. R. & Paniker C.K.J; Textbook of Microbiology.
7. Frazier.W.C; Food Microbiology-McGraw Hill Book and Co; New York.
8. Smith and Water; Introductory food services-McGraw Hill Book and Co., New york, 1971.
9. West Wood and Harger; Food Service in Institutions, 1966. John Wiley and Sons. Incorporation, New York, London.

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10. ADAMS M.R. and MOSS M.O; Food microbiology, the Royal society and chemistry. Cambridge 1991.
11. Banwart. G.J; Basic food microbiology, Chapman and Hall, New York.
12. HOBBS BC and Roberts. D; Food poisoning and food Hygiene. Edward Arnold (A diceision of Hodder and Stoughton), London.
13. Sarda Mornmore; HACCP, A practical Approach, Edn.1997.

**ALLIED**

**PAPER - 1**

**CHEMISTRY I**

**UNIT-I**

- 1.1 Extraction of Metals – Minerals and Ores – Difference – Minerals of Iron, Aluminum and Copper – Ore dressing or Concentration of Ore – Types of Ore Dressing - Froth Flootation and Magnetic separation.
- 1.2 Refining of Metals – Types of Refining – Electrolytic, Van Arkel and Zone refining.
- 1.3 Extraction of Thorium.

**UNIT-II**

- 2.1 Preparation and Properties of Cyclohexane. Baeyer Strain Theory.
- 2.2 Polar Effects – Inductive effect, mesomeric effect and steric effect. (Acid and Base Strength).
- 2.3 Stereoisomerism – Types, Causes of optical activity of lactic acid and tartaric acid . 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 reactions.
- 3.2 Catalysis – Catalyst – auto catalyst – enzyme catalyst – promoters – catalytic poisoning – Active center – Distinction between homogeneous and Heterogeneous catalysis – Industrial applications of catalyst.
- 3.3 Photochemistry – Grothus Drapers law, Stark Einstein's law – quantum yield – photosynthesis, phosphorescence, fluorescence – chemiluminescence – photosensitization.

**UNIT-IV**

- 4.1 VSEPR Theory – Shapes of simple molecules  $\text{BF}_3$ ,  $\text{PCl}_3$ ,  $\text{SF}_6$  and  $\text{XeF}_6$ .
- 4.2 Fuels – Calorific value of fuels – non conventional fuels – need of solar energy – Applications – Bio fuels.
- 4.3 Osmosis – Osmotic pressure – reverse osmosis – desalination of sea water.



**UNIT-V**

- 5.1 Nuclear Chemistry – Definition of Half life period – Group displacement law – Radioactive series. Nuclear Fission and Fusion – Application of nuclear chemistry in Medicine, Agriculture, Industries –  $C^{14}$  Dating.
- 5.2 Crude oil - Petroleum – Petroleum refining – Cracking – Applications of Cracking. Naphthalene – Preparation – Properties and uses of Naphthalene.
- 5.3 Elements of Symmetry – Unit cell – Crystal lattice – types of cubic lattice – one example each.

**SEMESTER II**

**PAPER - 2**

**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**

- a. Blood, lymph, spleen and RES: Blood composition and function - plasma proteins, distribution functions. Cell components - RBC - Structure, function, normal count; WBC - classification, function, normal values. Blood coagulation, Erythropoiesis, blood grouping. ABO system and RH system, spleen and RES – functions.
- 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.
- c. Respiratory system: Structure of pharynx, larynx, trachea, bronchi, lung and lung cavities. Physiology of respiration- Mechanism of respiration, gaseous exchange, nervous and chemical control of respiration.
- d. Excretory system: Structure and function of kidney, urine formation, micturition.

**UNIT-III: DIGESTIVE SYSTEM AND ITS ACCESSORIES**

Structure and functions of the digestive organs. Deglutition, Digestion and absorption of carbohydrates, proteins and fats, movements of G.I Tract.

### **UNIT-IV: NERVOUS SYSTEM**

- a. Neuron structure and functions - structure of Brain and Spinal cord - Lobes and functions of cerebrum, cerebellum, of brain stem. Autonomic nervous system - functions, reflex arc.

