

Department of Food Science and Nutrition (UG)
Programme Specific Outcomes (PSOs)

On the successful completion of the Undergraduate programme, the students will be able to

PSO1 Disciplinary Knowledge	apply the knowledge of biological sciences as a basis for understanding the role of food and nutrients in health and diseases.
PSO2 Communication Skills	communicate effectively on nutritional and health burdens with society at large, by being able to comprehend, write effective reports and design documentations.
PSO3 Problem Solving	categorise the prevalent demands for Food Science related issues in the contemporary society and formulate new methods to fulfill them with the best possible service for human upliftment.
PSO4 Analytical Reasoning	evaluate the practices in cookery, diet planning, diet counselling, food analysis, food preservation, food safety and quality control through outreach programmes.
PSO5 Research Skills	plan, carry out, and communicate the findings of investigations; establish connections between scientific advances in the lab and society.
PSO6 Digital Literacy	upgrade their learning skills through ICT and AI to meet the challenges in competitive examinations and grab more career opportunities.
PSO7 Leadership and Teamwork	maintain a harmonious interpersonal relationship as member or leader in team works and their wholesome personality, to attain a goal.
PSO8 Moral and Ethical Awareness/ Reasoning	practice the inculcated moral values and ethics for promoting sound health and holistic living by considering about environmental issues.
PSO9 Multicultural Competence	synergize a new generation with professional competence to face the challenges of the modern foods and to alleviate nutritional problems
PSO10 Self-directed & Lifelong Learning	recognize the need for, and have the preparation and ability to engage in independent and life-long learning in the broadest context of health care management.

Department of Food Science and Nutrition (UG)
Learning Outcomes-Based Curriculum Framework (LOCF)
(w.e.f 2024-2025)

Sem	Part	Course Code	Course Title	Hours/ Wk.	Cred its	Marks
1	I	24XXXNNNN	Tamil / Hindi / French	3	2	30
1	II	24XXXNNNN	English	3	2	30
1	III CC	24FSN1501	Food Science	5	5	75
1	III CC	24FSN1301	Basic Cookery Practical	3	3	45
1	III CC	24FSN1503	Human Physiology (TeL)	5	5	75
1	III S	24XXXNNNN	Offered by Chemistry	5	4	60
1	IV NME	24XXXNNNN	<i>Non Major Elective – I</i>	3	2	30
1	IV AEC	24FSN1200	Environmental Studies	3	2	30
1	V	24XXXNNNN	NSS/NCC/PED/SLP/GMP/ GNS/LIB/ACH	-	-	-
Total				30	25	375
2	I	24XXXNNNN	Tamil / Hindi / French	3	2	30
2	II	24XXXNNNN	English	3	2	30
2	III CC	24FSN1502	Human Nutrition	5	5	75
2	III CC	24FSN1302	Nutrition Practical	3	3	45
2	III CC	24FSN1504	Basics of Food Microbiology (TeL)	5	5	75
2	III S	24XXXNNNN	Offered by Chemistry	5	4	60
2	IV NME	24XXXNNNN	<i>Non Major Elective – II</i>	3	2	30
2	IV AEC	24HVS/ CHR1200	Human Values Development/ Christian Studies	3	2	30
2	V	24XXXNNNN	NSS/NCC/PED/SLP/GMP/ GNS/LIB/ACH	-	1	15
Total				30	25+1	375+15
3	I	24XXXNNNN	Tamil / Hindi / French	3	2	30
3	II	24XXXNNNN	English	3	2	30
3	III CC	24FSN2401	Nutrition through the lifecycle	4	4	60
3	III CC	24FSN2403	Human Development	4	4	60
3	III CC	24FSN2405	Nutritional Biochemistry (TeL)	4	4	60

Sem	Part	Course Code	Course Title	Hours/ Wk.	Cred its	Marks
3	III CC	24FSN2407	Food Safety and Quality control	4	4	60
3	III S	24XXXNNNN	Offered by Physical Education	5	4	60
3	IV SEC	24XXXNNNN	<i>Skill Enhancement Course-I</i>	3	2	30
3	V	24XXXNNNN	NSS/NCC/PED/SLP/GMP/ GNS/LIB/ACH	-	-	-
Total				30	26	390
4	I	24XXXNNNN	Tamil / Hindi / French	3	2	30
4	II	24XXXNNNN	English	3	2	30
4	III CC	24FSN2402	Public Health Nutrition	4	4	60
4	III CC	24FSN2404	Foundations of Entrepreneurship	4	4	60
4	III CC	24FSN2406	Quantity Food Production and Service (TcL)	4	4	60
4	III CC	24FSN2408	Food Service Management	4	4	60
4	III S	24FSN2410	Food Product Development	5	4	60
4	IV SEC	24XXXNNNN	<i>Skill Enhancement Course – II</i>	3	2	30
4	V	24XXXNNNN	NSS/NCC/PED/SLP/GMP/ GNS/LIB/ACH	-	1	15
Total				30	26+1	390+15
5	III CC	24FSN3601	Dietetics	6	6	90
5	III CC	24FSN3603	Dietetics Practical	6	6	90
5	III CC	24FSN3605	Functional foods for Chronic Disease	6	6	90
5	III DSE	24XXXNNNN	<i>Discipline Specific Elective - I</i>	5	4	60
5	III GE	24XXXNNNN	<i>Generic Elective – I</i>	4	3	45
5	IV IS	24FSN3255	Internship*	-	2	30
5	IV SEC	24XXXNNNN	Skill Enhancement Course - III	3	2	30
Total				30	29	435
6	III CC	24FSN3602	Clinical Nutrition (TcL)	6	6	90

Sem	Part	Course Code	Course Title	Hours/ Wk.	Cred its	Marks
6	III CC	24FSN3604	Food Preservation (TcL)	6	6	90
6	III CC	24FSN3606	Project	6	6	90
6	III DSE	24XXXNNNN	<i>Discipline Specific Elective – II</i>	5	4	60
6	III GE	24XXXNNNN	<i>Generic Elective – II</i>	4	3	45
6	IV SEC	24FSN3266	Professional Competency Skill	3	2	30
6	V	24XXXNNNN	NCC**	-	1**	-
Total				30	27	405
Grand Total				180	158+ 2	2370+30

* Internship - Second Year Vacation (30 Hrs.)

** Extra Credit – Only for NCC Students

Part III**Discipline Specific Elective (DSE)**

Sem	Part	Course Code	Course Title	Hours/ Wk.	Credits	Marks
5	III	24FSN3401	Fundamentals of Research in Nutritional Sciences	5	4	60
5	III	24FSN3403	Nutrition Education and Communication	5	4	60
6	III	24FSN3402	Principles of Resource Management	5	4	60
6	III	24FSN3404	Interior Decoration	5	4	60

Supportive (offered to Department of Physical Education)

Sem	Part	Course Code	Course Title	Hours/ Wk.	Credits	Marks
3	III	24FSN2409	Nutrition for Special condition	5	4	60

Generic Elective (GE)

Sem	Part	Course Code	Course Title	Hours/ Wk.	Credits	Marks
5	III	24FSN3301	Nutritional Assessment and Diet Counselling	4	3	45
5	III	24FSN3303	Women Health and Wellness	4	3	45
6	III	24FSN3302	Consumer Education	4	3	45
6	III	24FSN3304	Life skills Strategies and Techniques.	4	3	45

Part IV**Non-Major Electives (NME)**

Sem	Part	Course Code	Course Title	Hours / Wk.	Credits	Marks
1	IV	24FSN1201	Baking and confectionery	3	2	30
1	IV	24FSN1202	Pre School and Creche Management	3	2	30

Skill Enhancement Courses (SEC)

Sem	Part	Course Code	Course Title	Hours/ Wk.	Credits	Marks
3	IV	24FSN2201	Family Dynamics	3	2	30
4	IV	24FSN2202	Fundamentals of Art and Design	3	2	30
5	IV	24FSN3201	Computer Applications in Home Science	3	2	30

Mapping with POs

FSN	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10
	3	3	3	2	2	2	2	2	2	2

Mapping of Courses with PSOs

Courses	PSO1	PSO2	PSO3	PSO4	PSO5	PSO6	PSO7	PSO8	PSO9	PSO10
24FSN1501	3	3	3	2	2	1	2	2	2	2
24FSN1301	3	3	3	2	2	3	2	2	2	1
24FSN1503	3	3	2	1	1	2	1	2	2	1
24FSN1502	3	2	2	1	2	2	3	2	1	2
24FSN1302	3	1	3	3	2	2	3	2	2	3
24FSN1504	3	3	3	2	2	1	2	1	2	1
24FSN2401	2	2	2	2	1	2	1	2	2	1
24FSN2403	3	2	2	1	2	2	2	2	2	1
24FSN2405	3	2	3	2	2	1	2	2	2	1
24FSN2407	3	2	2	2	2	2	3	1	2	3
24FSN2402	3	3	3	1	2	2	2	2	2	2
24FSN2404	3	3	2	1	1	2	2	1	1	1
24FSN2406	3	3	2	1	1	1	1	1	2	2
24FSN2408	2	2	2	1	2	2	1	1	2	2
24FSN3601	3	2	2	2	2	2	3	1	2	3
24FSN3603	3	2	3	2	2	2	2	2	1	3
24FSN3605	3	3	3	2	2	2	1	2	2	2
24FSN3401/ 24FSN3403	3	2	2	3	2	2	2	2	2	3
24FSN 3255	3	3	3	3	3	3	3	1	3	3
24FSN3602	3	2	2	2	2	2	1	1	2	1
24FSN3604	3	3	3	1	1	1	1	1	1	1
24FSN 3606	3	3	3	3	3	3	3	3	3	3
24FSN3402/ 24FSN3404	3	3	3	2	1	1	2	1	1	1
24FSN3266	3	3	3	3	3	3	3	3	3	3
Average	2.9	2.5	2.5	1.8	1.8	1.9	2	1.6	1.9	1.9

Mapping of Courses with Pos

Courses	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10
24FSN1201	3	3	3	1	1	2	1	2	1	1
24FSN1202	3	2	1	1	2	2	2	2	2	1
24FSN2201	3	2	3	2	1	1	2	1	1	1
24FSN2202	3	3	3	2	1	1	2	1	1	1
24FSN3201	3	3	3	3	2	1	2	1	1	1
24FSN3301	3	2	3	2	1	2	1	2	2	1
24FSN3302	3	2	2	2	1	1	1	2	1	1
24FSN3303	3	2	2	2	1	2	1	2	1	2
24FSN3304	3	3	3	2	1	1	2	1	1	1
Average	3	2.4	2.5	1.8	1.2	1.4	1.5	1.5	1.2	1.1

Course Code	Name of the Course	Category	Hours/Wk.	Credits
24FSN1501	Food Science	Core	5	5

This is a foundational course for students to obtain knowledge on different food groups and their nutritive value, this course helps to understand the scientific principles underlying in food preparation and it also develops skills and techniques in food preparation with conservation of nutrients and palatability using cooking methods generally employed.

Course Outcomes:

At the end of the course, students will be able to

CO1: identify foods based on food groups and list their uses.

CO2: describe the classification, nutritive value, storage and preservation of foods

CO3: explain changes in food due to cooking, processing, and factors that affect palatability, acceptability and nutritive value.

CO4: compare different methods of cooking and select the methods best suited for cooking different Foods.

CO5: justify the selection, processing, storage and cooking methods to preserve the nutritive values of various foods and make them safe and acceptable.

Unit I:

15 Hours

Nutrient content of foods and Cooking Methods: Classification of foods according to nutrient content. Food groups for balanced diets. Study of the different cooking methods- dry heat, moist and combination methods, solar cooking, microwave cooking-merits and demerits, dishes prepared by these methods.

Unit II:

15 Hours

Cereals, Millets, Pulses, Legumes and Nuts: Cereals and Millets - Classification of Cereals, Structure, nutrient composition, storage, processing, milling, parboiling, scientific methods of preparation and cooking, acceptability and palatability of rice, wheat, maize and millets Cooking of starches -Dextrinization and gelatinization, retrogradation and resistant starch. Pulses and legumes – Types, nutritive value, methods of cooking, the effect of soaking and germination, a judicious combination of cereals and pulses-complementary effect, soybeans, fava beans and Kesaridhal -methods to inactivate/ remove toxins; storage. Nuts - types, composition, market forms, roasting, steaming of nuts, nuts butter; uses in sweets, baking, and confectionery; Storage. Oilseeds -types, methods of processing, uses, and shelf life.

Unit III:

15 Hours

Vegetables and Fruits: Vegetables - Classification, nutritive value, effect of cooking on color, texture, flavor, appearance and nutritive value, Purchase – storage and preservation. Fruits - Classification, nutritive value, changes during ripening, enzymatic browning, uses, preservation.

Unit IV:

15 Hours

Flesh foods, Eggs and Milk: Meats – structure, nutritive value, selection of meat,

postmortem changes in meat, ageing, factors affecting tenderness of the meat, methods of cooking and storage. Poultry- types, nutritive value, selection, and cooking. Fish- classification, nutritive value, selection, storage, cooking and preservation. Eggs - Structure, nutritive value, methods of cooking, storage, preservation and uses in cookery; foam formation and factors affecting foam formation. Milk and milk products - Nutritive value, kinds of milk, pasteurization, and homogenization, coagulation of milk, fermentation of milk; milk products- whole and skimmed milk, milk powders and yogurt, ghee, butter, cheese. Storage and preservation.

Unit V:

15 Hours

Fats and oils, sugars, beverages food adjuncts and Food adulteration: Fats and oils - Types, sources-animal fats and vegetable fats, functions, processing- the difference between cold pressed and regular cooking oils, hydrogenated fat, emulsification, rancidity, smoking point. Factors affecting absorption of oils while frying foods, harmful effects of reheated oils. Sugars -Types and market forms of sugars stages of sugar cookery, crystallization, factors affecting crystallization, and uses in confectionery. Beverages- Classification - fruit-based beverages; milk-based beverages nutritive. Value and uses, alcoholic beverages, coffee, tea and cocoa, malted Beverages. Food adjuncts-Spices and condiments: classification, source use in food preparation. Food adulteration -Definition, common adulterants in food

Learning Resources:

Text Books

1. Srilakshmi B (2019) Food Science (7thEd.) New Age International Publishers, New Delhi

References

1. Manay,S.and Shadaksharaswamy,M.(1987) Foods Facts and Principles. New Age International Publishers, New Delhi.
2. Peckham,G.C.and Freeland-Graves,J.H.(1979) Foundations of Food Preparation, 4thedition, Macmillan Publishing Co .Inc.,New York.
3. Shewfelt R.L.(2015) Introducing Food Science. CRCPress, Taylor and Francis Group.Boca Raton
4. Thangam E.Philip, Modern Cookery for Teaching and theTradeVolume-1&2 (6th Revised Edition), Orient Black
5. Vaclavik,V.A.and Elizabeth,W.C. (2013) Essentials of Food Science.2nded.Springer Publication, NewDelhi

Websites/ e-Learning Resources

1. <https://ia801408.us.archive.org/20/items/textbookoffoodsc0000khad/textbookoffoodsc0000khad.pdf>
2. <https://egyankosh.ac.in/handle/123456789/32947><https://unacademy.com/content/kerala-psc/study-material/basic-food-science/>

CO-PSO Mapping Table

CO/ PSO	POS1	PSO2	PSO3	PSO4	PSO5	PSO6	PSO7	PSO8	PSO9	PSO 10
CO1	3	3	3	2	2	1	2	2	2	2
CO2	2	3	3	2	2	1	2	3	2	2
CO3	3	3	3	2	2	1	2	3	2	3
CO4	3	2	3	3	2	1	2	2	2	3
CO5	3	3	3	2	2	1	2	2	2	2
Average	2.8	2.8	3	2.2	2	1	2	2.4	2	2.4

Strong – 3**Medium – 2****Low**

Course Code	Name of the Course	Category	Hours/ Wk.	Credits
24FSN1301	Basic Cookery Practical	Core	3	3

Course Outcomes:

At the end of the course, students will be able to

CO1: identify appropriate methods for weighing dry and wet food ingredients and for cooking different Foods.

CO2: select suitable methods for cooking cereals, pulses, vegetables, meat, fish, and poultry.

CO3: apply the principles of cookery, cooking techniques, and suitable ingredients in preparing dishes.

CO4: explain the reasons behind the changes that occur during food preparation.

CO5: justify the best preparation and cooking methods for the acceptability and retention of nutrients in different dishes

Unit I:**9 Hours**

Introduction to Basic Cooking Skills: Introduction to different cooking methods, cooking terminology; equipment and techniques used for pre-preparation, and different cooking methods. Methods of measuring and weighing liquids and dry ingredients. The use and care of simple kitchen equipment. Introduction to food safety, sanitation, and hygiene in the kitchen, Safe practices in handling knives, sharp instruments, and materials at high temperatures.

Unit II:**9 Hours**

Cereals, Millets and pulses: Cereals and Millets - Methods of combining fine and course cereal with Liquid (e.g.Ragi porridge, ravaupma). Method of cooking cereals and factors influencing texture and nutritive value- cooking rice by boiling and straining, absorption method, steaming, pressure cooking, microwave cooking; Gelatinization and dextrinization. Preparation of recipes using rice-puttu, dosai, idli/idiyappam, lemon rice, curd rice, coconut rice, fried rice, tamarind rice, tomato rice, and mint pulao. Wheat and Millet preparations such as Kesari, Phulka, poori, paratha, naan, ragi adai, samai curdrice, thinai uppuma. Pulses - Factors influencing texture, digestibility, and nutritive value of whole gram/legumes and pulses -soaking, the addition of soda bicarbonate, the addition of salt, water quality- hard and soft water, pressure cooking, boiling, and straining. Pulse preparations- Sundal, sambhar, sprouted green gram patchadi, Vadai, pongal, ompodi, green gram payasam, masala vadai, medhu vadai.

Unit III:**9 Hours**

Vegetables and Fruits: Vegetables - Basic cuts of vegetables-Slice and mince (onions) Shred (cabbage, spinach), dice (carrot), chop (tomato), grating (beetroot), and their uses in dishes. Changes in color and texture of vegetables and nutritive value due to different methods of cooking, cooking medium, and addition of acid/alkali. Vegetable preparations – Poriyal, Aloo methi curry, vegetable cutlet, thoran, vegetable kurma, avail, keerai meal, vegetable salad, vegetable soup, vegetable sandwich, kootu, mint chutney and carrot halwa. Fruits - Enzymatic browning in fruits and methods to prevent it. Fruit preparations- stewed apple, banana

fritters, fruits salad, fruit punch, fruit yoghurt, and fruit smoothie, preserve/jam.

Unit IV:

9 Hours

Eggs, milk and milk products, meat and fish: Egg Cookery - Boiling of eggs-hard- and soft-boiled eggs. The best method of boiling eggs. Prevention of Ferrous sulfide formation on the yolk. Poaching and frying. Coagulation of egg protein-stirred and baked custard. Egg preparations - egg curry, omelet, French toast, caramel custard (steamed), scrambled eggs and fried eggs- a few Factors affecting the whipping quality of egg white – effect of salt, sugar, vinegar, fat and milk, type of container used and beaters, Stages of foam formation in whipped egg whites and their uses in cookery. Milk and milk products - Curdling of milk using lime juice, butter milk, tomato juice, Milk preparations Cream of tomato soup, paneer masala, payasam, patchadi, thayirvadai, morkulumbu, basundhi, lassi, spiced buttermilk and baked macaroni and cheese. Meat and Fish- Methods of tenderizing meat-Pounding, mincing addition of acids like curd/lime juice in marinade, the addition of proteolytic enzymes-raw papaya Effect of different methods of cooking on flavour, texture, and appearance of meat and fish. Meat preparations - mutton ball curry, mutton vindaloo, mutton keema, liver fry, chicken springroll, chicken sweet corn soup, chicken biriyani. Seafood preparations – fish fry, fish moilee, fish cutlet, sweet and sour prawns.

Unit V:

9 Hours

Sugar cookery, Fats and oils food additives and raising agents: Sugar Cookery – Stages of sugar cookery and uses. Preparations of sweets using different stages of sugar cookery. Fats and oils - Effect of temperature of oil on texture and palatability of foods – Frying pooris at different temperatures. Smoking point of oil – bread cube test. Emulsions - definition, Preparation of mayonnaise. Food additives and Raising agents - Role of MSG, sodium benzoate and KMS in food preparation and preservation. Natural versus synthetic preservatives, -Advantages and limitations Use of baking soda, baking powder, yeast in baking and food preparation- Prepare one dish with each of these uses of herbs and spices to enhance flavor.

Learning Resources:

References

1. Martland, R.E. and Welsby, D.A. (1980) Basic Cookery, Fundamental Recipes and Variations. William Heinemann Ltd., London.
2. Krishna Arora (2008) Theory of cookery, Frank Brothers & Co.,
3. Negi J (2013) Fundamentals of Culinary Art, S. Chand and Co.
4. Peckham, G. C. and Freeland -Graves, J. H.(1987) Foundation of food preparation. 4th ed. Mac millan Publishing co, New York
5. Penfield M Pand Ada Marie C (2012), Experimental Food Science, Academic Press,,San Diego

Websites/ e-Learning Resources

1. https://www.ihmnotes.in/assets/Docs/Books/Theory_of_Cookery.pdf
2. <http://staffnew.uny.ac.id/upload/132318572/pendidikan/buku-esp.pdf>

CO-PSO Mapping Table

CO/ PSO	PSO1	PSO2	PSO3	PSO4	PSO5	PSO6	PSO7	PSO8	PSO9	PSO 10
CO1	2	3	3	2	3	3	2	2	2	1
CO2	3	3	3	2	1	3	2	2	2	1
CO3	3	3	3	2	2	2	2	2	2	1
CO4	3	3	3	2	2	3	2	2	2	1
CO5	3	3	3	1	2	3	1	2	2	1
Average	2.8	3	3	1.8	2	2.8	1.8	2	2	1

Strong – 3**Medium – 2****Low – 1**

Course Code	Name of the Course	Category	Hours/ Wk.	Credits
24FSN1503	Human Physiology (TcL)	Core	5 (3+2)	5

Students can learn the fundamentals of human anatomy and physiology in this course. Discover how systems, tissues, organs, and cells work together. Utilize the dietetics and nutrition principles based on a solid comprehension of human physiology.

