Vellalar College for Women (Autonomous), Erode -12

Bachelor of Science in Nutrition and Dietetics

2015-2016 Onwards

Course Content and Scheme of Examinations (CBCS Pattern)

Semester I

Part	Study Components	Subject Code	Titles of The Paper	Inst. Hrs./ Week	Exam .Dur Hrs.	Max.Marks			Credits
						CIA	ESE	Total	
1.	Language I	15TAMU101/ 14 HINU 101/	Tamil/Hindi	6	3	25	75	100	3
II	Language II	13 ENLU101	English	6	3	25	75	100	3
III	Core	13NDUC101	Human Physiology	5	3	25	75	100	4
		13NDUC102	Food Science I	2	3	25	75	100	5
			Food Science Practical	2	-	-	-	-	-
	Allied I	11CHUA001	Chemistry Paper I	4	3	20	55	75	4
		15 CHUAP01	Chemistry Practical	3	-	-	-	-	-
IV	Foundation Course	09FOCUIES	Environmental Studies	2	3	-	100	100	2
						Total		**575**	**21**

Semester II

I	Language I	15TAMU 202/ 14 HINU202	Tamil/Hindi	6	3	25	75	100	3
II	Language II	13 ENLU202	English	6	3	25	75	100	3
III	Core	13NDUC203	Principles of Nutrition	4	3	25	75	100	4
		13NDUC204	Food Science II	2	3	25	75	100	5
		13NDUCP01	Practical I Food Science	3	3	40	60	100	2
	Allied I	11CHUA002	Chemistry Paper II	4	3	20	55	75	4
		15 CHUAP01	Chemistry Practical	3	3	20	30	50	2
IV	Value Education	14VEDU2HR	Value Education & Human Rights	2	3	-	100	100	2
						Total		**725**	**25**

Semester III									
I	Language I	14TAMU 303/ 14 HINU303	Tamil/ Hindi	6	3	25	75	100	3
II	Language II	13 ENLU303	English	6	3	25	75	100	3
III	Core	13NDUC305	Food Service Management	4	3	25	75	100	4
			Food Analysis & Quality control Practical	2	-	-	-	-	-
	Allied II	13NDUA301	Biochemistry I	4	3	20	55	75	4
			Biochemistry Practical	3	-	-	-	-	-
IV	Skil Based Subject I	13NDUS301		3	3	25	75	100	3
	Basic Tamil			2	-	100	-	100	2
	Advanced Tamil				3	25	75		
	Non Major Elective I				3	-	100		
							Total	**575**	**19**

Semester IV									
I	Language I	14TAMU404/ 14 HINU404	Tamil/ Hindi	6	3	25	75	100	3
II	Language II	13 ENLU404	English	6	3	25	75	100	3
III	Core	13NDUC406	Family Meal Management	3	3	25	75	100	4
		13NDUCPO2	Practical II Food Analysis & Quality control	3	3	40	60	100	2
	Allied II	13NDUA402	Biochemistry II	4	3	20	55	75	4
		13NDUAP01	Biochemistry Practicals	3	3	20	30	50	2
IV	Skill Based Subject II	13NDUS402	Multi Skill Development paper	3	1*	40	60	100	3
	Basic Tamil			2	-	100	-	100	2
	Advanced Tamil				3	25	75		
	Non Major Elective II				3	-	100		
							Total	**725**	**23**

***** - Online Examination

Semester V									
III	Core	13NDUC507	Food Microbiology	5	3	25	75	100	4
		13NDUC508	Food Production & Agriculture	5	3	25	75	100	4
		13NDUC509	Dietetics	5	3	25	75	100	4
		13NDUC510	Food Biotechnology	4	3	25	75	100	4
			Dietetics Practical	2	-	-	-	-	-
	Elective I	13NDUE501	Bakery	4	3	25	75	100	5
			Food Preservation Practical	2	-	-	-	-	-
IV	Skill Based Subject III	13NDUS503#		3	3	25	75	100	3
							Total	**600**	**24**
Semester VI									
III	Core	13NDUC611	Computer Concepts in Nutrition	5	3	25	75	100	4
		13NDUC612	Community Nutrition	5	3	25	75	100	4
		13NDUCP03	Practical-III Dietetics	3	3	20	30	50	2
		13NDUIV01	Internship & Viva - voce	3	3	20	30	50	2
		13NDUCP04	Practical IV Food Preservation	3	3	40	60	100	2
	Elective II	13NDUE602	Food Quality Control	5	3	25	75	100	5
	Elective III	13NDUE6PV	Project & Viva - voce	3	3	--	-	100	5
IV	Skill Based Subject IV	13NDUS604 #		3	3	25	75	100	3
V	Extension Activity		NSS/NCC/Physical Education/YRC/ Green society /Citizen Consumer Club/Entrepreneurship Development Programme.	-	-	-	-	100	1
							Total	**800**	**28**
Total (I to VI Semesters)								**4000**	**140**

Subject code not changed, Syllabus Revised.

SKILL BASED SUBJECTS		
1	13NDUS301	Food Chemistry (Cafeteria-System)
2	13NDUS402	Multi Skill Development Paper
3	13NDUS503 #	Food Processing – I (Cafeteria System)
4.	13NDUS604 #	Food Processing - II (Cafeteria System)
NON - MAJOR ELECTIVES		
1	14TMLU301	Basic Tamil*
	14TMLU402	
2	14ADTU301	Advanced Tamil**
	14ADTU402	
1	13NDUN301	Basic Cookery
2	13NDUN402	Diet in Diseases

* For students whose Part I in Secondary education is not Tamil.

** For students whose Part I in Higher Secondary education is not Tamil.

Syllabus revised;

SELF-LEARNING PAPERS (Optional)					
S.No	Subject Code	Title of the paper	Exam Dur. Hrs	Max.Marks	Credits
1	13NDUSL01	Marriage & Family Counseling	3	100	5
2	13AUGSL05	General Awareness (On-line Examination)	1	100	5

CORE AND PAPERS	
Durations : 3.00 hrs	**Marks: 75**
Section-A	**(10 x 1 = 10 marks)**
Multiple Choice Questions – 10 (Two from each unit)	(Q. No 1- 10)
Section-B	**(5 x 5 = 25 marks)**
Answer all the Questions (Either Or pattern)	(Q. No 11-15)
One Questions from each unit	
Section-C	**(5 x 8 = 40 marks)**
Answer **Five** out of **Eight** Questions	(Q. No 16-20)
Atleast **One** question from each unit	

ALLIED PAPERS	
Durations : 3.00 hrs	**Marks: 55**
Section-A	**(10 x 1 = 10 marks)**
Multiple Choice Questions – 10 (Two from each unit)	(Q. No 1- 10)
Section-B	**(5 x 3 = 15 marks)**
Answer all the Questions (Either Or pattern)	(Q. No 11-15)
Section-C	**(5 x 6 = 30 marks)**
Answer **Five** out of **Eight** Questions.	(Q. No 16-23)
Atleast **One** Question from each unit	

SKILL BASED SUBJECTS

Five Questions out of **Eight** **(5 X 15 = 75 marks)**

SELF LEARNING PAPERS AND NON MAJOR ELECTIVE

Five Questions out of **Eight** **(5 X 20 = 100 marks)**

SEMESTER I

Core Paper I

HUMAN PHYSIOLOGY

Instructional Hours: 75 **Sub. Code : 13NDUC101**

Max Marks: CIA -25; ESE – 75 **Credits : 4**

Objectives:

Enable the students to

Understand the structure and functions of various organs of the body and to know about the various principles involved in physiology.

UNIT –I **15 Hrs**

Cell and its Organallae: Structure and function Tissues: Structure and functions of epithelial and connective tissues Digestive system: *Organisation, digestion, absorption and assimilation of carbohydrates, proteins and fats.*

UNIT –II **15 Hrs**

Blood: Composition & functions of blood, RBC, WBC and platelets – structure and functions. Blood pressure, cardiac impulse, Composition & functions of lymph, blood coagulation, blood groups and blood transfusion. Circulatory System: Heart structure and functions, blood & lymph vessels and their functions, cardiac cycle, **Excretory system** : Excretory Organs – Structure of kidney and its functions, structure of nephron, formation of Urine, *Composition of Urine, micturition.*

UNIT – III **15 Hrs**

Respiratory System: Basic anatomy of the respiratory system, Mechanism of respiration, diffusion of gases in lungs. Transport of oxygen from lungs to tissues through blood, transport of CO_2 from tissues to lungs through blood, factors influencing the transport of O_2 and CO_2. **Endocrine Glands**: Structure and functions of pituitary, thyroid and parathyroid, pancreas and adrenal Gland.

UNIT – IV **15 Hrs**

Male and female Reproductive System: Structure of male reproductive organ, spermatogenesis, function of testis. Female Reproductive system - Ovarian cycle, structure and hormones of ovaries, menstrual cycle, menopause, pregnancy, *parturition and lactation.*

UNIT - V **15 Hrs**

Muscles and Nervous system: Structure, myosin & actin and regulatory proteins, mechanism of muscular contraction and relaxation. Nervous System: Spinal cord functions – ANS functions ; structure of neuron, resting and action potential, structure of neuromuscular junction. Defence Mechanism of the body : Types of immunity and *Immunisation.*

PHYSIOLOGY PRACTICALS

1. Cytological preparation showing various parts of the cell.
2. Detailed study of various tissues –identification of slide.
3. Dissection of mammalian viscera – study of organs.
4. Blood cells – freshly mounted and stained.
5. RBC & WBC counting – neubauer's counting chamber.
6. Determination of Heamoglobin – Shali's method.
7. Demonstration of coagulation of Blood.
8. Demonstration of Blood Group.
9. Recording pulse rate and measurement of blood pressure.

TEXT BOOK:

1. Chatterjee C.C., *Human Physiology*, Vol. I, Medical Allied Agency, Calcutta, 1992.
2. Chatterjee C.C., *Human Physiology*, Vol. II, Medical Allied agency, Calcutta, 1992
3. Saradha Subramanyam, Madhavan Kutty K., *A Text book of Human Physiology,* S.Chand & Company Ltd, New Delhi, 1990.

