

**B.SC. NUTRITION AND DIETETICS**

# SYLLABUS

*(2023 onwards)*



**P. G. DEPARTMENT OF FOOD AND  
NUTRITION**

## **Department of Food and Nutrition**

### **Vision**

The department seeks to function with mutual love and social commitment to educate and engage students in research and extension activities to serve the community.

### **Our Mission**

- Provide opportunity to students to realize their potential in the broad and diverse domains of Nutrition and Dietetics through teaching, innovation, training, research & mentorship on how nutrients impact human health and disease.
- Provide opportunities to students to master communication Skills that prepares students for supervised practice through internships and extension activities leading to be a professional dieticians in providing service to professional, governmental and local community.
- Propagate student curiosity and inquiry about the theory and practice of dietetics that will lead to discovery and application of new ideas and knowledge

**On Successful Completion of B.Sc. Nutrition and Dietetics program, the Graduates will be able to**

### **Knowledge**

PO1 Recognize the composition of different foods and their physical, chemical and biological changes that occur during cooking/ processing of foods and their effect on human beings.

PO2 Extend nutrition services *as public health nutritionist, dietician*

*nutritionist, clinical nutritionist or sports nutritionist* to a diverse community.

PO3 Provide nutrition education to individuals, groups, and communities through out the life span using a variety of communication strategies including ICT.

### **Attitude**

PO4 Engage in self-directed continuous learning aimed at global competency, which will promote professional and personal growth.

### **Skills**

**PO5** Apply knowledge of public health, diseases, technical skills, clinical judgment and decision-making to make appropriate life style and food choices.

**PO6** Implement strategies with reference to food access, procurement, Preparation, and safety

**PO7** Analyze, interpret, evaluate and use professional literature to make evidence based decisions facilitating professional collaborations in the field of Nutrition and Dietetics

**PO8** Evaluate, adopt and apply the best practices relating to health, safety, Quality and client satisfaction in the field o food Nutrition and Dietetics.

### **Ethical & Social Responsibility**

**PO9** Develop management skills and entrepreneurial skills, by harnessing core Competencies tempered by values and ethics

### **Programme Specific Outcomes**

### **B.Sc. Nutrition & Dietetics**

**On successful completion of B.Sc., Nutrition and Dietetics program, the**

## **Graduate will be able to**

### **Intellectual Skills**

**PSO1** Identify the components of foods and apply the concepts learned to provide professional nutrition services in a wide variety of settings including academic, hospital, government, corporate, military, sports and community-based organization.

### **Practical Skills**

**PSO2** Exhibit skill and confidence to cater to the nutritional needs of diverse Population

**PSO3** Apply knowledge of food, nutrition and dietetics to develop practical skills of management of dietary departments of the various organizations

### **Transferable Skills**

**PSO4** Apply the principles of food science to produce commercial products for the benefit of the society honing the entrepreneur skills in students

## BSc. Nutrition and Dietetics Programme

Sem.	Part	Course	Course Title	Course Code	Hours / week	Credits	Marks		
							CIA	ESE	Total
I	I	Language I	பொதுத்தமிழ் I	U23TM1L1	6	3	25	75	100
	II	English I	Prose and Short Stories	U23EG1L1	6	3	25	75	100
	III	Core I	Human Physiology	U23ND101	5	5	25	75	100
		Core Prac. I	Human Physiology Practical	U23ND1P1	3	3	40	60	100
		Allied I	Allied Chemistry I	U23CH1Y1	3	3	25	75	100
		Allied Prac. I	Allied Chemistry Practical I	U23CHPY1	3	2	40	60	100
	IV	SEC I	Basics in Nutrition	U23ND1E1	2	2	25	75	100
		FC	Introduction to Food and Nutrition	U23ND1N1	2	2	100	--	100
					<b>30</b>	<b>23</b>			
II	I	Language II	பொதுத்தமிழ் II	U23TM2L2	6	3	25	75	100
	II	English II	Poetry and Shakespeare	U23EG2L2	6	3	25	75	100
	III	Core II	Food Science	U23ND202	5	5	25	75	100
		Core Prac. II	Food Science Practical	U23ND2P2	3	3	40	60	100
		Allied II	Allied Chemistry II	U23CH2Y2	3	3	25	75	100
		Allied Prac. II	Allied Chemistry Practical II	U23CHPY2	3	2	40	60	100
	IV	SEC II	Diet in Health and Disease	U23ND2E2	2	2	25	75	100
		SEC III	Food Safety and Hygiene	U23ND2S3	2	2	25	75	100
					<b>30</b>	<b>23</b>			
III	I	Language III	பொதுத்தமிழ் III	U23TM3L3	6	3	25	75	100
	II	English III	One Act Plays and Abridged Novel	U23EG3L3	6	3	25	75	100
	III	Core III	Nutritional Biochemistry	U23ND303	5	5	25	75	100
		Core Prac. III	Nutritional Biochemistry Practical	U23ND3P3	3	3	40	60	100
		Allied III	General Home Science I	U23ND3Y3	3	3	25	75	100
		Allied Prac. III	General Home Science Practical I	U23NDPY3	3	2	40	60	100
	IV	SEC IV	Entrepreneurship Development	U23ND3S4	1	1	100	--	100
		SEC V	Food Preservation and Processing	U23ND3S5	2	2	25	75	100
EVS		Environmental Studies	U23EST41	1	--	--	--	--	
					<b>30</b>	<b>22</b>			

IV	I	Language IV	பொதுத்தமிழ் IV	U23TM4L4	6	3	25	75	100
	II	English IV	Language through Literature	U23EG4L4	6	3	25	75	100
	III	Core IV	Principles of Human Nutrition	U23ND404	5	5	25	75	100
		Core Prac. IV	Principles of Human Nutrition Practical	U23ND4P4	3	3	40	60	100
		Allied IV	General Home Science II	U23ND4Y4	3	3	25	75	100
		Allied Prac. III	General Home Science Practical II	U23NDPY4	2	2	40	60	100
	IV	SEC VI	Life Skills	U23ND4S6	2	2	100	--	100
		SEC VII	Women Health and Wellness	U23ND4S7	2	2	100	--	100
		EVS II	Environmental Studies	U23EST41	1	2	25	75	100
					<b>30</b>	<b>25</b>			
V	III	Core V	Nutrition in Life Cycle	U23ND505	5	4	25	75	100
		Core VI	Advanced Dietetics	U23ND506	5	4	25	75	100
		Core Prac. V	Nutrition in Life Cycle Practical	U23ND5P5	4	4	40	60	100
		Core Project	Core Project with Viva Voce	U23ND5PJ	4	4	20	80	100
		Elective I	Public Health Nutrition	U23ND5:A	5	3	25	75	100
			Diet and Counselling	U23ND5:B					
	Elective II	Basics in Research Methodology	U23ND5:C	5	3	25	75	100	
		Changing Trends in Extension Education	U23ND5:D						
	IV	Internship	Internship	U23ND5I1	--	2	100	--	100
		VLO	Abundant Life	U23VLO51	2	2	100	--	100
Human Values			U23VLO52						
					<b>30</b>	<b>26</b>			
VI	III	Core VII	Food Microbiology	U23ND607	6	4	25	75	100
		Core VIII	Quantity Food Service and Physical Facilities	U23ND608	6	4	25	75	100
		Core Prac. VI	Food Microbiology Practical	U23ND6P6	6	4	40	60	100
		Elective III	Nutrition for Sports and Fitness	U23ND6:A	5	3	25	75	100
			Principles of Resource management and Interior Design	U23ND6:B					
		Elective IV	Food Product Development and Marketing Strategy	U23ND6:C	5	3	25	75	100
	Nutrition in Special Condition		U23ND6:D						
	IV	Extension Activity	Extension Activities	U23ETA61	--	1	--	--	--
PCS		Aptitude and Reasoning Skills for Competitive Examinations	U23ND6G1	2	2	100	--	100	
					<b>30</b>	<b>21</b>			
				<b>Total Credits :</b>		<b>140</b>			

Part - I	:4	PCS	:1
Part - II	:4	SEC	:7
Core Theory	:8	Environment Studies	:2
Core Practicals	:6	Extension Activities	:1
Allied Theory	:4	Value Education	:1
Allied Practicals	:4		
Elective	:4		
Foundation Course	:1		
Project	:1		
<b>Total Course</b>	<b>:48</b>		
<b>Total Credits</b>	<b>:140</b>		

<b>Course Type : Core –I Theory</b>	<b>Course Title: Human Physiology</b>
<b>Semester :I</b>	<b>Course Code : U23ND101</b>
<b>Credits : 5</b>	<b>Hours/Week :5</b>

**Course Learning Outcomes:**

After the completion of this course, the students will be able to:

	<b>Course outcome</b>	<b>K-Level</b>	<b>Unit</b>
CO1	Recollect the functions of basic units of the human system –cell	K3	I
CO2	Explain the role of circulatory system in carrying the nutrients throughout the body and crucial role of GI system in maintaining bodily functions	K2	II
CO3	Correlate the importance of immune system present in the body and understand the role of heart and circulation	K5	III
CO4	Analyze the role of respiratory and nervous system in regulating the smooth functioning of the body.	K4	IV
CO5	Evaluate the role and function of sex hormones, male and female reproductive system and endocrine glands	K5	V
CO6	Develop competency in analyzing the correlation between health,	K5	V



	disease and physiology		
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## **Syllabus**

### **Unit-I Cells**

**-15 Hours**

Cell–Structure of organelles and functions. Tissues–Structure, Classification and functions.

### **Unit-II Blood and Digestive system**

**-15 Hours**

Blood – Composition, functions, coagulation, factors affecting coagulation, blood groups. Gastrointestinal and Hepato biliary system – Structure, physiology, and functions for different organs and role of hormones and enzymes.

### **Unit-III Circulatory and Immune System**

**-15 Hours**

- A. Immune system** – Innate, acquired, and active immunity, cell-mediated immunity, humoral immunity, and complement system.
- B. Heart and circulation** – Structure, cardiac cycle, cardiac output, factors affecting cardiac output, normal ECG, heart failure, blood pressure, control, and factors affecting blood pressure.

### **Unit-IV Respiratory and Excretory system**

**-15 Hours**

- A.** Respiratory system – Structure and functions, Lung volumes and lung capacities, Factors affecting the efficacy of respiration.
- B.** Excretory system (A)Urinary System:-Structure and functions of organs of the urinary system ( In brief), Mechanism of urine formation. (B)Skin:- Structure and functions, Regulation of body temperature.

### **Unit-V Reproductive and Endocrine system**

**- 15Hours**

- A. (A)Female reproductive system**--Structure and functions, menstrual cycle, menarche and menopause.
- B. Male Reproductive system**—Structure and functions.

Endocrine system - Thyroid, Parathyroid, Adrenal gland, Pituitary and Sex glands – Structure and functions.

**Unit VI Topics for Self Study:**

1. Immunity – innate and acquired  
immunity.<https://www.creative-diagnostics.com/innate-and-adaptive-immunity>.
2. Heart lung  
machine.[https://www.youtube.com/watch?v=RmwMzw\\_YTNU](https://www.youtube.com/watch?v=RmwMzw_YTNU)
3. Renal failure –Kidney transplantation and artificial kidney dialysis and home remedies of detoxification diet,.<https://www.healthline.com/health/dialysis#risks>
4. Neurotransmitters –dopamine,serotonin, endorphins, oxytocin.  
<https://www.healthline.com/health/happy-hormone#food>

**Textbooks:**

1. Guyton A.C., “Human Physiology and Mechanism and Disease”, 13<sup>th</sup> Edition, Elsevier., 2015 .
2. Sembulingam, K., “Essentials of Medical Physiology”, 6<sup>th</sup> Edition, Jaypee Brothers Medical Publishers (P) Ltd., New Delhi, 2012.
3. Chatterjee C.C., “Human Physiology, Volume I & II”, 11<sup>th</sup> Edition, CBS Publishers, 2017.

## **References**

1. Ross and Wilson (2011), Anatomy and physiology in Health and Illness, 11th Edition, Church Hill Livingstone.
2. West, J.B. (2007), Best and Taylor's Physiological Basis of Medical Practice, 11<sup>th</sup> Edition.

<b>Course Type :Core Practical-I</b>	<b>Human Physiology Practical</b>
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<b>Semester :I</b>	<b>Course Code :U23ND1P1</b>
<b>Credits :3</b>	<b>Hours /Week : 3</b>

**Course Learning Outcomes:**

After the completion of this course the students will be able to:

	<b>Course outcome</b>	<b>K-Level</b>	<b>Unit</b>
CO1	Identify the structure of various tissues microscopically	K2	I
CO2	Analyze blood groups and differentiate the various blood groups	K4	II
CO3	Apply the various instrument like stethoscope and sphygmomanometer	K3	III
CO4	Estimate the amount of hemoglobin in blood	K4	IV
CO5	Correlate the use of various equipment in the evaluation of normal body functions	K5	V
CO6	Compare the various organs and it's functions	K5	V

**Syllabus**

1. Microscopic study of tissues- epithelial, connective and muscular.
2. Collection of blood sample-Capillary blood from finger tips and venous blood.
3. Separation of blood components (Centrifugation).
4. Estimation of hemoglobin-Sahli's Acid hematin method.

5. Determination of Hematocrit (Wintrobe method).
6. Preparation and examination of stained blood smear (Wedge or glass slide method).
7. Determination of Erythrocyte Sedimentation Rate (Wintrobe method).
8. Determination of blood group.
9. Determination of bleeding time (Duke method) and coagulation time (Capillary tube method).
10. Platelet count (Rees Ecker method by hemocytometry).
11. Clinical examination of radial pulse (pulse rate).
12. Measurement of blood pressure (Sphygmomanometry).
13. Effect of exercise on blood pressure and heart rate.
14. Microscopic structure of heart, digestive system and kidney.
15. Microscopic structure of reproductive organs ovary, uterus, mammary glands and testis.
16. Microscopic structure of endocrine glands- thyroid, pituitary and adrenal.

**Topics for Self Study:**

1. Visit to blood bank.
2. Observation of blood transfusion.
3. Arterial blood pressure and pulse rate, effect of exercise.
4. Histology of artery, vein, trachea and lung.

**Textbooks:**

1. Guyton A.C., “Human Physiology and Mechanism and Disease”, 13<sup>th</sup> Edition, Elsevier., 2015 .
2. Sembulingam, K., “Essentials of Medical Physiology”, 6<sup>th</sup> Edition, Jaypee Brothers Medical Publishers (P) Ltd., New Delhi, 2012.
3. Chatterjee C.C., “Human Physiology, Volume I & II”, 11<sup>th</sup> Edition, CBS Publishers, 2017.

### **Reference Books**

1. Clark Patricia., “Human Physiology Lab Manuel Study Guide”, Second Edition, Pat Clark., India, 2014
2. Bestand Taylor, “The Physiology Basis For Medical Practice”, Saunders Company, 1992.
3. G.K.Pal and Pravati pal, Text book of practical physiology, Orient Longman Ltd. 2001.

<b>Course Type : SEC- I Theory</b>	<b>Course Title : Basics in</b>
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	<b>Nutrition</b>
<b>Semester : I</b>	<b>Code : U23ND1E1</b>
<b>Credits : 2</b>	<b>Hours /Week : 2</b>

**Course Outcomes:**

After the completion of this course the students will be able

	<b>Course Outcomes</b>	<b>K-Level</b>	<b>Unit Covered</b>
<b>CO1</b>	Correlate the role of food and its importance in disease prevention.	K3	I
<b>CO2</b>	Compares the basic components present in food and the recommended allowance of each and every component.	K4	II
<b>CO3</b>	Classify the macronutrients in foods and their vital role in energy giving and body building functions.	K4	III
<b>CO4</b>	Analyze the micro and macronutrient deficiencies and the role of food in preventing them.	K4	IV
<b>CO5</b>	Acquire basic knowledge in the treatment of diseases through diet.	K4	V
<b>CO6</b>	Appreciate the importance of good food habits in leading a healthy lifestyle.	K4	

**Unit-I Food****-6 Hours**

Food definition, classification of food, basic five food groups classification of nutrients, RDA- reference man and women, factors influencing RDA

**Unit-II Carbohydrate****- 6 Hours**

Carbohydrates: functions, sources, classifications and requirements, disorder of CHO- under nutrition and obesity and Diabetes mellitus, Role of dietary fibre in health and disease.

**Unit-III Proteins****-6 Hours**

Definition of protein, Sources, functions of proteins, nutritional classifications of amino acids and its requirements, deficiency of protein metabolism- PEM, PCM.

**Unit-IV Lipids****-6 Hours**

Lipids - sources, functions of protein classifications and types of fatty acids and requirements, disorder of lipid metabolism- disease related to heart-hypertension and atherosclerosis.

**Unit - V Macro Minerals & Vitamin****-6 Hours**

- A. Macro Minerals:** sources, functions. Classifications, Requirements of macro minerals and effect of deficiency and excess.
- B. Micro Minerals:** sources, functions. Classifications, Requirements of iron, Iodine Zinc and fluorine effect of deficiency and excess.



## **Vitamins**

- A. Fat soluble Vitamins: Vitamin A, Vitamin D, E & K. Functions, Sources, Requirements and Deficiency diseases.
- B. Water soluble vitamins: Thiamine, Riboflavin, Niacin, Pantothenic acid, Biotin, Folic acid, Vitamin B12, Vitamin B6 and Vitamin C, Functions, Sources, Requirements and Deficiency diseases.