### **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. Guyton, A.C. Human Physiology and Mechanisms and Diseases. W.B. Saunders and Co., Philadelphia., 1992.
- b. Kimber, D.E; Gray, C.E; Stackpole, C.E and Leavel, L.C; Anatomy and physiology. The Mac Millan Co., New York, 1972.
- c. Ham, A.W, Histology, Pitman Medical Publishing Co., Ltd, London, 1967.
- d. Wright, Applied Physiology, Oxford University Press, Madras, 1966.
- e. Strand, F.L, Modern physiology. The Macmillan Co., New York, 1968.
- f. Horrobin, D.R. Essential physiology. Medical and Technical Publishing Co. Ltd. Lancaster, 1973.
- g. Davison, Hand Segal, H.B, Introduction to physiology, Gruea and Stratton, London, 1975.
- h. Langley, L.L. Cell functions, East West Press Ltd, New Delhi, 1968.
- i. Chatterjee, C.C. Human Physiology. Vol I & II, Medical Allied Agency, Calcutta, 1983.
- j. Vidhya Rathan, Handbook of Human physiology, Jaypee Brothers, New Delhi, 1986.
- k. Chaudhri, S.K. Concise Medical physiology, New Central Book Agency, Calcutta, 1988.
- l. Best, C.H & Taylor, N.B. The Living Body, Asia publishing House, B. Mumbai, 1964.
- m. Vander, A.J; Sherman, J.H and Luciano, D.S. Human physiology - The Mechanisms of Body functions, TMH Publishing Co. Ltd., Delhi, 1990.

## **CORE PRACTICAL I**

### **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, Simple Staining and Gram 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.
1. Microscopic structure of bone, cartilage.
2. Study of anatomy of sheep's brain, heart and kidney.
3. Microscopic study of blood, WBC, RBC estimation, Hb estimation, bleeding time, clotting time.
4. Blood grouping, blood pressure, histology of artery and vein.
5. Microscopic structure of lung and trachea.
6. Microscopic structure of the reproductive organs and endocrine glands - ovary, uterus, mammary glands, testis, thyroid, pituitary, adrenal.

**ALLIED - 1**  
**PAPER - 2**  
**CHEMISTRY II**

**UNIT-I: Co-ordination Chemistry**

- 1.1 Nomenclature of Coordination Compounds - Werner Theory of Coordination Compounds – Chelation – Functions and structure of haemoglobin and chlorophyll.
- 1.2 Industrial Chemistry:  
Fertilizers and manures – Bio fertilizer – Manures and their importance – Role of NPK in plants – preparations 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, gammexane and Freon.

**UNIT-II: Carbohydrates**

- 2.1 Classification – structure of glucose – properties and uses of starch – uses of Cellulose nitrate – Cellulose acetate.
- 2.2 Amino Acids and Proteins  
Classification of amino acids – preparation and properties of Glycine – Classification of proteins based on physical properties and biological functions.
- 2.3 Primary and Secondary structure of protein (Elementary treatment only) composition of RNA and DNA and their biological role. Tanning of leather –alum (aluminum trichloride tanning –Vegetable tanning)

**UNIT-III: Electrochemistry**

- 3.1 Specific and equivalent conductivity their determination – effect of dilution on conductance.
- 3.2 Kohlrausch law – Determination of dissociation constant of weak Electrolyte using conductance measurement – Conductometric Titrations.
- 3.3  $P^H$  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 paints - 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 and K – Hormones – Functions of insulin and adrenaline.
- 4.3 Chromatography –Principles and applications of column, paper and thin layer chromatography.

### **UNIT-V**

- 1.1 Drugs – Sulpha drugs Uses and mode of action of sulpha drugs – Antibiotics – Uses of Penicillin, Chloroamphenicols, streptomycin. Drug abuse and their implication- alcohol – LSD
- 1.2 Anaesthetics – General and local anaesthetics – Antiseptics – Example and their application. Definition and one example each for analgesics, antipyretics, tranquillizers, sedatives, causes of diabetes, cancer and Aids.
- 5.3 Electrochemical Corrosion and its prevention.

**ALLIED CHEMISTRY**

**PRACTICAL**

**VOLUMETRIC ANALYSIS**

1. Estimation of hydrochloric acid using standard sulphuric acid.
2. Estimation of Borax using standard sodium carbonate.
3. Estimation of  $\text{FeSO}_4$  using standard Mohr salt solution.
4. Estimation of Oxalic acid using standard  $\text{FeSO}_4$ .
5. Estimation of  $\text{K}_2\text{Cr}_2\text{O}_7$  using standard  $\text{K}_2\text{Cr}_2\text{O}_7$ .
6. Estimation of Copper using standard copper sulphate.
7. Estimation of  $\text{Fe}^{2+}$  using diphenylamine / N-Phenyl anthranilic acid as indicator Students must write the short procedure for the given Estimation in the examination and submit the paper for evaluation.