REFERENCE BOOK:

1. Arthur C. Guyton, *Human Physiology and Mechanisms of Disease*, W.B. Saunders Company, Philadelphia, 1987.
2. Babsky E.B., *Human Physiology*, Vol I MIR Publishers USSR, 1975.
3. Chakraborti B.K., Gosh H.N., Sahana S.N., *Human Physiology*, The New Book stall Calcutta, 1984.
4. Muthayya N.M., *Human Physiology*, Jaypee Brothers, Publishers, New Delhi, 2002.
5. Vidya Ratan, *Hand book of Human Physiology* V, Jaypee Brothers, Medical Publishers, New Delhi, 2004.

SEMESTER I

Core Paper II

FOOD SCIENCE I

Instructional Hours : 30 **Sub. Code : 13NDUC102**

Max Marks : CIA -25; ESE – 75 **Credits : 5**

Objectives:

Enable the students to,

Obtain knowledge of different food groups, their composition, Nutritive value and various methods of cooking. To know the basic principles of food for future research.

UNIT – I **5 Hrs**

Food group: Basic 4, 5 & 7 food groups; functional food groups – energy yielding, body building and protective foods (only sources and not properties and functions) *food pyramid*

UNIT – II **7 Hrs**

Study of various cooking methods: Boiling, steaming, stewing, frying, baking, roasting, broiling, and cooking under pressure, Microwave cooking and Solar cooking – advantages and disadvantages. Physical and chemical change with reference to general and not specific cooking methods. Stages of sugar cookery, *crystallization and factors affecting crystallization.*

UNIT – III **6 Hrs**

Cereals : Composition of rice, wheat, effects of cooking parboiled and raw rice, principles of starch cookery, gelatinization, dextrinization, flours-types, formation of dough and batter, *hydration and development of gluten.*

UNIT – IV **5 Hrs**

Pulses and grams: Varieties of pulses and grams, composition, nutritive value, cooking quality of pulses, *germination and its effect.*

UNIT – V **7 Hrs**

Vegetables: Classification, composition, nutritive value, selection and preparation for cooking methods and principles involved in cooking of vegetables. Fruits – Classification, composition, nutritive value, changes during ripening, methods and effect of cooking, *enzymatic browning*. Phytochemicals and Nutraceuticals – Concept and significance.

TEXT BOOK:

1. Brain A. Fox, Allan G. Cameron, *Food Science Nutrition and Health*, Edward Arnold Publication, London, 1989
2. Srilakshmi B., *Food Science*, New Age International Publishers, New Delhi, 2008.
3. Swaminathan. M, *Food Science and Experimental Foods*, BAPPCO. Bangalore, 1995.

REFERENCE BOOK:

1. Ahmed M.N., *Food Science and Nutrition*, Anmol Publication, 2005.
2. Gaman P.M., Sherring K.B., *The Science of Food, An Introduction to Food Science, Nutrition & Microbiology*, Pergamon Press, Oxford, 1994.
3. Norman N. Potter, Joseph H. Hotchkiss, Food Science, CSB Publications New Delhi, 2005.
4. Shalini Pathak, *Food Science*, Sonate Publications, New Delhi, 2007.
5. Sumathi R. Mudami, Shalini M. Rao., *Food Science*, Wiley Eastern Publishers. New Delhi, 1993.

SEMESTER II

Core Paper III

PRINCIPLES OF NUTRITION

Instructional Hours: 60 **Sub. Code : 13NDUC203**

Max Marks: CIA -25; ESE – 75 **Credits : 4**

Objectives:

Enable the students to,

Understand the vital link between nutrition and health and

Gain knowledge on functions, metabolism, effects and deficiency of nutrients.

To make use of basic principles of nutrition for future research work.

UNIT – I **15 Hrs**

Introduction to Nutrition: General introduction, Historical aspects, calorimetric studies, some important definitions. Functions of food, social function of food, psychological functions of food Energy: Definition of Kilocalories, Joule, energy value of foods, determination, physiological fuel values, SDA of foods, Reference Man and Reference Woman. Determination of energy requirements of body, basal metabolic rate – determination, factors influencing BMR, Recommended Dietary Allowance for energy.

Carbohydrates: Classification, functions, sources, digestion, *absorption and utilization, dietary fibre and health.*

UNIT – II **12 Hrs**

Protein: Classification (chemical and biological), functions, sources and requirements, digestion, absorption and utilization. Nutritional value of proteins, and supplementary value of protein. Definition: biological value NPU, digestibility coefficient, PER-definition and measurement. Deficiency due to shortage of protein and energy – PCM, reference protein egg (FAO), essential amino acids, and mutual supplementation of dietary protein. **Fats and Lipids**: Classification, functions, sources, requirement, digestion, absorption and utilization Importance of essential fatty acids, *their requirements and deficiency.*

UNIT - III **13 Hrs**

Vitamins: Fat soluble vitamins – A, D, E and K – functions, sources, requirements, deficiency disorders. Water soluble vitamins: The B- Complex vitamins, Niacin,

Folic acid, Biotin, Pantothenic acid, and Vitamins–C, functions, sources, *requirements and deficiency disorders.*

UNIT – IV **15 Hrs**

Minerals: General functions in the body, classification – macro and micro minerals. Micro minerals – Iron, Fluorine, Zinc, Copper, Iodine and other micronutrients, - sources, functions, requirements, deficiency and toxicity. Macro Minerals: Calcium & Phosphorus – sources, functions, absorption, utilization, requirements, *deficiency, and toxicity.*

UNIT – V **5 Hrs**

Water and electrolytes balance: Functions of water, distribution, maintenance of water and electrolyte balance, *regulation of acid – base balance in the body.*

PRACTICAL:

1. Demonstration of determination of energy content of food using Bomb Calorimeter, determination of BMR.
2. Qualitative Tests for sugars-Glucose, Fructose, Lactose, Maltose and Sucrose.
3. Qualitative Test – protein and minerals.
4. Qualitative estimation of glucose.

TEXT BOOK:

1. Gama P.M, Sherrington K.B, *The Science of Food*, (Second edition) Maxwell Macmillan International Editions – 1989.
2. Rashmi Desh Prabhu, *Child Development and Nutrition Management*, Book Enclave, Jaipur – 2001.
3. Shakuntala Manay.N, Shadaksharaswamy.M, *Food Facts and Principles*, New Age International (P) Ltd, Publishers, New Delhis – 2003.
4. Swaminathan M, *Advanced text book on Food & Nutrition* – Vol I, The Bangalore Printing and Publishing Co-Ltd. Bangalore -2008.
5. B. Srilakshmi – Nutrition Science, New Age International Publishers, 2008.

REFERENCE BOOK:

1. Chinta Palli Vidya, Bhaskara Rao.D, *Text book of Nutrition,* Discovery publishing House New Delhi -2004.
2. Garrow J.S, W.P.T *James, Human Nutrition and Dietetics* (ninth edition)- British library Cataloging publishing Ltd – 1993, Eden berg, London
3. Nirdosh Kumar Jain, *A Complete Book of Food and Nutrition, C*yber Tech publications New Delhi- 2008.
4. Priya Bhargan, & Tara Chand, *Food and Nutrition,* Ajay Verma for Common Wealthy Publishers – 2005.

SEMESTER II

Core Paper IV

FOOD SCIENCE II

Instructional Hours: 45 **Sub. Code : 13NDUC204**

Max Marks: CIA -25; ESE – 75 **Credits : 5**

Objectives:

Enable the students to,

Study about the structure, composition, nutritive value and principles of cooking of milk and milk products, egg, fish and flesh foods and Gain knowledge on beverages, spices and condiments and develop skills in basic milling and cooking.

UNIT – I **9 Hrs**

Milk and Milk Products: Composition, nutritive value, kinds of milk, cooking principles and methods, changes in milk during heat processing and cooking and *preparation of ice cream.*

UNIT – II **7 Hrs**

Egg: Structure, composition, selection, nutritive value, uses of egg in cookery, methods of cooking, *foam formation and factors affecting foam formation.*

UNIT -III **11 Hrs**

Flesh foods: Types of flesh foods- Meat, Poultry, and fish: composition, nutritive value, selection of meat, post mortem changes in meat, aging, tenderness and methods of cooking and effects. Poultry – types, composition and nutritive value.

Fish: Structure, composition, nutritive value, selection of fish, *methods of cooking and effects*

UNIT – IV **9 Hrs**

Fats – Nuts and Oils: Types of oils, function of fats and oils, shortening effects of oil, smoking point of oil, effect of heat on oil absorption and *factors affecting absorption of oil.*

UNIT- V **9 Hrs**

Beverages and Other foods: Classification, nutritive value, milk based beverages, fruit based beverages and preparation of carbonated beverages. Food Packaging: Definition, Principles and Packaging materials used. Spices and Condiments: *Uses and abuses.*

Field Visit: Visit to masala industries in local areas.

TEXT BOOK:

1. Brain A. Fox, Allan G. Cameron, *Food Science Nutrition and Health*, Edward Arnold Publication, London, 1989.
2. Srilakshmi B., *Food Science*, *New Age International Publishers*, New Delhi, 2008.
3. Swaminathan M., *Food Science, Chemistry and Experimental Foods*, BAPPCO. Bangalore, 1995.

REFERENCE BOOK:

1. Ahmed M.N., *Food Science and Nutrition*, Anmol Publication, 2005.
2. Gaman P.M., Sherring K.B., *The Science of Food, An Introduction to Food Science, Nutrition & Microbiology*, Pergamon Press, Oxford, 1994.
3. Norman N. Potter, Joseph H. Hotchkiss, *Food Science*, CSB Publications New Delhi, 2005.
4. Shalini Pathak, *Food Science*, Sonate Publications, New Delhi, 2007.
5. Sumathi R. Mudambi, Shalini M. Rao., *Food Science*, Wiley Eastern Publishers. New Delhi, 1993.