## **Unit VI :Topics for Self-study**

- A. Life style modification in prevention of diseases.
- B. [https://www.health.harvard.edu/newsletter\\_article/Lifestyle\\_prevention\\_Does\\_it\\_work\\_And\\_why](https://www.health.harvard.edu/newsletter_article/Lifestyle_prevention_Does_it_work_And_why)
- C. Food labels and their importance. <http://www.amzbolt.com/blog/Importance-of-checking-foodlabel/index.aspx>
- D. Hazards of junk food. <https://www.icicilombard.com/blog/health-insurance/hi/5-harmfuleffects-of-junk-food>
- E. Role of vegetables in boosting immunity. [https://www.onhealth.com/content/1/immune\\_system\\_boosting\\_foods](https://www.onhealth.com/content/1/immune_system_boosting_foods)

### **Text Books**

1. Srilakshmi, B., "Food science" , 7<sup>th</sup> edition, New Age International Pvt.Ltd., New Delhi., 2018.
2. "Dietary Guidelines for Indians", ICMR, National Institute of Nutrition, Hyderabad, 2013

### **Reference Books**

1. Anderson J. J. B., Root M. M., Garner S. C. (2015) Human Nutrition: Healthy Options for Life. Jones & Bartlett Learning, Massachusetts, USA.
2. Gordon M. Wardlaw, Paul Insel et, al. (2000) Contemporary Nutrition-Mosby, Chicago
3. Guthrie, H.A. (1989) Introductory Nutrition. 7th ed. Times Mirror / Mosby College Publishing, St. Louis
4. Insel P., Ross D., McMahon K., Bernstein M. (2016) Discovering Nutrition. 5<sup>th</sup> Ed., Jones & Bartlett Learning, Massachusetts, USA.
5. Mahan K and Sylvia E. Stump (2000) Krause's Food Nutrition and Diet Therapy, Saunders, USA

<b>Course Type : Foundation Course – I Theory</b>	<b>Course Title : Introduction to Food and Nutrition</b>
<b>Semester : I</b>	<b>Code : U23ND1N1</b>
<b>Credits : 2</b>	<b>Hours /Week : 2</b>

**Course Outcomes:**

After the completion of this course the students will be able to:

	<b>Course Outcomes</b>	<b>K- Level</b>	<b>Unit Covered</b>
<b>CO1</b>	Illustrate the concepts and principles of Food and Nutrition.	K2	I
<b>CO2</b>	Identify the nutritional deficiency on general health	K3	II
<b>CO3</b>	Analyse the role of food preservation to retard microbial growth	K4	III
<b>CO4</b>	Evaluate the role of different Quality Management System in food processing Industries	K5	IV
<b>CO5</b>	Asses the importance of Nutrition Education for Public Health	K5	V
<b>CO6</b>	Examine the fundamentals of food, nutrition and physiology	K3	

## Syllabus

### **UNIT-I Fundamentals of Food and Nutrition -6 hours**

- A. **Food Science** - Basic Food groups, Classification of Nutrients, Components of Food science and Technology, Functions of Food
- B. **Food Chemistry** - Biological functions of Carbohydrates, Protein and Fat, Water – Types, Properties and role

### **UNIT-II Physiology and Nutritional Deficiency - 6 hours**

- A. **Blood and Body fluids** – Properties and functions, Different systems of the body: Cardiovascular, Digestive, Excretory - Functions
- B. **Nutritional Deficiency** – Protein-Energy Malnutrition, Anemia, Vitamin – A, D, E and K deficiencies

### **UNIT-III Food Microbiology and Preservation - 6 hours**

- A. **Food Microbiology** - Classification of Microbes, Factors responsible for Food contamination and spoilage, Beneficial role in Food processing.
- B. **Food Preservation** – Principles, Classification of preservatives, Role of preservation in Food industry.

### **UNIT-IV Food Processing and Quality control -6 hours**

- A. **Food Processing** – Schematic diagram of Cereals, Pulses, Fruits and vegetables, Nuts and Oilseeds, Sugar processing.
- B. **Quality Control** – Responsibilities of Food Safety Officers, Role of HACCP, GMP, GHP in Food Processing Unit

## **UNIT-V Diet and Community Nutrition**

**- 6 hours**

- A. **Dietetics** - Roles and Responsibilities of Dietician, Balanced diet, Reference Man Vs Woman, Therapeutic diets – Types.
- B. **Community Nutrition** – Nutritional Assessment, Nutrition Educational aids – Importance and Types, Measures to eradicate Vitamin-A, Anaemia and goitre of public.

### **Unit VI : Topics for Self-study**

- 1. Importance of calcium in elders with osteoporosis
- 2. Electrolyte balance and Homeostasis
- 3. Fermented Food products
- 4. Post-harvest technology for by-products of cereals
- 5. Role of computers in Nutrition Education

### **Text Books**

- 1. Shakuntala Manay N Shadak Cheraswamy M, Food Facts and Principles. New age publisher, 2nd edition, 2004
- 2. B Srilakshmi, Food Science, New Age Publishers, 6th edition, 2015
- 3. Avantina Sharma, Textbook of food science and Technology, CBS Publisher and distributes Ltd, 3rd edition, 2017
- 4. Mahtab S. Bamji, N. Pralhad Rao, Vinodini Reddy, Text Book of Human Nutrition Oxford and IBH Publishing Co. Pvt. Ltd, New Delhi, Reprint 1999
- 5. Thomas Briony, Blackwell Manual of Dietetic Practice, (2nd Ed.) Oxford: New York ,1995

## **Reference Books**

1. Raocg, Essentials of food process engineering, PHI learning private ltd., 2006
2. Janet D Ward and Larry Ward, Principles of Food Science, Stem Publishers, 4<sup>th</sup> edition, 2006
3. Forsythe S J and Hayes P R, Food Hygiene, Microbiology and HACCP, Gaitersburg Maryland Aspen, 1998
4. Eskein, Biochemistry of Food, Elsevier publications, 1st edition, 2012
5. Robinson, Normal and therapeutic Nutrition: Macmillan Pub. Company New York, 2006.

<b>Course Type: Core –II Theory</b>	<b>Course Title : Food Science</b>
<b>Semester: II</b>	<b>Course Code: U23ND202</b>
<b>Credits: 5</b>	<b>Hours/Week: 5</b>

### Course Outcome

After the completion of this course the students will be able to:

	<b>Course Outcome</b>	<b>K-Level</b>	<b>Unit Covered</b>
CO1	Summarize and critically discuss the fundamental and applied aspects of Food Science.	K2	I
CO2	Identify and apply the principles of cooking cereals and pulses	K3	II
CO3	Analyse different foods and their functions and acquire knowledge on different methods of cooking and apply process of different foods	K4	III
CO4	Assess the suitable combination of foods in the development of food products.	K5	IV
CO5	Explain the adulterants and evaluate cooking temperature of different fats and oils	K5	V
CO6	Assess the importance of cooking in different food commodities	K5	

### 1. Syllabus

#### Unit-I Food and Beverage

- 15 Hours

- A. Food:** Definition, functional classification, groups (4, 5,7 and 11), food pyramid.
- B. Cooking:** Definition and objectives; Methods- Moist heat methods, dry heat methods, combination of both and micro wave cooking; Effect of cooking on nutrients.

- C. Beverages:** Classification; Coffee beverage- Constituents and method of preparation; Tea-Types, preparation; Cocoa- Composition, nutritive value and preparation of cocoa beverage; Fruit beverages- Types; Introduction to vegetable juices, milk based beverages, malted beverages, carbonated non-alcoholic beverages and alcoholic beverages.

## **Unit-II Cereals, Millets and Pulses**

**- 15 Hours**

- A. Cereals and millets:** Structure, composition and nutritive value of rice, wheat and oats; Nutritive value of maize, jowar, ragi and bajra. Cereal cookery: Effect of moist heat-Hydrolysis, Gelatinisation and factors affecting gelatinization, gelformation, retrogradation and syneresis; Effect of dry heat; Role of cereals in cookery.
- B. Pulses:** Composition, nutritive value, toxic constituents; Pulse cookery- Effect of cooking, factors affecting cooking quality, role of pulses in cookery, germination and its advantages.

## **Unit-III Milk and Non-Vegetarian Foods**

**- 15 Hours**

- A. Milk and milk products:** Composition and nutritive value of milk; Milk cookery- Effect of heat, effect of acid and effect of enzymes; Milk products- Non fermented and fermented products (does not include preparation); Role of milk in cookery.
- B. Egg:** Structure, composition, nutritive value; Egg cookery- Effect of heat, factors affecting coagulation of egg proteins and effect of other ingredients on egg protein; Role of egg in cookery; Home scale method for detecting egg quality.
- C. Meat:** Classification, composition, nutritive value, rigor mortis, ageing and tenderizing; Meat cookery- Changes during cooking.
- D. Poultry:** Classification, composition and nutritive value.
- E. Fish:** Classification, composition, nutritive value, selection and principles of fish cookery.



#### **Unit-IV Vegetables, Fruits and Spices**

**- 15 Hours**

- A. Vegetables:** Classification (nutritional), composition, nutritive value; Pigments in vegetables- Water soluble and water insoluble; Enzymes, flavor compounds and bitter compounds; Vegetable cookery- Preliminary preparation, changes during cooking, loss of nutrients during cooking, effect of cooking on pigments, role of vegetables in cookery.
- B. Fruits:** Classification, composition, nutritive value, ripening of fruits; Browning- Types and preventive measures.
- C. Spices:** General functions, role in cookery; Medicinal value of commonly used spices.

#### **Unit-V Fats and Oils, Sugars and Products**

**- 15 Hours**

- A. Fats and oils:** Composition and nutritive value, basic knowledge about commonly used fats and oils (lard, butter, margarine, cotton seed oil, ground nut oil, coconut oil, soya bean oil, olive oil, rice bran oil, sesame oil, rape seed oil, mustard oil and palm oil); Spoilage of fat- Types and prevention; Effect of heating, role of fats and oils in cookery.
- B. Sugar and related products:** Nutritive value, characteristics and uses of various types of sugars; Sugar cookery- Crystallization and factors affecting crystallization; Stages of sugar cookery; Role of sugar in cookery.

#### **Unit-VI Topics for Self-Study**

- Spherification of foods and its importance among consumers
- By-product utilization of cereals and pulses
- Fish Protein concentrates and Whey protein concentrates – importance
- Different types of driers available for dehydration of fruits and vegetables
- Fat substitutes – adverse health effects

[Interesterified fats: What are they and why are they used? A briefing report from the Roundtable on Interesterified Fats in Foods \(researchgate.net\)](#)

## **Text Books**

- Maney S Foods, Facts and Principles, 3rd Edition Published by Wiley Eastern, New Delhi, 2008
- Usha Chandrasekhar, Food Science and Application in Indian Cookery, Phoenix Publishing House P. Ltd., New Delhi, 2002
- Srilakshmi, B. Nutrition Science, New Age International (P) Ltd., New Delhi, 2017
- Mahtab, S. Bamji, Kamala Krishnasamy, Brahmam G.N.V, Text Book of Human Nutrition, Third Edition, Oxford and IBH Publishing Co. P. Ltd., New Delhi, 2012
- Sunetra Roday, Food Science and Nutrition, Oxford University Press, New Delhi, 2017

## **Reference**

- Raocg, Essentials of food process engineering, PHI learning private ltd., 2006
- Janet D Ward and Larry Ward, Principles of Food Science, Stem Publishers, 4th edition, 2006
- Srivastava R P and Kumar S., Fruits and Vegetables Preservation-Principles and Practices, International Book Distributing Co. 3rd edition, 2006
- W B Crusess, Commercial Unit and Vegetable Products, W.V. Special Indian Edition, PubAgrobios India, 2nd edition, 2004
- Forsythe S J and Hayes P R, Food Hygiene, Microbiology and HACCP, Gaitersburg Maryland Aspen, 1998

<b>Course Type: Core Practical -II</b>	<b>Course Title : Food Science Practical</b>
<b>Semester: II</b>	<b>Course Code: U23ND2P2</b>
<b>Credits: 3</b>	<b>Hours/Week: 3</b>

### Course Outcome

After the completion of this course the students will be able to:

	<b>Course Outcome</b>	<b>K-Level</b>	<b>Unit Covered</b>
CO1	Demonstrate the effect of cooking on volume and weight of different food commodities	K2	I
CO2	Identify appropriate cooking method to conserve nutrients	K3	II
CO3	Examine skills on different methods of cooking. Understand experimental cookery	K4	III
CO4	Discuss the factors responsible for physio-chemical changes in foods during cooking	K6	IV
CO5	Develop recipes by applying knowledge on cooking methods and properties of food	K6	V
CO6	Discuss the appropriate method of cooking and factors responsible for changes occurs during cooking of foods	K6	

### 1. Syllabus

1. Measurement of food materials using standard measuring cups, spoons and weighing.
2. Observe the microscopic structure of different starches before and after gelatinization (rice, wheat and corn).
3. Study the effect of temperature, time of heating, concentration, addition of sugar and acid on gelatinization of starch.
4. Demonstrate the best method of cooking rice.

5. Demonstrate the effect of soaking, hard water, sodium bicarbonate and papaya on cooking quality of pulses.
6. Prepare recipes using whole gram, dhal, pulse flours, sprouted pulses and cereal pulse combination.
7. Demonstrate the factors affecting coagulation of milk protein.
8. Prepare recipes using milk and its products.
9. Demonstrate the effect of addition of acid, fat, salt, water and sugar on the texture of omelettes.
10. Demonstrate the effect of acid, alkali and over cooking on vegetables containing different pigments.
11. Prepare the following using fruits and vegetables- salads, soups and curries.
12. Determine the smoking point of any 4 cooking oils.
13. Prepare recipes using shallow fat and deep fat frying methods.
14. Demonstrate the stages of sugar cookery.
15. Preparation of any one beverage under the following types- refreshing, nourishing, stimulating, soothing and appetizing.

### **Text Books**

- Maney S Foods, Facts and Principles, 3rd Edition Published by Wiley Eastern, New Delhi, 2008
- Usha Chandrasekhar, Food Science and Application in Indian Cookery, Phoenix Publishing House P. Ltd., New Delhi, 2002
- Srilakshmi, B. Nutrition Science, New Age International (P) Ltd., New Delhi, 2017
- Mahtab, S. Bamji, Kamala Krishnasamy, Brahmam G.N.V, Text Book of Human Nutrition, Third Edition, Oxford and IBH Publishing Co. P. Ltd., New Delhi, 2012
- Sunetra Roday, Food Science and Nutrition, Oxford University Press, New Delhi, 2017

## **Reference**

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- Janet D Ward and Larry Ward, Principles of Food Science, Stem Publishers, 4th edition, 2006
- Srivastava R P and Kumar S., Fruits and Vegetables Preservation-Principles and Practices, International Book Distributing Co. 3rd edition, 2006
- W B Crusess, Commercial Unit and Vegetable Products, W.V. Special Indian Edition, PubAgrobios India, 2nd edition, 2004
- Forsythe S J and Hayes P R, Food Hygiene, Microbiology and HACCP, Gaitersburg Maryland Aspen, 1998

<b>Course Type : SEC- II Theory</b>	<b>Course Title : Diet In Health And Disease</b>
<b>Semester : II</b>	<b>Code : U23ND2E2</b>
<b>Credits : 2</b>	<b>Hours /Week :2</b>

**Course Outcomes:**

After the completion of this course the students will be able to:

	<b>Course Outcomes</b>	<b>K-Level</b>	<b>Unit Covered</b>
<b>CO1</b>	Identify the essentials of food constituents and its important functions in our body.	K2	I
<b>CO2</b>	Explain the role of diet for persons with fever, obesity, underweight and anemia.	K4	II
<b>CO3</b>	Compare the effect of healthy food and physical activity on human body.	K4	III
<b>CO4</b>	Interpret the results of unhealthy lifestyle and inheritance of genes	K4	IV
<b>CO5</b>	Discuss the nutritional requirements during different diseases and disorders.	K4	V
<b>CO6</b>	Analyze the nutritional deficiencies and other risk factors associated with various nutritional problems and its dietary management.	K4	

**Syllabus**

**Unit – I Nutrition and Nutrients - 6 Hours**

Food-definition, classification of food, basic five food groups classification of nutrients, RDA-reference man and women, factors influencing RDA. Macronutrients and micronutrients.

**UNIT – II Diet in Fever - 6 Hours**

- A. Causes, Types, general Dietary consideration
- B. Typhoid ,Influenza, Malaria and Tuberculosis

- C. Diet in Obesity and underweight.
- D. Nutritional Anaemia –prevalence, causes, Types, iron deficiency anaemia and Prevention of anaemia.

**UNIT– III Diet in Cardiovascular Disease - 6 Hours**

- A. Prevalence, clinical effects
- B. Risk factors, Role of fat in the development of atherosclerosis
- C. Hypertension
- D. Dietary management
- E. Physical activity and Heart diseases

**UNIT IV Diet in Diabetes Mellitus - 6 Hours**

- A. Prevalence, Types, aetiology and symptoms
- B. Diagnosis ,treatment and Complication
- C. Dietary management

**Diet in Diseases of the Kidney**

- A. Functions of kidney
- B. Symptoms, Chronic and acute renal failure and urinary Calculi
- C. Principles of Dietary Management

## **UNIT V Diet in Cancer**

**- 6 Hours**

- A. Risk factors and Symptoms
- B. Nutritional problems of Cancer therapy
- C. Nutritional requirements
- D. Role of food in the prevention of cancer.