Course Outcomes:

At the end of the course, students will be able to

CO1: describe the structure and functions of a cell, various tissues, primary organs and systems in the body.

CO2: evaluate the role of the nervous and endocrine system in regulating the activities of other systems.

CO3: explain the gross morphology, structure and functions of various organs of human body

CO4: describe the anatomy and functions of heart and respiratory system in the human body

CO5: identify and label the parts of primary physiological systems in the body such as endocrine and reproductive systems.

Unit I: 15 Hours

Cell and Tissues - Structure of Cell and functions of different organelles. Classification, structure and functions of tissues. Blood- Constituents of blood- RBC, WBC & Platelets and its functions. Erythropoiesis, Blood clotting, Blood groups and histocompatibility. Immune system- Antigen, Antibody, Cellular and Humoral Immunity

Unit II: 15 Hours

Nervous system - General anatomy of nervous system, functions of the different parts. Sense organs - Structure and functions of Eye, Ear, Skin. Physiology of Taste and Smell.

Unit III: 15 Hours

Heart and Circulation - Anatomy of the heart and blood vessels, properties of cardiac muscle, origin and conduction of heartbeat, cardiac cycle, cardiac output, blood pressure - definition and factors affecting blood pressure, and description of ECG. Respiratory system - Anatomy and physiology of respiratory organs. Gaseous exchange in the lungs and tissues, Mechanism of respiration.

Unit IV: 15 Hours

Digestive system - Anatomy of Gastro-intestinal tract, Structure and functions of Liver and Pancreas. Digestion and absorption of carbohydrates, proteins and fats. Excretory system - Structure of kidney, functions of Nephron.

Unit V: 15 Hours

Endocrine system - Functions of hormones secreted by Pancreas, Pituitary gland, thyroid, parathyroid and adrenal glands. Effects of hypo and hypersecretion of these

glands. Reproductive system - Anatomy of male and female reproductive organs, Ovarian and Uterine cycle, influence of hormones on pregnancy and lactation.

Laboratory Exercise:

1. Microscopic study of different tissues: epithelial, connective, muscular and nervous tissue Blood Experiments- Blood Smear, Blood Count and Blood Grouping
2. Study of the Structure of Brain using model/ specimen and structure of Eye and Ear using models/charts
3. Recording of Blood Pressure, Study of the structure of Heart Lung using specimen, model/charts/ videos
4. Study of the Structure of Liver, Pancreas, Stomach using model /charts/specimen/ videos
5. Microscopic study of tissues of the Pituitary, Thyroid, Ovary and Testis Study of the structure of the male and female reproductive organs using models/charts/videos

Learning Resources:

Text Book

1. Sampath, T. K. and Uma Maheshwari, B. (2017). Human Anatomy and Physiology, 11th Edition, Mumbai: Birla Publications.

References

1. Beck, W.S. (1971) Human Design. Harcourt Brace Jovanovich Inc., New York.
2. Best, C. H. and Taylor, N. B. (1980) Living Body. 4th ed. BIP, Bombay.
3. Creager, J. G. (1992) Human Anatomy and Physiology. 2nd ed. WMC Brown Publishers, England.
4. Guyton, A.C. (1979) Physiology of the Human Body. 5th ed. Saunders College of Publishing, Philadelphia.
5. Subramaniam, S. and Madhavan Kutty, K. (1971) The Text Book of Physiology. OrientLongman Ltd., Madras.
6. Tortora G. J. Anagnostakos N.P. (1984) Principles of Anatomy and Physiology, 4th edition, Harper and Row Publishers, New York.
7. Waugh A and Grant A. (2012) Ross and Wilson Anatomy and Physiology in Health and Illness. 11th ed. Churchill and Livingstone, Elsevier
8. Wilson, K. J. W. (1987) Anatomy and Physiology in Health and Illness. 6th Ed. ELBS, Churchill Livingstone, London.

e-Websites/ e-Learning Resources

1. <http://epgp.inflibnet.ac.in/Home/Download>

CO-PSO Mapping Table

	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5	PSO 6	PSO 7	PSO 8	PSO 9	PSO 10
CO1	3	3	2	1	2	2	2	2	2	1
CO2	3	3	2	2	1	2	2	1	2	1
CO3	3	3	2	2	2	2	2	1	2	1
CO4	3	3	2	2	1	2	1	2	2	1
CO5	3	2	2	1	2	2	1	2	2	1
Average	3	2.8	2	1.6	1.6	2	1.6	1.6	2	1

Strong – 3

Medium – 2

Low – 1

Course Code	Name of the Course	Category	Hours/ Wk.	Credits
24FSN1201	Baking and Confectionery	NME	3	2

The course helps the students to gain insight into the planning and operation of bakery unit, familiarize with the equipment and tools used for baking, to understand the role of ingredients used in the making of bakery and confectionery products and acquire entrepreneurial skills in baking and confectionery with an emphasis on special dietary needs.

Course Outcomes:

At the end of the course, students will be able to

CO1: describe the principles and process of baking and confectionery

CO2: acquire knowledge on role of various ingredients used in baking and confectionery.

CO3: develop skills to design baked goods using alternative healthy ingredients to cater to special dietary needs.

CO4: identify and control faults in baking.

CO5: enhance entrepreneurial skills in bakery and confectionery to establish a bakery division.

Unit I:

9 Hours

An Overview of Bakery Industry - Current status and growth of bakery industry in India. Baking – principles, process. Layout and organization of a bakery unit. Equipment and tools used in baking and confectionery

Unit II:

9 Hours

Ingredients in Bakery and Confectionery - Ingredients - Flour, Sugar, Shortenings, Egg, Leavening agents-yeast, baking soda, baking powder, chocolates, cocoa powder. Other ingredients- salt, milk and milk derivatives, malt products, dough improver, oxidizing agents, flavours and colors, nuts, spices and condiments, preserved and candied fruit peels

Unit III:

9 Hours

Breads and Cakes - Bread - ingredients, types of breads, faults and its prevention. Cakes – ingredients, types of cakes, faults and remedies. Different types and techniques of cake decoration -icings and fillings. Modified baked products - high fiber, low / alternate sugar, low fat, gluten free, and millet-based bakery products for special nutritional requirements

Unit IV:

9 Hours

Pastries, Cookies and Biscuits: Pastries- types of pastries and preparation method- puff pastry, short crust, phyllo pastry, flaky pastry, choux pastry. Cookies & biscuits – ingredients, types, processing and preparation method

Unit V:

9 Hours

Confectionery and Marketing of Baked Products: Chocolates- production, types. Sugar based confectionery – fudge, fondant, sugar candies. Marketing and sales promotion- costing, packaging and labelling.

Learning Resources:**Text Books**

1. Yogambal Ashokkumar (2012) Theory of Bakery and Confectionary, PHI publication. New Delhi.

References

1. John Kingslee (2006) A Professional Text book to Bakery and confectionary. New Age International Pvt Limited Publisher, New Delhi.
2. Uttam K Singh (2011). Theory of Bakery and Confectionary – An Operational Approach. Kanishka Publishers and Distributors, New Delhi.
3. Nicoletto, I and Foote, R (2000). Complete Confectionary Techniques. Hodder and Solution, London.
4. Bakershand Book on practical Baking (2000) Published by U.S. Wheat Associates, New Delhi.
5. Dubey.S.C (2002) Basic Baking. 4th Edition. Published by the Society of Indian Bakers, New Delhi.
6. Sarah R. Lebensky, Pricilla et al., (2004) Textbook of Baking and Pastry Fundamentals, third edition, Pearson Education Ltd.
7. The Culinary Institute of America, Baking & Pastry: Mastering the Art and Craft, John Wiley & Sons, Inc New Jersey.2009.

Websites/ e-Learning Resources

1. <https://www.youtube.com/watch?v=dfvklBBO2g>
2. <https://www.lifestyleasia.com/ind/food-drink/dining/bookmark-the-best-baking-youtube-channels-to-bake-like-a-pro/>
3. www.bakels.in

CO-PSO Mapping Table

	PSO 1	PSO 2	PSO 3	PSO4	PSO5	PSO6	PSO 7	PSO 8	PSO9	PSO1 0
CO1	3	3	1	1	1	2	1	2	1	1
CO2	3	3	3	3	1	2	1	2	1	1
CO3	3	3	3	1	1	2	2	2	2	1
CO4	3	3	3	1	1	2	2	2	1	1
CO5	3	3	3	2	1	2	2	2	1	1
Average	3	3	2.6	1.6	1	2	1.6	2	1.2	1

Strong – 3**Medium – 2****Low – 1**

Course Code	Name of the Course	Category	Hours/Wk.	Credits
24FSN1200	Environmental Studies	AEC	4	2

This course is designed to introduce students the importance, scope and problems in environment. It focuses on the natural resources, energy flow and types of ecosystems. Values of biodiversity, hotspots, endangered species and conservation are emphasized. It also highlights the social issues and population explosion in the environment

Course Outcomes:

At the end of the course, students will be able to

CO1: Outline the values of renewable and non-renewable resources

CO2: Evaluate the concept, functions and types of ecosystems

CO3: Discuss the values of biodiversity and importance of conservation

CO4: Compare different types of pollution and assess the various waste management strategies

CO5: Critique the importance of sustainable development, climate change and population explosion.

Unit I:

12 Hours

Natural Resources: Ecology – Scope – Importance- Components –Awareness – Renewable resources – Forest, Water, Mineral, Food, Land and Energy resources – Renewable and Non-renewable energy – Conservation.

Unit II:

12 Hours

Introduction to Environmental Science and Food Systems: Nutrition ecology-principles of nutrition ecology and potential impact of climate change on food Science-Concept impact of climate change on Food Science - Potential Role of climate change dietary changes in mitigating climate changes.

Unit III:

12 Hours

Ecosystems: Concepts – Structure and Function – Food chain & Web and Ecological pyramids – Energy flow in the ecosystem – Ecological niche – Ecological succession. Types of ecosystems - Forest, Grassland, Desert and aquatic ecosystems

Unit IV:

12 Hours

Biodiversity: Introduction – Levels – Values of biodiversity – Global, National and local biodiversity – Hotspots – Major threats – Endangered species. Conservation of biodiversity – In situ and Ex situ conservation.

Unit V:

12 Hours

Environmental pollution: Definition – Source, Types, Effects and Control measures of Air, Water, Soil, Marine, Noise, Thermal pollution – Nuclear hazards – Solid waste management – Disaster management.

Learning Resources:

Textbook:

1. Kaushik A and C.P.Kaushik (2014), Perspectives in Environmental Studies, 4th multicolour edition, New Age International (P) Limited Publishers.

References:

1. Bharucha E (2013), Textbook of Environmental studies for Undergraduate courses, 2nd edition, Universities press (India) Private.Ltd.
2. Thatheyus A.J (2011) Textbook of Environmental Studies, Narosa Publishing House, New Delhi.

Websites/ e-Learning Resources:

1. [Environmental Science - Course \(nptel.ac.in\)](http://nptel.ac.in)
2. [Introduction to Environmental Science - 2nd Edition - Open Textbook Library \(umn.edu\)](http://um.edu)

CO-PSO Mapping Table

POS COS	PSO1	PSO2	PSO3	PSO4	PSO5	PSO6	PSO7	PSO8	PSO9	PSO10
CO1	2	2	2	2	1	2	2	2	1	1
CO2	2	3	2	3	1	2	-	2	2	1
CO3	2	2	2	3	1	2	2	2	2	1
CO4	2	2	2	3	1	2	2	1	2	1
CO5	2	2	2	2	1	2	2	1	1	1
Average	2	2.2	2	2.6	1	2	2	1.6	1.6	1

Strong – 3**Medium – 2****Low – 1**

Course Code	Name of the Course	Category	Hours/ Wk.	Credits
24FSN1502	Human Nutrition	Core	5	5

Human Nutrition is the science of nutrition and its interactions with human health. This subject deals with the various nutrients present in food, its sources, functions, and characteristics and their role in the maintenance of optimum human health.

Course Outcomes:

At the end of the course, students will be able to

- CO1:** define the basic concepts of nutrition science, and select the appropriate methods to assess the nutritional status of individuals.
- CO2:** describe the functions, classifications, metabolism, sources, deficiency diseases and quality aspects of carbohydrates and proteins.
- CO3:** interpret the functions, classifications, metabolism, sources, deficiency diseases of lipids and energy and its determination methods.
- CO4:** illustrate the functions requirements, deficiency diseases and toxicity of water and fat-soluble vitamins.
- CO5:** explain the functions, requirements and role of macro & micro minerals and water in health and disease.

Unit I:

15 Hours

Introduction to Nutrition: History of Nutrition – Development of Nutrition as a Science. Food as a source of nutrients, definition of nutrients, Balanced diets and dietary guidelines -current concepts. Signs and symptoms of adequate, optimum and good nutrition, malnutrition (Undernutrition, and over nutrition). Assessment of Nutritional status - Anthropometric, Biochemical, Clinical and Dietary aspects.

Unit II:

15 Hours

Carbohydrates & Proteins: Carbohydrates - Classification, Food Sources, Requirements and Functions of carbohydrates in the body. Review of digestion, absorption and metabolism. Physiological significance of Mono-saccharides, Disaccharides and Polysaccharides Glycaemic Index, Glycaemic load of Foods, and factors affecting it, Hormonal control of blood sugar. Role of fibre in the prevention of non-communicable diseases. Proteins - Amino acids- Indispensable and dispensable amino acids. Classification, Sources, Requirements and functions of protein. Mutual supplementation of proteins. Protein deficiency - Protein Energy Malnutrition-Kwashiorkor and Marasmus – aetiology, clinical features, treatment and prevention. Evaluation of protein quality- PER, BV, NPU and NPR, chemical score. Protein Supplements and Novel Protein sources- Benefits and Health concerns.

Unit III:

15 Hours

Lipids& Energy: Lipids - Classification, Sources, Requirements and functions, Essential fatty acids- deficiency, food sources and functions, Healthy and Unhealthy Fats in the diets, Dietary lipids and relation to cardiovascular diseases. Energy – Determination of the energy value of foods using a Bomb calorimeter, Physiological

value of foods, and the relation between oxygen used and calorific value. Direct and Indirect calorimetry direct calorimetry, Respiratory quotient Components of Energy expenditure -Basal metabolism, factors affecting BMR, food-related thermogenesis, Physical activity Energy requirements for different age groups, and various types of activities.

Unit IV:

15 Hours

Vitamins: Fat Soluble Vitamins – Food sources, Requirements, Functions, Effects of deficiency or Toxicity (wherever applicable). Water Soluble Vitamins – Food sources, Requirements, Functions, Effects of deficiency. Antioxidant role of certain Vitamins in Health Promotion.

Unit V:

15 Hours

Minerals & Water: Macro minerals - Calcium, phosphorus, Magnesium, Potassium, Sodium and Chloride- Distribution in the body, functions, food sources, requirements, effects of deficiency and toxicity. Micro/Trace minerals - Iron, Zinc, Iodine, Selenium, Manganese, Chromium, Fluoride and Copper Distribution in the body; functions, effects of deficiency, food sources and requirements, Role of Antioxidant minerals. Water - as a nutrient, functions, sources, and requirements. Distribution of water in the body, exchange of water in the body, composition of body fluids. Water balance, factors regulating it, dehydration, water intoxication

Learning Resources:

Text 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. Guthrie, H.A. (1989) Introductory Nutrition. 7th ed. Times Mirror / Mosby College Publishing, St. Louis
3. Insel P., Ross D., McMahon K., Bernstein M. (2016) Discovering Nutrition. 5th Ed., Jones & Bartlett Learning, Massachusetts, USA.
4. Mahan K and Sylvia E. Stump (2000) Krause's Food Nutrition and Diet Therapy, Saunders, USA
5. Medeiros D. M., and Wildman R. E. C. (2019) Advanced Human Nutrition. 4th Ed., Jones & Bartlett Learning, Massachusetts, USA.
6. Ross A. C., Caballero B., Cousins R. J., Tucker K. L., Ziegler T. R. (2014) Modern Nutrition in Health and Disease. 11th Ed., Wolters Kluwer | Lippincott Williams & Wilkins, Philadelphia, USA.
7. Sizer F. S. and Whitney E. (2014) Nutrition: Concepts & Controversies. 13th Ed., Wadsworth, Cengage Learning, USA.
8. Whitney, E.R. and Rolfes S.R. (1996) Understanding nutrition. 7th Ed., West Publishing Company, USA.

References

1. Parchuri, P., Besculides, M., Zhan, S., Cheng, F. Y., Timsina, P., Cheertirala, S. N., ... & Kia, A. (2024). Malnutrition risk assessment using a machine learning-based screening tool: A multicentre retrospective cohort. *Journal of Human Nutrition and Dietetics*.
2. Andhov, M., Mikulic, S., & Nielsen, L. R. (2024). 13 Transforming food systems. *Sustainable Food Procurement: Legal, Social and Organisational Challenges*, 203.

- Goswami, C., Pawase, P. A., Shams, R., Pandey, V. K., Tripathi, A., Rustagi, S., & Darshan, G. (2024). A Conceptual Review on Classification, Extraction, Bioactive Potential and Role of Phytochemicals in Human Health. *Future Foods*, 100313.

Websites/ e-Learning Resources

- <http://www.merck.com/mmhe/seciz/ch155/ch155a.html>
- <http://www.whereincity/medical/vitamins>

CO–PO/PSO Mapping Table

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10
CO1	3	3	1	2	2	2	3	1	2	2
CO2	3	3	2	2	2	2	3	2	2	3
CO3	3	2	2	2	2	2	2	2	2	2
CO4	3	1	2	1	2	2	3	1	1	2
CO5	3	3	2	1	2	1	3	2	1	3
Average	3	2.4	1.8	1.6	2	1.8	3	1.6	1.6	2.4

Strong – 3

Medium – 2

Low – 1

Course Code	Name of the Course	Category	Hours/ Wk.	Credits
24FSN1302	Nutrition Practical	Core	3	3

Nutritional (practical) provides the basic hands-on training to impart the analytical skills required for nutrition research. Further, it promotes the experiential learning of students on the evaluation of the nutritional status of humans and the nutritional composition of foods.

Course Outcomes:

At the end of the course, students will be able to

CO1: assess the nutritional status of an individual using anthropometric and dietary assessment methods

CO2: identify appropriate laboratory procedures suited for the estimation of select nutrients in food and body fluids

CO3: estimate select nutrients in food and metabolites in serum

CO4: compare the results with standard values and interpret the findings.

CO5: develop skills to assess the nutritional status of individuals and the community

Laboratory Exercises

45 Hours

1. Assessment of Nutritional status through Body composition parameters and circumference measurements.
2. Assessment of Nutritional Status through Clinical signs and Dietary Assessment.
3. Estimation of Vitamin C in fruits by Titrimetric method.
4. Determination of the Ash content of the foods.
5. Determination of Blood Glucose level using glucometer and colourimetry.
6. Estimation of Haemoglobin content in blood.
7. Determination of acid value of oil/fat.
8. Estimation of Protein content in the food by Kjeldahl method (demonstration)
9. Estimation of Calorific Value using Bomb Calorie meter (demonstration)
10. Determination of moisture content of the food.
11. Visit a Food analytical laboratory.

Learning Resources:

Text Books

1. Nielsen, S. S. (Ed.). (2003). *Food analysis laboratory manual* (p. 557). New York, NY, USA:: Kluwer Academic/Plenum Publishers.
2. Aurand, L. W. (Ed.). (2013). *Food composition and analysis*. Springer Science & Business Media.

References

1. Sauberlich, H. E., Dowdy, R. P., & Skala, J. H. (1973). Laboratory tests for the assessment of nutritional status. *CRC critical reviews in clinical laboratory sciences*, 4(3), 215-340.
2. Asaria, I., Blom, J., Morgan, J., Khaouli, M., Armstrong, D., & Pinto-Sanchez, M. (2024). A69 Expanded Role Of The Dietitian In The Clinical Management Of Patients With Celiac Disease. *Journal of the Canadian Association of Gastroenterology*, 7(Suppl 1), 46.

3. Hamaker, M. E., Oosterlaan, F., van Huis, L. H., Thielen, N., Vondeling, A., & van den Bos, F. (2021). Nutritional status and interventions for patients with cancer—a systematic review. *Journal of Geriatric Oncology*, 12(1), 6-21.

Websites/ e-Learning Resources

1. <https://iastate.pressbooks.pub/foodpreparationlab/>
2. <https://www.labster.com/course-packages/food-science-nutrition>

CO-PSO Mapping Table

POS COS	PSO1	PSO2	PSO3	PSO4	PSO5	PSO6	PSO7	PSO8	PSO9	PSO10
CO 1	3	2	3	3	3	2	3	1	2	3
CO 2	3	1	3	3	2	1	2	2	2	2
CO 3	3	1	3	3	3	2	3	2	2	3
CO 4	3	1	3	3	2	2	3	2	2	3
CO 5	3	1	3	3	3	1	3	2	2	3
Average	3	1.2	3	3	2.6	1.6	2.8	1.8	2	2.8

Strong – 3

Medium – 2

Low – 1

Course Code	Name of the Course	Category	Hours/ Wk.	Credits
24FSN1504	Basics of Food Microbiology (TcL)	Core	5 (3+2)	5

The paper deals with the characteristics of micro-organisms in food and environment, the role of microorganisms in food spoilage, health and illness, and the methods of controlling microorganisms.