SEMESTER II

Core Practical I

FOOD SCIENCE

Instructional Hours: 45 Sub. Code: 13NDUCP01

Max Marks: CIA-40; ESE-60 **Credits : 2**

S.No	Topic	Practicals
1	Food groups	Grouping of foods – Nutritive value of all foods
2	Measuring ingredients	Measuring raw ingredients.
3	Edible portion	Determination of percentage of edible portions
4	Microscopic Structure of Various Starches	Rice, Wheat, Corn, Ragi and potato starch identification
5	Physical and Chemical properties of Starch	To study the physical and chemical properties of Starch
6	Gelatinization of Starch	To study the physical and chemical properties of Starch
7	Cereals and Pulses cookery	Fine and coarse cereal cookery study the effect of hard water, soft water, sodium bicarbonate, vinegar and soaking, while cooking. Study the effect of germination of green gram and recipe preparation using germinated gram as main ingredient.
8	Millets	Recipe preparation using millets.
9	Vegetable and Fruits cookery	Effect of cooking time of vegetables Effect of different methods of cooking Effect of acid and alkali on vegetables Darkening of raw fruits and its prevention
10	Sugar cookery	Various stages of sugar cookery.
11	Egg cookery	Effect of heat on Egg white and Yellow Effect of cooking time – boiling of egg. Whipping quality of egg white Poaching of eggs
12	Milk cookery	Boiling of milk – skim milk preparation. Khoa preparation – Ice – cream preparation
13	Beverages	Preparation of milk based & fruits based beverages
14	Meat cookery	- To assess tenderness of meat using papaya and Ginger. - Cooking time – meat and poultry – Recipe preparation using meat and poultry.
15	Fish Cookery	Cooking time assessment. Protein change during boiling and roasting.

SEMESTER III

Core Paper V

FOOD SERVICE MANAGEMENT

Instructional Hours: 60 **Sub. Code: 13NDUC305**

Max Marks: CIA-25; ESE-75 **Credits : 4**

Objectives

Enable the students to

Understand the physical requirements for quantity food production and meal planning and know about the various types of food services institution and styles of service. To prepare the students to get employment in restaurants and star hotels.

UNIT – I **10 Hrs**

Physical Planning : space allocation for the various areas – Receiving, storage, preparation service and dishwashing areas. Working heights and dimensions of work centers, Lighting and Ventilation & *pest and rodent control*.

UNIT – II **10 Hrs**

Equipment: Required for Quantity food service – Major and Minor equipments *factors influencing their selection and purchase*.

UNIT – III **10 Hrs**

Different Styles of Food Services: Organization types and principles. Meal planning – principles involved, cooking fuels – *Safety measures and fuel saving techniques* – Sanitation and safety measures in food handling. Table setting – different food service methods – traditional and modern. (European style)

UNIT – IV **10 Hrs**

Cost Control: Method of food cost control – Standardization of recipes, portion control, *and utilization of left over foods*.

U**NIT – V** **20 Hrs**

Management: Principles and techniques and tools of effective management – Organization chart, work study and work improvement – Personnel Management – Selection and recruitment of employees – Orientation and training job description, *job specification of good human relations*.

Field Visit: Visit to star hotels and restaurants in local areas.

TEXT BOOK:

1. Earl R.Palan, Judith A. Stadlee, *Preparing for the Food Service Industry*, An Introductory Approach, Avi publishing Co., Inc West port, ET – 1986.
2. Jyoti S.Sharma, *Modern Techniques and Practices,* Akansha Publishing House, New Delhi – 2006.
3. Mohit Aggarwal, *Fast Food Operation*, Alfa Publications, New Delhi – 2006.
4. Mudit Bhojwani, *Food Services Management – Principles and Practices*, Rajat Publication, New Delhi – 2007.
5. Thangam E.Philip, *Modern Cooking for teaching and the trade vol I,* Orient Longman Ltd – (fourth edition) 1998.

REFERENCE BOOK:

1. Harris A.B, Robins G.V, *Nutrition in Catering*, Heinemann Publishers, London – 1985.
2. Vera Claussen Crusius, *Quantity Food Management – Principles and Applications* – Subject Publications, New Delhi – 1984.

SEMESTER III

Allied Paper II

BIO CHEMISTRY PAPER I

Instructional Hours: 60 **Sub. Code: 13NDUA301**

Max Marks: CIA-20; ESE-55 **Credits : 4**

Objectives:

Enable the students to understand the importance of biochemistry & review the chemical properties of biomolecules and apply the skill to identify the food sources for better nutrition.

UNIT – I **10 Hrs**

Carbohydrates: Monosaccharides – Definition, classification, structure and functions. Disaccharides – Definition, types, structure and functions. *Polysaccharides – Homopoly saccharides - types, structure, properties and functions*, hetero polysaccharides. (examples only)

UNIT – II **10 Hrs**

Lipids: Definition, classification and functions of lipids. Types of fatty acids. Classification and significance of lipoproteins and phospholipids, *structure and functions of cholesterol.*

UNIT – III **15 Hrs**

Amino acids: Classification of amino acids, essential amino acids, reactions of amino and carboxyl groups of amino acids. Color reactions of amino acids.

Proteins: Definition, Classification and function of proteins. Structural organization of proteins. Denaturation and ISO electric point of proteins. *Color reactions of proteins.*

UNIT – IV **10 Hrs**

Nucleic Acid: Components of DNA & RNA, Double helical structure of DNA. Structure and types of RNA. Genetic code. *Protein Synthesis.*

UNIT – V **15 Hrs**

Enzymes: Classification with examples. Co enzymes and co-factors (Structure – not needed) active site. Lock and key model induced fit hypothesis. Factors affecting enzyme activity. Michaelis Menten equation only. Types of inhibitors of enzyme action. *Clinical and industrial applications of enzymes.*

TEXT BOOK:

1. Deb A.C, *Fundamentals of Biochemistry,* New Century Book House, Chennai, 2002.
2. Lehninger A.L., Welson D.C, Cox M.M., *Principles of Biochemistry,* CBS Publishers, New Delhi, 1993.
3. Rama Rao A.V.S.S., *A Text book of Biochemistry,* UBSPD, New Delhi, 2001.

REFERENCE BOOK:

1. Agarwal G.R., Kiran Agarwal, Agarwal, *Text book of Biochemistry,* Goel Publishing House, Meerut 2005.
2. Albert L. Lehninger, *Principles of Biochemistry,* CBS Publishers, New Delhi, 1987.
3. Ambika Shanmugam, *Fundamentals of Biochemistry* for Medical Students, Chennai, 2005.
4. Jain J.L., *Fundamentals of Biochemistry,* S.Chand & Company, New Delhi, 1967.
5. Joshi R.A., *Question Bank of Biochemistry,* New Age International Publishers, New Delhi, 2006.
6. Vasudevan D.M., Sree Kumari S., *Text book of Biochemistry* for Medical Students, Jaypee Brothers Medical Publishers, New Delhi, 2005.

SEMESTER IV

Core PaperVI

FAMILY MEAL MANAGEMENT

Instructional Hours: 45 **Sub. Code: 13NDUC406**

Max Marks: CIA-25; ESE-75 **Credits :4**

Objectives

Enable the students to

Understand the nutritional demands in various stages of the life cycle and require skills in planning adequate meals with reference to various stages of life cycle.

UNIT – I **7 Hrs**

Basic principles of menu planning: *Importance of menu planning* – RDA-Reference Man and Woman. Definition and uses – calculation of various nutrients in a day's menu. Plan a day's menu for low, middle and high income groups.

UNIT – II **8 Hrs**

Nutritional needs during Pregnancy and Lactation: Physiological changes during pregnancy – Complications in pregnancy – physiology of lactation. Nutritional considerations in pregnancy and lactation – *Menu plan for pregnant and lactating mothers.*

UNIT – III **10 Hrs**

Nutritional needs during infancy : Nutritional demands during infancy – advantages of breast feeding – composition of human milk – comparison of human milk with cow's milk formula – factors to be considered in bottle feeding – different milk formulas, weaning foods – meaning – need and importance – *weaning foods developed by different organizations*.

UNIT – IV **10 Hrs**

Nutritional needs of pre–school children and school children: (2-5 yrs) factors to be considered in planning meals for pre-school children, eating problems and their management-preparation of Supplementary foods using available low-cost foods - weaning foods. Nutrition for school children: nutritional requirements and *meal planning for school children.* Packed lunch.

UNIT – V **10 Hrs**

Nutritional needs during adolescence, adults and old age: Special demands during menarche. Nutrition needs for adults: (men & women) in relation to occupation-meal planning. Nutrition during old age: requirements, *nutritional problems of aged and their management.* Menu plan for various age groups.

Field Visit: Visit to maternal hospitals and clinics.

TEXT BOOK:

1. Ashok Pande, *Text book of Food and Nutrition*, Akansha Publishing House, New Delhi – 2004.
2. Jim Mann, A. Stewart Truswell, *Essentials of Human Nutrition*, Oxford University Press (3rd edition) 2008.
3. Sheel Sharma, *Human Nutrition and Meal Planning* – Jnanada Prakashan (P & D), New Delhi – 2006.
4. Swaminathan M, *Principles of Nutrition & Dietetics*, The Bangalore Printing and Publishing Co – Ltd, 2001.
5. Swaminathan M, *Essentials of Food and Nutrition Vol I & II*, The Bangalore Printing and Publishing Co – Ltd, 2003.
6. Sri Lakshmi. B, *Dietetics*, New Age International (P) Ltd, Publishers, New Delhi, Chennai and Cochin (Revised fifth edition) 2009.

REFERENCE BOOK:

1. Brain A Fox, Allan. G. Cameron, *Food Science, Nutrition and Health* – fifth edition, 1987.
2. Nirdosh Kumar Jain, *A Complete book on Food and Nutrition*, Cyber Tech Publications, New Delhi – 2008.

SEMESTER IV

Core Practical II

FOOD ANALYSIS AND QUALITY CONTROL

Instructional Hours: 45 **Sub. Code: 13NDUCP02**

Max Marks: CIA-40; ESE-60 **Credits : 2**

1. Determination of Moisture content in foods.
2. Estimation of Ash content in fruits and vegetables.
3. Determination of Gluten content in wheat.
4. Estimation of Ascorbic acid content lime juice.
5. Estimation of Calcium content in milk..
6. Estimation of Total Soluble Solid in fruits.
7. Determination of Acid value.
8. Estimation of Total Phosphorus in any one fruit and vegetables.
9. Estimation of Iron.
10. Adulteration tests for various food items.
11. Taste sensitivity tests.

DEMONSTRATION

1. Protein estimation in any food using Kjeldhal Apparatus.
2. Estimation of Crude fibre in any food.

SEMESTER IV

Allied Paper II

BIO CHEMISTRY PAPER II

Instructional Hours: 60 **Sub. Code: 13NDUA402**

Max Marks: CIA-20; ESE-55 **Credits : 4**

Objectives:

Enable the students to gain an understanding of metabolism of major nutrients, and obtain employment skills in clinical laboratory techniques.