### **Unit VI :Topics for Self-study**

1. Role of fiber in health and disease.  
<https://www.mayoclinic.org/healthy-lifestyle/nutrition-and-healthy-eating/in-depth/fiber/art-20043983>
2. Common immunity boosters which help in viral infections.  
[https://www.onhealth.com/content/1/immune\\_system\\_boosting\\_foods](https://www.onhealth.com/content/1/immune_system_boosting_foods)
3. Prevention of diabetes and heart disease through lifestyle modification.  
[https://www.health.harvard.edu/newsletter\\_article/Lifestyle\\_prevention\\_Does\\_it\\_work\\_And\\_why](https://www.health.harvard.edu/newsletter_article/Lifestyle_prevention_Does_it_work_And_why)
4. Harmful preservatives found in junk food.  
<https://www.icicilombard.com/blog/health-insurance/hi/5-harmful-effects-of-junk-food>



## **Reference Books**

1. Antia P. "Clinical Dietetics and Nutrition", 2<sup>nd</sup> edition, Oxford University Press.
2. Garrow J.S, James W.P.T, Ralph A, (2000), "Human Nutrition and Dietetics", 10<sup>th</sup> edition, Churchill Livingstone, London.
3. Srilakshmi B, "Dietetics", 7<sup>th</sup> Edition, New Age International, New Delhi, (2016).

<b>Course Type : SEC-III Theory</b>	<b>Course Title : Food Safety and Hygiene</b>
<b>Semester : II</b>	<b>Code : U23ND2S3</b>
<b>Credits : 2</b>	<b>Hours / Week : 2</b>

**Course Outcomes:**

After the completion of this course the students will be able to:

	<b>Course Outcomes</b>	<b>K-Level</b>	<b>Unit Covered</b>
CO1	Analyze the importance of food safety in the processing industry	K4	I
CO2	Compare the effects of various Contamination	K4	II
CO3	Evaluate the various food safety programs	K5	III
CO4	Analyze various hazard analysis techniques and differentiate biological and chemical hazards.	K4	IV
CO5	Develop knowledge on various sanitation and hygiene programs.	K3	V
CO6	Perceive overall idea about food safety regulation in India.	K5	

**Syllabus**

**Unit – I Sanitation Overview Sanitary Regulations - 6 Hours**

Definition, Types of Hygiene and sanitation, Management of Sanitation, Microorganisms and Their Relationship to Sanitation Food Contamination sources. Hazard Analysis and Critical Control Points (HACCP)

## **Unit – II Cleaning Agents**

**- 6 Hours**

Classification of Cleaning Equipments, Functioning and care of Manual cleaning Equipment Functioning and care of Mechanical Cleaning Equipment, Groups of Cleaning agents, Use of Detergents, Use of after, Abrasives, degreasers acids, organic solvents and dry-cleaning agents.

## **Unit-III Food Storage Sanitation**

**- 6 Hours**

Food Transport Sanitation, Pest Control, Packaging Sanitation, Waste Product Disposal

## **Unit - IV Water & Air**

**- 6 Hours**

Sources of water and hazards of water pollution, Sources of air Pollution health effects of air pollution, Pollution Control ,Water borne diseases, air borne diseases preventing measure for diseases.

## **Unit - V Handling of Food**

**- 6 Hours**

Personal hygiene of the food handlers • Program of Good Health For Food handlers • Food Borne Diseases – Roots of Contamination • safety measures for food service personnel.  
• Care maintenance of Protective Clothing .

## **Unit VI : Topics for Self-study**

1. Natural food toxins -<https://www.who.int/news-room/fact-sheets/detail/natural-toxins-in-food>
2. Fumonisin  
-
3. [https://www.who.int/foodsafety/FSDigest\\_Fumonisin\\_EN.pdf?ua=1&ua=1](https://www.who.int/foodsafety/FSDigest_Fumonisin_EN.pdf?ua=1&ua=1)

4. Food safety events -  
[https://www.who.int/foodsafety/areas\\_work/infosan/INFOSAN-QS3/en/](https://www.who.int/foodsafety/areas_work/infosan/INFOSAN-QS3/en/)
5. Nutrition and food security -  
[https://www.who.int/foodsafety/areas\\_work/nutrition/en/](https://www.who.int/foodsafety/areas_work/nutrition/en/)

### **Reference Books**

1. Norman G. Marriott, "Principles of Food Sanitation", 6th edition, 1996
2. John A. Troller, "Sanitation in Food Processing", Academic Press
3. Peleezar, M.I. and Reid, K. D., "Microbiology", McGraw Hill Company, New York, 1978.
4. Benson Harold, J., "Microbiological Application", Publishers, U.S.A., 1990
5. Colling, C.E. and Lyne, P.M., "Microbiological Methods", Butterworth. Lon, 1976

<b>Course Type: Core-III Theory</b>	<b>Course Title : Nutritional Biochemistry</b>
<b>Semester : III</b>	<b>Code : U23ND303</b>
<b>Credits : 5</b>	<b>Hours /Week : 5</b>

### Course Outcomes

On completion of this course, students will be able to:

	<b>Course Outcomes</b>	<b>K-Level</b>	<b>Units Covered</b>
<b>CO1</b>	Obtain knowledge related to the role of TCA cycle and other metabolism in central carbon metabolism.	<b>K2</b>	<b>I</b>
<b>CO2</b>	Correlate the importance of lipid as storage molecules and as structural component of bio membranes.	<b>K4</b>	<b>II</b>
<b>CO3</b>	Evaluate the effects of the essential amino acids and their role in carbohydrate metabolism and vitamin synthesis and acquire fundamental knowledge on enzymes and their importance in biological reactions.	<b>K5</b>	<b>III</b>
<b>CO4</b>	Interpret the role of nucleic acids and the role of DNA and RNA.	<b>K5</b>	<b>IV</b>
<b>CO5</b>	Illustrate the concepts of preparation of buffers.	<b>K3</b>	<b>V</b>
<b>CO6</b>	Elaborate an in depth understanding on function of cells and correlate various metabolic pathways through understanding of their relationship.	<b>K6</b>	

### Syllabus

#### Unit I Carbohydrate Metabolism

- 15 Hours

Fundamentals of Biochemistry, Biological Membranes and Transport.

- A. **Carbohydrates** - Definition, classification, structure (linear) of Monosaccharides - Glucose, fructose and galactose; Disaccharides - Maltose, lactose and sucrose; Polysaccharides - Starch and glycogen.
- B. **Definition of Glycolysis**, glycogenesis, glycogenolysis and gluconeogenesis. Metabolism- Glycolytic pathway, glycogenesis, glycogenolysis, gluconeogenesis, oxidation of pyruvic acid, citric acid cycle and pentose phosphate pathway.

#### Unit II Lipid Metabolism

- 15 Hours

- A. Lipids - Definition, classification and properties.

- B. Metabolism - Beta oxidation and biosynthesis of fatty acids, cholesterol and phospholipid metabolism.
- C. Definition - Ketone bodies, ketogenesis and ketosis, formation and utilization of ketone bodies.

### **Unit III Protein Metabolism and Enzymes**

**-15 Hours**

- A. Protein - Definition, classification, structure, physical properties, chemical properties and utilization; Amino acids - Types, definition - deamination, transamination and decarboxylation, general reaction of amino acid metabolism.
- B. General pathways of catabolism of amino acids - Formation of ammonia, urea cycle, degradation of carbon skeleton of amino acids.
- C. Enzymes and co-enzymes - Definition, types, classification and factors affecting velocity of enzyme catalyzed reactions.

### **Unit IV Nucleic Acid Metabolism**

**-15 Hours**

- A. Introduction to genetic control of metabolism- Nucleic acids -Types, composition, structure, functions, replication.
- B. Elementary knowledge of biosynthesis of protein, electron transport chain and oxidative phosphorylation, bioenergetics.

### **Unit V Acid base and Fluid Balance**

**-15 Hours**

- A. Acid base balance - Acid base balance in normal health, definition of buffers, principles of buffers, major sources of acid produced in the body, physiological buffer system and role of different buffer systems.
- B. Fluid and electrolyte balance - Maintenance in normal health.

### **Unit VI Topics for Self-Study**

- Oligosaccharides in health and disease.
- Branched chain amino acids in energy production.
- EPA and DHA in health.
- Common genetic aberrations.

### **Text Books**

1. Ambika Shanmugam., (2016), Fundamentals of Biochemistry for

- Medical Students, New Age Publishers, New Delhi.
2. Deb. A.C., (2004), Fundamentals of Bio-chemistry, New Central Book Agency Publishers,
  3. Sathyanarayana, U., Chakrapani, U., (2010), Text Book of Biochemistry, Books and Allied Publishers, Kolkata.
  4. Pattabiraman.T.N., (2011), Concise Text Book of Bio Chemistry, All India Publishers and Distributors, New Delhi.
  5. Mahtab.S., Bamji, Kamala Krishnaswamy and G.N.V Brahman, (2009), Text Book of Human Nutrition, Oxford and IBH Publishing Company, New Delhi.
  6. Vasudevan.D.M., Sreekumari.S., (2007), Text Book of Bio Chemistry, Jaypee Publishers, New Delhi.

#### **Reference Books**

1. Berg JM, Tymoczko JL, Stryer L., (2011), Biochemistry, W.H. Freeman Publishers, New York.
2. Murray R K, Grannen DK, Mayes PA and Rodwell VW., (2012), Harper's Illustrated Biochemistry, Lange Medical Book, Mc Graw Hill Edition, New Delhi.
3. Voet, D., Voet., J., &Pratt, C.W., (2013). Principles of Biochemistry, John Wiley and sons, New Jersey.
4. Berg, J. M., Tymoczko, J. L., & Stryer, L., (2012). Biochemistry, Freeman and Company, New York.
5. Rama Rao, A. V. S. S., & Suryalakshmi, A., (2009). A Text Book of Biochemistry, UBS Publishers and Distributors, New Delhi.
6. Godkar, P. B., &Godkar, D.P., (2003), Textbook of Medical Laboratory Technology, Mumbai.Bhalani Publishing House, India

<b>Course Type: Core Practical –III</b>	<b>Course Title: Nutritional Biochemistry Practical</b>
<b>Semester : IV</b>	<b>Code : U23ND3P3</b>
<b>Credits : 3</b>	<b>Hours /Week : 3</b>

### Course Outcomes

On completion of this course, students will be able to

	<b>Course Outcomes</b>	<b>K-Level</b>	<b>Units Covered</b>
CO1	Demonstrate the various components of carbohydrates using qualitative tests.	K2	I
CO2	Experiment with qualitatively the amino acids present in food stuff.	K3	II
CO3	Examine the biological fluids in microscope.	K4	III
CO4	Evaluate the presence of sugar, protein, bile salts and bile pigments and urea in urine.	K5	IV
CO5	Estimate the quantity of glucose, cholesterol, iron and urea present in blood.	K6	V
CO6	Formulate qualitative and quantitative analysis of biological fluids such as urine, blood and their estimation using standard methods.	K6	

### 1. Syllabus

#### 1. Qualitative analysis of carbohydrate

- A. Glucose
- B. Fructose
- C. Lactose
- D. Sucrose
- E. Maltose



## **2. Qualitative analysis of amino acids**

- A. Histidine
- B. Methionine
- C. Tryptophan
- D. Tyrosine
- E. Arginine
- F. Cysteine

## **2. Microscopic examination of urine and blood**

### **3. Quantitative analysis of urine**

- A. Quantitative analysis of urine sugar, protein, bile pigments, bile salts
- B. Estimation of glucose in urine (Benedict's Method)
- C. Estimation of urea in urine (DAM Method)
- D. Estimation of phosphorus in urine

### **4. Quantitative analysis of blood**

- A. Estimation of blood glucose (Folin- WU Method)
- B. Estimation of blood urea (DAM Method)
- C. Estimation of serum cholesterol (Zak's Method)
- D. Estimation of blood iron

## **Text Books**

1. Ambika Shanmugam., (2016), Fundamentals of Biochemistry for Medical Students, New Age Publishers, New Delhi.
2. Deb. A.C., (2004), Fundamentals of Bio-chemistry, New Central Book Agency Publishers,
3. Sathyanarayana, U., Chakrapani, U., (2010), Text Book of Biochemistry, Books and Allied Publishers, Kolkata.
4. Pattabiraman.T.N., (2011), Concise Text Book of Bio Chemistry, All India Publishers and Distributors, New Delhi.
5. Mahtab.S., Bamji, Kamala Krishnaswamy and G.N.V Brahmam, (2009), Text Book of Human Nutrition, Oxford and IBH Publishing Company, New Delhi.

6. Vasudevan.D.M., Sreekumari.S., (2007), Text Book of Bio Chemistry, Jaypee Publishers, New Delhi.

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2. Murray R K, Grannen DK, Mayes PA and Rodwell VW., (2012), Harper's Illustrated Biochemistry, Lange Medical Book, Mc Graw Hill Edition, New Delhi.
3. Voet, D., Voet., J., &Pratt, C.W., (2013). Principles of Biochemistry, John Wiley and sons, New Jersey.
4. Berg, J. M., Tymoczko, J. L., & Stryer, L., (2012). Biochemistry, Freeman and Company, New York.
5. Rama Rao, A. V. S. S., & Suryalakshmi, A., (2009). A Text Book of Biochemistry, UBS Publishers and Distributors, New Delhi.
6. Godkar, P. B., &Godkar, D.P., (2003), Textbook of Medical Laboratory Technology, Mumbai.Bhalani Publishing House, India.

<b>Course Type: Allied -III Theory</b>	<b>Course Title : General Home Science - I</b>
<b>Semester :III</b>	<b>Course Code : U23ND3Y3</b>
<b>Credits : 3</b>	<b>Hours /Week: 3</b>

**Course Learning Outcomes:**

On completion of this course, students will be able to:

	<b>Course Outcomes</b>	<b>K- Level</b>	<b>Units Covered</b>
CO1	Identify the concepts and basics of textiles.	K3	I
CO2	Explain the basic principles of clothing construction.	K5	II
CO3	Assess the importance of home management and the motivation factors.	K5	III
CO4	Examine the concept, definition, universality, and scope of family resource management	K4	IV
CO5	Assess the role of interior design in Home Science	K5	V
CO6	Explain different aspects of Home science with a special focus on Textile, Family resource management, and Interior design.	K5	I - V

**Syllabus**

**Unit I - Introduction to Textile fibers**

**- 9 Hours**

**Textile** – Definition, Terminology and Classification of textile fibers. Basic unit and Polymer bonds in textile fiber, Physical and Chemical Properties of fibers. Processing of Manufacture of all Natural and Man-Made Fibers – Plant, Protein, Man-Made, Cellulosic, Synthetic, Metallic, Mineral and Elastomeric Fibers.

**Unit II - Concepts of Clothing and Fashion designing - 9 Hours**

- A. Clothing: Origin of Clothing, Principles of Clothing, Clothing Construction–
- B. Drafting flat pattern and Draping.
- C. Textile Designing, Fashion Designing – Influence Factors, Fashion Cycle, Broken fashion cycles, Fashion adoption theories and Business and Merchandising.

**Unit III - The process of Home Management - 9 Hours**

Home Management: Definition, Characteristic of Management, Importance of Home Management, Motivation Factors of Management (Values, Goals, Standards) , Home Management Process.

**Unit IV - Family resource management and Housing - 9 Hours**

Family Resource Management: Types and Characteristics of Family Resource.  
Family Decision Making–Definition and Types of Decision Making.

Housing – Definition, Importance and Functions of a House, Principles of Planning, Space Allocation and Organization in Independent Houses, Apartments and Flats.

Symbols used in Drafting Plans, Reading Plans and Blueprint.

**Unit V - Interior decoration and its aspects - 9 Hours**

Interior Design: Definition, Principles and Classification. Household Equipment Colors–Definition, Classification, Factors Influencing Choice of Colors Furniture and Lighting – Definition and Types.

**Unit VI Topics for Self Study**

Textile coloration and finishes

[https://epgp.inflibnet.ac.in/epgpdata/uploads/epgp\\_content/S000827HE/P001429/M012360/ET/1541399757H09TC11-QI.pdf](https://epgp.inflibnet.ac.in/epgpdata/uploads/epgp_content/S000827HE/P001429/M012360/ET/1541399757H09TC11-QI.pdf)

Techniques of work simplification

[https://epgp.inflibnet.ac.in/epgpdata/uploads/epgp\\_content/S000827HE/P001394/M011851/ET/1540987419H03RM19-QI.pdf](https://epgp.inflibnet.ac.in/epgpdata/uploads/epgp_content/S000827HE/P001394/M011851/ET/1540987419H03RM19-QI.pdf)

### **Text Books**

1. Varghese, M.A., Ogale N.N., Srinivasan.K., Home Management, New Age International publishers, 2011.
2. Mary Mathews, Practical Clothing Construction, Bhattarams Printers, Chennai, 2014.
3. [Ellen S. Fisher](#), [Jen Renzi](#), New York School of Interior Design: Home: The Foundations of Enduring Spaces, Clarkson Potter/Ten Speed, 2018.
4. Mitchell, Karen. Interior Design: A True Beginners Guide To Decorating On A Budget. N.p., Create Space Independent Publishing Platform, 2015.
5. Goldsmith, Elizabeth B.. Foundations of Family Resource Management. N.p., Taylor & Francis, 2022.