Course Outcomes:

At the end of the course, students will be able to

CO1: gain the knowledge in history of Food Microbiology and characters of microorganisms

CO2: criticize the principle involved in the contamination and spoilage of different foods

CO3: identify and outline the process involved in Fermented food products and beverages

CO4: summarize Food poisoning - Food borne intoxications and Food borne infections

CO5: describe the importance of sterilization, and culturing of microbes

Unit I:

15 Hours

Introduction to Microbes in Foods - History and Development of Food Microbiology
Classification of microorganisms. General morphological characteristics of bacteria, yeast, algae, mold, virus. Characteristics of predominant microorganisms in food, sources of microorganisms in foods. Study of different equipment's in a microbiology lab. Safety practices in microbiology laboratory.

Unit II:

15 Hours

Microbial spoilage and contamination of common food - Factors affecting growth of microorganisms-intrinsic and extrinsic. Sources of contamination and spoilage of common foods -Cereal and cereal products, fruits and vegetables, egg, meat and fish, milk and milk products.

Unit III:

15 Hours

Beneficial uses of microorganisms in food and health: Microorganisms used in fermented products - Alcoholic drinks, Dairy products, Bread, Vinegar, Pickled foods. Single-cell protein, Food Bio-preservatives of microbial origin. Intestinal Bacteria and Probiotics.

Unit IV

15 Hours

Food poisoning and Food borne disease: Food poisoning/ intoxication and food infection -definition. Bacterial food poisoning – *Staphylococcus aureus*, *Clostridium botulinum*, *Clostridium perfringens*, *Bacillus cereus*. Food Infection - Salmonellosis, Shigellosis, Cholera, Gastroenteritis. Measures to prevent food poisoning and food borne infection.

Unit V

15 Hours

Microorganisms found in water, soil, air and sewage - List of microorganisms and diseases caused; Test for sanitary quality of water, Purification of water. Control of Microorganisms in food - Control of Access of Microorganisms: sanitation, sterilization

and disinfection Control by Heat (Thermal Processing), Low Temperature, Reduced Water Activity and Drying, Low pH and Organic Acids, Modified Atmosphere, Reducing O-R Potential) Antimicrobial Preservatives and Bacteriophages Irradiation, Novel Processing Technologies, Combination of Methods (Hurdle Concept)

Laboratory Exercises

1. Study of different equipment's in a microbiology lab.
2. Safety practices in microbiology laboratory.
3. Microscopy - principles, parts, function and operation.
4. Microscopic structure of algae, molds, yeast, virus and bacteria.
5. Examination of organism using simple staining technique.
6. Examination of organisms using gram staining technique.
7. Examination of motility of bacteria using hanging drop technique.
8. Demonstration of sterilization of glass ware using hot air oven autoclave.
9. Demonstration of media preparation- Broth, deep, slant and plates.
10. Demonstration of culture techniques-streak,pour plate.
11. Visit (atleast one) to food processing units or any other organization dealing with advanced methods in food microbiology

Learning Resources:

Text Books

1. William C .Frazier, Dennis C. Westhoff, N. M. Vanitha (2017) Food Microbiology, 5th Edition, Mc Graw Hill Education

References

1. Parija S C. (2012) Textbook of Microbiology and Immunology, 2nd edition, Elsevier India.
2. Garbutt J. (1997) Essentials of Food Microbiology, 2nd edition, Arnold publication, NewYork, 1997
3. Adams M. R, Moss M. O and Peter.M (2016). Food Microbiology. 4th edition. Royal Society of Chemistry, United Kingdom.
4. Jay J. M, Loessner M J and Golden D. A. (2005) Modern Food Microbiology. 7th edition, CBS Publishers and Distributors, New Delhi.
5. Ananthanarayan and Paniker.(2017). Textbook of Microbiology, Tenth Edition, Orient Longman Limited, Hyderabad.
6. Ramesh. V (2007). Food Microbiology, M J P publishers, Chennai.
7. Gerald McDonell. (2020).Block's Disinfection, Sterilization and Preservation. 6th edition. Lippincott Williams and Wilkins, Philadelphia.

Websites/ e-Learning Resources

1. [FoodMicrobiologyNotes-MicrobeNotes](#)
2. [IntroductiontoFoodMicrobiologyMicrobiology.pdf\(egyankosh.ac.in\)](#)
3. [dm-6:lesson1.introductiontofoodmicrobiology:part-i:bacteria\(iasri.res.in\)](#)

CO-PSO Mapping Table

POS/ COS	PSO1	PSO2	PSO3	PSO4	PSO5	PSO6	PSO7	PSO8	PSO9	PSO 10
CO1	3	3	3	2	1	1	2	1	2	2
CO2	3	3	3	2	2	1	2	1	2	2
CO3	3	3	3	2	2	1	2	1	2	1
CO4	3	3	3	2	2	1	2	1	2	2
CO5	3	3	3	2	2	1	2	1	2	1
Average	3	3	3	2	1.8	1	2	1	2	1.6

Strong – 3**Medium – 2****Low – 1**

Course Code	Name of the Course	Category	Hours/Wk.	Credits
24FSN1202	Pre-school and Creche Management	NME	3	2

The subject deals with the significance of managing the creche and preschool, to understand the elements involved in organization and management of creche and Preschool and to create awareness of functions of various authorities dealing with crèche and preschool.

Course Outcomes:

At the end of the course, students will be able to

CO1: discuss the key Concept and organization of Creche and Preschool

CO2: explain Resource Management for creche and preschools

CO3: describe the criteria for records and register maintenance

CO4: identify importance and Planning of Preschool Education Activities

CO5: introduction to Personnel Management required for creche and preschools

Unit I:

9 Hours

Concept and organization of Creche and Preschool - Crèche and preschool -Meaning, types of preschools, need, importance of organization, Elements of organization and administration. Difference between crèche and preschool, Preschool Programme -Principles of preschool programme, Framing of preschool curriculum – types of curriculum, planning activities for children, audio-visual aids for children and its importance, Activities for children: Audio-visual aid for children and its importance.

Unit II:

9 Hours

Resource Management - Location, site and building, Types of rooms, Storage facilities, arrangement of room (activity centers), ventilation, lighting and safety, Provision of safe drinking water and sanitary facilities, Playground and safety aspects – indoor and outdoor games, Play equipment – types, criteria for selection, Maintenance of building-store, furniture, equipment Suggestive Low-Cost Educational Material-Teaching Aids.

Unit III:

9 Hours

Records and registers - Need, importance and maintenance of records and registers. Types of records (Important records)–Admission, Progress, Financial, Equipment, Correspondence, Health - sickness of child and immunization. Types of register - Attendance (Staff, children), Accounts, Stock, Staff Profile, services for children and daily diary. Methods of maintaining record of children– Cumulative and Anecdotal.

Unit IV:

9 Hours

Developmental stages: Planning of Preschool Education Activities - Skills & qualities of preschool children -Introductory Games/ activities for Rapport Building with Children. Physical & Motor Development - Gross Motor & Fine Motor Skills - Essentials of Optimum Physical Development Activities/ Games for Gross and Fine Motor Skills. Cognitive Development - Essentials for Cognitive Development - Development of Basic Skills – Activities for Sensory Development, Mental Skills and Concept Development. Language Development – Essentials for Language Development Games/Exercises for Language Development- Activities for Language Development - Listening Skills, Reading Skills and Writing Skills. Development of Science Experience & Creative Expression - Areas of

Creative Expression Science Experience Activities. Social & Emotional Development - Essentials for Social & Emotional Development Activities and games for Social-Emotional Development Games for Socio-Emotional Development

Unit V:

9 Hours

Personnel Management - Role and qualities of teacher and care - taker and other staff involved in welfare and care of children, Teacher-child ratio, Need for and importance of in-service training

Learning Resources:

Text Books

1. Tiles ton, D.W. (2005). Training Manual for Every Teacher, Chennai: Sage.
2. Forces and IAPE, (2000). Pre-school curriculum, Activity-based developmentally appropriate curriculum for pre- schoolers. Chennai

References

1. Ax line, V.M. (1964). Dibs in search of self. New York: Ballent in eBooks 754
2. Clarke, P. (2001). Teaching & learning: the culture of pedagogy. New York: Sage
3. Thomson, C.L., Holmberg, M.C., Baer, D.M., Hodges, W. L., and Moore, S.G. (1978). An Experimental Analysis of Some Procedures to Teach Priming and Reinforcement Skills to Preschool Teachers. Monographs of the Society for Research in Child Development. 43 (4), pp 1-86.
4. Jaya, N., & Jayapoorani. N. (2004). Participation in a nursery school Laboratory manual for students. Coimbatore: Saradalaya.

Websites/ e-Learning Resources

1. https://ddceutkal.ac.in/Syllabus/MA_Education/Paper_19.pdf
2. https://wcd.nic.in/sites/default/files/national_ecce_curr_framework_final_03022014%20%282%29.pdf

CO-PSO Mapping Table

CO/PSO	PSO1	PSO2	PSO3	PSO4	PSO5	PSO6	PSO7	PSO8	PSO9	PSO10
CO1	3	3	1	1	2	2	2	2	2	1
CO2	3	2	1	1	1	2	2	2	2	1
CO3	3	3	1	1	2	2	2	2	2	1
CO4	3	2	1	1	2	2	2	2	2	1
CO5	3	2	1	1	2	2	1	2	2	1
Average	3	2.4	1	1	1.8	2	1.8	2	2	1

Strong – 3

Medium – 2

Low – 1

Course Code	Name of the Course	Category	Hours/Wk.	Credits
24FSN2401	Nutrition Through Lifecycle	Core	4	4

The subject deals with understanding the role of nutrition in the growth and development through the lifecycle, gaining in sight into the principles of effective meal planning and understanding the nutritional needs of various age groups.

Course Outcomes:

At the end of the course, students will be able to

CO1: remember and understand the basic concepts and Principles of Nutrition through life cycle

CO2: apply the knowledge to understanding the practical problems faced by people in different age groups

CO3: develop indigenous, value added and low-cost complementary feeds and also to identify nutrition-related concerns and deficiency disorders at every stage of life cycle

CO4: demonstrate skills to plan and prepare appropriate and sustainable diets for deficiency diseases

CO5: develop skills by gaining knowledge about nutritional and health concerns

Unit I:

12 Hours

Introduction to meal planning and Nutrition for adult: Introduction to meal planning - Balanced diet, food groups, Food Guide Pyramid (ICMR), Food plate, RDA, factors affecting RDA. Principles of meal planning– steps involved in planning a diet. Nutrition for Adult-nutritional requirements, planning balanced diets for adult men and women, promoting healthy lifestyle through holistic approach.

Unit II:

12 Hours

Nutrition during pregnancy and lactation: Nutrition during pregnancy - Physiological demands of pregnancy, nutritional needs, effect of nutrition on pregnancy outcome, optimal weight gain, nutrition-related problems in pregnancy, complications of pregnancy. Nutrition during lactation- Physiology of lactation, nutritional requirements, concerns of breast-feeding mother.

Unit III:

12 Hours

Nutrition during infancy and preschool children: Nutrition during infancy- Growth and development, growth standards, food and nutritional requirements, breastfeeding, artificial feeding, low birth weight babies, complementary feeds. Nutrition for preschool children- Growth and development, food and nutritional requirements, eating habits and food behaviors, nutrition-related problems - PEM, VAD and their dietary interventions

Unit IV:

12 Hours

Nutrition for school children and adolescence: Nutrition for school children- Growth pattern, nutritional requirement, importance of healthy snacks, factors affecting eating habits, school lunch. Nutrition during

adolescence – Growth and development, nutritional requirements, food habits, nutritional problems –obesity, underweight, anaemia and eating disorders.

Unit V:

12 Hours

Nutrition for oldage -Physiological changes in elderly, food and nutritional requirements, nutritional and health concerns in oldage, healthy lifestyle

Learning Resources:

Text Books

1. Srilakshmi B. (2011) Dietetics, sixth edition, Newage Publishing Press, New Delhi.
2. Sara Abraham, Nutrition Through Life Cycle, Newage Publishing Press, New Delhi.
3. Swaminathan, Principles of Nutrition and Dietetics, The Bangalore Printing and Publishing Co., Ltd, Bangalore.

References

1. Gopalan, C., Ramanathan, P.V. Balasubramanian, S.C. (2001) Nutritive value of Indian foods, NIN, Hyderabad.
2. Longvah T, Ananthan R, Bhaskar K, Venkaiah K. (2017) Indian Food Composition Tables, National Institute of Nutrition.
3. Abraham S, Nutrition through Lifecycle. (2016) 1st edition, Newage international publishers, New Delhi.
4. Stacy N, William's Basic Nutrition and Diet Therapy. (2005) 12th edition Elsevier publications, United Kingdom.
5. Whitney E N and Rolfes S R, Understanding Nutrition. (2002) 9th edition West/ Wordsworth, London.
6. Groff J L, Gropper S S, Advanced Nutrition and Human Metabolism. (2000) 3rd edition, West/ Wadsworth, United Kingdom.
7. Cataldo, De Bruyne and Whitney, Nutrition and Diet therapy –Principles and Practice. (1999) 5th edition, West/ Wadsworth, London.

Websites/ e-Learning Resources

1. <http://vikaspedia.in/health/nutrition/dietary-guidelines-1/dietary-guideline-1>
2. <https://www.nhp.gov.in/healthyliving/healthy-diet>
3. <https://motherchildnutrition.org/india/complementary-feeding-guidelines.html>
4. <http://vikaspedia.in/health/nutrition/dietary-guidelines-1/diet-for-children-and-adolescents>
5. <https://motherchildnutrition.org/india/complementary-feeding-guidelines.html>
6. <https://sol.du.ac.in/mod/book/view.php?id=1422&chapterid=1288>

CO-PSO Mapping Table

	PSO1	PSO2	PSO3	PSO4	PSO5	PSO6	PSO7	PSO8	PSO9	PSO10
CO1	3	2	2	1	1	1	1	2	1	1
CO2	2	3	2	2	1	2	1	2	2	1
CO3	2	1	2	2	1	2	1	2	2	1
CO4	2	3	2	2	1	2	2	2	2	1
CO5	3	2	1	1	1	2	1	1	2	1
Average	2.4	2.2	1.8	1.6	1	1.8	1.2	1.8	1.8	1

Strong – 3**Medium – 2****Low – 1**

Course Code	Name of the Course	Category	Hours/ Wk.	Credits
24FSN2403	Human Development	Core	4	4

The course helps the students to familiarize with the growth process from conception to confinement as the development of an individual from infancy to old age with the physical, psychological, and social aspects. It also helps to develop an awareness of the problems of children, adolescent, and exceptional children.

Course Outcomes:

At the end of the course, students will be able to

CO1: explain the definition and guiding concepts of growth and development

CO2: explain developmental aspects during infancy, early and late childhood

CO3: evaluate developmental aspects during adolescence.

CO4: identify the developmental tasks during adult hood and old age.

CO5: overview of Special Needs Children, Their Identification, and Educational Rehabilitation

Unit I: 12 Hours

Growth and development - Meaning-growth and development, principles of governing growth and development, developmental task of different stages. Methods of study of human development.

Unit II: 12 Hours

Infancy and Childhood - Characteristics, physical, social, and emotional development, cognitive and language development during infancy, early childhood, and late childhood. Children's play – meaning, types, importance stages. Parental disciplinary Techniques – merits and demerits

Unit III: 12 Hours

Adolescence - physical and psychological changes, emotional, moral and social development, Problems of adolescence. Delinquency–causes, prevention, and rehabilitation. Educational and vocational guidance, role of family and schools and colleges in guiding adolescence

Unit IV: 12 Hours

Adulthood and Old Age

Adulthood - Characteristics and developmental tasks, all aspects of development and vocational adjustments. Old age- Characteristics of old age, physical changes, psychological changes. Place of the Aged in Indian Society

Unit V: 12 Hours

Exceptional Children – Introduction to Children with Special Needs and Identification & Educational Rehabilitation. Gifted children, Orthopedically challenged, Mentally retarded, Hearing impaired, Visually challenged, Learning disability

Learning Resources:**Text Books**

1. Hurlock E.B., (1972).Child Development ,New York : Mc Graw Hill Book company.
2. Srivastava Sushila and Rani K Sudha (2016), Text book of Human Development, S. Chand Publications

References

1. Hurlock , E. B., (1995) : Developmental Psychology-A Life Span Approach, 5th (Ed.) NewYork: Mc Graw Hill Book Co.
2. Nanda V.K, (1998): Principles of Child Development, New Delhi: Anmol Publications Pvt. Ltd.
3. Rajammal P. Devadas and Jaya N. Muthu (2002). A Textbook of Child Development, New Delhi: Macmillan Publishers.
4. Singh, A. (2015). Foundations of Human Development: A Life Span Approach. New Delhi: Orient Black Swan.
5. Suriakanthi A., (1997).Child Development–An Introduction, Tamil Nadu: Kavitha Publishers.
6. Swaminathan, M (1998). The First Five Years: A Critical Perspective on Early Childhood Care and Education in India. New Delhi: Sage Publications.
7. Suriakanthi, A.,(2009). Child Development. Kavitha publications, TamilNadu

Websites/ e-Learning Resources

1. http://www.wbnsou.ac.in/online_services/SLM/BED/SEM-01_A1.pdf
2. <https://ncert.nic.in/textbook/pdf/kepy104.pdf>
3. <https://egyankosh.ac.in/bitstream/123456789/17134/1/Unit-3.pdf>
4. https://www.cukashmir.ac.in/departmentsdocs_16/Growth%20&%20Development%20-%20Dr.%20Ismail%20Thamarasseri.pdf

CO-PSO Mapping Table

	PSO1	PSO2	PSO3	PSO4	PSO5	PSO6	PSO7	PSO8	PSO9	PSO10
CO1	3	1	2	1	1	2	2	2	2	2
CO2	3	2	2	1	2	2	2	1	2	2
CO3	3	2	3	2	2	2	2	1	2	1
CO4	3	2	2	1	2	2	2	2	1	2
CO5	3	2	3	1	2	2	2	2	2	1
Average	3	1.8	2.4	1.2	1.8	2	2	1.6	1.8	1.6

Strong – 3

Medium – 2

Low – 1

Course Code	Name of the Course	Category	Hours/ Wk.	Credits
24FSN2405	Nutritional Biochemistry (TcL)	Core	4 (2+2)	4

To enable the students to Study the basic concepts of metabolism of proximate principles and others and to learn the metabolic pathways of nutritional significance.

Course Outcomes:

At the end of the course, students will be able to

CO1: describe the role of enzymes and co enzymes in biological oxidation

CO2: explain metabolism and regulation of carbohydrate, lipids an proteins

CO3: analyze the integration of carbohydrate, lipid and protein metabolism

CO4: describe the classification, function and biosynthesis of lipid and fatty acid

CO5: discuss the structure and functions of nucleic acids and comprehend the significance of recent biochemical concepts namely xenobiotics, recombinant DNA technology and Nutrigenomics

Unit I:

12 Hours

Biological oxidation and Enzymes: Biological oxidation, Electron transport chain and Oxidative Phosphorylation. Enzymes - Definition, Types, Mechanism of action, Factors affecting enzyme activity, Coenzyme, Role of vitamin B as coenzyme. Free radicals – Definition, Formation in biological systems. Antioxidants– definition, Role of antioxidants in prevention of degenerative disorders.

Unit II:

12 Hours

Metabolism of Carbohydrates: Glycolysis, Citric Acid Cycle Glycogenesis, Glycogenolysis, Gluconeogenesis, Hexose Monophosphate Shunt and bioenergetics.

Unit III:

12 Hours

Metabolism of Protein: Classification of amino acids, Oxidative Deamination, decarboxylation, transamination and transmethylation of amino acids, urea cycle, biosynthesis of non-essential amino acids, catabolism of essential amino acids. Protein biosynthesis.

Unit IV:

12 Hours

Metabolism of Lipids: Classification of fatty acid, Biosynthesis of fatty acids, betaoxidation of saturated fatty acids, ketone bodies. Essential fatty acids –types and functions. Lipoproteins – classification and function. Biosynthesis of cholesterol. Classification of fatty acid, Biosynthesis of fatty acids, beta oxidation of saturated fattyacids, ketone bodies. Essential fatty acids – types and functions. Lipo proteins – classification and function. Biosynthesis of cholesterol.

Unit V:

12 Hours

Intermediary Metabolism, Nucleic acid & Recent concepts: Overview of intermediary metabolism of carbohydrates, protein and lipid. Hormonal regulation of carbohydrate protein and fat metabolism Structural components and functions of

nucleic acid, Structure of DNA, RNA types and functions. Recombinant DNA technology, Metabolism of Xenobiotics, Nutrigenomics

Laboratory Exercise

1. Qualitative tests for sugars - glucose, fructose, lactose, maltose and glucose.
2. Quantitative estimation of reducing sugar.
3. Qualitative tests for proteins
4. Estimation of total nitrogen in foods (Micro or Macro kjeldahl methods)
5. Determination of Iodine value
6. Determination of fat content in food using Soxhlet method

Learning Resources:

Text Books

1. Shanmugham Ambika (1985) Fundamentals of bio -chemistry to medical students. NVA Bharat Printers, and traders 56, Peters Road, Madras - 86.

References

1. Albanese, A.(Ed.). (2012). Newer methods of nutritional biochemistry V3: With applications and interpretations. Elsevier.
2. Bettelheim, F. A., Brown, W. H., Campbell, M. K., & Farrell, S. O. (2009). General, Organic & Biochemistry. Brooks /Cole Cengage Learning.
3. Champe, P. C., Harvey, R. A., & Ferrier, D. R. (2005). Biochemistry. Lippincott Williams & Wilkins, 6th Edition, Wolters Kluwer, London.
4. Harvey, R. and Ferrier, D., Lippincott's Illustrated Reviews: Biochemistry, 6th edition, Lippincott Williams and Wilkins, Philadelphia.
5. Lehninger, A. L. (1993) Biochemistry. 3rd Ed. CBS Publishers, New Delhi.
6. Lieberman, M., & Ricer, R. E. (2009). Lippincott'Si Illustrated Q & A Review of Biochemistry. Lippincott Williams & Wilkins.
7. Murray, R. K., Granner, D. K., Mayes, P. A. and Rodwell, V. W. (2000): 25th Ed. Harpers Biochemistry. Macmillan worth publishers.