UNIT – I **10 Hrs**

Buffers: Concept of acid base indicators: buffer systems of blood and body fluids.

Isotopes: Definition and units of radio activity examples of natural, *heavy and artificial isotopes in biological investigations.*

UNIT – II **15 Hrs**

Chromatography: Paper and TLC principle, instrumentation and applications.

Electrophoresis: Paper and Gel principle, instrumentation and applications.

Colorimetry – *Principles, Instrumentation and application.*

UNIT – III **10 Hrs**

Metabolic pathways: Carbohydrate metabolism: Glycolysis, TCA Cycle, HMP shunt, Glycogenesis, Glycogenolysis. Diabetes Mellitus – Types and regulation of blood sugar.

UNIT - IV

Lipid Metabolism: Beta-oxidation, biosynthesis of triglycerides, *biosynthesis of palmitic acid.* Electron Transport chain, oxidative phospharylation, High Energy phosphates.

UNIT – V **15 Hrs**

Protein Metabolism: Deamination; transamination and decarboxylation, Urea Cycle. Inborn errors – Albinism, Phenylketonuria and Cysteirnuria.

Inter – relationship of carbohydrates, fat and protein metabolism (flow chart only).

Field Visit: Visit to a clinical Laboratory.

TEXT BOOK:

1. Deb A.C, *Fundamentals of Biochemistry,* New Century Book House, Chennai, 2002.
2. Lehninger A.L., Welson D.C, Cox M.M., *Principles of Biochemistry,* CBS Publishers, New Delhi, 1993.
3. Rama Rao A.V.S.S., *A Text book of Biochemistry,* UBSPD, New Delhi, 2001.

REFERENCE BOOK:

1. Agarwal G.R., Kiran Agarwal, Agarwal, *Text book of Biochemistry,* Goel Publishing House, Meerut 2005.
2. Albert L. Lehninger, *Principles of Biochemistry,* CBS Publishers, New Delhi, 1987.
3. Ambika Shanmugam, *Fundamentals of Biochemistry* for Medical Students, Chennai, 2005.
4. Jain J.L., *Fundamentals of Biochemistry,* S.Chand & Company, New Delhi, 1967.
5. Joshi R.A., *Question Bank of Biochemistry,* New Age International Publishers, New Delhi, 2006.
6. Vasudevan D.M., Sree Kumari S., *Text book of Biochemistry* for Medical Students, Jaypee Brothers Medical Publishers, New Delhi, 2005.

SEMESTER IV

Allied Practicals II

BIO CHEMISTRY PRACTICALS

Instructional Hours: 45 **Sub. Code: 13NDUAP01**

Max Marks: CIA-20; ESE-30 **Credits : 2**

QUALITATIVE ANALYSIS:

1. **Reactions of Simple sugars:** Glucose, Fructose, Pentose, Sucrose, Lactose and Starch.
2. **Reactions of Aminoacids:** Tyrosine, Tryptophan, Histidine and Arginine.
3. **Reactions of Proteins:** Solubility, Biuret and Millons reaction. Xanthoproteic test Denaturation by heat, pH change, Precipitation by heavy metals and acidic reagents.
4. **Reaction of lipids:** Solubility, Saponification: Acrolein test for unsaturation Liber mann Buchard test for cholesterol.
5. Qualitative analysis of urine for pregnancy.

QUANTITATIVE ESTIMATIONS:

1. Estimation of Urea.
2. Estimation of Cholesterol.
3. Detection of sugars in a mixture by ascending paper chromatography (Group Experiment).
4. Detection of lipids by TLC.
5. Separation of Serum Proteins by Electrophoresis (Group Experiment).

SEMESTER V

Core Paper VII

FOOD MICROBIOLOGY

Instructional Hours: 75 **Sub. Code: 13NDUC507**

Max Marks: CIA-25; ESE-75 **Credits : 4**

Objectives

Enable the students to become aware of the basic principle of Microbiology. Apply the basic principles of sanitation in food service, Understand the importance of personal hygiene for food and service personnel. To know the importance of food safety and to apply in future research.

UNIT – I **10 Hrs**

History of Microbiology: *Pasteur's Contribution to Microbiology*.

Different terminology - Hetero tropic Nutrition, auto – tropic Nutrition, Saprophytic, holozoic, host, culture and parasite. Bacteria, Mold, Yeast and Algae – Out line of morphology – importance in Food and Food Industry; Role of Microorganism in value added products.

UNIT – II **15 Hrs**

Microorganisms in foods: Outline of morphology – importance and role in Food industry. Contamination and kinds of micro-organisms causing spoilage of cereal products – grains, flour, baked products – Fruits and vegetables – their products Fruit Juice & Pickles – *fleshy foods – meat, poultry and fish.*

UNIT – III **15 Hrs**

Microorganisms in foods: Spoilage of eggs – milk and milk products – cream, frozen deserts and butter – Fats and oils – bottled beverages, *Food poisoning and infection.*

UNIT – IV **20 Hrs**

Micro organisms in air and water: Air – micro organisms – air borne diseases. Water – sources – Bacteriological examination. Total count – Test for E.coli – Purification of water – *Water borne diseases.*

UNIT –V **15 Hrs**

Methods of destruction: Destruction of bacteria – sterilization, physical agents, light, desiccators, electricity, heat and chemical agents ; *Sewage and sewage disposal.*

Field Visit: Visit to Microbiology Laboratory in other institutions.

TEXT BOOK:

1. Adamas M.R, Moss. M.O, *Food Microbiology*, New International Publishers, 2006.
2. James M. Jay, *Modern Food Microbiology,* CBS Publishers and Distributors, New Delhi – (5^{th} edition) 2005.
3. Power and Daginawala, *General Microbiology* – Vol-II, Himalaya Publishing House – 2005.
4. William C. Frazier and Dennis C. Westhoff, *Food Microbiology*, Tata Mc Graw – Hill Publishing Company Ltd, New Delhi – (fourth edition) 2008.

REFERENCE BOOK:

1. Betlye. Hobbs and Dianne Roberts, *Food Poisoning and Food hygiene* Edward Amold Publishers Ltd, (first edition), 1987.
2. James M. Jay, *Modern Food Microbiology,* ITP – International Thomson Publishers, (1^{st} edition), 1997.
3. Nirdosh Kumar Jain, *A Complete Book on Food and Nutrition* – Cyber Tech Publications, New Delhi - 2008.
4. William C.FRAZIER, DENNIS C. WESTHOFF, *Food Microbiology*, Fourth edition, Tata McGraw-Hill Publishing Company Limited, New Delhi.

SEMESTER V

Core Paper VIII

FOOD PRODUCTION AND AGRICULTURE

Instructional Hours: 75 **Sub. Code: 13NDUC508**

Max Marks: CIA-25; ESE-75 **Credits : 4**

Objective:

Enable the students to understand the Agricultural practices to increase the production and to know about basic principles involved in dairying and poultry keeping. To obtain basic skills in agricultural practices and method of propagation in horticultural crops.

UNIT – I **15 Hrs**

Introduction to Agriculture: Importance of Agriculture in the economy of a Nation – Role of green revolution in food production, Food Security and Challenges. Importance of soil and climate. Types of soil – Dry land – Irrigated wet land with respect to crops cultivated. Importance of maturing – natural and synthetic fertilizers – *ploughing importance* – weeds and their control.

UNIT – II **15 Hrs**

A brief about the cultivation details: rice, cholam, wheat, redgram, black gram and green gram and *oilseed – (Ground nut and sunflower).*

UNIT – III **15 Hrs**

Kitchen gardening: lay out – objectives of gardening – advantages – *knowledge on propagation* – grafting, layering, and budding. Production technology of brinjal, tomato, ladies finger, cabbage, curry leaves and greens – importance of fruits and vegetables production.

UNIT – IV **15 Hrs**

Elementary knowledge on insects and pests : diseases and its control a basic knowledge on pesticides and fungicides and its application. Integrated Pest Management. Importance of bio-insecticide and fertilizers. *Importance of Organic Farming.*

UNIT –V **15 Hrs**

Poultry and dairying: Back yard poultry unit – cage and deep litter system – diseases affecting poultry – prevention and care. Dairying importance mulch breeds and cross breeds – feeding – *Management of important diseases*: White Revolution.

Field Visit: Visit to nearby farming lands.

TEXT BOOK:

1. Bhat P.N., Sharma R.D. and Lokeshwar, *Hand Book of Agriculture,* Directorate of Publications and information on Agriculture, PUSA, New Delhi, Printed at Vinayak Press 1997.
2. Gustafson, *Hand Book of fertilizer,* Agrobios (India) publication – Jaipur – 2000.
3. Singh S.P., *Principles of vegetables Production.* Agrotech publishing Academy, Udaipur 1997.
4. Vellamanda Reddy T, Sankara Reddi G.H, *Principles of Agronomy,* Kalyani Publishers Ludhiana and New Delhi – 2001.

REFERENCE BOOK:

1. Carmen R. Parkhurst and Georage J. Mountney, *Poultry meat and egg production,* An Avi Book, Nostrand Reinhold Company Publications, New York 1987.'
2. Dhawan B.D, *Studies in Irrigation and water Management,* Common Wealth Publishers, New Delhi – 1989.
3. Morgan R.P.C., *Soil Conservation problems and prospects,* International Book Distributors – Dehra Dun – 1990.
4. Raj Mohini Sethi, *Women in Agriculture,* Rawat Publications, Jaipur and New Delhi 1991.

SEMESTER V

Core Paper IX

DIETETICS

Instructional Hours: 75 **Sub. Code: 13NDUC509**

Max Marks: CIA-25; ESE-75 **Credits : 4**

Objectives:

Enable the students to gain knowledge about principles of diet therapy and different therapeutic diets for various disease condition. To make the student to get employment opportunity in hospitals, fitness centres and clinics as dietitian. To establish Diet Counselling centres and become an entrepreneur.

UNIT – I **15 Hrs**

Principles and importance of therapeutic diets: Different types of diet - Regular diet, clear liquid, full fluid diet, soft diet, light and bland diet. Different types of feeding, advantages of oral feeding, tube feeding - *and total parental feeding. Gastrostomy feeding*. Role of dietitian – Importance of whole body checkup – physical and biochemical parameters. Importance of diet counseling, Registration of IDA.