### **Reference Books**

1. Sunita Mishra, Selective and Scientific Books, New Delhi, 2018.
2. Bhargava,B, Family Resource Management and Interior Decoration, Delhi: University Book House.2001.
3. Housing and Space Management. Jaipur: University Book House, 2001
4. Seetharaman, P., Batra, S., & Mehra, P., An Introduction to Family Resource Management. New Delhi: CBS Publishers & Distributors (ISBN 13: 9788123911861), 2005
5. Shukul, M., and Gundotra.V, Home Management and Family Finance. New Delhi: Dominant Publishers and Distributors.(ISBN No. 81-7888-403-8, 2006

<b>Course Type : Allied Practical II</b>	<b>General Home Science Practical I</b>
<b>Semester :III</b>	<b>Course Code : U23NDPY3</b>
<b>Credits : 2</b>	<b>Hours /Week:3</b>

### **Course Outcome**

On completion of this course, students will be able to:

	<b>Course Outcomes</b>	<b>K- Level</b>	<b>Units Covered</b>
CO1	Identify the basic skills of home management such as preparation of First aid kit, filling bank forms and preparation of Budget.	K3	I
CO2	Estimate the cost of furniture through a market study.	K6	II
CO3	Assess various types of fibers and design the basic stitches.	K5	III
CO4	Examine the concept, definition, universality, and scope of family resource management	K4	IV
CO5	Assess the methods of soap preparation	K5	V
CO6	Explain different aspects of home science with a special focus on Textile, Family resource management, and Interior design.	K5	I - V

### **Syllabus**

1. To prepare first aid kit.
2. Preparation budget for low-, middle- and high-income group family
3. Learning to fill different bank forms- Fill form to withdraw and deposit

money, Open account in bank, Recurring deposit.

4. Drawing house plans for low-, middle- and high-income groups.
5. Drawing kitchen layout for different families with plumbing and wiring.
6. Preparation of an album on the development milestones of children.
7. Market study on–Cost of different types of furniture
- 8.** Designing greeting cards for different occasion (any five occasions).
9. Table setting-Fruit and vegetable carving.
10. To identify various types of fibers using-burning test and visual inspection.
11. Basic stitches.
12. Use of waste material for making decorative and utility materials.

### **Text Books**

1. Varghese, M.A.,Ogale N.N., Srinivasan.K., Home Management, New Age International publishers, 2011.
2. Mary Mathews, Practical Clothing Construction, Bhattarams Printers, Chennai, 2014.
3. [Ellen S. Fisher](#), [Jen Renzi](#), New York School of Interior Design: Home: The Foundations of Enduring Spaces, Clarkson Potter/Ten Speed, 2018.
4. Mitchell, Karen. Interior Design: A True Beginners Guide To Decorating On A Budget. N.p., Create Space Independent Publishing Platform, 2015.
5. Goldsmith, Elizabeth B.. Foundations of Family Resource Management. N.p., Taylor & Francis, 2022.

### **Reference Books**

1. Sunita Mishra, Selective and Scientific Books, New Delhi, 2018.
2. Bhargava,B, Family Resource Management and Interior Decoration, Delhi: University Book House.2001.
3. Housing and Space Management. Jaipur: University Book House, 2001
4. Seetharaman, P., Batra, S., &Mehra, P., An Introduction to Family Resource Management.
5. New Delhi: CBS Publishers &Distributors (ISBN 13: 9788123911861), 2005
6. Shukul, M., and Gundotra.V, Home Management and Family Finance. New Delhi: Dominant Publishers and Distributors.(ISBN No. 81-7888-403-8), 2006



<b>Course Type : SEC –IV Theory</b>	<b>Course Title :Entrepreneurship Development</b>
<b>Semester : III</b>	<b>Code : U23ND3S4</b>
<b>Credits : 1</b>	<b>Hours /Week : 1</b>

### **Course Outcomes:**

After the completion of this course the students will be able to:

	<b>Course Outcomes</b>	<b>K- Level</b>	<b>Unit Covered</b>
CO1	Describe Entrepreneurship characteristics	K2	I
CO2	Identify the systematic process to select and screen a business idea.	K3	II
CO3	Assess opportunities and constraints for new business ideas	K4	III
CO4	Design strategies for successful entrepreneurs	K6	IV
CO5	Apply the principles of project Formulation to design a project	K3	V
CO6	Evaluate an ability to discern and distinct entrepreneurial traits	K6	I – V

### **Syllabus**

#### **Unit I - Entrepreneurship**

**- 3 Hours**

Entrepreneurship – meaning, importance, types – the role of entrepreneurs in economic development, need, the transition from income generation to self-employment, and Entrepreneurship. Qualities of a good entrepreneur. Problems of entrepreneurs, qualities of an entrepreneur – entrepreneur as a career

## **Unit II - Factors influencing entrepreneurial development- 3 hours**

Factors influencing entrepreneurial development – Economic, legal, social and psychological factors. How to start a business – production, selection – a form of ownership plant location – land, building, water, and power – raw materials – machinery – manpower – other infrastructural facilities– Licensing, registration, and local bye-laws.

## **Unit III – Agencies supporting Entrepreneurial Development Programme -3 hours**

Arrangement for Entrepreneurship development – D.I.C., TIIC, S.I.D.C.O, N.S.I.C., S.I.S.I – Institutional Finance to Entrepreneurs – T.I.I.C.,S.I.D.B.I. Commercial Banks – Incentives to small-scale industries.

## **Unit IV - Project proposal - 3 hours**

Project proposal – Proposal format and content steps in its preparation, Feasibility testing, SWOT analysis. Project report – Meaning and Importance – Project Identification – Contents of a project report – (as per requirements of Financial Feasibility and Economic Feasibility – Break-Even Analysis.

## **Unit V - Entrepreneurship in food product development -3 hours**

Entrepreneurship developments in food product developments, functions, significance. Case histories of successful entrepreneurs– Entrepreneurship development in India – Women Entrepreneurship in India -Sickness in small scale industries and their remedial measures.

## **UNIT VI – Topics for Self Study**

Social Entrepreneurship – Edu premiership – Eco-preneur –  
Self Help Groups - Health Entrepreneurship – Tourism  
Entrepreneurship – Women Entrepreneurship

### **Text Books**

1. Chaiwallah S.A. Sales Management, Himalayan Publishing House New Delhi, 1999.
2. Dr.N.Rajan Nair, Sajith R. Nair Marketing, Sutanchand Sons, New Delhi, 2002
3. Entrepreneurship development- Your gateway to the journey of entrepreneurship, ICT Academy of Tamil Nadu, Chennai. 2015.
4. S.S. Khanka, Entrepreneurial development, S.Chand Publications, 2007.
5. Vasant Desai, Entrepreneurial development, Vol-1, Himalaya Publishing House, 2009.
6. C.B.Gupta and Srinivasan, Entrepreneurial Development, Sultan Chand & Company, New Delhi, 2018

### **Reference Book**

1. Bridge S et al- Understanding Enterprise: Entrepreneurship and Small Business (Palgrave, 2003)
2. Holt - Entrepreneurship: New Venture Creation (Prentice-Hall) 1998
3. David H. Moll, Entrepreneurship, prentice Hall of India, New Delhi 1999.
4. Frank Jerkins, Advertising, prentice Hall of India, New Delhi, 2000.
5. Hisrich, Entrepreneurship, Edition 9, Tata McGraw Hill, New Delhi, 2

<b>Course Type : SEC -V Theory</b>	<b>Course Title: Food Preservation and Processing</b>
<b>Semester : III</b>	<b>Code : U23ND3S5</b>
<b>Credits : 2</b>	<b>Hours /Week : 2</b>

**Course Outcomes:**

After the completion of this course the students will be able to:

	<b>Course Outcomes</b>	<b>K- Level</b>	<b>Unit Covered</b>
CO1	Describe the principles of food preservation	K4	I
CO2	Suggest the application of the preservation process depending on the type of food.	K5	II
CO3	To understand the principles of processing plant foods and to study the need for processing foods	K4	III
CO4	Choose the appropriate application of certain conservation processes with regard to the preservation of quality and the satisfactory durability of food products.	K4	IV
CO5	Optimize process parameters for selected conservation processes taking into account the physico-chemical properties of food products.	K5	V
CO6	Preservatives and its types and Shelf life of food products.	K5	

**Unit I Introduction to Food Preservation -6 Hours**

Introduction of food preservation - Definition and scope of food preservation, Principles of preservation, Food Preservation by high temperature Sterilization Pasteurization Blanching and Canning.

**Unit II Preservation by Drying and Dehydration - 6 Hours**

Food preservation by drying and dehydration: Definition, drying as a means of preservation, Differences between sun drying and types of driers used in the food industry. Evaporation – Definition, factors affecting evaporation, names of evaporators used in food industry

**Unit III Preservation by Low temperature - 6 Hours**

Food Preservation by Low temperature - Introduction to refrigeration, cool storage and freezing- Definition, Principle of freezing, changes occurring during freezing, Types of freezing. Preservatives and its types and Shelf life of food products.

**Unit IV Food Processing - 6Hours**

Food Processing- Definition, Importance, Scope of food processing industry. Classification of plant food processing - Fruit and vegetable processing, Cereal and legume processing and Oil seeds processing.

**Unit V Different types of animal food processing -6Hours**

Classification of animal food processing - Milk processing, Meat processing, Fish processing, Poultry processing. Introduction to Food Packaging- Objectives and functions of food packaging, Types of packaging Materials (briefly)

## **Unit VI Topics for Self Study**

Types of packaging Materials (briefly).

Current Trends in Food Processing

### **Text Books:**

1. Brennan JG and Grandison AS (2012) Food processing handbook. 2nd Edition, John Wiley.
2. Manoranjan Kalia (2014) Food Quality Management Second Edition, Agrotech Publishing Academy, Udaipur.
3. Walter A. Mercer, (1988) Advances in Food Research First Edition, Academic Press, University of California, U.S.A.
4. Potter N (1995) Food Technology, 5th Edition, Cornell University, Ithaca, New York.

### **Reference Books:**

1. Coles R, McDowell D and Kirwan MJ, Food Packaging Technology, CRC Press, 2003
2. Frazier WC and Westhoff DC, Food Microbiology, TMH Publication, New Delhi, 2004.
3. Meyer LH, Food Chemistry, CBS Publication, New Delhi, 1987  
8. Potter NH, Food Science, CBS Publication, New Delhi,
4. Ranganna S, Handbook of Analysis and Quality Control for Fruits and Vegetable, Products, 2 nd ed.

<b>Course Type : Core- IV Theory</b>	<b>Course Title: Principle of Human Nutrition</b>
<b>Semester :IV</b>	<b>Course Code : U23ND404</b>
<b>Credits :5</b>	<b>Hours/Week :5</b>

### Course Outcomes:

On completion of the course the students will be able to...

	<b>Course Outcome</b>	<b>K - Level</b>	<b>Unit Covered</b>
CO1	Evaluate and apply the principles from the various factors of foods.	K2	I
CO2	Recognize the importance of macronutrients in growth and development of humans.	K3	II
CO3	Analyse basic knowledge of the different nutrients and their role in maintaining health	K4	III
CO4	Apply knowledge of the physiological and metabolic functions of vitamins and minerals and their implications	K5	IV
CO5	Analyse the recent advances in the field of nutrient and diseases	K5	V
CO6	Estimate insight about recent concept and findings in field of nutrition and application of the same to prevent disease	K6	I-V

### Syllabus

#### Unit-I

**-15 hours**

- A. Science of Nutrition, Concept of Nutrition- Definition of nutrition, health, nutritional status and malnutrition. RDA- Definition, factors affecting RDA and methods used for deriving RDA.
- B. **Carbohydrates**- Definition ,composition, functions, maintenance of blood

sugar levels, requirement, sources, digestion and absorption; Dietary fiber- Definition, classification, physiological effects and sources.

## **Unit-II**

**- 15 hours**

- A. **Proteins-** Definition, composition, nutritional classification of proteins and amino acids, functions, sources, requirements, digestion and absorption. Evaluation of protein quality:PER, BV, NPU and Chemical score.
- B. **Lipids-** Definition, composition, functions, sources, requirements, digestion and absorption. Essential fatty acids – Definition, functions, sources and effects of deficiency.

## **Unit-III**

**- 15 hours**

**Energy-** Definition, units of measurement, direct and indirect calorimetry; Determination of energy value of food, Total Energy requirement, Factors affecting physical activity, Factors affecting Basal Metabolic Rate, factors affecting Thermic effect of food, Recommended Dietary Allowances and Sources

## **Unit-IV**

**-15 hours**

**Macro Minerals-** Calcium and Phosphorous: Functions, requirements, sources and effects of deficiency. Micro minerals- Iron, Iodine, Copper, Fluorine and Zinc: Functions, sources, requirements and effects of deficiency. Sodium and Potassium : Functions, sources, requirements and effects of imbalances.

## **Unit-V**

**-15 hours**

Fat soluble Vitamins – Vitamin A, D, E and K: Functions, requirements, sources and effects of deficiency. Water Soluble Vitamins – Thiamine, riboflavin, niacin, ascorbic acid, folic acid, vitamin B6 and vitamin B12: Functions, requirements, sources and effects of deficiency.

## **Unit VI Topics for Self Study**

1. Fiber present in fenugreek and flaxseed – effect of flaxseed and



- fenugreek in reducing blood sugar and cholesterol level.
2. Vitamin C and vitamin D as immunity boosters.  
<https://medicaldialogues.in/diet-nutrition/news/vitamin-c-vitamin-d-supplements-may-boost-immune-system-to-fight-covid-19-65125>
  3. Effect of potassium rich foods in prevention of hypertension.  
<https://www.cdc.gov/salt/potassium.htm>

**Text Books :**

1. Sumathi R. Mudambi, Rajagopal, M.V., Fundamentals of Foods and Nutrition, New Age International (P) Ltd, Publishers, Third edition, 1997.
2. Srilakshmi B., Nutrition Science, New Age International (P) Ltd, Publishers, Fifth, multi colour edition, 2016.
3. Mangala Kango, Normal Nutrition, Curing diseases through diet, CBS Publications, First edition, 2005.
4. Sue Rodwell Williams, Nutrition and Diet Therapy, C.V. Melskey Co., 6<sup>th</sup> edition, 2000.
5. Mahtab. S. Bamji, Kamala Krishnaswamy and G.N.V Brahman, Text Book of Human Nutrition, Oxford and IBH Publishing company, Third Edition, 2009.

**Reference Book**

1. Brown, J.E., "Nutrition Now", 3<sup>rd</sup> edition, Wadsworth Thomson Learning,

New York, 2002

2. Maurice, E. Shils, James A. Olson, Moshe Shike., “ Modern Nutrition in Health and Disease”, 8<sup>th</sup> Edition, Vol I and II, Lea & Febiger Philadelphia, A Waverly Company, 2000.
3. Mahan L.K. and Stamp, S.E., “Krause’s Food Nutrition and Diet Therapy”, 11<sup>th</sup> edition, W.B. saunder’s Company, Philadelphia, 2000.
4. Toteja, G.S and Singh P., “ Micronutrient Profile of Indian Population”, ICMR Publication, New Delhi, 2004
5. D. M. Swaminathan, “Principles of Nutrition and Dietetics”, BAPPCO, 88, Mysore Road, Bangalore, 2002.

<b>Course Type : Core Practical IV</b>	<b>Course Title: Principles of Nutrition Practical</b>
<b>Semester : III</b>	<b>Code : U23ND4P4</b>
<b>Credits : 2</b>	<b>Total Hours : 3</b>

**Course Outcomes:**

After the completion of this course the students will be able to:

	<b>Course Outcomes</b>	<b>K-Level</b>	<b>Unit Covered</b>
CO1	Obtain in-depth knowledge on the structure of nutritional components.	K2	I
CO2	Differentiate the various components of carbohydrates and proteins using qualitative tests.	K4	II
CO3	Analyze quantitatively the carbohydrates, proteins and fats present in various food stuff	K4	III
CO4	valuate the various components of protein metabolism such as nitrogen in the food stuff.	K5	IV
CO5	Estimate the quantity of crude fiber present in various foods.	K5	V
CO6	Analyze the composition of foods with regards to its nutrient composition.	K4	VI

## **Syllabus**

### **Qualitative Analysis**

1. Qualitative test for Carbohydrate – Glucose, Fructose, Lactose, Maltose and Galactose.
2. Qualitative test for Protein.
3. Qualitative estimation of iron, Ascorbic acid Vitamin A.
4. Demonstration of estimation of nitrogen.
5. Demonstration of fiber estimation.
6. Demonstration of total fat estimation.

### **Text Books**

1. Varley, H., Gowenlak, A.H. and Hill, M. “Practical Clinical Biochemistry”, William Itinmaon Medical Books, London, 2000.
2. Oser, B.L., “Harke’s Physiological Chemistry”, 15<sup>th</sup> Edition, Tata McGraw Hill Publishing Company Ltd., Bombay, 2001.

### **Reference Books:**

1. Sadasivam, S. and Manickam, "A. Biochemical Method", Second Edition, New Age International P. Ltd., Publishers, New Delhi, 2003.
2. Raghuramulu, N., Madhavannair, K. and Kalyana Sundaram, National Institute of Nutrition, "A Manual of Laboratory Techniques", Hyderabad, 500007, 2013.
3. Practical Organic Chemistry by R. Plimmer - Longmans
4. Practical Biochemistry by Keith Wilson, John M Walker (Paperback). 2000
5. Scientific Foundations of Clinical Biochemistry: Biochemistry in Clinical Practice v.2: Amazon.co.uk: David L. Williams, Vincent Marks: Books.