Websites/ e-Learning Resources

1. <https://www.udemy.com/share/1027yA/>
2. <https://www.classcentral.com/course/swayam-biochemistry-5229>
3. <https://www.classcentral.com/course/edx-biochemistry-biomolecules-methods-and-mechanisms-12585>
4. <https://www.classcentral.com/course/swayam-experimental-biochemistry-12909>
5. <https://youtu.be/y6YGZfcAegw>

CO-PSO Mapping Table

CO/ PSO	PSO1	PSO2	PSO3	PSO4	PSO5	PSO6	PSO7	PSO8	PSO9	PSO10
CO1	3	2	3	2	1	1	2	2	2	1
CO2	3	3	3	2	2	2	2	2	2	1
CO3	3	2	3	2	2	2	2	2	2	1
CO4	3	3	2	2	2	2	2	2	2	1
CO5	3	2	3	2	2	1	2	1	2	1
Average	3	2.4	2.8	2	1.8	1.6	2	1.8	2	1

Strong – 3

Medium – 2

Low – 1

Course Code	Name of the Course	Category	Hours/ Wk.	Credits
24FSN2407	Food Safety and Quality Control	Core	4	4

Food safety and quality control systems, insights into ensuring the safety and integrity of food products. Acquiring a basic understanding of quality concepts and practices in food companies enables them to maintain consistency and meet consumer expectations. Familiarity with standards and specifications equips students with the knowledge needed to uphold industry benchmarks and ensure product excellence.

Course Outcomes:

At the end of the course, students will be able to

CO1: explain the needs, importance, scope and concepts of food quality and the implementation of HACCP system in food industry

CO2: describe the various safety and quality control laws & programmes among national and international agencies

CO3: develop the instructions for personal hygiene, detection of adulterants and sanitation protocols concerning ensuring food safety

CO4: discuss the Indian standards, regulations and laws for food service sectors

CO5: acquire skills to prepare checklist for audits, manuals and SOPs for food industry.

Unit I:

12 Hours

Food safety - Introduction to concepts of food quality, food safety, food quality assurance. General food laws and food safety regulations. History of Food regulations. Importance of Food safety and quality control concepts applied in the food processing industry. Evaluation of food safety – Applications of HACCP in the food industry.

Unit II:

12 Hours

Quality assurance - Importance and functions of quality control. Theoretical and practical considerations, description of different systems: GAP, GMP, TQM, ISO. Indian food standards – Voluntary and Obligatory standards (PFA, FPO, MMPO, AGMARK etc) Codex Alimentarius.

Unit III:

12 Hours

Food sanitation, safety and Food adulteration: Food sanitation and safety – Factors contributing to physical, chemical and biological contamination in food chain, prevention and control of food borne hazards. Personal hygiene of food handlers cleaning compounds, sanitation methods waste disposal strategy (solid and liquid waste) and pest control. Food adulteration – Food adulteration, Common adulterants, Simple tests for detection of adulteration and toxic constituents. Functional role and safety issues - Recent trends and challenges in food adulteration

Unit IV:

12 Hours

Food safety regulation in India – An over view of Food Regulation in India; Food Laws and Regulations; Structure, organization and duties of regulatory system; Duties and responsibilities of food business operator; Registration and Licensing process and requirements; Labeling of Food Products; Traceability; Import and Export of Foods; Liability for Defective Products; Food safety management systems and certifications.

Unit V:

12 Hours

Standard operating procedure and checklist – Preparing scope, quality policy and quality objectives of food processing company, Defining Standard operating procedure. SOP for purchasing raw materials, receiving raw materials, storage, cleaning, holding, cooling, freezing, thawing, reheating, personal hygiene, facility and equipment's. Preparation of HACCP based SOP checklist - personal hygiene, food preparation, hot holding, cold holding, refrigerator, freezer and milk cooler, food storage and dry storage, cleaning and sanitizing, utensils and equipment's, large equipment's, garbage storage and disposal and Pest control.

Learning Resources:

Text Books

1. Bhatia, R. and Ichhpujan, R.L (2004), Quality assurance in Microbiology, CBS Publishers and Distributors, New Delhi. 2004.
2. Early, R. (2006) Guide to Quality Management Systems for the Food Industry, Blackie, Academic and professional, London.
3. Food safety and standards act 2006, Rules 2011, Regulations 2011, 10th Edition, ILBCO India, Indian Law Book Company, 2013.

References

1. AOAC International. (2005) Official methods of analysis of AOAC International. 17thEd., current through 1st revision. Gaithersburg, MD, USA, Association of Analytical Communities.
2. Bryan, F.L. (2007) Hazard Analysis Critical Control Point Evaluations A Guide to Identifying Hazards and Assessing Risks Associated with Food Preparation and Storage. World Health Organization, Geneva.

Websites/ e-Learning Resources

1. [https://ubblab.weebly.com/uploads/4/7/4/6/47469791/food quality assurance; principles & practices.pdf](https://ubblab.weebly.com/uploads/4/7/4/6/47469791/food_quality_assurance_principles_&_practices.pdf)
2. <https://www.food-safety.com/keywords/2933-ebooks>
3. https://ndl.iitkgp.ac.in/re_search?key=food%20safety%20and%20quality%20management

CO-PSO Mapping Table

CO/ PSO	PSO1	PSO2	PSO3	PSO4	PSO5	PSO6	PSO7	PSO8	PSO9	PSO10
CO1	3	2	2	2	2	1	3	2	2	3
CO2	3	1	1	2	2	3	2	1	2	3
CO3	3	3	3	2	2	1	2	2	2	3
CO4	3	2	2	2	2	2	3	1	2	3
CO5	3	2	2	1	3	1	3	2	2	3
Average	3	2	2	1.8	2.2	1.6	2.6	1.6	2	3

Strong – 3

Medium – 2

Low – 1

Course Code	Name of the Course	Category	Hours/Wk.	Credits
24FSN2409	Nutrition for Special Condition	S	5	4

This course enables the students to learn about the physiological modifications that occur during weather shifts and to treat common illnesses at home, various National nutritional emergencies and epidemic diseases. To comprehend the eating habits and selection of foods for specific conditions and to improve the ability to plan a menu.

Course Outcomes:

At the end of the course, students will be able to

CO1: describe the concept, purpose and principles of diet therapy for children with special needs.

CO2: gain in-depth knowledge in various epidemics and planning a diet for the same

CO3: discuss food related issues during natural disasters

CO4: develop and deliver appropriate information, products, and services to people in space

CO5: describe the nutritional requirements for military person

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:

15 Hours

Nutritional care for the children with special needs: Dengue, chikungunya and other epidemic conditions. Hypothyroidism and hyperthyroidism. Wilson's Disease

Unit III:

15 Hours

Nutritional Emergency: Nutrition during emergency: Natural calamity - war, flood, fire famine, Physiological changes, Nutritional requirement in cold polar and hot environment, food supplements. Mountaineering, Current challenges and controversies in nutrition in emergencies

Unit IV:

15 Hours

Space Nutrition: Physiological changes during space flight, Planning and serving the food, Classification of space food and Dehydrated foods use in space, essential quality and criteria required for space food

Unit V:

15 Hours

Military Nutrition: The history of Military nutrition, Nutrient Support in Military person, Dietary guidelines, the role of nutrient in injured person, Estimation of energy and protein metabolism in armed person. nutrient supplements and ration developed in military

Learning Resources:

Text Books

1. Bamji MS, Rao NP, and Reddy V. Text Book of Human Nutrition; Oxford & IBH Publishing Co. Pvt Ltd, 2009.

2. Gibney., “Public Health Nutrition”, Blackwell Publishing, 2004.
3. Khanna., “Textbook of Nutrition and Dietetics”, Phoenix Publisher,2013.

References

1. Jacalyn J. McComb, Reid Norman, et al., The Active Female: Health Issues Throughout the Lifespan 2010, Human press.
2. Aleta L. Meyer and Thomas P. Gullotta., Physical Activity Across the Lifespan: Prevention and Treatment for Health and Well-Being (Issues in Children's and Families' Lives), 2012, Springer.
3. Srilakshmi B. “Dietetics” Seventh Edition, New Age International (P) Ltd, 2016
4. Bamji MS, Rao NP, and Reddy V. Text Book of Human Nutrition; Oxford & IBH Publishing Co. Pvt Ltd, 2009.

Websites/ e-Learning Resources

1. <https://egyankosh.ac.in/handle/123456789/33312>

CO-PSO Mapping Table

	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5	PSO 6	PSO 7	PSO 8	PSO 9	PSO 10
CO1	3	3	3	1	1	1	1	1	1	1
CO2	3	3	3	1	1	1	1	1	1	1
CO3	3	3	3	1	1	1	1	1	1	1
CO4	3	3	3	1	1	1	1	1	1	1
CO5	3	3	3	1	1	1	1	1	1	1
Average	3	3	3	1	1	1	1	1	1	1

Strong – 3

Medium – 2

Low – 1

Course Code	Name of the Course	Category	Hours/ Wk.	Credits
24FSN2201	Family Dynamics	SEC	3	2

Family dynamics encompass the intricate interplay of relationships, roles, behaviors, and communication patterns within a family unit. These dynamics shape the way family members interact with one another, navigate challenges, and experience various aspects of life together

Course Outcomes:

At the end of the course, students will be able to

CO1: Describe key elements of family dynamics across arrange of family issues

CO2: Explain Family Patterns and Relationships

CO3: Discuss the main content and concepts of marriage

CO4: Identify family roles and explain theoretical Perspectives and Ecology of Parent Child Relations

CO5: Analysis to Significant contemporary issues and concerns regarding family crisis

Unit I:

9 Hours

Family types and Changing trends in India regarding family pattern: Meaning, family as the basic social institution, significance of family, Types, characteristics of family types of family with reference to India Family Dynamics–Meaning and Significance. The place of the individual, man, woman, and child in the family and their roles in society Changing trends in India regarding family pattern–structural, functional Alternate family lifestyles.

Unit II:

9 Hours

Contemporary Alternative Family Patterns and Relationships: Family life cycle – stages Singlehood : Historical and contemporary perspectives, reasons, successful singles, loneliness, fulfilment Cohabitation: Types, cohabitation and stability of relationship, legal issues The Child-Free family: Voluntary childlessness Single-parent Families: Divorce, binuclear family, custody of children (mothers, fathers, split, joint) Stepfamilies: Phases Individual roles, rights, and responsibilities within the family Areas of adjustment within the family at different stages of lifecycle Ways of dealing with adjustment.

Unit III:

9 Hours

Marriage – Concepts of marital behavior: Selection of a life partner Meaning, preparation, motives, functions, and types of marriage Characteristics of high-quality marital relationships Factors affecting marriage relationship–religion, socioeconomic status, careers, Social and emotional issues, financial concerns Marital adjustments – physiological, domestic, social, in- laws relationship, Marital satisfaction and marital stability Changes and challenges in marriage

Unit IV:

9 Hours

Parent’s Nurturance of Children over the Life Course: Parent-Child Relationships in Diverse Contexts–Planned parent hood and duties, styles of parenting, childrearing techniques-small family norms, Family process and relationship variables, Reciprocity between parents and children-Parental attitudes & behavior and their influence on their

children-Parental support, parental psychological and behavioral control- autonomy granting.

Unit V:

9 Hours

Family Crisis – Significant contemporary issues and concerns: Families with marital disharmony crisis casual factor responsible for stress and violence in family. Family conflict: Parent-child conflict, inter-parental conflict Intergenerational Family Problems children, women, and elderly Interventions for families in trouble scope Needs and assessment Counselling–premarital and marital Help lines and welfare programs

Learning Resources:

Text Books

1. Bretherton, I. (1993). Theoretical contributions from developmental psychology. In P.G. Boss, W.J. Doherty, R. La Rossa, W.R.Schumm, & S.K.Steinmetz (Eds.), Source book of family theories and methods: A contextual approach (pp. 505-524). New York, NY: Plenum.
2. Broderick, C. B. (1993) Understanding family process: Basics of family systems theory. New York: Sage.

References

1. Bengston, V.L., Acock, A.C., Allen, K.R., Dilworth-Anderson, P., & Klein, D.M.(Eds.) (2005). Sourcebook of family theory & research. New Delhi: Sage.
2. Bretherton, I. (1993). Theoretical contributions from developmental psychology. In P.G. Boss, W.J. Doherty, R. LaRossa, W.R. Schumm, & S.K. Steinmetz(Eds.), Source book of family theories and methods: A contextual approach (pp. 505-524). New York, NY: Plenum.
3. Broderick, C. B. (1993) Understanding family process: Basics of family systems theory. New York: Sage.
4. Cole M & Cole. S (1993) The development of children. New York: Scientific American Books.

Websites/ e-Learning Resources

1. https://us.sagepub.com/sites/default/files/upm-assets/109149_book_item_109149.pdf
2. <https://www.npaonline.org/sites/default/files/6.%20NPA%20Family%20Dynamics%20The>
3. [%20Good%20The%20Bad%20The%20Ugly_DePasquale.pdf](#)
4. https://www.researchgate.net/publication/327078511_Family_Dynamics_and_Intergenerational_Relations_A_psycho-Social_Analysis
5. <http://www.familiesandsocieties.eu/wp-content/uploads/2014/12/WP04BernardiEtal2013.pdf>

CO-PSO Mapping Table

	PO 1	PO2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO10
CO1	3	2	3	2	1	1	2	1	1	1
CO2	2	2	3	3	1	2	2	1	1	1
CO3	3	2	3	2	1	2	2	2	1	1
CO4	2	2	1	2	1	1	2	1	1	1
CO5	3	3	3	2	1	1	2	1	1	1
Average	2.6	2.2	2.6	2.2	1	1.4	2	1.2	1	1

Strong – 3

Medium – 2

Low – 1

Course Code	Name of the Course	Category	Hours/Wk.	Credits
24FSN2402	Public Health Nutrition	Core	4	4

This course enables students to gain knowledge about nutritional policies, programs and agencies involved in combating malnutrition, acquire knowledge and skills in assessment of nutritional status. To create awareness on improving health and nutrition of the community

Course Outcomes:

At the end of the course, students will be able to

CO1: define terms related to Public Health nutrition.

CO2: describe the nutritional problems prevalent in the community

CO3: explain the significance of assessment of nutritional status.

CO4: assess the role of various organizations in combating nutritional problems

CO5: conduct nutrition education programs to create awareness on improving health and nutrition of the community at large

Unit I:

12 Hours

Concept and scope of public nutrition: Definition, concept, scope and multidisciplinary nature of public nutrition, Nutritional problems affecting the community. Etiology, prevalence, clinical features and preventive strategies for malnutrition related problems and deficiency disorders - Under nutrition (Protein energy malnutrition, Wasting, Stunting), Over nutrition (obesity and related risks), Nutritional anemia, Vitamin A deficiency, Iodine deficiency disorders, Fluorosis.

Unit II:

12 Hours

Assessment of nutritional status: Objectives and importance, Methods of assessment: Direct (Clinical signs, Anthropometry, Biochemical tests); Indirect (Diet surveys, vital statistics)

Unit III:

12 Hours

Nutrition policy and programs: National nutritional policy; Integrated child development scheme (ICDS), Midday Meal Program-State and National (Poshan Abhyan), National programs for the prevention of anemia, Vitamin A deficiency, Iodine deficiency disorders, Fortification of Foods and Public Distribution System as a preventive approach.

Unit IV:

12 Hours

Nutrition education: Objectives, principles and scope of nutrition and health education, creating awareness on current public health issues and devising strategies for prevention and management.

Unit V:

12 Hours

Role of National and International agencies in combating malnutrition: International: WHO, FAO, UNICEF - Role, Target groups, Policies and Programs. National: FSSAI, ICAR, ICMR, NIN, FNB, CFTRI, NNMB-Role, Target groups, Policies and Programs.

Learning Resources:**Text Books**

1. Park K (2011). Park's Textbook of Preventive and Social Medicine, 21st Edition. M/s Banarasidas Bhanot Publishers, Jabalpur, India.

References

1. Wadhwa A and Sharma S (2003). Nutrition in the Community – A textbook. Elite Publishing House Pvt. Ltd. New Delhi.
2. Jelliffe D B, Jelliffe E R P Zervas A and Neumann C G (1989). Community nutritional assessment with special reference to less technically developed countries. Oxford University Press. Oxford.

References

1. WHO (2006). Child Growth Standards: Methods and development: height- for-age, weight-for-age, weight-for-length, weight-for-height and body mass index-for-age.
2. Gupta, M C. And Mahajan B K. (2003) Textbook of Preventive and Social Medicine 3rd Ed Jaypee brothers, Medical Publishers (p) Ltd.

Websites/ e-Learning Resources

1. www.nrhmorissa.gov.in/NIDDCP.html
2. www.Scripts.mit.edu
3. [http://www.who.int/childgrowth/standards/en/.](http://www.who.int/childgrowth/standards/en/)

CO-PSO Mapping Table

CO/PSO	PSO1	PSO2	PSO3	PSO4	PSO5	PSO6	PSO7	PSO8	PSO9	PSO10
CO1	3	3	3	1	3	1	2	2	2	2
CO2	3	2	3	2	3	2	2	2	2	2
CO3	3	3	2	1	3	2	2	2	2	2
CO4	3	2	3	2	2	2	1	2	2	2
CO5	3	3	3	2	2	2	2	2	2	2
Average	3	2.6	2.8	1.6	2.6	1.8	1.8	2	2	2

Strong – 3**Medium – 2****Low – 1**

Course Code	Name of the Course	Category	Hours/ Wk.	Credits
24FSN2404	Foundations of Entrepreneurship	Core	4	4

This course will enable the students to understand the meaning and importance of entrepreneurship and gain awareness about existing entrepreneurial development programmes, and helps to know the government financial schemes available for entrepreneurship.

Course Outcomes:

At the end of the course, students will be able to

CO1: recitation the concept of entrepreneurship.

CO2: analyze the types of entrepreneurs and understand their roles

CO3: assess the problems of women and rural entrepreneurs

CO4: prepare a proposal for entrepreneurship utilizing government financial schemes

CO5: identify the financial institutions and apply for loan schemes for starting a business

Unit I:

12 Hours

Entrepreneurship - Introduction, Concept of Entrepreneur, Entrepreneurship and Enterprise, Definition of Entrepreneurship, Objectives of Entrepreneurship Development, Phases of Entrepreneurship Development, Role of Entrepreneurship, Characteristics of Entrepreneurship, Traits of Entrepreneurship.

Unit II:

12 Hours

Entrepreneur - Meaning, Functions of Entrepreneur, types of entrepreneurs, stages of entrepreneurial process, role of entrepreneur in economic development.

Unit III:

12 Hours

Women entrepreneurship - Concept, functions, growth, problems, functions, development. Rural entrepreneurship – meaning – need – problems – how to develop rural entrepreneurs – Role of NGOs and SHGs in rural entrepreneurship

Unit IV:

12 Hours

Government Development Schemes - Prime Minister Employment Generation Programme (PMEGP), stand up India, Pradan Mantri Mudra Yojana (PMMY), Prime Minister Rural Development Fellows Scheme, Entrepreneurship and skill development programs (ESDP) and state development schemes.

Unit V:

12 Hours

Institutions providing financial assistance - Loan schemes offered by SIDBI, SIDC's, SIIC's, NSIC and NABARD- Difficulties in procuring Institutional finance Agencies for Urban and Rural Development – Government, District Rural Developmental Agencies (DRDA).

Learning Resources:**Text Books**

1. Jayshree Suresh (2012) Entrepreneurial Development, Margham Publications

References

1. Dutta and Sundaram, Indian Economy, S Ch and Publications, New Delhi,2013.
2. Rakesh Saxena (2020) Government Schemes, missions, campaigns and programmes in India, Prabhat Prakashan.
3. S S Khanka (2011) Entrepreneurial development, S Chand, and company
4. S.K.Singh, Rural Development Policies and Programmes, Northern book centre New Delhi,2002.
5. Sreedhar and Rajasekhar (2014) Rural Development in India Strategies and process, Concept Publishing Company.

Websites/ e-Learning Resources

1. <http://www.simplynotes.in/e-notes/mbabba/entrepreneurship-development/>
2. https://www.iare.ac.in/sites/default/files/lecture_notes/IARE_Entrepreneurial_Development_NOTES.pdf
3. <https://www.yourarticlelibrary.com/women/womenentrepreneurship/women-entrepreneurship/99813>
4. https://ccsuniversity.ac.in/bridge-library/pdf/DHA-MHA-403_Unit3.pdf
5. <https://www.creditmantri.com/article-top-10-government-schemes-to-support-startups-promote-the-spirit-of-entrepreneurship/>

CO-PSO Mapping Table

CO/ PSO	PSO1	PSO2	PSO3	PSO4	PSO5	PSO6	PSO7	PSO8	PSO9	PSO10
CO1	3	3	2	1	1	2	2	1	1	1
CO2	3	3	2	2	2	2	2	2	1	1
CO3	3	3	2	1	1	2	2	1	1	1
CO4	3	2	2	1	2	1	2	1	1	1
CO5	3	3	2	2	2	2	2	1	1	1
Average	3	2.8	2	1.4	1.6	1.8	2	1.2	1	1

Strong – 3

Medium – 2

Low – 1

Course Code	Name of the Course	Category	Hours/ Wk.	Credits
24FSN2406	Quantity Food Production and Services (TeL)	CORE	4 (2+2)	4

To enable the students to be acquainted with the type and operation of food service establishments, and to familiarize with the different types of menus and styles of service along with fostering entrepreneurship skills.