UNIT – II **15 Hrs**

Therapeutic diets for the following disorders: a) Under weight-definition etiology and treatment, b) obesity-Definition, etiology and dietary treatment. c) Disease of the gastrointestinal tract: peptic ulcer and duodenal ulcer-causes-treatment. *Dumping syndrome and constipation.* Acute and chronic diarrhoea-symptoms, causes and dietary management of above diseases.

UNIT – III **15 Hrs**

Diseases of the liver and gall bladder: a) Jaundice b) Hepatitis c) Cirhosis d) Fatty liver-Etiology symptoms, dietary management for above diseases.

Diseases of the cardiovascular system: a) *Atherosclerosis b) Hypertension c) congestive heart failure-causes, symptoms and dietary management.*

UNIT – IV **15 Hrs**

Diabetes mellitus: Causes, signs and symptoms, diagnosis (GTT) various types of diabetes – complications – Insulin shock – Hypoglycemic foods – prevention of diabetes – dietary management and food exchange list.

Diseases of the kidney and urinary tract: a) Acute and chronic nephritis b) Nephrosis. c) Renal failure d) urinary calculi-causes, signs and symptoms and dietary management. *Need for dialysis.*

UNIT –V **15 Hrs**

Diet in febrile conditions: short duration and intermittent fevers-Causes, signs and symptoms and dietary management. Pre and Post operative diets. Diet in allergy-definition, classification, common food allergens and dietary management. Dietary management for gout and phenyl ketonuria. *Dietary management for Cancer and HIV.*

Field Visit: Visit to dietary department of multispeciality hospitals and clinics & fitness centres.

TEXT BOOK:

1. Ashok Pande, *Text book of Food and Nutrition.* Akansha Publishing House, New Delhi – 2004.
2. Brain A. Fox and Allan G. Cameron, *Food Science, Nutrition and Health.* British Library Cataloguing in Publication Data, London, (fifth edition) 1989.
3. Sheel Sharma, *Human Nutrition and Meal Planning,* Jnanada Prakesh Publishers and Distributors – New Delhi – 2006.
4. Shubhangini. A. Joshi, *Nutrition and Dietetics* Tata Mc Graw – Hill Publishing Company Ltd, New Delhi – 2002.
5. Sri Lakshmi, *Dietetics*. New Age International (P) Ltd, Publishers – New Delhi, Chennai and Cochin, (Revised fifth editions) 2009.
6. Swaminathan. M., *Advanced Text book on Food and Nutrition, Volume I.* The Bangalore Printing and Publishing Co. Ltd, Bangalore – 1990.
7. Swaminathan. M., *Advanced Text book on Food and Nutrition Volume II.* The Bangalore Printing and Publishing Co. Ltd, Bangalore – 1997.

8. Swaminathan.M., *Principles of Nutrition and Dietetics* – The Bangalore Printing and Publishing Co. Ltd, Bangalore – 2001.

REFERENCE BOOK:

1 Briony. Thoma, *Manual of Dietetic Practice* (The British Dietetic Association) Black Well Scientific Publications, Oxford London, Edinburgh and Melbourne 1989.

2 Garrow J.S and James W.P.T., *Human Nutrition and Dietetics,* British Library Cataloguing in Publication Data, Edinburgh London Madrid New York and Tokyo 1993.

3 Jim Mann and Stewart Truswell. A, *Essentials of Human Nutrition,* Oxford, 2008.

4 Pegy S.Stanfield, *Nutrition and Diet Therapy,* Jones and Bart left Publishers, Boston-London – 1992.

SEMESTER V

Core Paper X

FOOD BIOTECHNOLOGY

Instructional Hours: 60 **Sub. Code: 13NDUC510**

Max Marks: CIA-25; ESE-75 **Credits : 4**

Objectives:

To make the students understand the modern developments in food bio technology and apply it in various branches of Food Technology. To use the biotechnology principles in future research work and to obtain job opportunities in biotechnology laboratories.

UNIT – I 10 Hrs

Biotechnology: Definition – Scope and importance – History of Biotechnology – Introduction to modern Biotechnology. Concept of Biotechnology – *Biotechnology and Food Industry.*

UNIT – II 15 Hrs

Food as a substrate for microbes: pH – Moisture – Water activity – Nutrients for growth of microbes – groups of yeast, bacteria, morphological characteristics important in food bacteriology. *Groups of bacteria important in food bacteriology.* Microbiological applications in food industry.

UNIT – III 10 Hrs

Enzymes:– Enzymes in Food processing – Importance of enzymes. *Industrial application of Microbial enzymes.*GM foods ,immobilized enzymes and its applications.

UNIT – IV 10 Hrs

Food Biotechnology : Functional genomics – Advantages of single cell protein – Algae as single cell protein – Mass culture of Spirulina – production – uses. *Mushroom* cultivation and processing.

UNIT –V **15 Hrs**

Fermentation: Stages of fermentation – Bioreactors formulation of medium – selection of microorganisms – fermented products – amino acid – organic acids – citric acid and lactic acid. Alcoholic beverage – *production of beer and wine* fermented food products – leavened bread – idly – cheese – Tempeh.

Field Visit: Visit to biotechnology laboratories in various Institutions.

TEXT BOOK:

1. Chhatwal G.R, *Text Book of Biotechnology,* Anmol Publication Pvt, Ltd, 2003.
2. Dubey R.C, *A Text Book of Biotechnology*, S.Chand and Company Ltd, New Delhi, 2006.
3. Kumar H.D, *A Text Book of Biotechnology,* Affiliated East – West Press Pvt Ltd, New Delhi, (second edition), 2004.
4. Rita Singh, *Food Biotechnology,* Vol I & II, Global Vision Publishing House, Delhi, (1st Edition), 2004.
5. Tripathy S.N, *Food Biotechnology,* Dominant Publishers and Distributors, 2006.

REFERENCE BOOK:

1. John. E. Smith, *Biotechnology,* Cambridge University Press, (third edition), 1996.
2. Kumanesan V, *Biotechnology*, Saras Publication, 2005.
3. Singh B.D, *Biotechnology*, Kalyani Publishers, Second revised & enlarged edition, 2005.
4. *Hand Book of Food Biotechnology*, NIIR Board of Consults & Engineers and National Institute of Industrial Research, Delhi, 1999

SEMESTER VI

Core Paper XI

COMPUTER CONCEPTS IN NUTRITION

Instructional Hours: 75 **Sub. Code: 13NDUC611**

Max Marks: CIA-25; ESE-75 **Credits : 4**

Objectives:

Enable the students to gain knowledge on computer operation and application, facilitate students to design computer based projects and programmes and utilize the recently developed health and nutrition based software. To make use of computer skills in nutrition related careers. To impart ICT enabled teaching using smart class rooms.

UNIT – I **15 Hrs**

Introduction to the computer : Basic Computer Concepts – History – Advantages – Types of Computer – Input, Output and peripheral devices – Introduction to software and its types – Data communication – *Basic concepts of operating systems.*

UNIT – II **15 Hrs**

MS – Windows – Introduction to windows: Basic operation on a window – Accessories – paint brush, control panel system. *MS word – concepts of the document and creating documents – saving, editing and template formation.* Spell check, grammar check – mail merge – macros, hyperlink and word art.

UNIT – III **15 Hrs**

MS Excel: Concepts of spread sheet – creating – worksheet and workspace – Basic operation on data. *Goal seek – Scenarios – creating link between documents.* Programming using macros – working with charts – printing worksheets. MS Power point – concepts of power point – creating, opening, clipart and pictures – slide show running – presentation in conferences. Video Conferencing – Applications and importance.

UNIT – IV **15 Hrs**

MS Access: Introduction to Microsoft Access – working data bases – Queries, forms, reports, macros and charts. Internet – introduction to Internet in India – Using E-mail – HTML – Browsing to nutrition field. *Collecting data related to nutrition field in various countries.*

UNIT –V **15 Hrs**

Computer application in Nutrition and Dietetics: Using computer in menu planning Slide show presentation regarding nutrition related issues – Diet counseling – *Nutrient calculation using computer.*

PRACTICAL ACTIVITY:

Students are provided with computer for 2 hours / week; practical experience are made available by using computer separately.

TEXT BOOK;

1. Rajaraman V., *Fundamentals of computers,* Prentice – Hall of India, Pvt Ltd – New Delhi (*fourth edition*) 2004.
2. Ramesh Bangia, *Understanding Word 2000* Cyber Publication, Delhi – 2001.
3. Ramesh Bangia, *Understanding Excel 2000* Cyber Publication, Delhi – 2001.
4. Sanjay Saxena, *Introduction to Computers and MS Office*, Vikas Publishing House Pvt Ltd, New Delhi, Mumbai and Chennai – 2002.
5. Sri Lakshmi.B, *Nutrition Science*, New Age International (p) Ltd, Publishers, New Delhi, Mumbai, Cochin, Chennai (second edition) 2006.

REFERENCE BOOK:

1. Gini Courter and Annette Marquis, *Microsoft Office 2000,* BPB Publications – New Delhi – 2003
2. Peter Norton, Jill T.Freeze and Wayne S. Freeze, *Complete Guide to Microsoft Office 2000, BPB* Publications, New Delhi – 1999.
3. Sanjay Saxena, *A first course in Computers 2003 Edition*, Vikas Publishing House Pvt Ltd, New Delhi, Mumbai and Chennai – 2003.

SEMESTER VI

Core Paper XII

COMMUNITY NUTRITION

Instructional Hours: 75 **Sub. Code: 13NDUC612**

Max Marks: CIA-25; ESE-75 **Credits : 4**

Objectives:

Enable the students to know about the application of basics of nutrition in the community and gain knowledge on community nutrition programmes of National and International organization. To gain knowledge on community issues related to Nutrition and make use in future research. Job orientation in various social welfare schemes.

UNIT – I **15 Hrs**

Characteristics of Community : Demography, Vital statistics, IMR, MMR, Morbidity, Ecology of malnutrition in the community – food habits, customs and practices, Availability of food, Socio economic factors, Housing and hygienic conditions, population explosion, Consequences of mal nutrition, Definition of Community, Family, Village and Block, Meaning of Optimum Nutrition (Adequate Nutrition) *Malnutrition – Under nutrition and over nutrition.* National Nutritional Policy (Salient features only).