**ORGANIC ANALYSIS**

Reactions of Aldehyde (aromatic), Carbohydrate, Carboxylic acid (mono and dicarboxylic acid), Phenol, Aromatic primary amine, Amide, and Diamide. Systematic Analysis of Organic compounds containing one functional group and characterization of confirmatory tests.

**SEMESTER III**

**PAPER - 3**

**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**

Cereal and Cereal products - Microscopic structure of various starch granules - Nutritive value of Rice, Wheat and locally available millets. Effect of cooking on the nutritive value of cereals. Gelatinisation, Dextrinization, gluten formation.

Pulses and nuts - Composition, Nutritive value of grams, dhals - some common nuts - meat substitutes - soya products. Textured Vegetable Protein (TVP). Effect of cooking on pulses.

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
- d. Poultry - Nutritive value, economic aspects. Principles and methods of cooking poultry.
- e. Eggs - Structure, composition, Nutritive value, selection - principles of egg cookery - uses of eggs in cookery, methods of cooking eggs.

### **UNIT-V**

- a. Fats and Oils - Types - saturated, MUFA, PUFA, Hydrogenation - Invisible fats - uses of fat in cookery - factors affecting absorption of fats - smoking point - Rancidity.
- 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:**

1. Bennion, M. and Hughes, D. Introductory foods Macmillan Publishing Co. Inc. New york. 1975.
2. Brich C.G. Spencer M and Cancerron, A.G Food Science, Pergamon Press, New York, 1977.
3. Gopalan. C, Ramasastri, P.N, Balasubramanian, S.C. Nutritive value of Indian Foods, National Institute of Nutrition, Hyderabad, 1977.
4. Growworld. R.H, The experimental study of foods. Houghton Mifflin Co, Boston, 1972.
5. Swaminathan. M, Food Science and Experimental foods. Ganesh and Co, Madras, 1979.
6. Mudambi. S.R, Rao, S.M. Food Science, Wiley Eastern Ltd, New Delhi, 1986.

**ALLIED - 2**

**PAPER - 3**

**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:**

Definition, classification and properties of Amino acids, isoelectric point, Isoelectric pH, Zwitter ion. Reaction with Ninhydrin, 1-fluoro-2, 4, dinitrobenzene [FDNB] and

Sieg Fried's carbamino reaction. Essential and Non essential Amino acids.

**UNIT-III : CHEMISTRY OF PROTEINS:**

Classification based on shape and size, solubility and biological function. Peptide bond. Structure of protein - Primary, secondary, tertiary and quaternary. N-Terminal determination - Edmans and dansyl chloride method. C-Terminal determination. Denaturation.

**UNIT-IV: CHEMISTRY OF LIPIDS**

Introduction, definition of fatty acids, classification, nomenclatures, structures, properties of fatty acids. Structure and function of prostaglandins, triacyl glycerol, phospholipids [lecithin, cephalin, phosphotidyl inositol, phosphotidyl serine], Spingomyelin, Plasmologen, Glycolipids and Cholesterol. Bile salts Functions.

**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:**

1. Lehinger's principle of Biochemistry (2000), Nelson and Cox.
2. Harper's Biochemistry - Rober K. Murray, Daryl K.Grammer, McGrawHill, Lange Medical Books
3. Fundamentals of Biochemistry - J.L Jain, Nitin Jain, S. Chand & Company.
4. Biochemistry - Dr. Amit Krishna De, S. Chand & Co., Ltd. et al
5. Biochemistry - Dr. Ambica shanmugam, published by author.
6. Bio molecules - C. Kannan, MJP publishers, Chennai-5

**SKILL BASED SUBJECT I**

**PAPER – 1**

**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
2. Kumud Khanna et al, The art and science of cooking, A student manuum, 3<sup>rd</sup> edition,. Published by Pr.Ouseph for phoenix, publishing House Pvt Ltd, 1998
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 - 1**

**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**

Fitness and its measurements: meaning of fitness, Tests of fitness, Exercise and Health related fitness: Health related fitness, health promotion and physical activity for health benefits.