Course Outcomes:

At the end of the course, students will be able to

CO1: identify and differentiate the types of food service sectors and food service systems

CO2: demonstrate skills in quantity food production

CO3: overall view on menu planning and its basic terminologies

CO4: distinguish various styles of service and identify the basic technical skills, and interpersonal skills required for food service

CO5: identify the entrepreneurial ventures in food production and service

Unit I:

12 Hours

Food Service Industry, Classification of food service establishments, Food Service systems: Food Service Industry - History of development of food service institution in India. Classification of food service establishments – Commercial - Transport catering Hotels, Restaurants, Outdoor catering and Non-commercial /Welfare - Hospital, Institutional -School/ College, Orphanage/ Oldage homes, prisons, Industrial catering. Food Service systems - conventional, ready –prepared, commissary, and assembly-serve.

Unit II:

12 Hours

Quantity food production: Production forecasting, planning, production scheduling; Standardization of recipes definition, need, uses, methods of enlargement of recipes. Portion control, effective use of leftovers.

Unit III:

12 Hours

Menu planning and Basic terminologies: Menu - origin, definition and functions of menu, importance of planning menus, factors affecting menu planning, French classical menu. Types of menu - A la carte, Table d' hote, Du jour, static, cyclic, single use, construction and writing menu, menu display. Basic terminologies in food service relating to stocks, soups, sauces, salads and beverages - alcoholic and non-alcoholic.

Unit IV:

12 Hours

Food and Beverage Service, Food service personnel and Styles of Service: Food and Beverage Service - Table Setting - Mise-en-scene, Mise-en-place, Basic rules for laying a table, Cover – definition, Ala Carte cover and Table d'hote cover. Food service personnel: basic technical skills, interpersonal skills, attributes of food and beverage personnel. Duties of a waiter- before guests arrive, when guests arrive, during the meal and after guests leave, rules for waiting at table. Styles of Service - Table Service - Waiter – Silver / English, Family, American, French,Russian, Gueridon; Bar Counter, Assisted- Carvery, Buffet, Self-Service-Cafeteria-Counter,

Free-flow, Echelon, Supermarket, Single-point Service - Takeaway, Drive-thru, Fastfood; Vending; Kiosks; Foodcourt, In-situ Service - Tray, Trolley, Home delivery, Lounge, Room, Drive-in

Unit V:

12 Hours

Entrepreneurship in catering: Entrepreneurship – concept and significance, Entrepreneur - definition, characteristics and classification. Food startup, Start-up process, steps, opportunities and challenges, problems faced by women entrepreneurs.

Laboratory Exercise

1. Plan menu for different types of food service institutions - commercial and non - commercial food service institution
2. Preparation of menus for different types of events.
3. Preparation and standardization of dishes of different cuisines (one portion).
4. Quantity production and service of meals - stepping up of recipe to 50 portions.
5. Table Setting– Cover-A la carte and Table d’hote covers.
6. Napkin folding.
7. Visit to food service units – commercial and non-commercial.
8. Organise food sales.
9. Internship in food service establishment for a month.

Learning Resources:

Text Books

1. Sethi, Mohini, Malhan, Surjeet. (2015). Catering Management –An Integrated Approach, 3rd Ed, New Age International Publishers, New Delhi

References

1. June Payne-Palacio, Monica Theis, Introduction to Food service (2009), 11th illustrated, Published by Pearson/ Prentice Hall.
2. Dhawan and Vijay. (2001). Food and Beverage Service, Frank Boss and Co, New Delhi.
3. Suganthi, V and Premakumari, C. (2017). Food Service Management, Dipti Press (OPC) Pvt. Ltd, Chennai.
4. Andrews and Sudhir. (2000). Introduction to Hospitality Industry, Tata-McGraw Hill Pub. Co, New Delhi.
5. Foskett David. (2011). The Theory of Hospitality and Catering, Hodder Education, London.
6. Gupta, C B and Srinivasan, N P.(2002) Entrepreneurial Development, Sultan Chand & Sons, New Delhi.
7. Jagmohan. N.(2013).Food and Beverage Service Operation, S.Chand & Co.Ltd.,New Delhi.

Websites/ e-Learning Resources

1. <https://www.scribd.com/document/119449120/History-of-Food-Service-Industry>
2. <https://sirvo.com/>
3. <https://www.yaaka.cc/unit/types-of-catering-establishment/>
4. <https://www.scribd.com/doc/24003230/Unit-1-Food-and-Beverage-Service-Management>
5. <https://www.universalclass.com/.../types-of-service-and-table-settings-in-waiter>

CO-PSO Mapping Table

	PSO1	PSO2	PSO3	PSO4	PSO5	PSO6	PSO7	PSO8	PSO9	PSO10
CO 1	3	3	2	1	1	2	1	2	2	2
CO 2	3	3	1	1	2	1	1	2	2	2
CO 3	3	3	2	1	1	1	1	1	2	1
CO 4	3	3	2	1	2	1	1	2	2	2
CO 5	3	3	2	2	2	2	1	1	2	2
Average	3	3	1.8	1.2	1.6	1.4	1	1.6	2	1.8

Course Code	Name of the Course	Category	Hours/ Wk.	Credits
24FSN2408	Food Service Management	Core	4	4

The subject deals with understanding of organizing and managing a food service institution, impart knowledge regarding purchase and storage of food to ensure quality service and Familiarize with the layout of food service outlet and food service equipment.

Course Outcomes:

At the end of the course, students will be able to

CO1: apply the principles, tools of management to ensure for effective functioning of the organization

CO2: develop the managerial skills to select, train, and appraise human resources

CO3: acquire skill in purchase storage and food production

CO4: develop skills in starting own food service establishment

CO5: use the basic concept of book keeping and elements of cost to assess the financial viability of the organization

Unit I:

12 Hours

Organization Management: Types of Organisation, Management - definition, principles, functions and tools of management organization chart, job description, job specification, job analysis, work schedule, Intangible tools - budget, leadership styles, decision making, and communication skills.

Unit II:

12 Hours

Personnel Management: Definition, functions of personnel department, Recruitment-sources, Selection- steps, Induction - definition, methods, uses, Training - advantages, methods, supervision, performance appraisal, promotion, demotion, transfer, retirement, termination and dismissal of employees. Labor laws pertaining to the food service establishment.

Unit III:

12 Hours

Food Management: Food purchase – purchasing process, functions of food buyer, methods of buying open market, formal, negotiated, wholesale, blanket order, contract. Storage in food service – types of stores, store room management, purchase, stores records- Physical and perpetual inventory order form, requisition slip, invoice, goods received book, stockbook, bin card, stores ledger

Unit IV:

12 Hours

Plant and equipment management: Planning of food service unit -Layout of a food service, planning of storage, production and service areas, concepts of work flow and work simplification technique. Environmental hygiene – pest control - types of pests and pest control methods; garbage disposal method. Safety in food service institution – Accidents – causes and prevention. Equipment in food service - Classification of equipment, factors affecting selection of equipment.

Unit V:

12 Hours

Financial Management: Book-keeping – definition, advantages of double entry system, books of accounts – an introduction. Costing and Cost control: Basic cost concepts – elements of cost (material, labour, overheads), behavior of cost (fixed, variable, semi-fixed /semi-variable), methods of costing (Dish, meal, menu costing & costing for events), cost control, concept of break-even, break-even point. Pricing – factors affecting pricing, pricing methods (cost plus, factor, rate of return, subsidy, discount).

Learning Resources:**Text Books**

1. Mohini Sethi, (2015).Catering Management – An Integrated Approach, 3rd Ed, New Age International Publishers, New Delhi.
2. Suganthi, V and Premakumari, C. (2017). Food Service Management, Dipti Press (OPC) Pvt. Ltd, Chennai.

References

1. Andrews and Sudhir. (2000). Introduction to Hospitality Industry, Tata- Mc Graw Hill Pub. Co.,New Delhi.
2. Dhawan and Vijay.(2001). Food and Beverage Service, Frank Boss and Co,New Delhi.
3. Foskett David. (2011). The Theory of Hospitality and Catering, Hodder Education, London.
4. Lillicarp, D. R.and Cousins, J.(2010). Food and beverage Service,8th Edition, Hodder Education, London.
5. Verghese and Brian. (2000). Professional Food and Beverage Service Management,Macmillan India Ltd.,India.

Websites/ e-Learning Resources

1. <http://open.lib.umn.edu/principlesmanagement/chapter/1-5-planning-organizing-leading-and-controlling-2/>
2. https://www.managementstudyguide.com/management_functions.htm
3. <http://www.bngkolkata.com/web/food-and-beverage-service-equipment/>
4. <http://www.fcijammu.org/food/food/orders/F&B%20Service-Unit-2.pdf>
5. <https://www.scribd.com/doc/29362905/Equipments-in-Food-amp-Beverage>

CO-PO Mapping Table

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10
CO1	3	2	2	2	1	2	1	1	2	2
CO2	2	3	1	1	2	2	2	2	2	2
CO3	2	1	1	1	2	2	1	2	2	2
CO4	2	3	2	1	2	2	1	1	2	2
CO5	3	2	2	2	2	2	1	1	1	2
Average	2.4	2.2	1.6	1.4	1.8	2	1.2	1.4	1.8	2

Strong – 3**Medium – 2****Low – 1**

Course Code	Name of the Course	Category	Hours/ Wk.	Credits
24FSN2410	Food Product Development	S	5	4

This course enables the students to understand the concepts and steps involved in new food product development and learn about consumer preferences and market trends.

Course Outcomes:

At the end of the course, students will be able to

CO1: define the basic concepts in food product development, packaging, costing advertising and marketing.

CO2: explain the need, characteristics and factors influencing the new product; test marketing, packaging and quality attributes

CO3: illustrate the quality attributes, food safety, packaging and labelling, regulations, and marketing tools for a food product

CO4: analyse the significance of packaging, labelling, advertising, costing and quality concepts for the new food product

CO5: develop a new food product and evaluate its quality and acceptability

Unit I:

15 Hours

Introduction to New Food Product Development: Food products, definition, Classification, Characterization Reasons for new food product development. Factors shaping new product development - Social concerns, health concerns impact of technology and market place influence. Utilizing traditional foods, unconventional sources, functional, Nutraceuticals foods for new product development. Market Survey to identify the new product.

Unit II:

15 Hours

Product Development: New Product Development Team, Sources of New Product ideas, Designing new product, Stages of product development, Causes of product failure/success in product development.

Unit III:

15 Hours

Product Evaluation and Quality Control: Quality attributes – physical, chemical, nutritional, microbial, and sensory indicators. Principles and types of assessment of quality. Subjective and objective methods of evaluation of product quality. Role of sensory evaluation in consumer product acceptance; requirements for sensory analysis – Sensory panel Evaluation of New Product: Nutritional evaluation (estimation of relevant parameters) Evaluation of shelf-life of the product (testing for appropriate quality parameters- physical, chemical, microbiological and nutrient content, acceptability studies). Food safety standards and regulations: Domestic regulations FSSAI, AGMARK, BIS Quality management systems in India; (ISO9001, ISO22000); Global Food safety Initiative; International food standards Various national and international organizations dealing with inspection, trace ability and authentication, certification, and quality assurance

Unit IV: 15 Hours

Packaging and labelling: Packaging Material - types; factors affecting type of packaging material used; Aseptic packaging, modified atmosphere packaging, Controlled Atmosphere Packaging and active packaging. Packaging and Labelling of the product – Packaging design, graphics and labelling–FSSAI regulations for food labelling

Unit V: 15 Hours

Marketing the product: Product lifecycle Costing the product and determining the sales price Advertising and test marketing the product

Learning Resources:**Text Books**

1. Gordon W. Fuller, 2001. New Food Development, CRC Press

References

1. Earle M., Earle RL. and Anderson A. (2001) Food Product Development: Maximizing success, Woodhead Publishing Ltd, Food Series, No.64,2001.
2. Fuller, G W (2011). New food product development: From concept to market place. 3rd Ed. New York, N Y: C R C Press
3. Lawless H T and Klein B P (1991) Sensory Science Theory and Applications in Foods. Marce Dekker Inc.
4. Moskowitz H R, Saguy I S and Straus T (2009). An Integrated approach to New Food Product Development. Ed. New York, NY: CRC Press
5. Paine F A, Paine H Y (Eds.) (1992) A handbook of Food Packaging (2nd Ed), Blackie Academic and Professional.
6. Sharma A (2018). Food product Development. CBS Publishers & Distributors Pvt Ltd

Websites/ e-Learning Resources

1. <https://www.destechpub.com/wp-content/uploads/2015/01/Methods-for-Developing-New-Food-Products-preview.pdf>
2. <https://www.youtube.com/watch?v=iL0iGpa4vg>
3. <https://www.youtube.com/watch?v=5kOXUH8kaCs>

CO-PSO Mapping Table

CO/PSO	PS O1	PS O2	PS O3	PS O4	PS O5	PS O6	PS O7	PS O8	PSO 9	PSO1 0
CO1	3	3	3	2	2	1	2	1	1	1
CO2	3	3	3	2	2	1	2	1	1	2
CO3	3	2	3	2	2	1	2	1	1	2
CO4	3	2	3	2	2	1	2	1	1	2
CO5	3	3	3	2	2	1	2	1	1	1
Average	3	2.6	3	2	2	1	2	1	1	1.6

Strong – 3**Medium – 2****Low – 1**

Course Code	Name of the Course	Category	Hours/Wk.	Credits
24FSN2202	Fundamentals of Art and Design	SEC	3	2

The fundamentals of art and design serve as the cornerstone for all visual creations, providing a framework through which artists and designers express their ideas, emotions, and messages

Course Outcomes:

At the end of the course, students will be able to

CO1: discuss the design, types like structural and decorative design

CO2: use different elements of design appropriately in creating design objects.

CO3: apply the Art principles in Interior Design.

CO4: analysis colour harmonies in various rooms

CO5: explain the principles in planning a lifespan

Unit I:

9 Hours

Introduction to Art and Design : Importance of design, Application of good taste and Role of good designer. Types of design - Structural and Decorative design. Classification of Decorative Design - Naturalistic, Stylized, Abstract and Geometrical Design

Unit II:

9 Hours

Elements of design: Line and its types—horizontal, vertical, diagonal, curved, zigzag; Shape; Form—2D & 3D, Size, Texture- tactile and visual; light, pattern, Space – positive & negative and Colour-warm and cool. Application of elements to form design

Unit III:

9 Hours

Principles of Design: Harmony—harmony of line, shape, size, texture and ideas. Balance – symmetrical, asymmetrical and radial. Proportion – proportional relationships, Greek oblong and Scale. Emphasis – emphasis through grouping of objects, use of contrast color, decoration, plain background space, unusual lines, shapes, and sizes. Rhythm – achieving rhythm through repetition of shapes, progression of size, continuous line movement, radiation, and gradation.

Unit IV:

9 Hours

Colour - Definition, Qualities of colour, Hue, Value, Intensity. Tints and Shades. The colour wheel/systems - Prang colour system, Physicist's Theory, Psychologist's Theory, Harmonies of related colors- Mono chromatic, Analogous and Accented Neutral; Harmonies of contrasting colours –Direct, double, split and triad.

Unit V:

9 Hours

Housing Selection of site and functions of house. Basic principles of planning a life space - Orientation, Grouping, Roominess, Lighting, Circulation, Storage Facilities and Privacy. Creating a life space- Factors in planning different rooms—Living Room, Bedroom, Dressing Room, Dining, Kitchen, Study Room, Store room, Bathroom, Utility space, Staircase and Verandah.

Learning Resources:**Text Books**

1. Bengtson, V.L., Acock, A.C., Allen, K.R., Dilworth-Anderson, P., & Klein, D.M. (Eds.) (2005). Sourcebook of family theory & research. New Delhi: Sage.
2. Bretherton, I. (1993). Theoretical contributions from developmental psychology. In P.G. Boss, W.J. Doherty, R. La Rossa, W.R. Schumm, & S.K. Steinmetz (Eds.), Sourcebook of family theories and methods: A contextual approach (pp. 505-524). New York, NY: Plenum.

References

1. Bengtson, V.L., Acock, A.C., Allen, K.R., Dilworth- Anderson, P., & Klein, D.M. (Eds.) (2005). Sourcebook of family theory & research. New Delhi: Sage.
2. Bretherton, I. (1993). Theoretical contributions from developmental psychology. In P.G. Boss, W.J. Doherty, R. LaRossa, W.R. Schumm, & S.K. Steinmetz (Eds.), Sourcebook of family theories and methods: A contextual approach (pp. 505-524). New York, NY: Plenum.
3. Broderick, C. B. (1993) Understanding family process: Basics of family systems theory. New York: Sage.
4. Cole M & Cole. S (1993) The development of children. New York: Scientific American Books.
5. De Lamater, J., & Hyde, J. (2004). Conceptual and theoretical issues in studying sexuality in close relationships.
6. Erlbaum Heath, P. (2005). Parent-child relations: History, theory, research, and context. New Jersey: Prentice-Hall.
7. Ingoldsby, B.B., Smith, S., & Miller, J.E. (2004). Exploring family theories. Los Angeles: Roxbury. Kuczynski, L. (2002). Handbook of dynamics in parent-child relations. New York: Sage.
8. G.W. Peterson & K.R. Bush (eds). Handbook of marriage and the family (pp 423-447). New York, NY: Springer.

Websites/ e-Learning Resources

1. https://us.sagepub.com/sites/default/files/upm-assets/109149_book_item_109149.pdf
2. https://www.npaonline.org/sites/default/files/6.%20NPA%20Family%20Dynamics%20The%20Good%20The%20Bad%20The%20Ugly_DePasquale.pdf
3. https://www.researchgate.net/publication/327078511_Family_Dynamics_and_Intergenerational_Relations_A_psycho-Social_Analysis
4. <http://www.familiesandsocieties.eu/wp-content/uploads/2014/12/WP04BernardiEtal2013.pdf>

CO-PO Mapping Table

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10
CO1	2	3	3	1	1	1	2	1	1	1
CO2	3	3	3	3	2	1	1	1	1	1
CO3	3	2	3	3	2	1	3	1	1	1
CO4	3	2	3	3	1	1	2	1	1	1
CO5	3	3	3	2	1	1	2	1	1	1
Average	2.8	2.6	3	2.4	1.4	1	2	1	1	1

Strong – 3**Medium – 2****Low – 1**

Course Code	Name of the Course	Category	Hours/ Wk.	Credits
24FSN3601	Dietetics	Core	6	6

The dietetics syllabus entails a thorough understanding of the fundamental principles and methodologies underlying therapeutic diet formulation, custom-tailored to specific health conditions. Furthermore, it underscores the acquisition of expertise in evaluating the nutritional needs of individuals affected by illness, thereby cultivating essential skills requisite for a profession in dietetics.

Course Outcomes:

At the end of the course, students will be able to

- CO1:** explain the concepts of diet therapy and the role of the dietitian in the healthcare system
- CO2:** identify the aetiology, symptoms and principles of dietary management for various GI tract diseases.
- CO3:** apply the principles of dietetics to plan therapeutic diets for various Liver, Gall bladder and Febrile disease conditions
- CO4:** identify the pathophysiology of the metabolic disorders of individuals to develop dietary management in treating those conditions
- CO5:** summarize the causes and symptoms of cancer and other excretory system diseases/ disorders to prepare a suitable diet plan using the principles of MNT

Unit I:

18 Hours

Concept of Diet Therapy and Role of Dietitian: Principles of therapeutic diets, modification of normal diet, classification of therapeutic diets. Different feeding techniques -enteral and parenteral feeding. – Indications, contraindications and complications, Dietitian- Definition, role and code of ethics, classification of dieticians in nutritional care.

Unit II:

18 Hours

Diseases of Gastrointestinal tract: Etiology, symptoms, dietary management of: Diarrhoea, dysentery, constipation, Peptic ulcer, irritable bowel syndrome & inflammatory bowel disease (ulcerative colitis), Crohn's disease and celiac disease

Unit III:

18 Hours

Diseases of the Liver, Gall bladder & Febrile conditions: Etiology, symptoms, dietary management of: Disease of liver & Gall bladder- Hepatitis, cirrhosis, gall stones Febrile conditions - Acute & Chronic fevers (Typhoid, influenza, malaria, tuberculosis, COVID).

Unit IV:

18 Hours

Metabolic Disorders: Aetiology, symptoms, and dietary management of Obesity and PCOS, Diabetes mellitus- types, symptoms and metabolic changes, treatment with diet and insulin, GI, GL, carbohydrate counting, artificial sweeteners and complications. Cardiovascular diseases – hypertension, atherosclerosis

Unit V:**18 Hours**

Diseases of the excretory system and cancer: Etiology, symptoms, and dietary management of Glomerular nephritis, Nephrotic syndrome, urinary calculi, renal failure. Cancer – Risk factors, modification of diet in cancer, nutritional problems of cancer therapy, Role of antioxidants in prevention of degenerative diseases

Learning Resources:**Text Books**

1. Antia F. P.(2002), Clinical Dietetics and Nutrition, 4th Edition,Oxford University Press,Chennai.
2. Guthrie H.A, Picciano M. F (1995) Human Nutrition, Mosby, St. Louis Missorie.
3. Joshi S.A. (2005) ,Nutrition and Dietetics, Tata Mc Graw- Hill Publishing Company Ltd., NewDelhi.

References

1. Passmore R. and Davidson S. (1986) Human Nutrition and Dietetics. Liming stone publishers
2. Sharma, A. (2017), Principles of Therapeutic Nutrition and Dietetics, CBS Publishers &Distributors Pvt Ltd New Delhi.
3. Srilakshmi B Dietetics (2019), 8th Edition, New Age International Publishing Ltd, New Delhi
4. Williams S. R, (2000) Basic Nutrition and Diet Therapy, Mosby publication.