UNIT – II **15 Hrs**

Assessment of the nutritional status of the Community: Direct and Indirect methods – Anthropometry, Clinical, Biochemical, Functional and Diet surveys. Nutritional Problems in India; Nutritional problems of women and Men - infants and children – Anemia, Vitamin A deficiency, B complex deficiency. – PEM – Marasmus and Kwashiorkor.

Other problems – Goiter, Fluorosis and Lathyrism. Communicable diseases – Polio, TB, Typoid – prevalence and prevention. Pulse Polio Programme.

UNIT – III **20 Hrs**

Nutrition Intervention Programmes:

ICDS – Objectives and Services, Mid – Day Meal Programme, TINP. Vitamin A Prophylaxis, Prevention of Anemia and *Iodine Deficiency Disorders,* NSI, National Food for Work Programme.

UNIT – IV **15 Hrs**

National Agencies: ICMR, ICAR, NNMB, CFTRI, NIN. International Organizations – WHO, FAO, CARE AND UNICEF. Home Science – Meaning and objectives; Role of Home Scientists in Rural Development – with reference to on going programmes like Family Welfare Programme and *Adult Education Programme.* MGNREGP – Objectives and services.

UNIT –V **10 Hrs**

Nutrition Education for Community: Different methods, Advantages and Disadvantages Communication – Principles, Methods and Classification, Advantages and limitations of different methods. *Audio – Visual Aids: Types, Advantages and limitations,* Cone of Experience. Uses of Computer in Nutrition Education.

RELATED EXPERIENCE:

Visit to a Noon Meal Center / ICDS Centre.

Visit to PHC.

TEXT BOOK:

1. Swaminathan.M, *Advanced Text Book on Food & Nutrition*, Vol II, Bapp Co Publishers, 2000.
2. Chalkey A.M, *A Text Book for the Health Worker*, New Age International Publication, 2008.
3. Shubhangini A Joshi, *Nutrition and Dietetics*, Tata Mc Graw – Hill Publishing Company Ltd, (third edition), 2002.
4. Srilakshmi B, *Nutrition Science*, New Age International Publishers, (fourth revised edition) 2012.

REFERENCE BOOK:

1. Frankle. Owen, *Nutrition in the Community*, Mosby Publishers, (third edition) 1993.
2. Jim Mann & A. Stewart Truswell, *Essentials of Human Nutrition*, (third edition), Oxford University Press, 2008.
3. Poonam Lakra & Mrs. Mansi Dass Singh, *Text Book of Nutrition and Health*, Academic Excellence, India, 2008.

SEMESTER VI

Core Practical III

DIETETICS

Instructional Hours: 45 **Sub. Code: 13NDUCP03**

Max Marks: CIA-20; ESE-30 **Credits : 2**

1. Weights and measures of foods.
2. Formulation of standard balanced diets and standard food exchange table.
3. Calculation for i) Ideal body weight ii) Food portion table and iii) nutrients calculations.
4. Menu planning and the calculation for regular diet light died full fluid diet, clear liquid diet and bland diet.
5. Diet for obesity under weight and anemic conditions, adolescent and expectant mothers.
6. Diet for diseases of gastro intestinal tract. i) Diarrhea. ii) Constipation iii) Peptic ulcer.
7. Diet for cardio vascular diseases i) atherosclerosis - middle age and old man ii) Hypertension.
8. Diet for kidney diseases. i) nephritis ii) nephrosis iii) chromic renal failure.
9. Diet for diabetes mellitus i) Juvenile ii) adult diabetus iii) Diabetes with kidney disorder.
10. Diet in febrile conditions. i) Short duration – Typhoid ii) long duration – Tuberculosis.
11. Diet in liver disorders i) Jaundice ii) Viral hepatitis iii) Cirrhosis.
12. Dietary charts preparation for various disease conditions.

SEMESTER VI

INTERNSHIP AND VIVA - VOCE

Instructional Hours: 45 **Sub. Code: 13NDUIV01**

Max Marks: CIA-20; ESE-30 **Credits : 2**

S.NO	PLACE	PUNCTUALITY	FUNCTIONALITY	REPORT	VIVA VOCE	TOTAL MARKS
1	FOOD INDUSTRY/ DIETARY DEPARTMENT	10	10	-	-	20
2	DEPARTMENT (NUTRITION & DIETETICS)	-	-	20	10	30
					TOTAL MARKS	**50**

SEMESTER VI

Core Practical IV

FOOD PRESERVATION

Instructional Hours: 45 **Sub. Code: 13NDUCP04**

Max Marks: CIA-40; ESE-60 **Credits : 2**

CONTENTS

1. Different methods of Food Preservation
    a) Preservation by addition of Sugar:
        Jam, Jelly, Squash, preserve, Marmalade, Toffees.
    b) Preservation by addition of Salt, Oil & spices:
        Pickles, Sauces, Chutneys, Ketchup.
    c) Preservation by Dehydration:
        Effect of pre-treatment for dehydration: Vathal, Vadagam.
    d) Preparation of Bakery items:
        Biscuits & cakes.

SEMESTER V

Elective Paper I

BAKERY

Instructional Hours: 60 **Sub. Code: 13NDUE501**

Max Marks: CIA-25; ESE-75 **Credits : 5**

Objectives:

Enable the students to understand the science and technology of baking, understand the role of different ingredients in baking and develop skills in planning and maintenance of a bakery institution. To train the students to become an entrepreneur in bakery.

UNIT – I **10 Hrs**

Baking: Definition, Advantages and disadvantages, Principles of baking, *classification of baked foods.* Ingredients and their role in Baking – Flour, Yeast, Sugar, Egg, Butter, Salt, Chemical leavening agents – baking powder, baking soda and other ingredients.

UNIT – II **15 Hrs**

Yeast raised dough products: Bread – Ingredients used, Preparation. Bread Making Methods – Straight Dough method and Sponge and Dough Method; Assessment of the quality of Bread – External and Internal Characteristics; Bread Faults Factors responsible for creating faults in bread; Staleness in Bread – Crust staling and crumb staling. *Measures to delay the process of staling.*

UNIT – III **10 Hrs**

Preparation of Items: Buns, doughnuts, biscuits and *cookies – preparation; common problems.* Pastry – Definition, Classification – short crust, puff, Flaky and Choux pastry.

UNIT – IV **15 Hrs**

Cakes: Cake-making ingredients; Cake making methods: Sugar – batter method, flour-batter method, Blending method, Boiled method, sugar – Water method, All – in process; Two classes – Shortened and Un-shortened cakes.

Characteristics of cakes – External and Internal characteristics. Cake faults and Remedies. Decoration of Baked Foods – *Icing – Types of icing, Role of Icings.*

UNIT –V **10 Hrs**

Baking Unit: Points to be considered while planning a bakery; plan layout and design of a baking unit; Major and Minor Equipments used in bakery. *Sanitation and hygiene.*

Field Visit: Visit to a Bakery Unit.

Bakery Practicals:

1. Ingredients used in Bakery : Role of flour, sugar, salt, egg, milk, leavening agents – yeast, baking powder, other ingredients – water, flavouring and colouring agents.
2. Experimental cookery on dough development.
3. Preparation of bakery products : Types of :

   a) Cakes b) biscuits c) cookies d) pastries e) doughnuts

TEXT BOOK:

1. Dubey S.C, *Basic Science and Craft*, G.D. Enterprises-Bombay (3rd edition) 1996.
2. Shakuntala Manay N, M.Shadakssharaswamy *Food Facts and Principles*, New Age International (P) Ltd, Publishers, (third edition) 2008.
3. Sri Lakshmi B, *Food Science*, New Age International Publishers, (fourth edition) 2008.

REFERENCE BOOK:

1. Thangam E. Philip, *Modern Cookery*, Vol II, Orient Longman, (fourth edition) 2008.
2. Vijaya Khader, *Text book of Food Science and Technology*, Indian Council of Agricultural Research Research, New Delhi, 2001.
3. William. J.Sultan, *Practical Baking*, Van Nostrand Reinhold, New York, (5th edition) 2001.

SEMESTER VI

Elective Paper II

FOOD QUALITY CONTROL

Instructional Hours: 75 **Sub. Code: 13NDUE602**

Max Marks: CIA-25; ESE-75 **Credits : 5**

Objectives:

Enable the students to study about the food quality control and gain knowledge on food standards and food laws. To make the students to develop skills in identifying the food standards and make use it in future research.

UNIT – I 20 Hrs

Principles of quality control of Food: Raw material control, processed control and finished product inspection, Food additives – Their Uses. Coloring Agents – Natural colors, accepted artificial colors, other non – certified colors. Leavening Agents – Classification and uses, optimum levels. *Flavoring Agents, Flavour enhancers – their Uses.*

UNIT – II 20 Hrs

Food Laws: PFA, FPO, BIS, AGMARK, ISI, Codex Alimentarius, HACCP.

Food adulteration – Definition, Common adulterants in foods and *tests to detect common adulterants*. FSSAI – meaning and significance.

UNIT – III 10 Hrs

Standard for Foods: Cereals and pulses, sago and starch, fruits and fruit products, *Vegetables and Vegetable products*.

UNIT – IV 20 Hrs

Standards for foods: Coffee, Tea, Sugar and Sugar Products. Home scale methods to detect the quality of testing of Egg. Standards for selection of fleshy foods.

UNIT – V 20 Hrs

Sensory Assessment of Food Quality: Appearance, Color, flavour, texture and taste, different methods of sensory analysis, *preparation of score card.*

Field Visit: Visit to Agmark – Laboratories in local area.

TEXT BOOK:

1. Sri Lakshmi B, *Food Science,* New Age International (P) Ltd Publishers Chennai, Hyderabad, Luck now, (third edition), 2008.
2. Swaminathan M, *Food Science and Experimental Cookery,* BAPPO publishers- Bangalore, 2002.
3. William C. Frazier, Dennis C. Westhoff, *Food Microbiology,* The Mc Graw Hill Companies. (Fourth edition) 2006.

REFERENCE BOOK:

1. Bhatia S.C, *Hand book of food processing Technology.* vol II, *Biochemical & Microbiological aspects.* Atlantic Publishers & Distributors (P) Ltd, 2008.
2. Mahindra S.N, *Food Additives,* Tata Mc Graw – Hill Publishing Company Ltd – New Delhi, 2000.