**UNIT-III**

Sports related fitness: Nutritional requirements of athletes: Role of nutrition in sports – Carbohydrates, Protein lipids, minerals, water and other fluid requirements, Sports supplements

**UNIT-IV**

Energy for Exercise performance: Energy expenditure during physical activity, carbohydrate metabolism and performance, fat metabolism and performance, effect of exercise on protein requirements.

**UNIT-V**

Exercise programmes: types of exercise, resistance exercise training, aerobic exercise, Weight Control – dieting or exercise, weight reduction programme.

Exercise in relation to other factors: Heart diseases, Diabetes management, Bone diseases, mental health and Pregnancy.

### **REFERENCES:**

1. K. Park Text book of preventive and social medicine, 15<sup>th</sup> edition, MIS Banarsidas Bhano Publishers, Jabalpur, 1997.
2. Melvin H.Williams, Nutrition for Health, fitness and Sports, 7<sup>th</sup> edition, MC Graw Hill international Edition, 2005.
3. Micheal J.Gibney, Ian A Macdonald and Helan M.Roche, Nutrition and Metabolism, Blackwell Publishing Company, Bangalore, Reprint 2004.
4. B. Srilakshmi, Dietetics, New Age International Publishers, New Delhi, 2010
5. Shubhangini A Joshi, Nutrition and Dietetics, 3<sup>rd</sup> edition, Tata McGraw Hill Education private limited, New Delhi, 2011.

**SEMESTER IV**

**PAPER - 4**

**HUMAN NUTRITION**

**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.
2. Carbohydrates - Definition and composition, classification, carbohydrate, Review of Digestion, absorption and metabolism - Regulation of blood sugar. Hormonal controls, functions of carbohydrates in the body. Dietary fibre - definition soluble and insoluble fibres, sources of fibre, components, physiological effects of dietary fibre, Role of fibre in human nutrition, sources and requirements. Water - water balance, water compartment, and physiological variation.

**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 - determinatio 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.

**UNTI-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 -



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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.

2. Protein - Composition - structure and classification, function of protein, Amino acids - Indispensable and dispensable amino acids - special function of amino acids - protein deficiency - Evaluation of protein quality - PER, BV, NPU, NPR, chemical score, mutual and amino acid supplementation of proteins.

### **UNIT-IV**

1. Fat soluble vitamins - Vitamin A, D, E and K - function effects of deficiency, sources, requirements, units of measurement and hyper - vitaminosis.
2. Function, effects of deficiency, sources and requirements of water soluble vitamins - ascorbic acid, thiamine, riboflavin and Niacin.
3. Importance of folic acid, Vit B-12, pyridoxine, Biotin and Pantothenic 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. Trace elements in human nutrition - copper, fluorine, zinc - functions, food sources, requirements and effects of deficiency.
3. Selenium and Vitamin E relationship.
4. Chromium and glucose tolerance factor.

### **References:**

1. Guthrie H. Andrews - Introductory Nutrition C.V. Mosby Co.St. Lours.
2. Bogert, J.G.V. Briggs, D.H. Calloway Nutrition and physical fitness, 11<sup>th</sup> edition - 1985 - W.B. Saunders Co., Philadelphia, London, Toronto.
3. Wardlaw, G.M. Insel, P.H. - Perspectives in Nutrition (1990) Times Mirror / Mosby College Publishing Co. St. Louis, Toronto, Boston.
4. William; Sue Rodwell - Nutrition and Diet Therapy (1985) 5<sup>th</sup> edition, Mosbey Co. St. Louis.
5. M. Swaminathan "Principles of Nutrition and Dietetics", 1993, Bappeo 88, Mysore Road, Bangalore - 560 018.
6. Maurice E Shils, James A. Olson, Moshe Shike "Modern Nutrition in health and disease" eighth edition, Vol I & II Lea & Febiger Philadelphia, A waverly company, 1994.