Websites/ e-Learning Resources

1. <https://epgp.inflibnet.ac.in/Home/ViewSubject?catid=NuAs6SreCGryddEfs4kkBA=>
2. <https://onlinelibrary.wiley.com/journal/17470080>
3. <https://study.com/academy/lesson/dietetics-definition-history-importance.html>

CO-PSO Mapping Table

CO/ PSO	PSO1	PSO2	PSO3	PSO4	PSO5	PSO6	PSO7	PSO8	PSO9	PSO10
CO 1	3	3	2	3	1	2	3	2	2	3
CO 2	3	2	3	2	2	1	2	2	2	3
CO 3	3	2	3	3	2	2	3	1	2	3
CO 4	3	3	3	2	2	1	2	1	2	3
CO 5	3	3	1	1	2	2	3	2	2	3
Average	3	2.6	2.6	2	1.8	1.6	2.6	1.6	2	3

Strong – 3**Medium – 2****Low – 1**

Course Code	Name of the Course	Category	Hours/ Wk.	Credits
24FSN3603	Dietetics Practical	Core	6	6

Gain knowledge and develop skills and techniques in planning and preparation of therapeutic diets. Plan diets based on the medical history of the patients and nutritional assessments – anthropometric measurements. Calculate the nutrient content of diets.

Course Outcomes:

At the end of the course, students will be able to

CO1: list the principles of dietary management for various conditions

CO2: identify the various disease conditions using the clinical diagnosis methods

CO3: calculate the required nutrient content for various disease conditions based on the dietetic principles.

CO4: plan and prepare diets for various disease conditions

CO5: justify the choice of foods, preparation methods, content, and consistency for different disease conditions.

Planning, Calculation of nutrient content, Preparation and Service of diets for, 90 Hours

1. Tube feeds for special conditions
2. Fevers,
3. Typhoid
4. Tuberculosis
5. Peptic Ulcer
6. Diarrhoea
7. Constipation
8. Viral hepatitis
9. Cirrhosis of liver
10. Obesity,
11. Diabetes Mellitus
12. Atherosclerosis
13. Hypertension
14. Chronic kidney disease

Learning Resources:

Text Books

1. Antia, F. B. (2010), Clinical Nutrition and Dietetics, Oxford University Press, London.
2. Vimala V. (2010). Advances in Diet Therapy, 1st Ed., National Institute of Nutrition – Hyderabad.
3. SriLakshmi. B. (2019) Dietetics, 8th Ed, New Age International Pub. Co, Chennai.
4. Sharma. A. (2017), Principles of Therapeutic Nutrition and Dietetics, CBS Publishers & Distributors Pvt Ltd, New Delhi

References

1. IDA.(2018), Clinical Dietetic Manual, 2nd Edition, Elite Publishing House, New Delhi
2. Williams S. R, (2000) Basic Nutrition and Diet Therapy, Mosby publication.

- Bajaj. M (2019) Diet Metrics: Handbook of Food Exchanges, Norton Press, Chennai.

Websites/ e-Learning Resources

- <https://www.labster.com/course-packages/food-science-nutrition>
- <https://virtual-patient.edietinglab.eu/>
- <https://clinic.edietinglab.eu/>

CO-PSO Mapping Table

CO/ PSO	PSO1	PSO2	PSO3	PSO4	PSO5	PSO6	PSO7	PSO8	PSO9	PSO10
CO 1	3	2	2	1	3	2	3	2	1	3
CO 2	3	2	3	3	2	2	3	2	1	3
CO 3	3	1	3	1	2	2	1	2	1	3
CO 4	3	2	3	3	2	2	3	2	1	3
CO 5	3	3	2	3	3	2	2	2	1	3
Average	3	2	2.6	2.2	2.4	2	2.4	2	1	3

Strong – 3

Medium – 2

Low – 1

Course Code	Name of the Course	Category	Hours/ Wk.	Credits
24FSN3605	Functional Foods and Chronic Diseases	Core	5	4

This course gives a comprehensive understanding of different functional foods and students will understand the potential of various functional foods in promoting human health and its prevention from degenerative diseases.

Course Outcomes:

At the end of the course, students will be able to

CO1: Define functional foods and recall the components of functional foods and their health Benefits

CO2: List out different functional foods, their properties, and their functions

CO3: Explain the impact of functional foods in the prevention and management of CVD and kidney diseases

CO4: Evaluate the role of functional foods in the prevention and management of cancer.

CO5: Summarize the role of functional foods in the prevention and management of obesity and type 2 diabetes mellitus

Unit I:

15 Hours

Introduction to Functional foods and food sources: Functional foods - Definition, History, types, and classification of functional foods, Relation of functional foods (FF) to chronic diseases. Food sources - Functional foods in different foods: cereal products (oats, wheat bran, rice bran, etc.), fruits and vegetables, milk and milk products, legumes, nuts, oil seeds and seafood, herbs, spices, and medicinal plants. Coffee, tea, and other beverages as functional foods/drinks and their protective effects.

Unit II:

15 Hours

Antioxidant Properties and functions of various functional food ingredients - Concept of free radicals and antioxidants, antioxidant role as functional foods. Antioxidant and chronic diseases. Properties and functions of various functional food ingredients - Protein, complex carbohydrates (dietary fiber) as functional food ingredients; probiotics, prebiotics and symbiotic foods, and their functional role. Sources and role of isoprenoids, isoflavones, flavonoids, carotenoids, tocopherols, chlorophyll, polyunsaturated fatty acids, lecithin, choline, terpenoids, Glucosamine, Glutathione, lycopene, proanthocyanins.

Unit III:

15 Hours

Functional foods and cardiovascular diseases (CVD): Epidemiology of cardiovascular diseases, Biomarkers of different cardiovascular diseases, effect of functional foods on biomarkers of CVD, Effect of functional foods like green tea, grapes, oats, soybean, sunflower seeds or pumpkin seeds on CVD

Unit IV:

15 Hours

Functional foods and cancer & Functional foods and renal diseases: Functional foods and cancer - Functional Food Components in Cancer Disease, Effect of functional foods like cruciferous vegetables, green tea, garlic, walnuts, and berries on

cancer. Functional foods and renal diseases. Epidemiology of kidney disease, functional foods for kidney diseases, Effect of functional foods like garlic, buckwheat on kidney.

Unit V:

15 Hours

Functional foods, obesity and diabetes: Functional foods and obesity: Functional foods and obesity, biomarkers of obesity, bioactive compounds in functional foods to manage healthy weight. Effect of functional foods like dietary fibres, and psyllium husk on obesity. Functional foods and diabetes: Epidemiology of Diabetes, Functional Foods for Type 2 diabetes, the effect of functional foods like turmeric, garlic, green tea, dietary fibre on diabetes

Learning Resources:

Text Books

1. Wildman, Robert E. C (2006),“Handbook of Nutraceuticals and Functional Foods”. C R C Press, USA

References

1. Cho S. S. and Dreher, M. L. (2001): Handbook Dietary Fibre, Marcel Dekker Inc., New York.
2. Gibson G. R. and C. M. Willams (2000),“Functional Foods: Concept to Product”. Woodhead.
3. Giuseppe Mazza (1998), “Functional Foods Biochemical and Processing Aspects”, Volume 1; CRC Press, USA.
4. Goldberg, I Ed (1994): Functional Foods: Designer Foods, Pharma Foods, Nutraceuticals, Chapman & Hall, New York.
5. Ikan, Raphael (2005), “Natural Products: A Laboratory Guide”, 2nd Edition, Academic Press/ Elsevier.

Websites/ e-Learning Resources

1. <https://youtu.be/AT4FfrWw0HM?si=8IabAHIUBMw8OsVV>
2. <http://epgp.inflibnet.ac.in/Home/Download>

CO-PSO Mapping Table

CO/ PSO	PSO1	PSO2	PSO3	PSO4	PSO5	PSO6	PSO7	PSO8	PSO9	PSO10
CO1	3	3	3	2	1	2	1	2	2	1
CO2	2	3	3	3	2	2	1	2	2	2
CO3	3	3	3	2	2	2	1	2	2	2
CO4	3	2	2	3	1	2	1	2	2	1
CO5	3	3	3	1	2	2	1	2	2	2
Average	2.8	2.8	2.8	2.2	1.6	2	1	2	2	1.6

Strong – 3

Medium – 2

Low – 1

Course Code	Name of the Course	Category	Hours/Wk.	Credits
24FSN3401	Fundamentals of Research in Nutritional Sciences	DSE	5	4

The Fundamentals of Research in Nutritional Sciences deals with the basic concepts of statistics and research methodology and helps the learners to understand the recent innovations and developments in the Nutritional Sciences to enable them to carry out their project and present a report.

Course Outcomes:

At the end of the course, students will be able to

CO1: identify the appropriate problems for the nutritional science research

CO2: develop a research design, variables for the research and data collection methods

CO3: choose an appropriate statistical method for the evaluation of collected data based on the objective of the research

CO4: analyze the data and present the results in an efficient manner to draw conclusions

CO5: document the research findings and present them as a report

Unit I:

15 Hours

Introduction to Research: Research- Meaning, objectives, significance. Research problem- Definition and selection of research problem. Nutritional Sciences Research – Types, importance, scope, Recent advances

Unit II:

15 Hours

Data Collection: Research design –Types of research design. Sampling – definition, importance, selection of suitable sampling size, Method of sampling - probability and non-probability sampling – Merits and Demerits.

Data – definition, Primary and secondary data. Variables – dependent variables and independent variables, Selection of an appropriate method for data collection. Tools used for data collection- Questionnaire and Interview schedule

Unit III:

15 Hours

Basic statistical tools for analysis and interpretation: Measures of central tendency – Mean, Median, Mode. Variations - the range and standard deviation Correlation –Karl Pearson’s coefficient of correlation Test of significance- Student’s t-test

Unit IV:

15 Hours

Data visualization and presentation: MS – Excel – basics of Data entry and computation, Tabulation of data – parts of the table, Presentation of data - use of bar graphs, Histograms, Line diagrams, and pie charts

Unit V:

15 Hours

Report writing: Report writing – types, structure, ethics, and Steps in report writing. Bibliography-citing references-any one style. Tools used for report writing – Reference Managers, Databases for articles, e-resources and e-books.

Learning Resources:**Text Books**

1. Kothari, C.R. (2019). Research methodology methods and techniques, New Age International publishers, New Delhi.
2. Kumar, R. (2005) Research Methodology: A Step-by-Step Guide for Beginners.Sage Publications, New Delhi.

References

1. Goode, WJ and Hatt, PK (1981) Methods in Social Research, McGraw-Hill International Editions, Sociology Series.
2. Gupta, S.P. (2019) Statistical methods. 46th ed. Sultan Chand and Co, New Delhi.
3. Kerlinger F. N. and Lee, H.B. (2000) Foundations of Behavioural Research 4th Ed. Harcourt College Publishers.

Websites/ e-Learning Resources

1. [https://ebooks.lpude.in/library_and_info_sciences/MLIS/year_1/DLIS401 METHODOLOGY OF RESEARCH AND STATISTICAL TECHNIQUES.pdf](https://ebooks.lpude.in/library_and_info_sciences/MLIS/year_1/DLIS401_METHODOLOGY_OF_RESEARCH_AND_STATISTICAL_TECHNIQUES.pdf)
2. <https://mfs.mkcl.org/images/ebook/Fundamental%20of%20Research%20Methodology%20and%20Statistics%20by%20Yogesh%20Kumar%20Singh.pdf>

CO-PSO Mapping Table

	PSO1	PSO2	PSO3	PSO4	PSO5	PSO6	PSO7	PSO8	PSO9	PSO10
CO1	3	2	3	2	3	2	3	1	2	3
CO2	2	2	2	2	3	2	2	1	1	3
CO3	2	2	2	2	3	2	2	1	2	3
CO4	1	1	2	2	3	2	3	1	2	3
CO5	2	2	3	2	3	2	3	1	2	3
Average	2	1.8	2.4	3	3	2	2.6	1	1.8	3

Strong – 3**Medium – 2****Low – 1**

Course Code	Name of the Course	Category	Hours/Wk.	Credits
24FSN3403	Nutrition Education and Communication	Core	5	4

The course helps the students to gain knowledge about nutritional policies, programs and agencies involved in combating malnutrition, organize nutrition education programs for the community and develop communication strategies to promote positive behaviours needed for a healthy lifestyle.

Course Outcomes:

At the end of the course, students will be able to

CO1: identify nutritional problems affecting the community.

CO2: describe objectives of public health policies and programs offered by various agencies.

CO3: display good communication skills needed for the conduct of the Nutrition education programs

CO4: develop skills pertaining to assessment of the nutritional status.

CO5: plan nutrition education programs relevant to specific target groups.

Unit I:

15 hours

Nutrition Education - Importance of Nutrition education, objectives, principles and scope of nutrition and health education and promotion.

Unit II:

15 hours

Nutritional problems affecting the community - Etiology, prevalence, clinical features and preventive strategies for malnutrition related problem- - Protein energy malnutrition, Obesity, Nutritional anemia, Vitamin A deficiency, Iodine deficiency disorders, Fluorosis.

Unit III:

15 hours

Assessment of Nutritional Status - Objectives and importance, Methods of assessment: Direct (Clinical signs, nutritional anthropometry, biochemical tests, biophysical tests); Indirect (Diet surveys, vital statistics) and Indirect assessment methods of nutritional status.

Unit IV:

15 hours

Nutrition Policy and Programs - National nutritional policy; Integrated child development scheme (ICDS), Midday Meal Program, National programs for the prevention of anemia, Vitamin A deficiency, Iodine deficiency disorders. Implementation of Nutrition Education Program. National organizations and agencies - FSSAI, ICMR, CFTRI, NSI, FNB, NIN. International organizations and agencies - FAO, WHO, UNICEF.

Unit V:

15 hours

Community - Characteristics of rural and urban community, types of community, community nutrition, community health, Factors affecting community health.

Introduction to Communication - Concept, Elements of Communication, Models of Communication. Expanding scope of Nutrition Practice. Communication Systems - Nature, characteristics, and types - Formal and Informal communication, Verbal and Non-verbal Communication, Approaches of Communication - One way-two way, Upward-downward, Horizontal - vertical and Interpersonal Communication - Concept, types and functions of interpersonal communication, Barriers of Communication.

Learning Resources:

Text Books

1. Jelliffe DB, Jelliffe ERP, Zerfas A and Neumann CG (1989). Community nutritional assessment with special reference to less technically developed countries. Oxford University Press. Oxford.

Reference Books

1. Park K (2011). Park's Textbook of Preventive and Social Medicine, 21st Edition. M/s Banarasidas Bhanot Publishers, Jabalpur, India.
2. Suryatapa Das (2016). Textbook of Community Nutrition. Academic Publishers, Kolkata.
3. Wadhwa A and Sharma S (2003). Nutrition in the Community- A textbook. Elite Publishing House Pvt. Ltd. New Delhi.

Websites/ e-Learning Resources

1. <https://books.google.co.in/books?id=o5CxDAAAQBAJ&printsec=frontcover#v=onepage&q&f=false>
2. <https://nces.ed.gov/pubs/96852.pdf>-
<http://www.fao.org/docrep/017/i3235e/i3235e.pdf>

CO-PO Mapping Table

	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10
CO 1	3	3	2	2	1	2	2	1	1	2
CO 2	3	2	1	1	1	2	1	2	1	2
CO 3	3	2	1	1	1	2	2	2	1	2
CO 4	3	2	2	2	1	1	2	1	1	2
CO 5	3	3	2	2	1	2	1	2	1	2
Average	3	2.4	1.6	1.6	1	1.8	1.6	1.6	1	2

Strong – 3

Medium – 2

Low – 1

Course Code	Name of the Course	Category	Hours/Wk.	Credits
24FSN3301	Nutritional Assessment and Diet Counselling	GE	4	3

This course aims to learn the different methods and techniques available to assess nutritional status Usage and gender-specific techniques to assess nutritional status. Learn the significance of assessment parameters in conditions of health and disease

Course Outcomes:

At the end of the course, students will be able to

CO1: screen the nutritional status of subjects using appropriate tools

CO2: use anthropometric methods of assessment to classify subjects as belonging to normal, undernutrition, overweight or obesity.

CO3: evaluate micronutrient adequacy using clinical and biochemical assessment techniques

CO4: determine adequacy of nutrient intake employing suitable dietary assessment Techniques

CO5: acquire skills in diet counseling using nutritional techniques

Unit I:

12 Hours

Nutritional screening: Nutritional assessment and Identification of at-risk groups using SGA/ MNA Estimation of total energy requirement using factorial method Plotting growth chart for infants and identifying growth faltering, suggesting suitable nutritional remedies

Unit II:

12 Hours

Anthropometric assessment: Measurements of height, weight, mid-arm circumference, waist circumference Measurement of Body fat using skin fold calipers, body fat analyser etc., Conduct anthropometric assessment and nutritional diagnosis on a select group of subjects.

Unit III:

12 Hours

Clinical and Biochemical assessment : Use clinical examination schedule and conduct clinical examination under the guidance of a medical supervisor to identify nutrient deficiencies (preferably preschool children) Learn the biochemical tests to be conducted to analyze nutritional deficiencies; analyze available biochemical reports for nutritional adequacy.

Unit IV:

12 Hours

Dietary assessment : Estimate nutrient intake using 24-hour recall, food frequency questionnaire. Estimate nutrient intake using appropriate software. Conduct diet survey and suggest alterations in food intake to improve nutrient adequacy.

Unit V:

12 Hours

Diet counseling : Preparing a nutritional assessment sheet for the given patient Planning a diet counseling program with components such as assessment of needs, education of the patient, follow up and establishing rapport with the patient and family members.

Learning Resources:**Text Books**

1. Gibney, M.J., Margetts, B.M., Kearney, J.M. and Arab, L. (2013). Public Health Nutrition. John Wiley & Sons Inc., New Delhi.

References

1. Gelso Charles, J. and Fretz Bruce, R. (1995) Counselling Psychology, a PRISM Indian edition Harcourt Brace College Publishers
2. Guthrie H.A. (1983) Introductory Nutrition C.V. Mosby Co. St. Louis.
3. Insel, P., Ross, D., McMahon, K. and Bernstein, M. (2014). Nutrition, 15th edition. Jones & Bartlett Learning, USA.
4. Schlenker, E.D. and Long, S. (2007). Williams' Essentials of Nutrition & Diet Therapy, 9th edition. Mosby Elsevier, Canada.
5. Srilakshmi, B. (1997) Dietetics New Age International(P)Ltd,

CO-PO Mapping Table

	PO 1	PO2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10
CO1	3	2	3	2	2	2	1	2	2	1
CO2	3	2	3	2	2	2	1	2	2	1
CO3	3	2	3	2	1	2	1	2	2	1
CO4	3	2	3	2	1	2	1	2	2	1
CO5	3	2	3	2	2	2	1	2	2	1
Ave.	3	2	3	2	1.6	2	1	2	2	1

Strong – 3**Medium – 2****Low – 1**

Course Code	Name of the Course	Category	Hours/ Wk.	Credits
24FSN3303	Women's Health and Wellness	GE	4	3

To enable the students to understand the diverse factors that have a bearing on women's health, along with different aspects of health that contribute to a good lifestyle for women across the globe

Course Outcomes:

At the end of the course, students will be able to

CO1: Overall view on nutritional requirement of women to maintain a healthy life style.

CO2: Explains the importance of maintaining a good physical health.

CO3: Explain the significance of maintaining the reproductive health of a women.

CO4: Devise strategies to improve women's mental health.

CO5: Discuss the need for good social health for the overall well-being of women.

Unit I:

12 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-Socio economic, Environmental conditions, Health conditions; Consequences of Eating disorders in young women.

Unit II:

12 Hours

Physical Health: Significance of Body weight and Body composition parameters, Benefits of Aerobic, Flexibility and Strength training exercises – on General health, Bone health, and risks associated with NCD's.

Unit III:

12 Hours

Reproductive Health: Menstrual Health, Pregnancy and Lactation, Pre- and Post-Menopausal concerns – preventive measures, sexually transmitted diseases – an overview

Unit IV:

12 Hours

Mental Health: Common mental health problems – Trends and issues relating to women, Depression, Anxiety and coping with Stress, Strategies to improve mental health – learning new skills and hobbies, Relaxation techniques such as yoga and meditation.

Unit V:

12 Hours

Social Health: Balancing home and career, strengthening relationships, enhancing communication skills and Personality Development, technological advancements and its impact, Dealing with domestic violence, and harassment issues

Learning Resources:

Text Books

1. Minkin M. J. and Wright C. V. (2003) The Yale Guide to Women's

Reproductive Health from menarcheto menopause. Yale University Press, London

References

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.Sizer F. S. and Whitney E. (2014) Nutrition: Concepts & Controversies. 13th Ed., Wadsworth, Cengage Learning, USA.

Websites/ e-Learning Resources

1. https://www.nhp.gov.in/social-health_pg
2. <https://ncert.nic.in/textbook/pdf/jehp112.pdf>
3. <https://ncert.nic.in/textbook/pdf/iehp113.pdf>
4. <https://ncert.nic.in/textbook/pdf/lebo104.pdf>
5. <https://www.nih.gov/health-information/social-wellness-toolkit>
6. <https://www.cdc.gov/reproductivehealth/womensrh/index.htm>
7. <https://www.nimh.nih.gov/health/topics/caring-for-your-mental-health>

CO-PO Mapping Table

	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10
CO 1	3	3	2	2	1	2	2	1	1	2
CO 2	3	2	1	1	1	2	1	2	1	2
CO 3	3	2	1	1	1	2	2	2	1	2
CO 4	3	2	2	2	1	1	2	2	1	2
CO 5	3	3	2	2	1	2	1	2	1	2
Average	3	2.4	1.6	1.6	1	1.8	1.6	1.8	1	2

Strong – 3

Medium – 2

Low – 1

Course Code	Name of the Course	Category	Hours/Wk.	Credits
24FSN3255	Internship	IS	-	2

This will provide students with a comprehensive learning experience that bridges the gap between academic knowledge and practical application. Our goal is to equip you with the skills, insights, and hands-on experience necessary to thrive in students with their chosen field.