<b>Course Type: Allied IV Theory</b>	<b>Course Title: General Home Science II</b>
<b>Semester : IV</b>	<b>Course Code : U23ND4Y4</b>
<b>Credits : 3</b>	<b>Hours /Week : 3</b>

### Course Outcomes

On completion of this course, students will be able to:

	<b>Course Outcomes</b>	<b>Level</b>	<b>Units Covered</b>
CO1	Provide situations to understand significance of family income and expenditure and saving for future.	K1	I
CO2	Identify the importance of early childhood years and significance of intervention programs for early childhood development.	K2	II
CO3	Illustrate women's human rights and laws related to women in India.	K3	III
CO4	Develop knowledge on consumer protection Laws and Acts and reflect upon personal rights and responsibilities.	K6	IV
CO5	Design the concept of extension, extension approaches and models.	K5	V
CO6	Plan and organize education to family regarding child development, childhood care and human development through extension education.	K6	

### Syllabus

**Unit I Family****-9 Hours**

Meaning and Characteristics of Family, Types of Family, Family Life Cycle, Family Wants, Family Income, Family Expenditure and House Hold Accounts, Family Budgets, Economics, Consumer Protection - Definition, Importance, Law, Consumer Education and Advertisement.

**Unit II Child Development****-9 Hours**

- A. Principles of Development, Stages of Growth and Development.
- B. Life Span Development - Psychodynamic Theory - Psycho - Analytic Theory of Freud-Erick Ericksons, Psycho-Social Theory, Learning Theory, Social Learning Theory, Cognitive Developmental Theory, Kohlberg's Moral Reasoning Theory, Information Processing Theory, Bronfen Brenners Theory, Life Span and Life Cycle Theory.

**Unit III Early Childhood Care and Education****-9 Hours**

Early Childhood Care and Education: Emerging Trends-Trends, Issues and Concern, Development Problems, Mental Sub normality - Mental Retardation - Learning Disabilities, Behavior Difficulties - Speech and Language Disorders - Hearing Impairment-Visual Impairment - Physical Handicap - Giftedness, Guidance and Counseling.

**Unit IV Child and Human Development****- 9 Hours**

- A. Early Childhood Care and Development Principles of Development, Types of Change in Development.
- B. Socialization in various Family Contexts Across Different Cultures - Process in Socialization, Social and Non- Social People, Difficulties in Conforming to Social Expectations, Foundations of Social Behavior laid by Babyhood, Behavior patterns in social situations during early childhood.
- C. Women Studies-Women's Equality, Violence against Women, Women Health, Women Empowerment, Women and Human Rights.

## **Unit V Extension Education**

**- 9 Hours**

- A.** Extension Education: Non-Formal Education and Extension Education, History and Development of Home Science Extension, Concepts of Extension Education, Philosophy of Extension Education, Principles of Extension Education, Difference between Formal and Extension Education, Extension Education: A Developed discipline.
- B.** Curriculum Planning and Development: Objectives of non-formal education, Planning non formal education Programme, Management and Administration of formal/non formal and extension education, Monitoring, Supervision and evaluation formal, non-formal and extension education, Major types of tests, Qualities of a good test.

## **Unit VI Topics for Self-Study**

- Experiences in individual and group decision making process.
- Preparation of an album on developmental mile stones of children.
- Visit to Maternity Ward, Ante-natal clinics and Anganwadi.
- Plotting Growth Monitoring Chart and Interpretation.
- Preparation of Immunization Card.
- Observation of Motor activities of a toddler.
- Compilation of songs for finger play and lullabies suitable for infants and toddlers.
- Preparation of a low-cost toy for a pre-school child.
- Doing a case study of a toddler.

## **Text Books**

1. Bhargava,B.(2005).Family Resource Management and Interior Decoration, Apple and V. R. Printers, Jaipur.
2. Suriakanthi. A., (2009), Child Development - An Introduction,



Kavitha Publications, Gandhigram.

3. Santrock, J.W., (2010), Child Development: An Introduction, McGraw Hill, New York.
4. Sharma,O.C., (2000), Crime Against Women, Sterling Publishers Private Limited, New Delhi.
5. Subbamma,M., (2001), Women, Tradition and Culture, Ashish Publishing House, New Delhi.

### **Reference Books**

1. Deacon,R.F., and Firebaugh, F.M., (1975), Home Management: Contexts and Concepts. Houghton Mifflin Company, Boston.
2. Nisha,M.(2006), Understanding Extension Education, Kalpay Publications, New Delhi.
3. Reddy,A.A., (2001), Extension Education, Sri Lakshmi Press, Bapatla.
4. Singh,U.K and Nayak, A.K., (2007), Extension Education, Common Wealth Publishers, New Delhi.
5. Sunita Mishra., (2018), Selective and Scientific Books, New Delhi.

<b>Course Type : Allied Practical II</b>	<b>General Home Science Practical II</b>
<b>Semester :III</b>	<b>Course Code : U23NDPY2</b>
<b>Credits : 2</b>	<b>Hours /Week:2</b>

### **Course Outcome**

On completion of this course, students will be able to:

	<b>Course Outcomes</b>	<b>K-Level</b>	<b>Units Covered</b>
CO1	Identify the basic skills of home management such as preparation of First aid kit, filling bank forms and preparation of Budget.	K3	I
CO2	Estimate the cost of furniture through a market study.	K6	II
CO3	Assess various types of fibers and design the basic stitches.	K5	III
CO4	Examine the concept, definition, universality, and scope of family resource management.	K4	IV
CO5	Assess the methods of soap preparation.	K5	V
CO6	Explain different aspects of home science with a special focus on Textile, Family resource management, and Interior design.	K5	I - V

### **Syllabus**

1. Paper cutting for decorating a house for special occasions.
2. Prepare one poster/chart on environmental / personal hygiene and sanitation.

3. Preparation and evaluation of label-Evaluation of label on different type of food products, Prepare label.
4. Methods of strain removal.
5. Methods of soap and detergent preparation.
6. Kitchen gardens-use the waste container (any four greens).
7. To prepare simple dishes using different germination methods (any five food).
8. Demonstration on preparation of weaning foods.
9. Development of riddles for languages and concepts for school children.
10. Compilation of outdoor games and games for cognitive development.

### **Text Books**

1. Varghese, M.A.,Ogale N.N., Srinivasan.K., Home Management, New Age International publishers, 2011.
2. Mary Mathews, Practical Clothing Construction, Bhattarams Printers, Chennai, 2014.
3. [Ellen S. Fisher](#), [Jen Renzi](#), New York School of Interior Design: Home: The Foundations of Enduring Spaces, Clarkson Potter/Ten Speed, 2018.
4. Mitchell, Karen. Interior Design: A True Beginners Guide To Decorating On A Budget. N.p., Create Space Independent Publishing Platform, 2015.
5. Goldsmith, Elizabeth B.. Foundations of Family Resource Management. N.p., Taylor & Francis, 2022.

## **Reference Books**

1. Sunita Mishra, Selective and Scientific Books, New Delhi, 2018.
2. Bhargava,B, Family Resource Management and Interior Decoration, Delhi: University Book House.2001.
3. Housing and Space Management. Jaipur: University Book House, 2001
4. Seetharaman, P., Batra, S., &Mehra, P., An Introduction to Family Resource Management.
5. New Delhi: CBS Publishers &Distributors (ISBN 13: 9788123911861), 2005
6. Shukul, M., and Gundotra.V, Home Management and Family Finance. New Delhi: Dominant Publishers and Distributors.(ISBN No. 81-7888-403-8), 2006

<b>Course Type : SEC VII – Theory</b>	<b>Course Title : Women Health and Wellness</b>
<b>Semester : IV</b>	<b>Code : U23ND4S7</b>
<b>Credits : 2</b>	<b>Total Hours : 2</b>

### Course Outcomes:

After the completion of this course the students will be able to:

	<b>Course Outcomes</b>	<b>K-Level</b>	<b>Unit Covered</b>
CO1	To comprehend the key concepts of S-L and differentiate the community service and Service-Learning	K2	I
CO2	Discuss the need for right nutrition, exercises and skills needed for the overall well-being of women.	K2	II
CO3	Demonstrate the various parameters and maintaining physical, reproductive, mental, and social health for the overall women.	K3	III
CO4	Apply the different kinds of survey, case study to improve women's health.	K3	IV
CO5	Analyze the various kinds of nutritional disorder and create the Nutritional awareness for all women's.	K4	V
CO6	To comprehend the key concepts of S-L and differentiate the community service and Service-Learning	K2	

## Syllabus

### Unit - I

-6 hours

**Service-Learning** – Definition, difference between community service and service-learning, Principles; Whole Person Education. Identifying Community Needs, Community Partners, Reflection, Reciprocity. Public Dissemination; Understanding of community dynamics. Project Planning Stages and report preparation

### Unit - II

-6 hours

**Nutrition for Women** - Dietary Guidelines for a healthy lifestyle, Current concepts pertaining to Balanced Diets, Nutrient requirements for young and older women with special focus on Protein, Iron, Vitamin D and Calcium, Factors affecting nutrient intake in women.

### Unit - III

-6 hours

**Women's Health** - Significance of Body weight and Body composition parameters, Benefits of Aerobic, Flexibility and Strength training exercises-on General health, Mental Health - Common mental health problems- Depression, Anxiety and coping with Stress, Relaxation techniques such as yoga and meditation. Reproductive Health - Menstrual Health, Pregnancy and Lactation,

### Unit - IV

-6 hours

**Community Engagement I** - survey on nutritional deficiency disorder in the target community. Creation of awareness on millets. Case study on - Protein energy malnutrition, Anemia, vitamin D and Vitamin A disorders.

### Unit - V

-6 hours

**Community Engagement – II** Nutrition Education and Diet

Counselling -Diet Counseling for Malnutrition - obesity and overweight, anemia, vitamin A deficiency and pre and post-menopausal women, Workshop on Fitness, Yoga and Meditation.

## **Unit VI :Topics for Self-study**

Classify the various kinds of parameters used for women's health

### **Text Books**

1. Lanza di Scalea T, Matthews KA, Avis NE, et al. (2012) Role stress, role reward, and mental health in a multiethnic sample of midlife women: results from the Study of Women's Health Across the Nation (SWAN). *J Women's Health*; 21(5):481-489.
2. Mahan K and Sylvia E. Stump (2000) Krause's Food Nutrition and Diet Therapy, Saunders, USA.
3. Minkin M. J. and Wright C. V. (2003) The Yale Guide to Women's Reproductive Health from menarche to menopause. Yale University Press, London

### **Reference Books**

- 1.Sizer F. S. and Whitney E. (2014) Nutrition: Concepts &Controversies. 13<sup>th</sup> Ed.,Wadsworth, Cengage Learning, USA.
2. Sperry L. (2016) Mental Health and Mental Disorders. ABC-Clio, Californi
3. Williams M.H., Anderson D.E., Rawson E.S. (2013) Nutrition for Health, Fitness and Sport. McGraw Hill, New York.Wrzus C, Hänel M, Wagner J, Neyer FJ. (2013) Social network changes and life events

<b>Course Type : Core-V Theory</b>	<b>Course Title :Nutrition in Life Cycle</b>
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<b>Semester :V</b>	<b>Course Code: U23ND505</b>
<b>Credits :4</b>	<b>Hours /Week:5</b>

**Course Outcomes:**

After the completion of this course the students will be able to:

	<b>Course Outcomes</b>	<b>Level</b>	<b>Unit Covered</b>
CO1	Study the relationship between nutrition and health	K2	I
CO2	Obtain knowledge on the nutritional needs pertaining to different stages of life	K2	II
CO3	Compare the physiological changes on various stages of life and coping up with their daily dietary requirements	K5	III
CO4	Evaluate the changes during various stages of growth and development throughout life cycle.	K5	IV
CO5	Estimate the nutritional requirements throughout life cycle.	K5	V
<b>CO6</b>	Plan and execute a diet for all stages of life and health conditions	K5	

**Syllabus**

**Unit-I Nutrition during Pregnancy and Lactation**

**- 15 Hours**



- A. **Menu planning**– Objectives, planning balanced diets, food exchange lists.
- B. **Nutrition in pregnancy** – Food and nutrient requirements, physiological changes during pregnancy, developmental stages of the embryo, physiological cost of pregnancy and complications in pregnancy.
- C. **Nutrition in lactation** – Food and nutrient requirements, physiology of lactation, composition of breast milk, influence of mother’s diet on the quality and quantity of milk production.

**Unit-II Nutrition during Infancy**

**- 15 Hours**

- A. Nutrition during infancy – Growth and development during infancy, food and nutrient requirements, advantages of breast feeding, artificial feeding, preterm baby –nutritional requirements, weaning- types of weaning foods and supplementary foods, problems in weaning.

**Unit III Nutrition for Children**

**- 15 Hours**

- A. **Nutrition during preschool age** – Food and nutrient requirements, eating habits and behaviour, growth and development and factors inhibiting growth.
- B. **Nutrition for school going children** – Food and nutrient requirement, growth pattern, packed lunches, school lunch programmes.

**Unit IV Nutrition during Adolescence**

**- 15 Hours**

- A. Nutrition during adolescence – Food and nutrient requirements, changes in growth pattern, puberty, menarche, changes in food habits, binge eating disorder, predisposition to osteoporosis, anaemia, under nutrition, premenstrual syndrome, malnutrition due to early marriage, nutritional programmes.

## **Unit V Nutrition during Adulthood and Old age**

**- 15 Hours**

- A. Nutrition in adulthood** – Food and nutrient requirements, changes in consumption pattern - physical, mental, and social changes influencing meal pattern.
- B. Nutrition in old age** – Food and nutrient requirements, physical, physiological, biological and psychological changes influencing meal pattern.

## **Unit VI Topics for Self Study**

1. Effects of alcohol and smoking on pregnancy.  
<https://share.upmc.com/2016/03/how-smoking-alcohol-drugs-harm-your-baby/>
2. Myths and realities regarding lactation.  
<https://www.chla.org/blog/rn-remedies/ten-myths-and-facts-about-breastfeeding>
3. Feeding pre-term infants.  
[https://www.who.int/elena/titles/feeding\\_vlbw\\_infants/en/](https://www.who.int/elena/titles/feeding_vlbw_infants/en/)
4. Traditional food practices that are followed during puberty in girls and its significance.  
<https://www.prb.org/nutritionofwomenandadolescentgirlswhyitmatters/>

## **Text Books**

1. Mahtab, S, Banarji, Kamala Krishnasamy, G.N.V. Brahmam, “Text book of Human Nutrition”, Third Edition, Oxford and IBH Publishing Co. P. Lit., New Delhi, 2012.
2. Srilakshmi, B., “Dietetics”, Sixth Edition, New Age International (P) Ltd., New Delhi, 2013.

### **Reference Books**

1. “Dietary Guidelines for Indians”, ICMR, National Institute of Nutrition, Hyderabad, 2013.
2. Gobalan,C. Rama Sastri B.V. andBalasubramanian, “Nutritive value of Indian Foods”, NIN, ICMR, Hydrabad,2014.
3. Krause, M.V and Hunscher, M.A., “Food, Nutrition and Diet Therapy”,14<sup>th</sup> Edition, W.B.Saunders. 2014

<b>Course Type : Core - VI</b>	<b>Course Title : Advanced Dietetics</b>
<b>Semester : V</b>	<b>Code : U23ND506</b>
<b>Credits : 4</b>	<b>Hours /Week : 5</b>

**Course Learning Outcomes:**

After the completion of this course the students will be able to:

	<b>Course Outcomes</b>	<b>K-Level</b>	<b>Unit Covered</b>
<b>CO1</b>	Integrate knowledge of research principles and methods associated with nutrition and dietetics practice.	K2	I
<b>CO2</b>	Use effective and appropriate communication skills in providing information, advice and professional opinion to individuals, groups and communities	K2	II
<b>CO3</b>	Collect,organize and assess data relating to the health and nutritional status of individuals, groups and populations	K5	III
<b>CO4</b>	Demonstrate initiative and judgment using a professional, ethical and entrepreneurial approach advocating for excellence in nutrition and dietetics.	K5	IV
<b>CO5</b>	Independently plan and execute a research project in regard to nutrition and dietetics practice.	K5	V
<b>CO6</b>	Nutritional Management of Immune deficiency, Classification, dietary modification	K5	

## **Syllabus**

### **Unit-I Introduction to Diet Therapy**

**-15 Hours**

Concepts in diet therapy - Growth and Scope of Dietetics, Purposes and Principles of Therapeutic Diets, Modifications of Normal Diets, Classification of the Therapeutic Diets.

### **Unit-II Diet in Obesity and Underweight**

**- 15 Hours**

Diet Therapy in Obesity, Underweight and Diabetes Mellitus Etiology, Pathophysiology, Clinical symptoms, metabolic alterations, Assessment/Indicators, Lifestyle & Dietary guidelines for the following conditions- Obesity (Bariatric Surgery: types, Management), Underweight, Diabetes Mellitus (Acute and Chronic Complications of Diabetes Diet Modifications, Use of Food Exchange Lists, Insulin-Types and Use, Oral Hypoglycemic Agents, Carbohydrate counting, Glycemic Index, Glycemic Load).

### **Unit-III Diet in GI and Liver Diseases**

**-15 Hours**

Diet Therapy in Gastrointestinal Disorders and Diseases of the liver Etiology, Pathophysiology, Clinical Symptoms, Assessment/Indicators, Lifestyle & Dietary guidelines for the following conditions- Diarrhea, Dysentery, Constipation, Peptic Ulcer, Jaundice, Hepatitis, Fatty Liver, Cirrhosis.

### **Unit IV Diet in Cardio vascular and Kidney Diseases - 15 Hours**

Diet Therapy in Diseases of the Cardio Vascular System and Kidney Diseases Etiology, Pathophysiology, Clinical Symptoms, Lifestyle & Dietary guidelines for the following conditions- Atherosclerosis, Hyperlipidemia, Hypertension, Nephrotic Syndrome, Nephrolithiasis, Acute and Chronic Renal Failure, Dialysis and Kidney Stones.