## **CORE PRACTICAL II**

### **A. 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
6. Fats and oils - preparation of shallow and deep fried foods.
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
2. Pulses - Effect of hard and soft water, alkali, cooking time of grams and dhals.
  3. Vegetables - Effect of acids, alkali, covering, steaming and pressure cooking on the different pigments and acceptability of vegetables.
  4. Fruits - Study of different methods of preventing enzymatic browning of cut fruits, pectin content of fruits.
  5. Eggs - Coagulation of egg protein - factors. Egg white foam - effect of beating, sugar, acid and temperature.
  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
6. Quantitative estimation of phosphorous.
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 - 2**

**PAPER - 4**

**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.
2. Processing of condiments and spices. Beverages, tea, coffee and cocoa.

**UNIT-III**

1. Preservation - using sugar, jams and alkalies.
2. Chemical preservation and use of antibiotics. Removal of moisture, drying, dehydration and concentration.

**UNIT-IV**

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

**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.
3. Nowman N.Potter, Professor Food Technology, Cornell University, Ithaca, New York.

**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 – 2**

**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:**

1. Sivarama Prasad.A, 1985, Agricultural Marketing in India-Mittal Publications, New Delhi.
2. Acharya.S.S, and N.L.Agarwal, 1992, Agricultural Marketing in India-Oxford and IBH Publishing Pvt., Ltd., New Delhi.
3. Developing New Food Products For a Changing Market Place, 2<sup>nd</sup> Edition, 2005, Aaron, L.Brody, John B.Lord.
4. New Food Product Development, 2004, Gordon W.Fuller.



**NON-MAJOR ELECTIVE**

**PAPER - 2**

**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:**

1. Alexander, M.J. Design Interior Environment, Harcourt Brace, Havana, 1972.
2. Goldstein and Goldstein. Act in Everyday Life, Macmillan Co, New York, 1960.
3. John Lester and Steven Violet. The world of House plants and Flower Arranging, Galahod Book, New York, 1975.
4. Coe Stella and Ikebana. A practical and philosophical guide to Japanese Flower Arrangement, Century publishing Co. Ltd., London, 1984.
5. Jean, T. Flower arranging, Mac Donald Guidelines, London, 1980.

**SEMESTER V**

**PAPER - 5**

**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**

1. The concept of development and growth - principles governing growth and development, developmental tasks of different stages.
2. Stages of Life span - conception, infancy, early childhood, late childhood, adolescence, adulthood, middle age and old age.

**UNIT-II**

1. Prenatal Development - Conception, test tube baby, Periods of prenatal development - signs of pregnancy.
2. Prenatal care - Management of normal pregnancy - hygiene, diet and medical supervision and hazards during pregnancy.
3. Labor - sign of labor, stages of labor - types of birth, multiple pregnancy.
4. Post-natal care, prevention of gynecological complications.
5. Adjustment of the newborn to temperature, breathing, feeding and elimination.

**UNIT-III**

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

1. 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.
2. Importance of preschool education.
3. Late childhood (Elementary school period 6 - 12 years) - Developments - physical, social, emotional, cognitive and language. Sex Education.
4. Children with special needs - identification and rehabilitation.

### **UNIT-V**

1. Adolescence (12 - 18 years) Physical, emotional, intellectual and motor development, personal adjustment and mal adjustment. Delinquency - causes, prevention and rehabilitation. Drug addiction and alcoholism - rehabilitation.
2. Adulthood (18 - 60 years) - Characteristics and developmental tasks. All aspects of development and vocational development.
3. 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:**

1. Devadass, R.P; Jaya, N. A Text Book on Child Development, Macmillan Indian Ltd., Delhi, 1996.
2. Parikh, S; Sudarshan, R. Human Development and Structural Adjustment, UNPP, Delhi, 1993.
3. Mussen etal. Child Development and personality, Harper and Row publishers, New York, 1990.

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4. Suriakanthi. A. Child Development, Swagath Fine Auto, Sivakasi, 1991.
5. Papalia, D.E. Human Development, Tata McGraw Hill Publishing company Ltd, New Delhi, 1997.
6. Suriakanthi, A. A Handbook on Human Development, Gandhigram Rural University, Gandhi gram, 1992.
7. Charles, S.P. Adolescent Psychology, Vikas House, New Delhi, 1983.
8. Hurlock, E.B. Development psychology Tata Mc Graw Hill Publishing Co, Ltd, New Delhi, 1975.
9. Hurlock, E.B. Adolescent Development, Tata McGraw Hill Co. Ltd, New Delhi, 1973.
10. Arya Subash, C. Infant and child care of the Indian Mother, Vikas Publishing Co., Delhi, 1970.