Course Outcomes:

At the end of the course, students will be able to

CO1: interpret the nature and fundamental concepts about the Food Science and Nutrition, dietetics, etc.

CO2: acquire technological expertise in their specialized fields of study.

CO3: exhibit qualities like keen observational abilities, teamwork, and interpersonal skills developed through site visits.

CO4: implement the project or develop the field assignment using the knowledge gained.

CO5: evaluate and present the data and findings, effectively in their academic and technological expertise.

Students will be pursuing hands-on training internships from the food industries, hospitals, and other institutions with their respective interested fields, and submit their internship reports. The students will be given marks based on their performance in the presentation and viva.

CO-PO Mapping Table

	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5	PSO 6	PSO 7	PSO 8	PSO 9	PSO 10
CO 1	3	3	3	3	3	3	3	1	3	3
CO 2	3	3	3	3	3	3	3	1	3	3
CO 3	3	3	3	3	3	3	3	1	3	3
CO 4	3	3	3	3	3	3	3	1	3	3
CO 5	3	3	3	3	3	3	3	1	3	3
Average	3	3	3	3	3	3	3	1	3	3

Strong – 3

Medium – 2

Low – 1

Course Code	Name of the Course	Category	Hours/Wk.	Credits
23FSN3201	Computer Application in Home Science	SEC	3	2

Computer applications play a vital role in modern home science, revolutionizing various aspects of household management, nutrition, family relationships, and interior design. These applications leverage technology to streamline tasks, enhance efficiency, and empower individuals to make informed decisions for themselves and their families.

Course Outcomes:

At the end of the course, students will be able to

CO1: recall the features of MS Office package.

CO2: describe the application of AutoCAD for design

CO3: explain computer applications in the field of Nutrition

CO4: create textile design patterns using Textile CAD.

CO5: analyze research data using appropriate software and interpret results.

Unit I:

9 Hours

General commands: Creating and opening a file, Steps in creating a folder and saving a file in the destined folder. MS Office Package-Software in MS Office package, creating a document using MS Word, preparing slide presentation using MS Power Point. Making Graphs and Charts using MS office

Unit II:

9 Hours

Computer Application in Space planning: Auto CAD in Interior Design - Need, Purpose and merits. Application – Preparing Plan, Elevation and section drawings for interiors and exteriors. Need for rendered views in design. Creating 3D models and 3D views using Google Sketchup. Advantages of software in design field.

Unit III:

9 Hours

Computer Application in Nutrition: Software package in nutrition education and diet counselling -Patient's health record, Nutritive value of food items, Nutritional analysis, Meal planning and recipes, Types of nutrition Software's – Nutrium, Nutrition maker, Nutritionist pro, Nutritics, Coreplus. Benefits of Nutrition Software's to Nutritionists and Clients

Unit IV:

9 Hours

Computer Application in Textiles: AutoCAD in Textile Designing – Definition, Concept, Application of CAD – Sketching, pattern making, grading patterns, Making markers, Apparel production. Types of Textile CAD software – Woven Textiles, Knitted Fabrics, Printed fabrics, SketchPad system, Texture mapping, Embroidery system, Apparel industry and computer. Advantages of Textile CAD.

Unit V:

9 Hours

Computer Application in Research : Data collection–creating online form using Google forms, Data entry in MS Excel and data analysis using SPSS – Frequency analysis, Cross Tabulation, Chi-Square, T– test, ANOVA and Correlation Co-efficient. Export and saving results in Word document. Creating Tables

Learning Resources:**Text Books**

1. Bengtson, V.L., Acock, A.C., Allen, K.R., Dilworth-Anderson, P., & Klein, D.M. (Eds.) (2005). Sourcebook of family theory & research. New Delhi:
2. Erlbaum Heath, P. (2005). Parent-child relations: History, theory, research, and context. New Jersey: Prentice-Hall.

References

1. Bengtson, V.L., Acock, A.C., Allen, K.R., Dilworth-Anderson, P., & Klein, D.M. (Eds.) (2005). Sourcebook of family theory & research. New Delhi: Sage.
2. Bretherton, I. (1993). Theoretical contributions from developmental psychology. In P.G. Boss, W.J. Doherty, R. La Rossa, W.R. Schumm, & S.K. Steinmetz (Eds.), Sourcebook of family theories and methods: A contextual approach (pp. 505-524). New York, NY: Plenum.
3. Broderick, C. B. (1993) Understanding family process: Basics of family systems theory. New York: Sage.
4. Cole M & Cole. S (1993) The development of children. New York: Scientific American Books.
5. De Lamater, J., & Hyde, J. (2004). Conceptual and theoretical issues in studying sexuality in close relationships.
6. Erlbaum Heath, P. (2005). Parent-child relations: History, theory, research, and context. New Jersey: Prentice-Hall.
7. Ingoldsby, B.B., Smith, S., & Miller, J.E. (2004). Exploring family theories. Los Angeles: Roxbury. Kuczynski, L. (2002). Handbook of dynamics in parent-child relations. New York: Sage.
8. G.W. Peterson & K.R. Bush (eds). Handbook of marriage and the family (pp 423-447). New York, NY: Springer.

Websites/ e-Learning Resources

1. https://us.sagepub.com/sites/default/files/upm-assets/109149_book_item_109149.pdf
2. https://www.npaonline.org/sites/default/files/6.%20NPA%20Family%20Dynamics%20The%20Good%20The%20Bad%20The%20Ugly_DePasquale.pdf
3. https://www.researchgate.net/publication/327078511_Family_Dynamics_and_Intergenerational_Relations_A_psycho-Social_Analysis
4. <http://www.familiesandsocieties.eu/wp-content/uploads/2014/12/WP04BernardiEtal2013.pdf>

CO-PO Mapping Table

	PO 1	PO2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO10
CO1	3	2	3	2	1	1	2	2	1	1
CO2	3	3	3	3	2	1	1	2	2	1
CO3	3	2	2	3	2	1	2	1	2	1
CO4	3	2	3	3	1	1	2	1	1	1
CO5	3	2	3	2	2	1	2	1	1	1
Average	3	2.8	2.8	2.6	1.6	1	1.8	1.4	1.4	1

Strong – 3 Medium – 2 Low – 1

Course Code	Name of the Course	Category	Hours/Wk.	Credits
24FSN3602	Clinical Nutrition (TcL)	Core	6 (3+3)	6

The subject deals with understanding the etiology, physiologic and metabolic anomalies of acute and chronic diseases and patient needs, knowing about the biochemical changes of the disorder to learn the clinical significance of biochemical findings, and familiarizing with recent advances in the medical nutritional management of various diseases

Course Outcomes:

At the end of the course, students will be able to

CO1: Describe the biochemical changes due to disorders of metabolism

CO2: Describe how various disorders can be treated with diet and metabolism

CO3: Evaluate and formulate dietary recommendations and customized diet plans based on clinical conditions

CO4: Illustrate the etiology, manifestation and assessment of diseases of the heart, liver, gallbladder, kidneys and gastrointestinal tract.

CO5: Exhibit skills in qualitative and quantitative estimation of blood and urine samples.

Unit I:

18 Hours

Biochemical changes due to disorders of metabolism : Metabolic and Nutritional implications in Diabetes mellitus, Inborn errors of metabolism – Gout, phenylketonuria, Galactosemia, Lactose intolerance, Ageing–physiological changes with aging. Cellular adaptations to stress

Unit II:

18 Hours

Cardiovascular Disorders: Metabolic and Nutritional implications of Myocardial infarction, atherosclerosis, hyperlipidaemia, hypertension, metabolic syndrome, Role of lipids in cardiovascular disease and Recent advances.

Unit III:

18 Hours

Digestive System, Liver and Pancreatic Disorders: Metabolic and Nutritional implications of Diarrhoea, constipation. Gastritis, ulcers, colitis, malabsorption syndrome, celiac disease, Inflammatory bowel disease, Irritable bowel syndrome, Diet and gut micro flora. Recent advances. Metabolic and nutritional implications of Hepatitis. Cirrhosis of liver, Hepatic coma, Pancreatitis, Cholecystitis and Cholelithiasis. Recent advances

Unit IV:

18 Hours

Renal Disorders: Metabolic and nutritional implications of Nephritis, Nephrotic syndrome, Renal Transplant, Nephrolithiasis and Dialysis. Role of kidney in Water and Electrolyte Balance and Imbalance.

Unit V:

18 Hours

Carcinogenesis : Carcinogens in Food, Types of cancer, Causes, pathogenesis, cancer cachexia, Effect of cancer on metabolism and nutritional status, Recent developments in nutrition and cancer.

Laboratory Experiments

1. Menu plan for Gout,
2. Lactose intolerance
3. Menu for atherosclerosis,
4. Hyper-lipidaemia,
5. Hypertension
6. Menu for Diarrhoea,
7. Constipation.
8. Ulcers,
9. Hepatitis.
10. Cirrhosis of liver,
11. Cholelithiasis.
12. Menu for Nephritis,
13. Nephrotic syndrome
14. Menu for cancer

Learning Resources:**Text Books**

1. Srilakshmi B. (2011) Dietetics, sixth edition, New age Publishing Press, New Delhi.
2. Shubhangini A Joshi, Nutrition and Dietetics, Tata Mc Graw Hill Publishing Company Limited, New Delhi

References

1. Schlenker, E., & Gilbert, J. A, (2018), Williams 'Essentials of Nutrition and Diet Therapy – E - Book. Elsevier Health Sciences.
2. Wardlaw, G M., (2004), Contemporary Nutrition, 2nd Edition, Mosby Publishing.
3. Rolfes, S. R., Pinna, K., & Whitney, E. (2020), Understanding normal and clinical nutrition, Cengage learning.
4. Carol Byrd–Bredbenner, (2013), Wardlaw's perspectives in Nutrition, 9th Edition Mc Graw –Hill International Edition.
5. Mahan L.K., Sylvia Escott- Stump, (2012), Krause's Food Nutrition and Diet Therapy, 13th Edition, W B. Saunders Company, London.
6. Srilakshmi B, (2014), Dietetics, 7th Edition, New Age International Pvt. Ltd. New Delhi.
7. Antia F. P., Abraham P, (2002), Clinical Dietetics, 4th Edition, Oxford Publishing Company.
8. Whitney, E., & Rolfes, S R., (2018), Understanding nutrition. Cengage Learning.

Websites/ e-Learning Resources

1. <https://www.nutrition.gov/>
2. <https://nutrition.org/>
3. [NutritionResourcesforOnlineLearning\(healthyeating.org\)](https://www.healthyeating.org/)

CO-PSO Mapping Table

	PSO1	PSO2	PSO3	PSO4	PSO5	PSO6	PSO7	PSO8	PSO9	PSO10
CO1	3	2	2	2	2	2	1	1	2	1
CO2	3	2	2	2	2	2	1	1	2	1
CO3	3	2	2	2	2	2	1	1	2	1
CO4	3	2	2	2	2	2	1	1	2	1
CO5	3	2	2	2	2	2	1	1	2	1
Average	3	2	2	2	2	2	1	1	2	1

Strong – 3**Medium – 2****Low – 1**

Course Code	Name of the Course	Category	Hours/ Wk.	Credits
24FSN3604	Food Preservation (TcL)	Core	6 (3+3)	6

Food preservation encompasses gaining a comprehensive understanding of the principles underlying the preservation of foods, including the various techniques employed to extend their shelf life. Through this curriculum, students learn to apply acquired knowledge and skills to develop preserved food products effectively

Course Outcomes:

At the end of the course, students will be able to

CO1: Describe the food spoilage, causes and the basic principles of food preservation

CO2: Compare the principles and techniques of various food preservation methods involving high temperatures

CO3: Apply the various low temperature food preservation techniques to increase the shelf life of food products

CO4: Apply the various techniques of drying to preserve different foods so as to increase the shelf life of foods

CO5: Justify the role of non-thermal preservation techniques, and packaging materials on the shelf life of food products

Unit I:

18 Hours

Introduction to food preservation: Food Spoilage - Definition, causes, microorganisms involved in spoilage of bread, fruits and vegetables, meat, fish, egg, milk, juices and pickle. Food preservation - Definition, principles and importance, classification – bactericidal and bacteriostatic methods

Unit II:

18 Hours

Preservation by high temperature: Processing and preservation by high temperature: blanching, pasteurization, sterilization and UHT processing, canning, extraction cooking, dielectric heating, Dehydration.

Unit III:

18 Hours

Preservation by low temperature: Processing and preservation by low temperature – refrigeration, freezing, dehydro-freezing.

Unit IV:

18 Hours

Preservation by drying: Processing and preservation by drying, concentration and evaporation: various methods sun – drying, tray or tunnel drying, spray drying, drum drying freeze drying, fluidized bed drying, advantages and disadvantages.

Unit V:

18 Hours

Preservation by non- thermal methods and food packaging: Processing and preservation by non–thermal methods: salt, sugar, chemicals, smoking, irradiation. Food additives: Definition, types and functions, permissible limits and safety aspects. Food packaging- its types and uses.

Laboratory Exercises

1. Preparation of jams,

2. Jellies
3. Squashes using seasonal fruits and vegetables.
4. Preparation of pickles using fruits and vegetables.
5. Preparation of sauce and ketchup.

Learning Resources:

Text Books

1. Suganthi. V and Subaratinam. R (2021) Textbook on Food preservation, Dipti Press (OPC) Pvt .Ltd, Chennai.
2. Fellows, P. J (2016): Food Processing Technology: Principles and Practice, second Edition, CRC Woodhead publishing Ltd, Cambridge.
3. Rahman M S (2020) Handbook of Food Preservation CRC Press, USA.

References

1. Arthey, D and Ashurst, P. R (1996), Fruit processing, Blackie academic and professional. London.
2. Gould. G. W (1995), New methods of food preservation. Blackie academic and professional. London.
3. Srilakshmi B (2017) Food Science, New Age International Publications, New Delhi.

Websites/ e-Learning Resources

1. <https://www.sciencedirect.com/topics/agricultural-and-biological-sciences/food-spoilage>.
2. <http://ecoursesonline.iasri.res.in/mod/page/view.php?id=111436>
3. <http://ecoursesonline.iasri.res.in/mod/page/view.php?id=111435>
4. <http://www.homepreservingbible.com/2247-an-introduction-to-the-drying-food-preservation-method/>

CO-PSO Mapping Table

CO/ PSO	PS O1	PS O2	PS O3	PS O4	PS O5	PS O6	PS O7	PS O8	PS O9	PSO 10
CO1	3	3	3	2	1	1	1	1	1	1
CO2	3	3	3	2	1	1	1	1	1	1
CO3	3	3	3	1	1	1	1	1	1	1
CO4	3	3	3	1	1	1	1	1	1	1
CO5	3	3	3	1	1	1	1	1	1	1
Average	3	3	3	1.4	1	1	1	1	1	1

*Strong – 3 Medium – 2 Low – 1

Course Code	Name of the Course	Category	Hours/Wk.	Credits
24FSN3606	Project	Core	6	6

This paper mainly focused on developing critical thinking and comprehensive experiential learning in students that connects academic knowledge and practical application. The major objective is to equip the students with the analytical, interpretation and presentation skills, insights, and hands-on experience necessary to thrive in their chosen field.

Course Outcomes:

At the end of the course, students will be able to

CO1: identify the problems and form a hypothesis.

CO2: comprehend the outline of their research study.

CO3: prepare and execute the appropriate scientific research methodology

CO4: Integrate theoretical understanding with the results to interpret.

CO5: develop a new concept/solution for a problem based on scientific research methods.

The students will be doing their project work and present their findings in the form of oral presentation and a dissertation thesis. The students will be given marks based on their performance in the project and viva voce.

CO-PSO Mapping Table

	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5	PSO 6	PSO 7	PSO 8	PSO 9	PSO 10
CO 1	3	3	3	3	3	3	3	3	3	3
CO 2	3	3	3	3	3	3	3	3	3	3
CO 3	3	3	3	3	3	3	3	3	3	3
CO 4	3	3	3	3	3	3	3	3	3	3
CO 5	3	3	3	3	3	3	3	3	3	3
Average	3	3	3	3	3	3	3	3	3	3

Strong – 3

Medium – 2

Low – 1

Course Code	Name of the Course	Category	Hours/Wk.	Credits
24FSN3402	Principles of Resource Management	DSE	5	4

This course enables the students to recognize appropriate resources and develop skills in utilizing the available resources in day-to-day life and helps to gain knowledge about work simplification and effective management of Time, Energy and Money

Course Outcomes:

At the end of the course, students will be able to

CO1: apply the principles of management process in day-to-day life

CO2: identify and analyze the need for resources

CO3: utilize tools of time management effectively in day-to-day life.

CO4: apply work simplification techniques while managing work

CO5: develop good decision – making skills and plan a budget within the available income and to maintain accounts

Unit I:

15 Hours

Introduction to Management: Management Concepts - Definition, Concept, Micro and Macro environment. Principles of Management Process - Planning, Controlling, Evaluating. Qualities of a Good Manager. Motivational factors - Values, Goals and Standards.

Unit II:

15 Hours

Resources and Decision making: Resources - Meaning and classification, optimizing the use of family resources, Factors affecting the use of resources. Decision making – Meaning and its importance, Types of decisions, Decision making process, Methods of resolving conflicts

Unit III:

15 Hours

Time and energy Management: Tools in time management - Time norms, Peak loads, Work Curves and rest periods, Time management process – Planning – Steps in making time plans – Controlling the planning action - Evaluation. Energy Management – The efforts required in home – making activities; Energy required for house hold activities.

Unit IV:

15 Hours

Work Simplification and Body Mechanics: Work Simplification - Definition, Importance, Techniques – Formal and Informal Techniques - Mundel's Classes of change – Planning efficient work areas in kitchen. Body Mechanics - Posture, Gravity, Rhythmic movement, Proper use of Muscle and to take advantage of Momentum. Fatigue- Concepts, Types – Physiological and Psychological fatigue and Managerial process applied to energy

Unit V:

15 Hours

Money Management and family expenditure: Money Management – Family Income - Types, sources and methods of augmenting family income. Family Expenditure – Budget – Meaning – Types of budgets, Planning a budget for a family of a fixed income, Hotel / Restaurant, advantages of budgeting, Factors affecting family budget, Engel's law of consumption, methods of handling money – Family financial records, Savings-

Importance and types

Learning Resources:

Text Books

1. Bela Bhargava (2005), “Family resource Management & Interior Decoration”, university book house pvt ltd, ISBN-13:978-8187339229

References

1. Marion Giordan (2016), “Consumer Education: A handbook for Teachers”, Routledge; 1st Edition, ISBN-13:978-1138839151
2. Nickell & Dorsey (2002), “Management in Family Living”, CBS; 4th edition, ISBN-13:978-8123908519
3. Pushpa Chakravorty (2007), Home Management, New Delhi: Pointer Publishers.
4. Rao (2020), “Taxman’s Human Resource Management”, Taxman Publications Pvt .Ltd.; 2nd edition, ISBN-13:978-9390128396
5. Ready GB (2021), “EBC consumer Protection Act”, LAW BOOKS, ASIN: B097TQ64QV.
6. Steven, D.S, (2016). Consumer Economics: A Practical Overview”, New York: Routledge Taylorand Francis group.
7. Sudhir Dixit (2018), “Time Management”, Manjul Publishing House, ISBN-13:978-9388241106

Websites/ e-Learning Resources

1. <http://www.yourarticlelibrary.com/decision-making/decision-making-in-management-definition-and-features-explained/25657/>
2. <http://www.familyresourcemanagement.org/services/goals/>
3. <http://www.familyresourcemanagement.org/services/standards/>
4. [http://www.nios.ac.in/media/documents/sechmscicour/english/home%20science%20\(eng\)%20ch-15.pdf](http://www.nios.ac.in/media/documents/sechmscicour/english/home%20science%20(eng)%20ch-15.pdf)
5. <https://books.google.co.in/books?id=NJkrzK3CgisC&pg=PA149&lpg=PA149&dq=time,+energy,+money+as+resource+in+management&source=bl&ots=xmSp->

CO-PSO Mapping Table

CO/PSO	PSO1	PSO2	PSO3	PSO4	PSO5	PSO6	PSO7	PSO8	PSO9	PSO10
CO1	3	3	3	2	1	1	1	1	1	1
CO2	3	3	3	2	1	1	1	1	1	1
CO3	3	3	3	1	1	1	1	1	1	1
CO4	3	3	3	1	1	1	1	1	1	1
CO5	3	3	3	1	1	1	1	1	1	1
Average	3	3	3	1.4	1	1	1	1	1	1

Strong – 3

Medium – 2

Low – 1

Course Code	Name of the Course	Category	Hours/Wk.	Credits
24FSN3404	Interior Decoration	DSE	5	4

The subject deals with developing innovative ideas in the use of interior accessories and flower arrangements, to implement the appropriate furniture styles and lighting fixtures for interiors and exteriors.

Course Outcomes:

At the end of the course, students will be able to

CO1: select accessories and arrange pictures suited to the background of interiors.

CO2: Creating innovative flower arrangements in accordance to the occasion and needs.

CO3: apply the principles of furniture arrangement in various areas of Interiors

CO4: apply proper lighting for efficient lighting in interiors and exteriors.

CO5: use decorative styles and wall decoration techniques appropriately in various rooms

Unit I:

15 Hours

Accessories - Definition, Types of accessories, Selection and arrangement of accessories in various areas – living room, Dining room, bedroom, study room with application of art principles and elements of design.