## **Unit-V Diet in Fever**

**-15 Hours**

Diet Therapy for Fever -Acute and chronic infectious disease-Typhoid, Tuberculosis And HIV and AIDS a. Guidelines for management of tuberculosis and infectious diseases. Cancer- Etiology, Metabolic alterations, Types of Cancer, Dietary Recommendation for Cancer Survivors. Nutritional therapy for Cancer.

## **Unit VI Topics for Self Study**

1. Nutritional Management of Immune deficiency, Classification, dietary modification
2. Nutritional Management of HIV, AIDS- dietary modification
3. Nutritional Management of Wilson disease, Parkinson's Disease, Alzheimer's Disease.
4. Diets -Mediterranean diet, Detoxification, Warfarin Diet and Gluten free Diet.

## **Text Books:**

1. Mahan L.K., Sylvia Prescott-Stump Krause's Food Nutrition and Diet Therapy. W.B. Saunders Company London. 10<sup>th</sup> edition. 2000
2. Srilakshmi.B., Dietetics. K.K. Gupta For New age International Pvt. Ltd. New Delhi Publisher, 2007.
3. Antia F.P. And Philip Abraham, Clinical Nutrition and Dietetics. Oxford Publishing Company., .2001.
4. Passmore P. And M.A. East Wood. (Digitised in Human Nutrition And Dietetics. Churchill Living Stone., 2010
5. Mudambi S R., Rajagopal. M.K. Fundamentals, Food Nutrition and Diet therapy. New Age Publishers. 5<sup>th</sup> edition, 2009.
6. Robinson Ch., M.B. Lawlea, W.L., Chenoweth, And A.E., Carwick Basic Nutrition and Diet therapy, Macmillan Publishing Company, 1990

## **Reference Books:**

1. Garrow JS, James WPT, Ralph A Human Nutrition and Dietetics.Churchill Livingstone, NY. 10<sup>th</sup> edition. 2000.
2. Groff L James, Gropper S Sareen,Advanced Nutrition and Human Metabolism.West / Wadsworth, UK. 3<sup>rd</sup> edition, 2000.
3. Sue Rodwell Williams. Nutrition, Diet Therapy.W.B. Saunders Company London. 7<sup>th</sup> edition.1993.
5. Whitney, E. N. and C. B..Cataldo Understanding Normal and Clinical Nutrition. West Pub. S1. Paul. .1983.

<b>Course Type:Core- Practical-V</b>	<b>Nutrition in Life Cycle Practical</b>
<b>Semester :V</b>	<b>Course Code:U23ND5P5</b>
<b>Credits :4</b>	<b>Hours /Week:4</b>

**Course Outcome**

After Completion of the Course, Students will be able to:

	<b>Course Outcomes</b>	<b>K-Level</b>	<b>Unit Covered</b>
CO1	Estimate the critical nutritional factors that contribute to healthy growth, development and functional capacity throughout life	K4	I
CO2	Apply a variety of dietary assessment methods and describe the various measurements employed to monitor nutritional status at different life stages	K3	II
CO3	Plan a nutritional requirements of women before and during pregnancy and lactation, discuss strategies to overcome nutrition- related problems	K5	III
CO4	Integrate the physiological, cultural and behavioural factors that determine nutrition requirements from infancy to adulthood	K5	IV
CO5	Describe conditions associated with ageing and their nutritional implications, discuss successful dietary interventions to stabilize physiological decline and enhance physical and mental resilience	K4	V
CO6	Support practical session equips one with the knowledge and skills to handle an emergency situation	K5	



## **Syllabus**

1. Display raw and cooked food materials according to exchange lists given below. Record their nutritive value. Milk exchange list, Meat exchange list, Pulse exchange list, Cereal exchange list, Vegetable-A exchange list, Vegetable-B exchange list, Fruit exchange list and Fat exchange list.
2. Prepare and display one serving of common cooked foods given below. Record their weight and nutritive value. Cereal preparations, pulse preparations, vegetable preparations, fried snacks, non vegetarian preparations, bakery products, chutneys and sweets.
3. Planning, preparing and serving a meal for low income family, middle income family and high income family.
4. Planning, preparing and serving a meal for a pregnant woman in first second and third trimesters.
5. Planning, preparing and serving a meal for a lactating woman (0-6 months and 6-12 months).
6. Planning ,preparing and serving a meal for an infant.
7. Planning and preparing in digenous weaning mixes.
8. Planning ,preparing and serving a meal for a preschooler.
9. Planning, preparing and serving a meal for a school going child (a boy and a girl).
10. Planning ,preparing and serving a meal for an adolescent.
11. Planning and preparation of any five packed lunches.
12. Planning,preparing and serving a mea for an adult (sedentary, moderate andheavy worker).Planning,preparing and serving a meal for anoldage person.

## **Reference**

1. Srilakshmi,B.Dietetics,NewAgeInternationalP.Ltd.,NewDelhi, 2018.
2. Dietary Guidelines of Indians – A Manual, National Institute of Nutrition, Hyderabad, 2015.
3. Dietary Guidelines of Indians – A Manual, National Institute of Nutrition, Hyderabad, 2011.

<b>Course Type: Elective –I Theory</b>	<b>Course Title : Public Health Nutrition</b>
<b>Semester : V</b>	<b>Code : U23ND5:A</b>
<b>Credits : 3</b>	<b>Hours /Week : 5</b>

**Course Outcomes:**

After the completion of this course the students will be able to:

	<b>Course Outcomes</b>	<b>K-Level</b>	<b>Unit Covered</b>
<b>CO1</b>	Finally, the concepts and knowledge required for the delivery of community nutrition services will be applied to program planning, intervention and program evaluation.	K4	I
<b>CO2</b>	Gaining knowledge on nutritional programmes and policies overcoming malnutrition.	K3	II
<b>CO3</b>	Finally, the concepts and knowledge required for the delivery of community nutrition services will be applied to program planning, intervention and program evaluation.	K4	III
<b>CO4</b>	Understanding the national, international and voluntary nutritional organizations to combat malnutrition.	K5	IV
<b>CO5</b>	Understanding the national, international and voluntary nutritional organizations to combat malnutrition.	K3	V
<b>CO6</b>	Able to organize community nutrition education programme with the application of computers.	K5	

## **Syllabus**

### **Unit-I Introduction to public health nutrition 15 hours**

- A. Introduction to public health nutrition a National development- Meaning and Scope of Public Health Nutrition, Roles and responsibilities of public health nutritionists, Definitions of optimum health, malnutrition (under nutrition, overweight, obesity, micronutrient deficiency ), nutritional status, nutrition intervention, food and nutrient supplements, , nutrition education, morbidity, mortality rates.
- B. **Malnutrition** - Ecology Consequences and of Malnutrition, Strategies To Overcome Malnutrition. Relation of nutrition to national development, Nutrition and food security.

### **Unit-II Nutritional assessment**

**15 hours**

- A. **Nutritional assessment** Introduction, Definition of Nutritional Status, Instruments, Standard of Reference, Age Assessment, Measurement Techniques, Weight, Linear Measurement/Height, Circumferences, Soft Tissue Subcutaneous Fat, Objective and Classification of nutritional assessment Methods Overview of nutritional status assessment methods: Direct Nutritional Assessment parameters -Anthropometry, clinical signs and symptoms, dietary assessment and biochemical parameters.
- B. **Indirect Nutritional Assessment parameters-** a)Vital Statistics: Age Specific Mortality Rate, Morbidity and Cause of Specific Mortality, b) Ecological variables including crop production and c)Economic factors i.e. per capita income, population density & social habits

### **Unit-III Social & behavior change**

**15 hours**

Social & behavior change communication Concepts, components and process of communication for nutrition health promotion Definitions of Formal – non-formal communication, Participatory communication Components of BCC( Sender, Message, Channel, Receiver) Various types of communication – interpersonal, mass media, visual, verbal/ non-verbal. need of SBCC in India. Training workers in nutrition education programmes Methods of education when to teach, whom to teach.

### **Unit –IV National, international voluntary organizations 15hours**

- A. National, international and voluntary organizations to combat malnutrition Role of Nutrition in Achieving Global Targets Optimal Infant and Young Child Feeding: Significance of the first 1000 days of life Improving maternal, infant and young child nutrition – WHO Global Targets 2025 Nutrition Intervention programmes in India – ICDS , Mid-Day Meal (MDM) program. Fortification program National Programs to Combat Micronutrient Malnutrition: NIPI, VAPP and NIDDCP.
- B. National and international agencies in combating malnutrition: International- WHO, FAO, UNICEF- Aim and functions. National- ICAR, ICMR, NIN, NFI, FNB, CFTRI, NNMB, NSI, DFRL- Aim and functions.

### **Unit-V Communicable diseases**

**- 15 hours**

Epidemiology of communicable diseases Definition, causes, signs and symptoms, treatment and prevention of communicable diseases, Respiratory infections and intestinal infections, Other infections- dengue, Flu Types of immunity- active, passive and herd-group

protection Immunization agents- Immunization schedules - National and WHO Expanded Programme on Immunization Universal Passive, Combined, Chemoprophylaxis, non-specific measures.

### **Unit VI Topics for Self Study**

- A. Incidence of vitamin B-complex deficiency in malnourished children.
- B. <http://www.theprofesional.com/index.php/tpmj/article/download/3937/3041/>
- C. Food security and national development.
- D. <http://www.fao.org/sustainable-development-goals/overview/fao-and-the-post-2015-development-agenda/food-security-and-the-right-to-food/en/>
- E. New nutritional policies implemented recently (after vaccines, immunoglobulin 2018).
- F. [https://niti.gov.in/writereaddata/files/document\\_publication/Nutrition\\_Strategy\\_Booklet.pdf](https://niti.gov.in/writereaddata/files/document_publication/Nutrition_Strategy_Booklet.pdf)

### **Textbooks :**

1. Park A. (2007), Park's Textbook of Preventive and Social Medicine XIX Edition M/S Banarasidas, Bharat Publishers, 1167, Prem Nagar, Jabalpur, 428 001 (India)
2. Bamji M.S, Prahlad Rao N, Reddy V (2004). Textbook of Human Nutrition II Edition, Oxford and PBH Publishing Co. Pvt. Ltd , New Delhi
3. Bhatt D.P (2008), Health Education, Khel Sahitya Kendra, New Delhi Gibney MJ, Margetts BM, Kearney JM, Arab L (2004) Public Health Nutrition Blackwell Publishing Co. UK

**References:**

- National Nutrition Mission – ICDS. [icds-wcd.nic.in](http://icds-wcd.nic.in) • Ministry of Health & Family Welfare, [www.mohfw.nic.in](http://www.mohfw.nic.in)
- Field guide to designing communication strategy, WHO publication-2007
- Communication for Development (C4D) Capability Development Framework, UNICEF and 3D Change, 2009

<b>Course Type : Theory – Elective -I</b>	<b>Course Title : Diet and Counseling</b>
<b>Semester : V</b>	<b>Course Code : U21ND5:B</b>
<b>Credits : 3</b>	<b>Hours / Week : 5</b>

**Course Outcomes:**

After the completion of this course the students will be able to:

	<b>Course Outcomes</b>	<b>K-Level</b>	<b>Unit Covered</b>
CO1	Explain the concept, purpose and principles of diet counseling.	K5	I
CO2	Develop in-depth knowledge in various conditions and planning a diet for the same	K3	II
CO3	Identify and solve food related issues with teaching aids and diet charts.	K3	III
CO4	Develop and deliver appropriate information, products, and services to individuals, groups, and populations.	K3	IV
CO5	Evaluate the role of diet counselor and identify the appropriate teaching aids	K5	V
CO6	Develop a good communication and skills in computer menus to develop digital teaching aids.	K6	



## **Syllabus**

### **UNIT – I Counseling**

**-15 hours**

- A. Definition , History and importance of counseling, scope of counseling, types of counseling , Practical consideration in giving dietary advice and counseling - Factors affecting and individual food choice. Communication of dietary advice c) Consideration of behavior modification d) Motivation. The Counseling Process - Techniques for obtaining relevant information- Clinical Information, Medical History and General Profile, nutritional assessment, Dietary diagnosis- Assessing food and nutrient intakes, Lifestyles, physical activity, stress.

### **UNIT –II Counseling and Educating Patient**

**-15 hours**

- A. Introduction to nutrition counseling Determining the role of nutrition counselor, Responsibilities of the nutrition counselor, Practitioner v/s client managed care, Conceptualizing entrepreneur skills and behavior f) Communication and negotiation skills. Evaluation - Measuring the success of performance of client and evaluating the counseling process.

### **UNIT - III Teaching Aids**

**- 15 hours**

- A. Introduction, Scope and Importance of Teaching aids used by Counselor charts, leaflets, posters, Pamphlets and other materials etc., preparation of teaching material for patients suffering from NCD'S- Digestive disorders, Hypertension, Diabetes, Atherosclerosis & Hepatitis and cirrhosis.
- B. Implementation - Counseling the client/patient – client concurrence, coordination of care plans-the provision of learning experience.

**UNIT-IV Computer Use****-15 hours**

Introduction, History of computer in hospital administration, computer menu Importance of computer using in counseling session, Computer application a) Use of computers by dietitian b) Dietary computations, Dietetic management, Education/ training , Information storage, Administrations and Research.

**UNIT-V Computer Application****-15hours**

Computer application Scope of computer counseling, methods of counseling apparatus, Digital counseling aids and importance, Execution of software packages , Straight line, frequency table, bar diagram, pie chart, Preparation of dietary charts for patients c) Statistical computation- mean, median, standard deviation, conclusion and regression test.

**Unit VI Topics for Self Study**

1. Setting up Small, Medium & Large scale industry, Quality and quantity control in nutrition industries,  
<https://www.nutritionenterprisesinc.com/>
2. Location of an enterprise, steps for starting a small industry, incentives and subsidies, exploring export possibilities.  
<http://www.zonalinfo.com/shopinfo/hyderabad/enterprise/fitnessand-nurition-enterprises/2699418>

## Reference Books

1. Antia F.P. Clinical dietetics and nutrition., Oxford University Press, New Delhi 2008.
2. Mahan, L.K. and Escott-Stump S., Krause's Food Nutrition and Diet Therapy 10th Edition, W.B. Saunders Ltd, 2000.
3. Zeeman, Frances J. Applications of clinical nutrition. Englewood cliffs: Prentice Hall International Inc., 1998.
4. Thomas Briony; (1995). Blackwell Manual of Dietetic practise. (2nd Ed.) Oxford: New York .,1995.
5. Robinson., Normal and therapeutic nutrition.: Macmillan Pub. Company New York , 2006.
6. Sumati R. Mudambi, M.V. Rajagopal., Fundamental of food, nutrition and diet therapy. New age international publishers, New Delhi, 2015.

<b>Course Type : Theory – Elective -II</b>	<b>Course Title : Basics in Research Methodology</b>
<b>Semester : V</b>	<b>Course Code : U21ND5:C</b>
<b>Credits : 3</b>	<b>Hours / Week : 5</b>

**Course Outcomes:**

After the completion of this course the students will be able to:

	<b>Course Outcomes</b>	<b>K-Level</b>	<b>Unit Covered</b>
<b>CO1</b>	Basic knowledge on the role and importance of research in science.	K3	I
<b>CO2</b>	Critically analyse research methodologies identified in existing literature.	K4	II
<b>CO3</b>	Understanding the complex issues inherent in selecting a research problem, selecting an appropriate research design, and implementing a research project.	K3	III
<b>CO4</b>	Develop a research proposal or industry project plan.	K5	IV
<b>CO5</b>	Search for, select and critically analyse research articles and paper	K5	V
<b>CO6</b>	Literature review - Definition, Purpose and Importance.	K4	

## **Syllabus**

### **Unit I**

**15 hours**

- A. **Research**- Meaning, Definition, Characteristics, Objectives, Motivation
- B. **Importance and types.** Research Methods and Research Methodology, Criteria of a good research.

### **Unit II**

**15 hours**

**Literature review** - Definition, Purpose and Importance. Research Design - Definition, Essential, Element, Characteristics and Types.

### **Unit III**

**15 hours**

**Sample Design**- Definition and Types. Data Collection - Definition and Types.

### **Unit IV**

**15 hours**

- A. **Processing of Data** - Editing, Coding, Classification and Tabulation.
- B. Analysis of Data(Theory)- A) Measures of central tendency-Mode, Median and Mean. B) Measures of dispersion- Range, Mean Deviation and Standard Deviation.

### **Unit V**

**15 hours**

- A. **Layout of the Research Report** - Preliminary Page, Main Text and End Matter. Types of Reports - Technical and Popular Oral Presentation - Structure of Presentation. Sample
- B. Research Proposal in Science- Introduction, Problem Statement, Objectives, Preliminary Literature Review, Methodology and Reference.

## **Unit VI Topics for Self Study**

1. Prepare a Research Proposal
2. Steps in preparing a proposal

### **References:**

1. Kothari, C.R., (2004), Research Methodology, Methods and Techniques, Second Revised Edition, New Age International Publishers, New Delhi.
2. Ranjit Kumar, (2011), Research Methodology: a step-by-step Guide for Beginners, Third Edition, SAGE Publications, New Delhi.
3. Beverley Moriarty, (2018), Research Skills for Teachers – From Research Question to Research Design, Allen & Unwin Publishers, Australia.
4. Rajendra Kumar, C. (2008), Research Methodology, APH Publishing Corporation, New Delhi.
5. Pagadala Suganda Devi (2017), Research Methodology: A Handbook for Beginners, Notion Press, Chennai.
6. Vijayalakshmi Ponnuraj and Sivaprakasam, C. (2008), Research Methods: Tips and Techniques, MJP Publishers.