**PAPER – 6**

**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**

- a. Nutrition in Infancy, Preschool and School going age :
- b. Preschool - Growth and development of preschool children, Food habits and nutrient intake of preschool children. Dietary allowances and supplementary foods.
- c. 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:

- a. Adolescence: Changes of growth characteristics of adolescents. Nutritional needs of the adolescents. Eating disorders.
- b. Adults: Nutrition for adults. Basis for requirement. Nutrition and work efficiency.

**UNIT-IV: NUTRITION IN PREGNANCY**

ICMR Nutrient allowances, Dietary guidelines. Common nutrition related problem of pregnancy and Lactation. Current scenario in the field of Nutrition in pregnancy and Lactation.

**UNIT-V**

**1. Geriatric Nutrition**

Nutrition allowances - Dietary Guidelines - Nutrition and work efficiency modifications in diet. Physiological changes in aging - psycho social and economical factors affecting eating behavior.

**2. Infancy**

Rate of growth, weight as the indicator, Nutrition allowances for the infants. Breast feeding. Weaning foods suitable for infants. Premature infant and their feeding infant formulas. Lactose intolerance.

**Reference**

1. Clark, N., Sports Nutrition Guide Book, Versa Press, U.S.A., 1997.
2. Williams, M.H Nutrition Aspects of Human, physical and Athletic performance, II Edition, Spring field publication, Illinois, 1995.
3. Lankford, R.T. Marie and Steward, J., Nutrition and physical fitness, Foundation of Normal and Therapeutic Nutrition, Wiley Medical publication, New York, 1985.
4. William, Sue Rodwell - Nutrition and Diet Therapy (1985) 5<sup>th</sup> edition Moshey Co., St Louis.
5. M. Swaminathan "Principles of Nutrition and Dietetics" 1993, Bappeo 88, Mysore Road, Bangalore - 5600018.
6. Maurice E, Shils, James A. Olson, Moshe Shike "Modern Nutrition in health and disease" eighth edition, Vol I, II Lea & Febiger Philadelphia, A Waverly Company, 1994.

**PAPER – 7**

**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**

Methods of assessment of Nutritional status - sampling, Direct assessment - Diet survey, anthropometry, clinical and biochemical estimation. Indirect assessment - Food balance sheet, Agricultural data, Ecological parameter and vital statistics, use of growth chart.

**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**

Nutrition Education - Meaning, Scope, Methods - Planning, conduct of evaluation of Nutrition education Programme.

**Reference**

1. Health and Hygiene - A Lesties Banks and Hislop J.A., Universal Tutorial Press, London.
2. Challenges in Rural Development - Senha H.K, Discovery publishing.
3. Food consumption and planning - Vol V, International encyclopedia.
4. Theory and practice of public Health, Oxford University press, London.
5. Applied Nutrition and Health Education, Sabarwal B, Common wealth publishers, New Delhi.
6. Foundations of Community Health Education, Mc Graw Hill, London.
7. Nutritional Problems of India, P.K. Shukla, Prentice Hall, India.

**ELECTIVE**

**PAPER – 1**

**ENTREPRENEURSHIP MANAGEMENT**

**OBJECTIVES:**

To enable the students to

1. Learn the qualities of an entrepreneur.
2. Understand the process and procedures of setting up of an enterprise.
3. 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**

Financial Management - book keeping, breakeven analysis, working capital cost concept, financial ratios and their significance.

**UNIT-V**

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

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### **REFERENCES:**

1. Gupta and Sourirasan, N.P (1985), Entrepreneurial Development, New Delhi, Sultanchand and Sons Educational Publishers.
2. Holt D.H. (1990) Entrepreneurship, New Delhi, New Venture Creation, Prentice Halls of India.
3. Khanka S.S. (1990), Entrepreneurial Development, New Delhi, Chand.S
4. Deshpande. M.R. (1984), Entrepreneurship of Small Scale Industries Concept, Growth Management, New Delhi, Deepavel Deep Publications.
5. Paramjeet Kavir Dillon (1993), Women Entrepreneurships Problems and Percepts, New Delhi, Blaze Publishers Co., Ltd.