SEMESTER VI

ELECTIVE III – PROJECT AND VIVA - VOCE

(CLINICAL / FOOD PROCESSING / COMMUNITY ORIENTED PROJECTS)

Instructional Hours: 45 **Sub. Code:**

13NDUE6PV

Max Marks: ESE (Project) 80: (Viva) 20 **Credits : 5**

Objectives:

Enable the students to gain knowledge in

Basic Research Methodology

Research and Development aspects in Food Processing and

Nutritional and clinical aspects in the community

CONTENTS

1. Cereals / Pulses / Fruits / Vegetables / Milk / Egg / Meat Processing Methods.
2. Post Harvest Techniques and Applications.
3. Development of value added food products.
4. Diet Survey Method.
5. Bio Chemical Estimation.
6. Food Supplementation Methods.
7. Prevalence and Diet Counseling to various diseases.

SEMESTER III

Skill Based Subject I

FOOD CHEMISTRY

Instructional Hours: 45 **Sub. Code: 13NDUS301**

Max Marks: CIA-25; ESE-75 **Credits : 3**

Objectives

Enable the students to

Gain knowledge on the basic principles in foods chemistry and make the students to utilize the principles in future research work.

UNIT – I **9 Hrs**

Role of water in foods and cookery: Structure and properties of water molecule, water activity and absorption phenomena, Types of water in plant and animal tissues, bound water, capillary water and loosely bound water, role of water in food spoilage, moisture content of dehydrated foods and shelf life, role of water in cookery.

UNIT – II **9 Hrs**

Carbohydrates: Chemical structures of Glucose, Fructose, Lactose, Sucrose, starch, Cellulose and Glycogen. Effect of dry heat – dextrinisation, Effect of moist heat – gelatinisation, Gel formation, syneresis, retrogradation of starch – Non – enzymatic browning reactions - types and explanation (Chemical reactions not required), *Prevention and impairment of nutritional quality.*

UNIT – III **9 Hrs**

Proteins: Denaturation and renaturation, native and denatured proteins, Colloids – sols, emulsion, gel formation – theories of gel formation, gelatin – properties and preparation, *Texturised vegetable proteins (soya).*

UNIT – IV **9 Hrs**

Fats & Oils: Classification and chemical properties of fatty acids. Hydrogenation – mechanism & factors affecting. Hydrolysis – enzymatic and alkali. Oil – slipping point, smoke, flash and fire points, Rancidity – types and factors affecting rancidity, *changes in fats due to heat during cooking.*

UNIT – V **9 Hrs**

Fruits & Vegetables: Pigments and polyphenols, flavour compounds in fruits and vegetables. Effect of heat on colour and flavour, enzymatic browning, *Ripening of fruits – chemical changes.*

PRACTICAL EXPERIENCE

Visit to a Food Analytical Laboratory .

TEXT BOOK:

1. Meenakshi Paul E.D, *Experimental Food Chemistry,* Gene – Tech Books, New Delhi, 2007.
2. Srilakshmi. B. *Food Science, New Age Intersnational Publishers,* New Delhi, 2008.
3. Swaminathan M., *Hand Book of Food Science and Experimental Foods,* BAPPCO, Bangalore, 1988.

REFERENCE BOOK:

1. Chopra H.K. Panesar P.S., *Food Chemistry,* Narosa Publishing House, New Delhi, 2010.
2. Gaman P.M. Sherrington K.B., *The science o Food, An Introduction to Food Science,* Max Well Macmillan Publishers, New Delhi, 2005.
3. Iqbal S.A., Mido Y., *Food Chemistry,* Discovery Publishing House, New Delhi, 2005.
4. Lillian Hoagland Meyer, *Food Chemistry,* CBS Publications, New Delhi, 1987.
5. Seema Yadav, *Food Chemistry,* anmol Publication, New Delhi, 1997.

SEMESTER IV

Skill Based Subject II

MULTI SKILL DEVELOPMENT PAPER

Instructional Hours:45 **Sub. Code: 13NDUS402**

Max Marks: 100 (ESE – 60 CIA – 40)
(Online) **Credits : 3**

Aim: To equip the students with knowledge on all topics as desirable from the point of view of brilliant success in the competitive examinations.

Objectives: To familiarize the students with various types of tests that are employed by the diverse examining bodies.

UNIT –I: **9 Hrs.**

Communication : Question tag – Gerund and Infinitives – Spotting the errors – Vocabulary – Synonyms – Antonyms – Prepositions – Articles – One word substitution – Sentence completion.

UNIT – II: **9 Hrs.**

Numerical aptitude: Problems on numbers – Problems on Ages – Percentage – Profit and loss – Ratio & Proportion – Time & Work – Time & Distance – Simple Interest – Compound Interest.

UNIT – III: **9 Hrs.**

Critical Reasoning: Logical Inference Questions and Syllogism.

Analytical Reasoning: Arrangement problems – Family / Blood Relation Qualms – Sense of Directions – Age Doubts.

Verbal Reasoning: Verbal Analogy (Letter series and number series only)- Coding and Decoding.

UNIT – IV: **9 Hrs.**

Self Introduction and group Discussion: Soft skills – Interpersonal Skills – Employability Skills – Soft Skills Training – Resume Preparation – Interview Tips and Questions. Importance of group discussion – Types of GD - GD Skills, Essential elements of a GD.

UNIT – V: **9 Hrs.**

Basic Statistics and Research methodology: Mean, media, mode, testing of hypothesis, 't' test, standard deviation – Types of research, abstract and research article writing and presentation – project report preparation and viva-voce presentation.

REFERENCE BOOKS:

1. Hari Mohan Prasad & Uma Rani Sinha.2011. Objective English for Competitive Examinations. New Delhi: Tata Mc Graw Hill Education Private Ltd.(Unit-1)
2. Agarwal R.S, Quantitative Aptitude, S.Chand 2010.(Unit – II)
3. Edgar Thorpe, Test of Reasoning for Competitive Examinations – 4th edition, Tata Mc Graw – Hill Publishing Company Limited, New Delhi. (Unit-III)
4. Agarwal R.S., A Modern Approach to Verbal Reasoning (Fully Solved) – Revised Edition, S. Chand Company Limited, New Delhi, 2012.(Unit-III)
5. Rao M.S., Soft Skills Enhancing Employability – Connecting Campus with corporate, IK International Publishing House, New Delhi. 2010.(Unit-IV)
6. Alex. K, Soft Skills – Know Yourself and Know the World, S. Chand Company Ltd., 2011.(Unit-V)
7. Group Discussion – Pass with Flying Colours, G.K.Publications, Noida, 2012.
8. Kothari C.R, Research Methodology Wishwa Prakasam, New Age International (P) Ltd.-2nd 2003.
9. Gupta S.P, Statstical methods, Sultanchand and sons Educational Publisher – 2007.
10. Elizabeth B.Hurlock 1976: Personality Development. The Mc.Graw Hill Education Private Limited, New Delhi.
11. Robert J. Georgy 2004: Psychological Testing, Fourth Edition, Person Education in South Asia, Noida.

SEMESTER- V

Skill Based Subject III

FOOD PROCESSING –I

Instructional Hours : 4 **Sub. Code:13NDUS503**

Max Marks :CIA-25**; ESE-**75 **Credits :** 3

Objectives

- ✓ Enable the students to understand the control measures in handling the food commodities from harvest to consumption stage and gain knowledge about food processing methods.
- ✓ To make the students to get employment opportunities in Grains Processing Centres.

UNIT –I **9 Hrs**

Cereal technology –Post harvest losses of cereal grains – Agents causing food losses –Prevention of losses - Agencies concerned with grain storage - Save Grain Campaign, Food Corporation of India, Warehouses.

UNIT-II **9 Hrs**

Processing of cereals –Rice processing- By products of rice milling, Wheat processing, New wheat products, Processing of maize , Breakfast cereals - ready to eat cereals and ready to cook cereals.

UNIT-III **9 Hrs**

Legume Technology –Processing- decortication, germination and fermentation. New improved technologies of legume processing- Pulse milling-canning –quick cooking legumes-Instant Legume powders-Legume protein concentrates-By product-Utilization of legume processing.

UNIT-IV **9 Hrs**

Processing of oil seeds-Methods of oil extraction-Solvent extraction – Rendering-Pressing with mechanical presses-Hydrogenation-Deodorization – Winterisation –Peanut butter preparation; Commercial Fat Products- Margarine, Mayonnaise.

UNIT-V **9 Hrs**

Extruded Foods – Principles of Extruders-Classification of extruders-Production of pasta-Merits and Demerits of Extruder technology-Uses of extruded foods-Packaging of extruded foods.

TEXT BOOK

1. Devendra Kumar Bhatt and priyanka Tomar, *An Introduction to Food Science, Technology and Quallity Management*, Kalyani Publishers – New Delhi (India) 2006.
2. Joneja G.C.L,*A practical guide to save grain compaign*, Dept. of food, Ministry of Agriculture and irrigation, New Delhi – 1998.
3. Norman N. Potter and Joseph. H. Hotchkiss, *Food Science*, CBS publishers and Distributors – New Delhi – 2005
4. Samuel A. Matz, *The Chemistry and Technology of cereals as Food and Feed* – CBS publishers and Distributors - New Delhi – 1996.
5. Srilakshmi.B, *Food Science*, New Age International Publishers, New Delhi- 2013
6. Subbulakshmi G, *Food Processing and Preservation*, New Age International Publishers, New Delhi-2013
7. Sivasankar.B, *Food Processing and Preservation*, Prentice- Hall of India Private Limited, New Delhi- 2007.

REFERENCE BOOK

1. Akhtar Rseyaz, *Problem of food storage and losses in India*, Moshit publication, New Delhi – 2002
2. Donald.B. Brooker, Fred W.Bakker and carl W. Hall, *Drying and storage of grains and oil seeds* – CBS publishers and Distributors – New Delhi.
3. Harry W. Von Loeseeke, *Outlines of Food Technology*, Agrobios publication, and Jodhpur. 2001.
4. Kent, N.L and Evers A.D, *Technology of cereals*, British library cataloguing in publication data – Great Britain – 1994.
5. Manay Shakuntala.M, Shadakshara Swamy, *Foods Facts and Principles*, New Age International Publishers, New Delhi- 2013 – 2001.