<b>Course Type Elective II</b>	<b>Course Title :Changing Trends in Extension Education</b>
<b>Semester : V</b>	<b>Course Code : U21ND5:D</b>
<b>Credits : 3</b>	<b>Hours / Week : 5</b>

**Course Outcomes:**

After the completion of this course the students will be able to:

	<b>Course Outcomes</b>	<b>K-Level</b>	<b>Unit Covered</b>
CO1	To understand the key Concept of HomeScience Extension Education	K3	I
CO2	Diffusion and Adoption of Innovations	K2	II
CO3	Understand the criteria for Communication process	K2	III
CO4	Identify importance and Planning teaching and learning	K2	IV
CO5	Introduction to Current approaches in extension education	K1	V
CO6	Various programme introduced by the Govt. Of India	K2	

**Syllabus**

**Unit I Home Science Extension Education-15 hours**

A. Extension education – meaning, scope, characteristics, objectives, need, principles, process, models and philosophy- emergence of Home Science Extension Education in India Extension Education as a profession – adult education and distance education .Leadership – role, styles and management grid, Qualities of a good extension manager: Changing role of extension managers caused by globalization in Home Science.

**Unit II Diffusion and Adoption of Innovations** **15 hours**

- A. Predicting innovativeness: Simulation of innovation, innovation decision process - Types of innovation decision, consequence on innovations, desirable or undesirable, direct or indirect anticipated or unanticipated consequence. Concept of homophily and heterophony and their influence on flow of innovation Concept of Diffusion and its elements.
- B. Adoption Process - concept of stage, shade of agreement, neglected element.
- C. Adopter categories - Innovativeness and adopter categories, adopter categories as idea types, characteristics of adopter categories.
- D. Diffusion - perceived attributes of innovation and their rate of adoption.

**Unit III Communication process** **-15 hours**

- A. Communication process – concept, elements and their characteristics Models and theories of communication communication skills – fidelity of communication, communication competence and empathy, communication effectiveness and credibility, feedback in communication, social networks and Development communication – Barriers in communication
- B. Message – Meaning, dimensions of a message, characteristics of a good message, Message treatment and effectiveness, distortion of message.

**Unit IV Teaching and Learning** **-15 hours**

Concept of teaching and learning Classification of Extension teaching methods Various extension teaching aids – selection of appropriate methods, features, advantage, limitation of various methods of teaching (mass, group, individual)

**Audio visual aids** – planning, selection and types of visual, audio and audio – visual aids Contribution of AV Aids in Extension education.



## **Unit V Current approaches in extension education -15 hours**

- A. Farming situation-based extension, market – led – extension, farm fieldschool, ATIC, Kissan Call Centers, and NAIP.
- B. Problems in Rural Development. Need for Volunteerism in Rural Development, Role of NGO's Assistance available to Voluntary agencies from different ministries/Departments of Govt. of India. - Details of function in to Central/State Social Welfare Board and CAPART Employments Generation Programmes – NREGP, Women Development Programmes – ICDS, Self Help Groups, MSY, RMK

### **Unit - VI Topics for Self study**

Extension Education - Adult Education and Distance Education.– Analysis of Extension systems – State Departments Extension system and NGOs – Current Approaches in Extension: Decentralised , Farm Field School, ATIC, Kisan Call Centres, NAI

### **References**

1. Albrecsht, H. *et al .*, Rural Development Series, Agricultural Extension, Vol I & II, Basic concepts and methods, Wiley Eastern Limited, New Delhi, 1989
2. Chaubey, B.K., A Hand Book of Education Extension, Jyoti Prakashan, Allahabad, 1979
3. Extension Educatioin in Community Development : Ministry of Food and Agriculture, Government of India, New Delhi, 1981
4. Pankajam, G., Extension – Third Dimension of Education, Gyan Publishing House, New Delhi, 2000
5. Reddy, A., Extension Education, Sree Lakshmi Press, Bapatla, 1999
6. Waghmare, S.K., Exploring of Extension Excellence, Multi Tech.Pub. Company, 1988

<b>Course Type: Core –VII Theory</b>	<b>Course Title: Food Microbiology</b>
<b>Semester : VI</b>	<b>Course Code: U23ND607</b>
<b>Credits :4</b>	<b>Hours /Week: 6</b>

**Course Learning Outcomes:**

After the completion of this course the students will be able to:

	<b>Course outcome</b>	<b>K-Level</b>	<b>Unit</b>
CO1	Apply the concept of microbiology and use of microscope in identifying the microbes in foods	K4	I
CO2	Assess the different types of micro organism involved in food spoilage and the conditions under which they will grow	K5	II
CO3	Analyze the characteristics of food borne, waterborne and spoilage microorganisms, and methods for their isolation, detection and identification	K4	III
CO4	Evaluate the role of microorganisms in fermentation and assess the benefits and adverse effects of fermentation	K5	IV
CO5	Determine the role and significance of microbial inactivation, adaptation and environmental factors on growth and response of microorganisms in various environments	K5	V
CO6	Develop the knowledge on the effects of microorganisms in health and disease	K5	V

## **Syllabus**

### **Unit-I Introduction to Food Microbiology**

**- 18 Hours**

- A. Microorganisms important in food microbiology – Mold, Fungi, Algae, Bacteria and Virus – general characteristics. Contamination of foods – green plants and fruits, animals, sewage, soil, water, air during handling and processing. Spoilage – cause, classification, factors affecting kinds and numbers of microorganisms in food.

### **Unit-II Microbial Food Spoilage**

**- 18 Hours**

- A. Spoilage of different groups of foods—cereal and cereal products, vegetables and fruits, meats and meat products, fish and other sea foods, eggs, poultry, milk and milk products and canned foods.

### **Unit III Food Preservation using High and Low temperatures - Hours**

- A. **Food preservation** – Methods and principles of food preservation, delay of microbial decomposition, prevention of microbial decomposition, removal of micro organisms.
- B. **Preservation by use of high temperatures** – Factors affecting heat resistance of microorganisms, commercial heat preservation methods –sterilization, canning, pasteurization, blanching.
- C. **Preservation by use of low temperatures** – Growth of microorganisms at low temperatures, low temperatures storage – cellar, chilling and frozen.

### **Unit IV Preservation by Irradiation**

**-18 Hours**

- A. Preservation by drying - Methods of drying, factors in control of drying, treatments of foods before after drying. Preservation by chemicals,
- B. Preservation by Irradiation – Microwave radiation, Ultraviolet radiation and ionizing radiation.

## **Unit V Food Borne Illness**

**- 18 Hours**

- A. Food borne Illness – Food hazards, significance of food borne disease, incidence of food borne illness, risk factors associated with food borne illness.
- B. Bacterial agents of food borne illness – Clostridium botulinum, Escherichia coli, Salmonella, Shigella and Staphylococcus- The organism, pathogenesis and clinical features and association with foods.

### **Topic for Self Study**

1. Probiotics and prebiotics – difference - role of probiotics and prebiotics in gut health – natural and artificial probiotics.
2. <https://www.prebiotin.com/prebiotin-academy/what-are-prebiotics/prebiotics-vs-probiotics/>
3. Flavour changes in cheese due to the fermentation through various molds
4. <https://www.cheesescience.org/microbes.html>
5. Canning – principle behind canning – puffing of can – maintenance of headspace in can – botulism and botulinum poisoning in canned foods.
6. <https://ir.library.oregonstate.edu/downloads/ft848t80r>

### **Text Books**

1. Vijaya Ramesh,K, “Food Microbiology”, MJP Publishers, Chennai, 2007.
2. Garbutt, J., “Essentials of Food Microbiology”, Arnold, London, 1997.
3. Banwart.G.J., “Basic Food Microbiology”, Chapman and Hall, NewYork,1991.

### **Reference Books:**

1. Adams M.R ., Moss M. O. , Food Microbiology, New age international publishers, New Delhi, 2015.
2. William C Frazier., Dennis C West Hoff., Food Microbiology, McGraw Hill education private limited, New Delhi, 2014.
3. Sivasankar., Food Processing and Preservation, PHI Learning private limited New Delhi, 2015.
4. Branen A.L. and Davidson, P.M, Antimicrobials in Foods, Marcel Dekker, New Delhi, 1983.
5. Jay J. M., Modern Food Microbiology.3<sup>rd</sup> Edition, VNR Publishers, NewYork,1980.

<b>Course Type : Core VIII Theory</b>	<b>Course Title : Quantity Food Service and Physical Facilities</b>
<b>Semester: VI</b>	<b>Code: U23ND608</b>
<b>Credits: 4</b>	<b>Hours /Week: 6</b>

### Course Outcomes

On completion of this course, students will be able to

<b>S.No</b>	<b>Course Outcomes</b>	<b>Level</b>	<b>Units Covered</b>
<b>CO1</b>	Describe the quantity food service systems.	<b>K1</b>	<b>I</b>
<b>CO2</b>	Identify and manage the human resources with in a food services organization or department.	<b>K2</b>	<b>II</b>
<b>CO3</b>	Illustrate appropriate purchasing procedures, receiving and storage of food.	<b>K3</b>	<b>III</b>
<b>CO4</b>	Develop nutritional menus for food service production and manage the quantity food production, pricing and sale of the product	<b>K6</b>	<b>IV</b>
<b>CO5</b>	Design and run a quantity food service establishment.	<b>K5</b>	<b>V</b>
<b>CO6</b>	Plan and organize quantity food production for different events using different styles of food service.	<b>K6</b>	

### Syllabus

#### Unit I Quantity Food Service

**18 Hours**

Meaning and evolution. Classification of food service institutions according to

- A. Function: Profit oriented, service oriented and public health facility oriented
- B. Processing method: Conventional system, commissary system and fast-food service systems
- C. Service of food: Self-service, tray service and waiter-waitress service

**Unit II Space Organization and Equipments****18 Hours**

- A. Kitchen: Size and type; developing kitchen plan; work simplification- work area, worker's area of reach, work space, equipment materials and supplies and movement at work; features to be considered in designing kitchen; kitchen lay out.
- B. Storage space: Location, planning, lay out, safety and security. Service area: Location, planning, dimensions and decor.
- C. Equipments: Classification, selection, design, installation, operation, care and maintenance of commonly used equipments.

**Unit III Purchasing, Receiving and Storage of Food****18 Hours**

- A. Food purchasing: Food buyer- Knowledge, quality and functions of a food buyer; methods of buying food.
- B. Receiving and storage of food: Delivery methods, delivery procedure; Receiving; Storage- organization of storages, general procedure for storage; Store keeping- store records, order form and goods received book.

**Unit-IV Menu Planning, Standardization and Portion Control 18 Hours**

- A. Menu planning: Menu- Definition, functions, need for and factors to be considered in menu planning, procedure for writing menu, types and construction of menu, menu display.
- B. Standardization of recipe: Definition, methods of standardization, standard recipe format and uses.
- C. Standard portion sizes: Definition, portioning equipments and portion control.

**Unit V Food Production and Styles of Food Service****18 Hours**

- A. Food production: Meaning, types of food production system, process of food production (briefly), large quantity cooking techniques, use of leftover food and holding techniques.
- B. Food service: Meaning, styles-waiter service, self-service and vending.

## **Unit VI Topics for Self-Study**

- Plan a layout of food plant.
- Prepare album on various menu planning types.
- Visit to catering organization to learn - Catering Equipments, Food purchasing, receiving, storage, production & service procedures.
- Laboratory experience on laying table cloth and napkin folding.

## **Text Books**

1. Sethi, M., (2005), Institutional Food Management, New Age International Publishers, Chennai.
2. Palacio, J.P., Harger, V., Shugari, G., (2001), West and Woods, Introduction to Food Service. Mac Millan Pub Co., New York.
3. Bali, P.S., (2011), Quantity Food Production Operations and Indian Cuisine, Oxford University Press, India.
4. Sethi, M., Malhan, S., (2007), Catering Management - An Integrated Approach, New Age International Publishers, Chennai.
5. Bobby George., (2006), Food and Beverage Services, Jaico Publishing House, Mumbai.
6. Vijay Dawan., (2007), Food and Beverage Services, Frank Brothers & Co, New Delhi.

## **Reference Books**

1. Ruby Parker Puckett., (2004), Food Service Manual for Health Care Institutions, American Society for Healthcare Food Service Administrators, John Wiley Publications, New York.
2. Andrews,S., (2005), Food and Beverage Service, Training Manual, Tata McGraw, Hill Publishing Company Ltd, New Delhi.
3. Barrows, W.C., Powers, T & Reynolds, D.R., (2012), Study Guide to accompany Introduction to Management in the Hospitality Industry, John Wiley and Sons, India.
4. Payne-Palacio, J. and Monica., (2016), Food Service Management: Principles and Practices, Harlow: Pearson.
5. Knight, J.B., Kotschevar, L.H., (2017), Quantity: Food Production, Planning and Management, John Wiley and Sons, New York.



<b>Course Type : Core Practical VI</b>	<b>Course Title:Food Microbiology Practicals</b>
<b>Semester :VI</b>	<b>Course Code : U23ND6P6</b>
<b>Credits : 4</b>	<b>Hours /Week : 6</b>

### Course Outcomes

After completion of this course the students will be able to:

	<b>Course outcome</b>	<b>K-Level</b>	<b>Unit</b>
<b>C01</b>	Analyze the various staining methods to identify the microbes in foods	<b>K4</b>	<b>I</b>
<b>C02</b>	Assess the role of microorganisms in fermentation	<b>K5</b>	<b>II</b>
<b>C03</b>	Construct the role of microorganisms in food spoilage and their effects	<b>K5</b>	<b>III</b>
<b>C04</b>	Evaluate the role of heat in cereals and structure and shape of various starch	<b>K5</b>	<b>IV</b>
<b>C05</b>	Explain the changes taking place in fats and oils on heating	<b>K2</b>	<b>V</b>
<b>C06</b>	Demonstrate the changes taking place in starch cookery and the structure of microorganisms in syneresis	<b>K5</b>	<b>V</b>

### Syllabus

1. Instrumentation in microbiology laboratory and their function. (microscope, autoclave & hot air oven)
2. Preparation of culture media.

3. Preparation of Pure culture techniques (Spread plate, Streak plate, pour plate methods)
4. Estimation of Staining technique - simple and differential.
5. Preparation of Microbiological evaluation of milk and milk products.
6. Isolation of spoilage organisms from different food commodities.
7. Estimation of Microbiological analysis of water and air.

### **Text Books**

1. Vijaya Ramesh,K, "Food Microbiology", MJP Publishers, Chennai, 2007.
2. Garbutt, J., "Essentials of Food Microbiology", Arnold, London, 1997.
3. Banwart.G.J., "Basic Food Microbiology", Chapman and Hall, NewYork, 1991.

### **Reference**

1. Adams M.R., Moss. M.O, Food Microbiology, New age international publishers, New Delhi, 2015.
2. William C Frazier., Dennis C West Hoff., Food Microbiology, McGraw Hill education private limited, New Delhi, 2014.
3. Siva Sankar., Food Processing and Preservation, PHI Learning private limited New Delhi, 2015.
4. Branen A.L. and Davidson. P.M, Antimicrobials in Foods. Marcel Dekker, New Delhi, 1983.
5. Jay J.M., Modern Food Microbiology, 3<sup>rd</sup> Edition, VNR Publishers, New York, 1980.

<b>Course Type :Elective - III</b>	<b>Course Title : Nutrition for Sports and Fitness</b>
<b>Semester : VI</b>	<b>Course Code :U17ND6:A</b>
<b>Credits : 3</b>	<b>Hours /Week : 6</b>

**Course Outcomes:**

After the completion of this course the students will be able to:

	<b>Course Outcomes</b>	<b>K-Level</b>	<b>Unit Covered</b>
<b>CO1</b>	Obtain knowledge regarding the body composition and their techniques to measure.	K2	I
<b>CO2</b>	Understand the importance and of fitness to enhance endurance, strength and flexibility.	K6	II
<b>CO3</b>	Assess the sports persons regarding their cardiovascular endurance, muscular strength and endurance and flexibility.	K5	III
<b>CO4</b>	Analyze the need of nutrients and their metabolism during exercise.	K3	IV
<b>CO5</b>	Evaluate the significant changes during exercise, needs of the sports persons and the role of nutritional supplements.	K5	V
<b>CO6</b>	Compare the effects of yoga and fitness on various body systems and the nutritional needs in special conditions.	K5	

## Syllabus

### **UNIT – I Body Composition and Fitness (18 Hours)**

- A. **Body Composition** - classification (Fat mass and fat free Mass) and its components, factors influencing body mass composition. Techniques for measuring body composition Muscular-skeletal anatomy - i. General anatomy and physiology ii. Kinds of muscles iii. structure of skeletal muscle
- B. **Fitness**-definition, parameters of fitness- cardiovascular endurance, muscular strength, muscular endurance, flexibility and body composition

### **UNIT - II Assessment and Benefit of Exercise (18 Hours)**

- A. **Benefit of exercise**- physiological, psychological and sociological. Physical activity guidelines. Role of hormones in exercise
- Assessing personal fitness**- preparticipation, screening and risk assessment.
- B. Dynamics of pulmonary ventilation and exercise - i. Regulation of ventilation in exercise iii. Pulmonary ventilation during Exercise v. Ventilation and energy demands. Energy cost of breathing RQ, VO<sub>2</sub> max and OBLA

### **UNIT – III Energy Systems and Electrolyte Balance (18 Hours)**

- A. Reference sports person- dietary recommendations and principles of diet planning Carbohydrate intake and exercise: i. Pre exercise diet ii. Carbohydrate supplementation during exercise iii. Post exercise diet iv. Carbohydrate utilization

during exercise

- B. Reviews of Different Energy Systems for Endurance and Power Activity-** Fuels and nutrients to support physical activity .Shifts in carbohydrate and fat metabolism, mobilization of fat stores during exercise.
  