**SKILL BASED SUBJECT**

**PAPER - 3**

**PRE SCHOOL MANAGEMENT**

**OBJECTIVES:**

1. To train the students in organizing and administration of a preschool for children below 6 years of age.
2. To develop in the students knowledge and understanding of the methods, equipments and materials required for early childhood education.
3. 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**

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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.
2. Devadoss R.P. The text book on Child Development, New Delhi, the Macmillan Co., 1979.
3. Grewal J.S. Early Childhood Education - Foundation and Practice, agra, National Psychological Corporation 1984.
4. Hammond etal. Good Schools for Young Children, New York, Macmillan Co., New York 1963.

**SEMESTER VI**

**PAPER - 8**

**NUTRITION POLICIES AND NUTRITION DELIVERY MECHANISMS**

**Objectives:**

- To have an overview of the existing policies and programmes concerning health, food and nutrition and their implementation.
- To understand the approaches adopted in the delivery of nutrition services
- To be aware of the Nutrition Monitoring and Surveillance mechanisms regarding

**Unit-I: Food and Nutrition Security:**

National Nutrition Policy and Approaches in Nutrition Delivery. Reference to food and nutritional status in the Indian Constitution, National Nutrition Policy, National policy for empowerment of women- (Origin, salient features, scope, operational aspects). National Commission for women, Women's Development Corporation (Origin, salient features, scope, operational aspects). Approaches in Nutrition delivery – food based approaches (food production, supplementary feeding, biotechnological approaches) 'pill' or syrup based approaches (Vitamin A prophylaxis programme, iron folic acid supplementation) genetically modified food (GM crops).

**Unit-II: Direct Nutrition Programmes:**

Ministry of Women and Child Dev – ICDS, Nutrition Programme for Adolescent Girls (NPAG). Nutrition Advocacy and Awareness Generation Programmes of Food and Nutrition Board (FNB). Ministry of Health and Family Welfare - Iron and Vit A supplementation of pregnant women, Vitamin A supplementation of children 9 – 36 months age group, National Iodine Deficiency, Disorders Control Programme, Dept. of Elementary Education and Literacy – Mid Day Meal Programme.

**Unit-III: Indirect Nutrition Programmes:**

Dept for Agriculture and Cooperation – Increased food production, horticultural interventions. Food and Public Distribution – Targetted Public Distribution System, Rural and Urban dev – Food for work programme, poverty alleviation programmes, safe drinking water and sanitation, National Rural Employment Guarantee Scheme.

### **Unit-IV: Indirect Nutrition Programmes (contd.)**

Ministry of Health – National Rural Health Mission, Integrated mgt of Neonatal and Childhood illnesses, various public health measures, Dept of Elementary Education and Literacy – Sarva Siksha Abhiyan, adult literacy programme, Central and State Social Welfare Boards – various women’s welfare and support programmes.

### **Unit-V: Nutrition monitoring and surveillance mechanisms**

National Nutrition Monitoring Bureau (NNMB), Management Information System (MIS) under NRHM and ICDS, National Family Health Survey I, II and III, District level Health Survey (DLHS), Under Ministry of Health and Family Welfare – Central Bureau of Health Intelligence, Statistical 67 Division, ICMR, NIN, NNMB, periodicity, scope and adequacy of information, strengths and weaknesses UN agency reports.

### **PRACTICALS**

1. Students to visit one Anganwadi centre and observe the school feeding programme in a school.
2. Students should be oriented to observe the infrastructure facilities, especially with reference to cooking, serving and cleaning, the quantity and quality of food served and the adult child interaction.
3. The nutritional status of children could be assessed and students may be asked to give a small report of their observations. Teacher should discuss the nutritional status of the children and the strengths and weaknesses of the services.

### **REFERENCES:**

1. GOI (2001) ‘National Policy for Empowerment of Women’  
<http://wcd.nic.in/empwomen.htm>
2. GOI (1992) National Commission for Women <http://ncw.nic.in/>
3. GOI (1992) ‘National Nutrition Policy’ Ministry of Health and Family Welfare
4. GOI (2006) Report of the Working Group on integrating Nutrition with Health, Ministry of Women and Child Development.
5. Sehgal S and Raghuvanshi R (2004) ‘Textbook of Community Nutrition’ Indian Council of Agricultural Research, New Delhi. ISBN – 978-81-7164-074-4.