SEMESTER- VI

Skill Based Subject IV

FOOD PROCESSING –II

Instructional Hours : 4 **Sub. Code: 13NDUS604**

Max Marks :CIA-25**; ESE-**75 **Credits :** 3

Objectives

- ✓ Enable the students to understand the processing of food commodities from harvest to consumption stage and gain knowledge about food processing methods.
- ✓ To make the students to get employment opportunities in Food Processing Centres.

UNIT-I **9 Hrs**

Vegetable Processing –Storage of vegetables-vegetables salads –Dehydrated vegetables –Canned vegetables-Pickled vegetables-Vegetable pastes-Juices-vegetable powders.

UNIT-II **9 Hrs**

Fruit Processing-Ripening of fruits- Blanching-storage of fruits; Fruit products - Dried fruits-Canned fruits-Fruits syrup, Jams, Jellies, Marmalades-Fruit beverages –Fruit juices-Squashes (Pineapple & Grapes only) - Fruit powders; Fruit nectar , Fruit drinks , Cordial ,Punch.

UNIT-III **9 Hrs**

Dairy Technology-Processing of milk-Cooling-Boiling-Pasteurization, Advantages and Types of pasteurization –Concentrating of milk- Homogenization – Cream separation-Manufacture of Butter, Ghee and Cheese; Preparation of Ice Cream, Srikhand, Condensed milk, Tonned milk and Milk powders.

Cultured fluid dairy products – Buttermilk , Source cream , Yoghurt.

UNIT-IV **9 Hrs**

Meat – Preservation and Storage of Meat **–** Cured Meat, Sausages, Casings , Smoked meats, Poultry –Processing ; Poultry Meat Products; Egg Products – Refrigerated liquid products, Frozen egg products, Dried egg products, Speciality products. Fish processing & storage of fish , Fish meal & Fish oils.

UNIT-V **9 Hrs**

Food Irradiation and Food Packaging-Ionizing Radiation –Kinds of Ionizing Radiation and their applicability on Food Processing-Mode of action – Effects of Food Irradiation –Basic packaging materials-Types of packaging –Effects of packaging on nutritive value of foods.

TEXT BOOK:

1. Devendra Kumar Bhatt and priyanka Tomar, *An Introduction to* Food Science, Technology and Quallity Management, Kalyani Publishers – New Delhi (India) 2006.
2. Morris T.N, *Principles of fruit preservation*, Biotech Books, (third edition) 2004.
3. Norman N. Potter and Joseph. H. Hotchkiss, Food Science, CBS publishers and Distributors – New Delhi – 2005
4. Sivasankar.B, Food Processing and Preservation, Prentice- Hall of India Private Limited, New Delhi- 2007.
5. Srilakshmi.B, Food Science, New Age International Publishers, New Delhi- 2013

REFERENCE BOOK:

1. Bhatia S.C, *Handbook of Food processing Technology*, vol I. Basic concepts and processing Aspects –Atlantic publishers &s Distributors (p) Ltd – 2008.
2. Bhutani R.C, *Fruit and vegetable preservation* – Biotech Books, Delhi – 2003.s
3. Manay Shakuntala.M, Shadakshara Swamy, *Foods Facts and Principles*, New Age International Publishers, New Delhi- 2013 – 2001.
4. Subbulakshmi G, *Food Processing and Preservation*, New Age International Publishers, New Delhi-2013

SEMESTER III

Non Major Elective I

BASIC COOKERY

Instructional Hours: 30 **Sub. Code: 13NDUN301**

Max Marks: ESE-100 **Credits : 2**

Objectives:

To make the students understand the basic cooking methods and the changes occur during cooking.

To Practice the students to cook the food items without any nutrients loss and use their skills to develop new food products.

UNIT – I **5 Hrs**

Functions of food: energy yielding – body building – protective foods. ICMR – Basic Five Food Groups, *Basic seven food groups*.

UNIT – II **5 Hrs**

Cooking: Preliminary preparations – advantages – disadvantages, cooking methods – moist heat – Dry heat and combination methods. *Advantages and disadvantages.*

UNIT – III **7 Hrs**

Objectives of cooking: Cooking of cereals and pulses. Changes occur during cooking. *Best method of cooking.*

UNIT – IV **7 Hrs**

Cooking of Vegetables: Cooking of green leafy vegetables, others vegetables and roots and tubers. changes occur during cooking *–method of cooking.*

UNIT – V **6 Hrs**

Cooking of milk, meat, poultry and fish: (Channa curd, ghee and ice cream) cooking of meat, fish, poultry and egg. Changes occur during cooking. *Best method of cooking.*

TEXT BOOK:

1. Kumud Khanna, Sharda Gupta, *The Art and Science of Cooking* –A Student's Manual phoenix publishing house Pvt. Ltd – (third edition) 1998
2. Seema Yadav, Text book of Nutrition and Health – Anmol Publications Pvt. Ltd – New Delhi -1997.
3. Thangam E.Philip, *Modern Cookery for Teaching and the Trade,* Vol – Orient Longman Ltd (4^{th} edition) 1998.
4. Victor laserani, Ronld kinton ands Davids Foskett, *Practical Cookery* – ninth edition – ELST Publication – 2000.

REFERENCE BOOK:

1. Chinta Palli Vidya, D, Bhaskara Rao, Text book of nutrition – Discovery publishing House – New Delhi – 2004.
2. Nirdosh KumarJain, *A Complete Book on Food and Nutrition – Cyber tech publications* – New Delhi – 2008.
3. Sri Lakshmi.B, *Nutrsition Science* – New age International publishers – 2006.

SEMESTER IV

Non Major Elective II

DIET IN DISEASES

Instructional Hours: 30 **Sub. Code: 13NDUN402**

Max Marks: ESE-100 **Credits : 2**

Objectives:

To enable the students to understand about foods and its uses in various diseased conditions.

To develop skills in planning menus with balanced diet.

UNIT – I **6 Hrs**

Food groups: Balanced diet – Nutrients – Health – Recommended Dietary Allowances: *Reference man and reference women*.

UNIT – II **6 Hrs**

Menu Planning : Principles of menu – Planning – Therapeutic diets – Principles – clear fluid diet, Full fluid, *Tube feeding and Total Parental Nutrition*.

UNIT – III **6 Hrs**

Nutritional deficiency disorders: under nutrition – anemia, Obesity – complications in *pregnancy – Diet management.*

UNIT – IV **6 Hrs**

Dietary Management: Fever, Ulcer, Diarrhoea, Constipation, jaundice, cardiovascular disease and *Hypertension*.

UNIT – V **6 Hrs**

Dietary Management: Diabetes, Glomerular nephritis, Nephrosis and Renal failure. Diet *Management for allergy and cancer*. Diet management for AIDS patients.

TEXT BOOK:

1. Ashok Pande, *Text Book of Food and Nutrition.* Akansha Publishing House, New Delhi – 2004.
2. Brain A. Fox and Allan G.Cameron, *Food Science, Nutrition and Health.* British Library Cataloguing in Publication Data, London, (fifth edition) 1989.
3. Sheel Sharma, *Human Nutrition and Meal Planning,* Jnanada Prakesh Publishers and Distributors – New Delhi – 2006.
4. Shubhangini. A. Joshi, *Nutrition and Dietetics* Tata Mc Graw – Hill Publishing Company Ltd, New Delhi – 2002.
5. Sri Lakshmi, *Dietetics*. New Age International (p) Ltd, Publishers, New Delhi, Chennai and Cochin, (Revised sixth edition) 2010.
6. Swaminathan. M., *Advanced Text book on Food and Nutrition, Volume I*. The Bangalore Printing and Publishing Co. Ltd, Bangalore – 1990.

REFERENCE BOOK:

1. Briony. Thoma, *Manual of Dietetic Practice* (The British Dietetic Association) Black Well Scientific Publications, Oxford London, Edinburgh and Melbourne 1989.
2. Garrow J.S and James W.P.T., *Human Nutrition and Dietetics,* British Library Cataloguing in Publication Data, Edinburgh London Madrid New York and Tokyo, 1993.
3. Jim Mann and Stewart Truswell. A, *Essentials of Human Nutrition*, Oxford, 2008.
4. Peggy S.Stanfield, *Nutrition and Diet Therapy,* Jones and Bart left Publishers, Boston-London, 1992.

Self Learning Subject I

MARRIAGE AND FAMILY COUNSELING

Instructional Hours: Self Learning **Sub. Code: 13NDUSL01**

Max Marks: 100 **Credits: 5**

Objectives:

Enable the Students to deal with emotions and stress and developing interpersonal relationship, skills to undertake premarital counseling and to gain employment opportunities in counseling organizations.

Unit – I

Marriage: Definition, Mate selection, Love, Rational or emotive choice, marriage in the Indian culture, contemporary changes in marriage. Age at marriage, the marriage relationship – Goals in marriage, Typological models, marital satisfaction.

UNIT – II

Divorce ands Remarriage: Facts about divorce, causes of divorce, divorce experience, remarriage, alterations to marriage, singlehood – Causes, types, advantage, disadvantage.

UNIT – III

The family System: Frame of reference, health and family – social health, characteristics of a healthy family – Love, discipline, consistency, authority, ten commandments to parents. Roles of Husband and Wives**:** Husband's role – love, Non-verbal and verbal gestures, role model, polite and considerate, positive strokes, Wife's Role – understanding, Respect, Good Manager, Positive attitudes and good qualities.

UNIT – IV

Adjustment Psychology in Family System: Factors in adjustment and growth, self – concept, sources of conflicts, Interpersonal relations. Stress – factors associated and stress busters.

UNIT – V

Pre Marital Counseling: Couples Communicating Programs (CCP), Premarital relationship improvements by maximizing empathy and self Disclosure (PRIMES), Premarital Relationship Enhancement Program (PREP), Mate Selection – Filtering models, reasons for marriage, Marrageability Traits, Resources to use in the premarital counseling.

REFERENCE BOOK

1. Bharat S, *Family Measurement in India*. Sage Publications, New Delhi, 1994.
2. Blood R Wolfe, *Husband and Wife* – The Dynamics of Married Livings. The Free Press. New York 1960.
3. *Communication and Adjustment IN Marriage*, Family Process – Navran Inc., New Delhi, 1967.
4. Dhruti A. Thakkar *Institute for Psychotherapy & Management Studies*, Mumbai 2000.
5. Kapadia K.M. *Marriage and Family in India*. Vikas Publications, 1970.
6. Lood R, *Love-match and Arranged Marriage*. The Free Press, New York 1967.