- C. Water and Electrolyte Balance-** Losses and their replenishment during exercise and sports event, effect of dehydration, sports drinks.

#### **UNIT-IV**

**18 Hours**

##### **A. Nutrition for Sport Persons**

Definition, physiological and significant changes during exercise, types of stress faced by sports persons, nutrition needs of sports persons-macro and micronutrient needs, role of water and electrolytes.

- B. Role of Nutrition and Recommendations** – pre-exercise, during and post –exercise Nutrition supplement and ergogenic aids. Sports drinks and hydration aids . Nutritional problems of athletes

- C. Proteins and protein supplementation** i. Dietary protein requirements for endurance and strength trainers, Protein feeding pre, during and post event

#### **UNIT- V Yoga and Nutrition Fitness in Special Conditions (18Hours)**

- A. Yoga and Fitness-** effects on general vitality and on immune, endocrine, neurons, digestion and muscular systems, dietary pattern. Awareness about the alternative systems for health and fitness like ayurveda, yoga, vegetarianism and traditional diets.

- B. Nutrition and Fitness in Special Conditions-** space mission and high altitude-changes in body composition, nutrient requirements, food system and suitable types of food.

### **Unit VI Topics for Self-study**

- A. BCAA as sports supplement.
- B. <https://www.otsuka.co.jp/en/nutraceutical/about/nutrition/sportsnutrition/essential-nutrients/bcaa.html#>:
- C. Carbohydrate loading.

<https://www.mayoclinic.org/healthy-lifestyle/nutrition-and-healthy-eating/in-depth/carbohydrate-loading/art-20048518>

- D. Difference between sports drink and health drink.<https://www.aappublications.org/content/32/6/32.2#>

### **Unit VI Topics for Self-study**

1. BCAA as sports supplement.

<https://www.otsuka.co.jp/en/nutraceutical/about/nutrition/sportsnutrition/essential-nutrients/bcaa.html#>:

2. Carbohydrate loading.

<https://www.mayoclinic.org/healthy-lifestyle/nutrition-and-healthy-eating/in-depth/carbohydrate-loading/art-20048518>

3. Difference between sports drink and health drink.<https://www.aappublications.org/content/32/6/32.2#>

### **Text Books**

1. Mahan, L.K. & Ecott - Stumps, Krause's "Food, Nutrition and Diet therapy", 14<sup>th</sup> edition, W.B.Sunders Ltd, 2016.
2. Sizer, F. & Whitney, E., "Nutrition- Concepts & Controversies", 8<sup>th</sup> edition, Wadsworth Thomson learning, 2000.
3. Shills, M.E., Olson, J.A., Shike, N. and Ross, A.C.(Ed), "Modern Nutrition in Health & disease", 9<sup>th</sup> edition, Williams & Wilkins,1999.

## Reference Books

1. Whitney, E.N. & Rolfes, S.R., "Understanding Nutrition", 8<sup>th</sup> edition, West/Wadsworth, an International Thomson publishing Co., 2002
2. Ira Wolinsky (Ed), "Nutrition in exercise and sports", 3<sup>rd</sup> Edition, CRC press, 1988
3. Parizkova, J. "Nutrition, physical activity and health in early life", Ed. Wolinsky, I., CRC press, 2001
4. McArdle, W.Katch, F. and Katch, V. "Exercise Physiology. Energy, Nutrition and Human performance", 4<sup>th</sup> edition, Williams and Wilkins, Philadelphia, 2009
5. Barbak Ann Dushman, "Complete guide to fitness and health", American college of sports medicine library and congress catalog in publication data, 2006.



<b>Course Type : Elective III</b>	<b>Course Title : Principles of Resource Management and Interior Design</b>
<b>Semester : VI</b>	<b>Course Code : U21ND6:B</b>
<b>Credits :3</b>	<b>Hours / Week : 6</b>

**Course Outcomes:**

After the completion of this course the students will be able to:

	<b>Course Outcomes</b>	<b>K-Level</b>	<b>Unit Covered</b>
<b>CO1</b>	Make use of efficient management skills with good managerial potentials and Identify human and non-human resources for efficient management of the family	K3	I
<b>CO2</b>	Explain put forth by recent trends in availability of resources	K2	II
<b>CO3</b>	Evaluate elements needed for appropriate designing to achieve required visual effect.	K5	III
<b>CO4</b>	Analyze theme-based color harmonies in interiors.	K3	IV
<b>CO5</b>	Evaluate and choose furniture for different areas of an establishment.	K5	V
<b>CO6</b>	Determine the composition, construction, and finishes applied on fabrics for furnishings.	K5	

## Syllabus

### UNIT I Management

-18 hours

- 1.1 **Resource Management:** Understanding, meaning, classification and characteristics of resources, factors affecting utilization of resources.
- 1.2 Maximizing the use of resources and resource conservation.
- 1.3 Availability and management of specific resources by an individual / family-money, time, energy, space.
- 1.4 **Functions of management:** Decision making, planning, supervising, controlling, organizing.

### UNIT II Design & Colour

18 hours

- 2.1 **Design and good taste:** Objectives of aesthetic planning, beauty, expressiveness, functionalism, concept of design, purpose of design, elements of design, types of design, structural design and decorative design.
- 2.2 **Colour:** Sources of colour – dimension of colour (hue, value, intensify/chroma). The pang colour system (primary, secondary, intermediate hue, tertiary and quaternary colour).
- 2.3 **Procedure for Making a Colour Scheme for a Room:** Factors affecting the use of colour scheme for room (the room, mood, style, fashion, personality, possession).
- 2.4 Application of art principle in the use of colours for a room (balance, proportion, harmony, rhythm, emphasis).

### **UNIT III Lighting**

**18hours**

- 3.1 **Lighting:** Source of light (natural, artificial light).
- 3.2 **Types of Lighting:** General/ambient lighting, task lighting, accent lighting.
- 3.3 **Requirements of an Ideal Lighting Installation** – Steadiness of the source of light, elimination of glare, avoidance of shadows, sufficient illumination to suit the nature of the visual task, nonproduction of excessive heat, minimum consumption of oxygen from the air.

### **UNIT IV Furniture and Furnishings**

**18 hours**

- 4.1 **Furniture:** Requirement and arrangement in the home, materials used in furnishing items.
- 4.2 **Furnishing:** Different types of furnishing, factors considered in the selection of furnishing.
- 4.3 **Floor coverings:** Factors for selecting floor coverings, salient features of carpet, types use and care of floor coverings.

### **UNIT V Accessories**

**18 hours**

- 5.1 Accessories: Selection, types, use and care of accessories.
- 5.2 Traditional and Modern: Art objects, pictures.
- 5.3 Flower arrangement: Principles, types and steps in preparing flower arrangement.

## Topics for Self-Study

- Comparison of resource management techniques at home and industry.  
<https://www.planview.com/resources/guide/resource-managementsoftware/top-12-resource-management-best-practices>
- Interior design for budget consumers.  
<https://www.housebeautiful.com/home-remodeling/interiordesigners/g4293/interior-designer-tricks-to-update-a-room/>
- National and international flower arrangements.  
<https://www.myweddingplanning.in/wedding-flower-decor>
- Personal touch in decorating your house.  
<https://www.homify.in/ideabooks/729123/here-s-how-to-add-a-personal-touch-to-your-home-decor>

## Text Books

1. Graig, H.T., and Rush, C.H. "Homes with Character", D.C. Health and Company, Boston 1965.
2. Alexander, M.J., "Designing Interior Environment", Har Court Brace Jauaroui Inc., New York, 1972.
3. Sherwood, R.F. "Homes Today and Tomorrow", Chart Bannet, Co., Inc., PEORIC, Illinois, 1972.
4. Premavathy Seetharaman and Parveen Banu, "Interior Design and Decoration", CBS Publishers, New Delhi, 2007.

## Reference Books

1. Nickell, P. and Dorsey, J.M. "Management in Family Living", John Wiley and Sons, Inc, New York 1960.
2. Goldstein, H and Goldstein, V. "Art in Everyday Life", Macmillan and Company, New York, 1966.
3. Rutt, A.H., "Home Furnishings", John Wiley and Sons, New York, 1961.
4. Roy Day, "All about Decorating Your Home" Hamlyn, London, 1976.

<b>Course Type : Theory- Elective IV</b>	<b>Course Title : Food Product Development And Marketing Strategy</b>
<b>Semester : VI</b>	<b>Course Code : U23ND6:C</b>
<b>Credits : 3</b>	<b>Hours / Week : 5</b>

**Course Outcomes:**

After completion of this course the students will be able to:

	<b>Course Outcomes</b>	<b>K- Level</b>	<b>Unit Covered</b>
<b>CO1</b>	Identify the basic principles and concepts of food product development	K2	I
<b>CO2</b>	Analyze various cultural factors involved in the dietary pattern of various groups.	K4	II
<b>CO3</b>	Discuss the steps involved in product development, portion size, cost calculation and nutritive value calculation.	K4	III
<b>CO4</b>	Develop a new food product for different age groups.	K5	IV
<b>CO5</b>	Compare the market structure and develop practical skills in formulating and promoting the food product in a market.	K5	V
<b>CO6</b>	Develop of the global trends in developing entrepreneur skills.	K4	

## **Syllabus**

### **Unit – I Concepts of Product Development (15 hours)**

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 Market Process (15 hours)**

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 Formula Development (15 hours)**

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 Government Proportion (15 hours)**

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      Sanitation**

**(15 hours)**

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.

### **Topics for Self-study**

1. Low cost recipes.

<https://vikaspedia.in/health/nutrition/nutritive-value-of-foods/lowcost-nutritious-supplements>

2. Novel foods without preservatives.

[https://www.researchgate.net/publication/328283201\\_Novel\\_natural\\_food\\_preservatives\\_and\\_applications\\_in\\_seafood\\_preservation\\_A\\_review](https://www.researchgate.net/publication/328283201_Novel_natural_food_preservatives_and_applications_in_seafood_preservation_A_review)

3. Spirulina in food processing industry.

<https://www.longdom.org/proceedings/spirulina-arthrospiraplatensis-as-food-a-commodity-to-better-feed-the-world-37470.html>

4. Nutrigenomics in new product development.

<https://www.newfoodmagazine.com/article/77093/inspiring-the-food-of-tomorrow/>



## **Text Books**

1. Sudhir Gupta, "Handbook of Packaging Technology", Engineers India Research Institute, New Delhi , (2017)
2. Khanaka, S.S., "Entrepreneurial Development", S. Chand and Company Ltd, New Delhi, 2016.

## **Reference Books**

1. Suja, R. Nair, "Consumer Behaviour and Marketing Research", 1st Edition, Himalaya Publishers, (2014).
2. Hmacfie, "Consumer led Food Product Development", Weedhead Publishing Ltd., UK, (2017)
3. Fuller, Gordon, W., "New Food Product Development", 2nd Edition, CRC Press, Boca Raton, Florida, (2015)  
Schaffner .D,J, Schroder , W.R. "Food Marketing and International Perspectives", Web/McGraw Hill , (2010)

<b>Course Type : Theory-Elective IV</b>	<b>Course Title : Nutrition in Special Condition</b>
<b>Semester : VI</b>	<b>Course Code : U23ND6:D</b>
<b>Credits : 3</b>	<b>Hours / Week : 5</b>

**Course Outcomes:**

After completion of this course the students will be able to:

	<b>Course Outcomes</b>	<b>K-Level</b>	<b>Unit Covered</b>
<b>CO1</b>	Evaluate the concept, purpose and principles of diet therapy for children with special needs.	K5	I
<b>CO2</b>	Gain in-depth knowledge in various epidemics and endemics and planning a diet for the same.	K4	II
<b>CO3</b>	Identify and solve food related issues during natural disasters.	K2	III
<b>CO4</b>	Develop and deliver appropriate information, products, and services to individuals, groups, and populations.	K6	II
<b>CO5</b>	Evaluate the role of various feeding techniques for people in special environments such as spacecraft and remote areas such as army personnel.	K5	V
<b>CO6</b>	Plan and prepare a balanced diet for people with special needs.	K6	IV

## **Syllabus**

### **UNIT I:**

**(15 hours)**

#### **Nutritional care for the children with special needs**

Overview of the disability, food and nutritional needs and their modification.

- i. Attention deficit hyperactivity disorder.
- ii. Autism.
- iii. Cerebral palsy.
- iv. Down's syndrome.

#### **Unit-II Epidemic diseases**

**(15 hours)**

(i) Dengue, chikenguniya and other epidemic conditions. Hypothyroidism and hyperthyroidism. Wilson's Disease.

#### **Unit- III Nutritional Emergency**

**(15 hours)**

Nutrition during emergency: Natural calamity - war, flood, fire famine Nutrition in sea voyage, Mountaineering,

#### **Unit- IV Space Nutrition:**

**(15 hours)**

Food Selection. Food preparation for space, Planning and serving the food, Classification of space food and Dehydrated foods use in space.

#### **Unit – V Armed forces nutrition:**

**(15 hours)**

The history of Military nutrition, Nutrient Support in Military person, the role of nutrient in injured person, Estimation of energy and protein metabolism in armed person.

### **Unit - VI Topics for self-study:**

- A. Role of nutrition in pandemic.
- B. Recent natural calamity which needed nutritional support.
- C. Military nutrition in different terrains.
- D. Evolution of space nutrition.

### **References:**

1. Gibney ., “Public Health Nutrition”,Blackwell Publishing, 2004.
2. Khanna., “Textbook of Nutrition and Dietetics”, PhoenixPublisher,2013.
3. Sharma S, Wadhwa A.,“Nutrition in the Community- A textbook”, ElitePublishing House Pvt. Ltd, 2003.
4. Srilakshmi B. “Dietetics” Seventh Edition, New Age International (P)Ltd, 2016
5. Bamji MS, Rao NP, and Reddy V. Text Book of Human Nutrition;Oxford & IBH Publishing Co. Pvt Ltd, 2009.
6. Lakra P, Singh MD. Textbook of Nutrition and Health,, First Ed, 2008;Academic
7. Defiance Food Services Integrated Project Food for thought (DVD),Team 2007.

<b>Course Type : PCS</b>	<b>Course Title : Aptitude and Reasoning Skills for Competitive Examination</b>
<b>Semester : VI</b>	<b>Course Code : U17ND6G1</b>
<b>Credits : 2</b>	<b>Hours / Week : 1</b>

**Course Outcomes:**

After completion of this course the students will be able to:

	<b>Course Outcomes</b>	<b>K-Level</b>	<b>Unit Covered</b>
<b>CO1</b>	Understand the basic concepts of quantitative aptitude	K2	I
<b>CO2</b>	Infer and gain in depth knowledge on various concepts of logical reasoning skills.	K2	II
<b>CO3</b>	Excel and able to solve aptitude and reasoning papers in campus interview.	K3	III
<b>CO4</b>	Make use of Acquire satisfactory competency in use of reasoning	K1	II
<b>CO5</b>	Compete efficiently in national and international level competitive exams.	K2	V
<b>CO6</b>	Inculcate and Develop confidence	K2	IV

**Syllabus**

**Unit -I Quantitative Ability (Basic Mathematics) 6 hours**

Number Systems, LCM and HCF, Simplification, Square Roots and Cube Roots, Average, Problems on Ages, Percentages, Problems on Numbers.

**Unit -II Quantitative Ability (Advanced Mathematics) 6 hours**

Probability, Profit and Loss, Simple and Compound Interest, Time, Speed and Distance, Time & Work, Ratio and Proportion.

### **Unit III Data Interpretation**

- A. Tables,
- B. Column Graphs,
- C. Bar Graphs,
- D. Line Charts,
- E. Pie Chart,
- F. VennDiagrams

### **Unit IV Verbal and Non-Verbal reasoning**

**6 hours**

Analogy, Blood Relation, Directional Sense, Number and Letter Series, Coding – Decoding, Calendars, Clocks, Venn Diagrams, Mathematical Operations, logical sequence of work, Mirror-image, Water-image, Completion of incomplete pattern, Grouping of identical figures

### **Unit V Logical Reasoning**

**6 hours**

Statement – Argument, Statement Assumptions, Statement – Course of action, Statement and Conclusions, Cause and Effect reasoning, Deriving conclusion from passages, Theme detection.

### **Topic of Self Study**

1. Data Interpretation level-II News paper reading: The Hindu & Economic Times
2. Verbal English
3. Sentence Corrections, Fill the blanks with appropriate words/articles/ preposition/
4. verbs/adverbs/ conjunction. Reading Comprehension (Advance Level) Vocabulary.

### **References**

1. *Agarwal, R. S. A Modern Approach to Verbal & Non Verbal Reasoning. S.Chand. 2000*
2. Sijwali, B. S and Indu Sijwali. Analytical and Logical reasoning, Arihant Publications, 2014.
3. Guha A, Quantitative Aptitude by Competitive Examinations, 7th Edition, Mcgraw Hill Education Publication, 2020
4. Rajgotra, A. & Pradhan P. Wileys Exam Xpert A simpler Approach to Logical Reasoning, Willey Publications, 2020