**PAPER - 9**

**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**

- a. Types of catering - history of development - commercial - Hotel, Motel, Restaurant, Cafeteria and Chain hotels.
- b. 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 everyday 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 recipes portion control. Effective use of left over.
- b. Quantity Food Service: Types - their objectives, styles of service - Waiter or 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**

1. Bennion, M and Hughes, D. 1975 - Introductory foods, Macmillan Publishing Co. Inc-New York.
2. Brich, C.G Spencer, M. and Cameron, A.G. 1977 - Food Science, 2<sup>nd</sup> edition, pergamon press, New York.
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6. Mydambi, S.R. and Rao S.M. 1986 - Food Science, Wiley Eastern Ltd. New Delhi. Bangalore.

**PAPER - 10**

**DIETETICS**

**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.
2. Etiology, symptoms and modification of diet in diseases of liver and gall bladder. a. hepatitis b. cirrhosis c. Cholecystitis and Cholelithiasis.

**UNIT-III**

1. Prevalence, pathogenesis, symptoms, risk factors and modification of diet in cardiovascular disease - Atherosclerosis, hypertension.
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 nephritis, nephritic syndrome, acute and chronic renal failure, dialysis - urinary calculi.
2. Symptoms, Risk factors and modification of diet in cancer - Nutritional problems of cancer therapy - Role of antioxidants in the prevention of degenerative diseases.

## **B.Sc. Nutrition, Food Service Management and Dietetics: Syllabus (CBCS)**

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### **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.

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1. Sue Rodwell Williams Nutrition and Diet therapy 1985. The C.V. Mosby Saint Louis.
2. Bogeri, J.G.V Brigg – D.H. Colloway, Nutrition and Physical fitness 1973, W.B. Saunders Philadesphra - London.
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12. Davidson & Passmore R & Brock J.B Human Nutriton & dietetics, 1976. The English Languages Bood Society & Churchill Living stone.
13. David, M. Paize et al. Clinical, Nutrition, 1988 C.V. Moshy Co. St. Louis.

### **Journals**

1. Journal of American Dietetics Association, American Dietetic Association, U.S.A.
2. India Journal of Nutrition and Dietetics - Avinashilingam Institute for Home Science and High Education Coimbatore.

**CORE PRATICAL - 3**

**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
4. Planning, conducting and Evaluating Nutrition Education programme.

**CORE PRACTICAL – 4**

**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.
2. Diet in fever – Typhoid, tuberculosis.
3. Diet in obesity and under weight.
4. Diet in atherosclerosis and hypertension.
5. Diet in ulcer, diarrhoea 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.

**ELECTIVE II**

**PAPER – 2**

**FOOD QUALITY CONTROL**

**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-patentable.

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:**

1. A.Y.Sathe, A first course in food analysis - New Age Publications, 1999.
2. Norman.N. Potter and Joseph. H. Hotchkiss, Food Science - CBS Publishers, 1996.
3. M.Swaminathan, Food Science, Chemistry and Experimental Foods - Bappco Publishers.
4. BIS standards.
5. Desrosier and Desrosier, Technology of food preservation - CBS Publishers, Fourth edition, 1999.

**ELECTIVE**  
**PAPER – 3**  
**FOOD PACKAGING**

**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**

Packages of Radiation Stabilized Foods: Introduction, rigid containers, flexible containers, general methods for establishing radiation stabilization. Radiation measurement of radiations.

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. Aseptic packaging, retortable containers, modified and controlled atmosphere packaging, skin, shrink 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:**

1. Vijaya Khader, Text book of Food Science and Technology, Indian Council of Agricultural Research, New Delhi, 2001.
2. Stanley Sacharous. Roger C Griffin. Principles of Food Packaging 2<sup>nd</sup> Edition AVI Publishers Co. Westport.
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6. Paine F.A. The packaging media. Blackie and Sons Ltd., London
7. NIIR. Food Packaging Technology hand book, Delhi.

**SKILL BASED SUBJECT IV**

**PAPER - 4**

**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 counselor or family counselors in family welfare organization.

**UNIT-I**

Historical Background to the child guidance movement and services.

Causes and determinants of common childhood problems genetic - psychological, socio cultural factors. Description and analysis of common varieties of behavioural problems of normal children - typical problems.

**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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3. Ginnolt - group psychotherapy with children - Mc Graw Hill (1961)
4. Kaat D.B (1974) Fundamentals of child counseling - Houghton Mifflin.
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