Pictures – Concept, Selection of pictures, framing and mounting of pictures – glass, mat backing, frame, pictures. Types of picture frame – Shadow box, decorative, standard, floating and collage. Hanging law of margin in picture framing

Unit II:

15 Hours

Flower Arrangement - Definition, importance of flower arrangement, Styles of flower arrangement – Traditional, Oriental/Japanese styles - Ikebana, Moribana, Nagarie, Shikibana, Morimono, Rikka, Ukibana and Modern. Selection of containers based upon styles of arrangement. Flowers – Names, its colours, textures and its visual perception in various in doors paces.

Unit III:

15 Hours

Furniture Arrangement - Styles of furniture – traditional, contemporary and modern design. Furniture for different purpose, furniture materials. Selection and arrangement – Furniture for various rooms – Living, dining, bedroom, kitchen, study room, office. Furniture Dimensions, Care and maintenance

Unit IV:

15 Hours

Lighting - Lighting requirements - Definition and Importance of lighting. Ideal light requirements, Types of lighting - General/ Ambient lighting, Task/Spot lighting, Architectural lighting - valance, soffit, bracket, cone, recessed, cornice. Lighting fixtures – Movable and immovable fixtures. Principles of home lighting, Glare - types and causes of glare. Suggestions for improving daylight illumination

Unit V:

15 Hours

Decorative Styles - Concept and Characteristic features of Contemporary, Modern, Traditional, Transitional and Eclectic styles. Wall decoration–Origin, Motifs, Styles and Technique of Madhubhani, Warli, Pithora, Fresco and Tempera

Learning Resources:**Text Books**

1. Andal and Parimalam (2015), “A Textbook of Interior Decoration”, Satish Serial Publishing House, ISBN-13: 978-8189304508
2. Frida Ramstedt, (2020), “The Interior Design Handbook”, Particular Books, ISBN-13: 978-0241438114

References

1. Gary Gordon (2015), “Interior Lighting for Designers”, Wiley; 5th edition, ISBN-13:978- 0470114223
2. Grimley C and Mimi Love (2018), “The Interior Design Reference & specification Book”, Rockport Publishers, ISBN-13 978-1631593802:
3. Mark Karlen, Christina Spangler, et al (2017), “Lighting Design Basics”, Wiley; 3rd edition, ISBN-13: 978-1119312277
4. Nikita Mittal (2021), “The Key of Interior Design (Illustration of Methods &Principles), STANDARD BOOK HOUSE; 1st edition, ISBN-13: 978-8194359753
5. Pratap Rao. M (2020), “Interior Design: Principles and Practice”, Standard Publishersand Distributors Pvt Ltd, ISBN-13: 978-8180141560
6. Seethaeaman P (2019), “Interior Design and Decoration”, CBS; 1st edition, ASIN: 8123911920, ISBN-13 : 978-8123911922

Websites/ e-Learning Resources

1. Greg Batten (2015), “Lighting Control Methods”, <https://www.controlco.com.au/blog/2015/7/16/lighting-control-methods>
2. Frankel Building Group (2021), “7 Elements of Interior Design”, <https://www.frankelbuildinggroup.com/resources/7-elements-of-interior-design/>
3. Prerna Makhija (2022), “The 7 Elements of Design – and how to use them in your home interiors”, <https://www.beautifulhomes.com/home-decor-ideas/interior-design/the-7-elements-of-design-and-how-to-use-them-in-your-home-interiors.html>
4. Foyr (2020), “Importance of Accessories in Interior Design”, <https://foyr.com/learn/accessories-in-interior-design/>
5. Hamstech (2021), “Selection of Accessories in Interior Designing”, <https://www.hamstech.com/selection-of-accessories-in-interior-designing>

CO-PSO Mapping Table

	PSO1	PSO2	PSO3	PSO4	PSO5	PSO6	PSO7	PSO8	PSO9	PSO 10
CO1	3	2	2	2	1	1	2	2	1	1
CO2	3	3	2	2	2	1	2	2	2	2
CO3	3	2	2	2	2	1	2	1	1	1
CO4	2	2	2	1	2	1	1	1	1	1
CO5	2	2	2	2	1	1	2	1	1	1
Average	2.6	2.2	2	1.8	1.6	1	1.8	1.4	1.2	1.2

Strong – 3**Medium – 2****Low – 1**

Course Code	Name of the Course	Category	Hours/Wk.	Credits
24FSN3302	Consumer Education	GE	4	3

To enable the students to be familiar with the problems in buying and consumer legislations. Becoming aware of marketing conditions and the means for problem redressal and to create awareness on various consumer buying problems.

Course Outcomes:

At the end of the course, students will be able to

CO1: identify the major influences on consumerism and consumer buying problem

CO2: overall view on what Human wants, Demand and Supply

CO3: explanations on markets and marketing strategies along with different consumer aids

CO4: assess the quality of product based on different standards

CO5: explain consumer protection legislation and its standards based on consumer problems.

Unit I:

12 Hours

Consumerism and Consumer Buying Problem: Definition and the concept of consumerism–consumer, produce and market. Characteristics of consumers, role of consumers in the Indian economy. Malpractices–Incorrect weights and measures. Misleading, Advertisement and Misbranding.

Unit II:

12 Hours

Human Wants, Demand and Supply: Human Wants, Demand and Supply Definition, classification of human wants–necessities, comfort and luxuries. Meaning of demand and supply. Relation between utility, demand and supply. Factors influencing demand and supply. Types of income - Real, money, psychic, relationship of GNP, national income, personal income, disposable income.

Unit III:

12 Hours

Markets and Marketing: Basic Concept, Classification and functions of Markets, Types of Market. Channels of Distribution: Meaning, types and their advantages and disadvantages. Consumer in the market - Consumer buying habits, buying motives and buying problems. Consumer Aids - Brand–Different types and its importance. Labels–Importance, Merits and demerits. Importance of Packaging and Advertising.

Unit IV:

12 Hours

Quality Assessment of Products: Definition–Standards and standardization and its importance. Quality Seal–BIS, ISI, AGMARK, ISO, HALLMARK, BEELABEL and FPO

Unit V:

12 Hours

Consumer decision-making process and Consumer Protective Services - Consumer decision-making process: Types of consumer decisions, process of decision making, factors determining and influencing consumer behavior, guidelines for wise buying practices. Consumer Protective Services- Consumer Protection Act, Food Adulteration Act–FSSAI. Quality control and inspection Act. Consumer Rights and

Consumer Responsibilities.

Learning Resources:

Text Books

1. Gupta, C.B. and Nair, R.N (2004).Marketing Management: Sultan Chand and Sons,
2. Juliana, M (2011). Green consumerism, United States : SAGE Publishers.

References

1. Kathiresan, S. Radha, V (2004), Marketing: Chennai, Prasanna Publisher.
2. Kumar, N., (1999), Consumer Protection in India, Delhi, Himalaya Publishing House.
3. Pattanchetti, C. C. and Reddy, 2002). Principles of Marketing, Coimbatore : Rainbow Publishers, India.
4. Seetharaman, P. and Sethi, M. (2001). Consumerism: Strategies and Tactics, CBS Publishers and Distributors, New Delhi.
5. Steven, D.S, (2016). Consumer Economics: A Practical Overview”, NewYork: RoutledgeTaylor and Francis group.
6. Suja Nair (2002). Consumer Behaviour : New Delhi. Sultan Chand and Sons.

Websites/ e-Learning Resources

1. <http://www.jagorahakjago.com/consumer-rights/>
2. <https://consumeraffairs.nic.in/organisation-and-units/division/bureau-indian-standards>
3. <https://www.consumer-voice.org/food/know-your-quality-marks/>
4. <http://ecoursesonline.iasri.res.in/mod/page/view.php?id=120087>
5. <http://ecoursesonline.iasri.res.in/mod/page/view.php?id=120086>
6. <https://www.nios.ac.in/media/documents/srsec321newE/321-E-Lesson-17.pdf>

CO-PO Mapping Table

	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10
CO 1	3	2	2	2	1	1	1	1	1	1
CO 2	3	2	2	1	1	1	1	2	1	1
CO 3	3	3	2	2	1	1	1	1	1	1
CO 4	3	2	1	1	1	1	1	2	1	1
CO 5	3	3	2	2	1	1	1	2	1	1
Average	3	2.4	1.8	1.6	1	1	1	1.6	1	1

Strong – 3

Medium – 2

Low – 1

Course Code	Name of the Course	Category	Hours/Wk.	Credits
24FSN3304	Life Skills Strategies and Techniques	GE	4	3

To enable the students to Develop skills for a healthy personal and professional approach to life and gain competency and confidence through mastery of skills needed

Course Outcomes:

At the end of the course, students will be able to

CO1: Identify skill needed for communication skills

CO2: Describe different skills and techniques needed to maintain a healthy personal and professional approach to life

CO3: Develop interpersonal skills and adopt good leadership behaviour for self-empowerment and the empowerment of others

CO4: Recommend life skill strategies for the holistic development of the individual

CO5: Know about universal human values and understand the importance of values in individual and social circles

Unit I:

12 Hours

Communication Skills: Developing Listening, Speaking and Reading Skills, An introduction to Scientific Writing, Letter Writing, Usage of Non-verbal Communication. Writing for Grants – a brief Proposal, Statement of Purpose (SoP). Effective use of social media in communicating messages

Unit II:

12 Hours

Professional Skills: Resume Writing. Interview Skills. Group Discussions, Presentation Skills. Work – Life Balance - Strategies to achieve them, Time Management.

Unit III:

12 Hours

Leadership skills: Leadership skills, Managerial skills, Team building, Entrepreneurial skills, Ethics and Integrity.

Unit IV:

12 Hours

Basic Lifestyle – related Skills: Healthy eating using simple cooking practices, Home makeover skills, Basics in Gardening, Stress Management- Yoga and Fitness practices - benefits for a Holistic Life, An introduction to Martial Arts as a protective strategy

Unit V:

12 Hours

Human Value Skills: Strategies and techniques to promote Non-Violence, Service to the community, developing skills pertaining to administering First Aid

Learning Resources:

Text Books

1. Sullivan D.R.E.(2022). Effective Leadership Skills for Teachers of Young Children. 3rded. Red leaf Press.

References

1. Ashokan, M. S. (2015). Karma yogi: A biography of E. Sreedharan. Penguin, UK.
2. Hanson C.W.
3. (2021). Resume Writing 2021: The ultimate guide to writing are sum that lands youth job. Independently Published, Kindle.
4. Jane E., Burt S., and Nudelman G. (2018). Professional Communication: Deliver effective written, spoken and visual messages.4thed. Juta and Company Pvt. Ltd., Cape Town, South Africa.
5. Kelly T., and Kelly D. (2014). Creative Confidence: Unleashing the Creative Potential Within Us All. William Collins
6. Kumar S., and Lata P. (2015). Communication Skills. 2nd ed. Oxford University Press, India.
7. Kurien V., and Salve G. (2012). I Too Had a Dream. Roli Books Private Limited
8. O'Toole J. (2019) The Enlightened Capitalists: Cautionary Tales of Business Pioneers Who Tried to Do Well by Doing Good. Harper collins.

Websites/ e-Learning Resources

1. <https://www.forbes.com/sites/kimberlyfries/2018/02/08/8-essential-qualities-that-define-great-leadership/#452ecc963b63>
2. https://www.ted.com/talks/david_kelley_how_to_build_your_creative_confidence
3. https://www.ted.com/talks/anil_gupta_india_s_hidden_hotbeds_of_invention
4. <https://www.youtube.com/watch?v=laGZaS4sdeU>

CO-PSO Mapping Table

CO/ PSO	PSO1	PSO2	PSO3	PSO4	PSO5	PSO6	PSO7	PSO8	PSO9	PSO10
CO1	3	3	3	2	1	1	2	1	1	1
CO2	3	3	3	2	1	1	2	1	1	1
CO3	3	3	3	2	1	1	2	1	1	1
CO4	3	3	3	2	1	1	2	1	1	1
CO5	3	3	3	2	1	1	2	2	1	1
Average	3	3	3	2	1	1	2	1.2	1	1

Strong – 3

Medium – 2

Low – 1

Course Code	Name of the Course	Category	Hours/Wk.	Credits
24FSN3266	Professional Competency Skill	SEC	-	2

The Under Graduate degree programmes in Food and Nutrition will provide for purpose-driven education, research and outreach in terms of developing competency among the graduates to face the challenges of the competitive food processing sector. The present food market demand drivers include the need to supply both globally and locally adequate quantities of safe, healthy and diversified food from production to consumption, which calls for skilled, knowledgeable and practice-ready food scientists. The fast paced growth of the food processing sector throws immense challenges in terms of nutrition, health and wellbeing of the increasing population groups who demand for novel foods in terms of quality, shelf life and functionality. Towards this end, competency in food and nutrition at the post graduate level is an important contributor to building the capacity of individuals to think and act effectively when developing and implementing strategies for combating malnutrition and other degenerative diseases.

Course Outcomes:

At the end of the course, students will be able to

CO1: relate knowledge to pursue higher studies.

CO2: formulate innovative ideas in Food industries

CO3: prepare for competitive exams with confidence

CO4: impart knowledge and skills necessary to work in R&D laboratories, food industries, health sectors and at the community level.

CO5: synergise a new generation of post graduates with professional competence to face the challenges of the Food Processing, Quality Control, Food Safety, and Nutritional Sciences.

CO-PSO Mapping Table

CO/PSO	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5	PSO 6	PSO 7	PSO 8	PSO 9	PSO 10
CO 1	3	3	3	3	3	3	3	3	3	3
CO 2	3	3	3	3	3	3	3	3	3	3
CO 3	3	3	3	3	3	3	3	3	3	3
CO 4	3	3	3	3	3	3	3	3	3	3
CO 5	3	3	3	3	3	3	3	3	3	3
Average	3	3	3	3	3	3	3	3	3	3

Strong – 3

Medium – 2

Low – 1

Value Added Courses**w.e.f. 2024-2025**

Sem	Course Code	Course Title	Hours/ Wk	Credits
2	24FSN122V	Health & Nutrition	2	2
3	24FSN221V	Food Adulteration and Additives	2	2
5	24FSN321V	Value Addition of Fruits & Vegetables	2	2

Course Code	Name of the Course	Category	Hours/Wk.	Credits
24FSN122V	Health & Nutrition	VAC	2	2

This course aims to exhibit the importance of nutrition during mental illness. This course will guide the learners to understand the milestones in the development of behavior, cognition, and emotions in various stages of life through proper nutritional support.

Course Outcomes:

At the end of the course, students will be able to

CO1: describe the nutritional problems affecting the community

CO2: discuss the role of nutrition in promoting and maintaining health.

CO3: describe the Nutrition Policy and Programmes

CO4: state interventions to Food and Nutrition Security.

CO5: develop patient and family teaching plans for healthy nutrition.

Unit I

6 Hours

Nutritional problems affecting the community - Etiology, prevalence, clinical features and preventive strategies of Undernutrition - Protein energy malnutrition: Severe Acute Malnutrition and Moderate Acute Malnutrition

Unit II

6 Hours

Nutritional Anaemias, Vitamin A Deficiency, Iodine Deficiency Disorders, Overnutrition – obesity, coronary heart disease, diabetes, Fluorosis

Unit III

6 Hours

Strategies for improving nutrition and health status of the community Appropriate interventions involving different sectors such as Food, Health and Education.

Unit IV

6 Hours

Nutrition Policy and Programmes National Nutrition Policy Integrated Child Development Services (ICDS) Scheme, Mid day Meal Programme (MDMP), National programmes for prevention of Anemia, Vitamin A deficiency, IodineDeficiencyDisorders

Unit V

6 Hours

Food and Nutrition Security ,Concept, components, determinants and approaches. Overview of Public Sector programmes for improving food and nutrition security

Learning Resources

Text book(s)

1. Wadhwa A and Sharma S (2003). Nutrition in the Community-A Textbook. Elite Publishing House Pvt. Ltd. New Delhi.
2. Park K (2011). Park's Textbook of Preventive and Social Medicine, 21st Edition. M/s BanarasidasBhanot Publishers, Jabalpur, India.
3. Bamji MS, Krishnaswamy K and Brahmam GNV (Eds) (2009). Textbook of Human Nutrition, 3rd edition. Oxford and IBH Publishing Co. Pvt. Ltd. New Delhi.
4. Gibney MJ (2005). Public Health Nutrition. Vir S. (2011) Public Health Nutrition in developing countries. Vol 1 and 2

CO-PSO Mapping Table

CO/PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10
CO1	3	3	3	1	2	2	2	1	2	2
CO2	3	3	3	1	2	2	2	2	1	1
CO3	3	3	2	2	2	1	2	1	2	2
CO4	3	2	3	1	2	2	2	2	1	1
CO5	3	3	3	2	2	2	2	1	2	2
Average	3	2.8	2.8	1.4	2	1.8	2	1.4	1.6	1.6

Strong – 3**Medium – 2****Low – 1**

Course Code	Name of the Course	Category	Hours/ Wk.	Credits
24FSN221V	Food Adulteration and Additives	VAC	2	2

This course aims to introduce various Food additives and Food adulterants. This paper provides understating on techniques and methods of detecting the adulterants in the food product

Course Outcomes:

At the end of the course, students will be able to

CO1: Compassionate with the various areas of Food Safety & Quality Assurance

CO2: Gather knowledge of the adulteration of food products

CO3: Decipher food quality managements systems

CO4: Apprehend the Food additives

CO5: Be aware of the concept of adulteration in food products

Unit I:

6 Hours

Introduction to food additives: Food additives - Definition, types and functions, permissible limits and safety aspects.

Unit II:

6 Hours

Food additives: Acid, bases, buffer systems, chelating agent, antioxidant, antimicrobial agent, sweeteners, fat replacers and Masticatory substances.

Unit III:

6 Hours

Functionality of food additives: Regulatory and legal aspects, sensory properties of foods objectives of additives, functional classification of additives, additives of natural origin, synthetic additives. Health and safety aspects of food additives. Present status of various food additives. Controversial food additives Saccharin, history, function, controversy status, aspartame, nitrite and nitrate compounds, nitrosamines.

Unit IV:

6 Hours

Food Adulteration: Definition, reasons for food adulteration, methods of adulteration, and methods of detection.

Unit V:

6 Hours

Types of Adulterants: Common adulterants for foods like milk and milk products, honey, wheat flours, edible oils, cereals, condiments (whole and ground) pulses, coffee, tea, confectionery, baking powder, non-alcoholic beverages, vinegar, besan and curry powder.

Learning Resources:

Textbook

1. Branen, A.L., Davidson PM & Salminen S. 2001. Food Additives. 2nd Ed. Marcel Dekker.

References

1. Gerorge, A.B. 2006. Encyclopedia of Food and Color Additives. Vol. III. CRC Press.
2. Gerorge, A.B. 2004. Fenaroli's Handbook of Flavor Ingredients. 5th Ed. CRC Press.

3. Madhavi, D.L., Deshpande, S.S & Salunkhe, D.K. 2006. Food Antioxidants: Technological, toxicological and Health Perspective. Marcel Dekker
4. Nakai S & Modler HW. 2000. Food Proteins. Processing Applications. Wiley VCH.

CO-PSO Mapping Table

CO/PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10
CO1	3	3	3	1	2	1	1	2	2	2
CO2	3	3	3	2	2	1	2	1	1	2
CO3	3	3	3	2	2	1	2	1	2	1
CO4	3	3	3	1	2	1	2	2	1	2
CO5	3	3	3	2	2	1	2	1	2	2
Average	3	3	3	1.6	2	1	1.8	1.4	1.6	1.8

Strong – 3

Medium – 2

Low – 1

Course Code	Name of the Course	Category	Hours/ Wk.	Credits
24FSN321V	Value Addition of Fruits & Vegetables	VAC	2	2

This course aims to understand the processing of fruits and vegetables and to impart technical knowledge about products development and preservation.

Course Outcomes:

At the end of the course, students will be able to

CO1: Identify the production status and post-harvest handling methods of fruits and vegetables

CO2: Explain the methods of processing and preservation of freshly harvested and cut fruits and vegetables.

CO3: Illustrate the production and preservation methods of fruit juices.

CO4: Classify the dehydration methods and design of driers used for drying fruits and vegetables.

CO5: Describe the aseptic technology for product preservation

Unit I:

6 Hours

Selection of Fruit and Vegetables: Production of Fruits and vegetables in India. Cause for heavy losses, Composition of each of the major fruits and vegetables produced in the country- Spoilage factors, Post harvest field operations.

Unit II:

6 Hours

Preservation of fruits and vegetables: Canning operations of fruits and Vegetables.- Different filling, closing and sterilization operations- . Bottled Products: Preparation of products like Jams, Jellies, Marmalades, Ketchup, Sauce, and Squashes etc. - FSSAI specifications.

Unit III:

6 Hours

Processing of fruits and vegetables: Common machinery for operations like Peeling, Slicing/Dicing and Pulping. Preparation of specialty products like, Fruit juice concentrates, Fruit Bars and Fruit powders. Processing and packaging of cut fruits and vegetables.

Unit IV:

6 Hours

Dehydration: Dehydration principles and equipment used for drying –Cabinet tray dryer, Bin dryer, Freeze Dryers. Freeze drying Preparation of Fruit Powders. Working of Spray Dryer and Drum Dryer. Preparation of Dried slices, Intermediate Moisture Food.

Unit V:

6 Hours

Aseptic processing: Aseptic processing and Bulk packing of Fruit juice and vegetables concentrates. Aseptic heat exchangers for sterilizing and concentrating the product.

Learning Resources:

Text Books

1. Hui Y.H and Others, “Hand Book of Vegetable Preservation and Processing”, Marcel Dekker, New York, 2004.
2. James G. Brennan, (2006) Food Processing Hand book. Weinheim, Germany.

References

1. Chakraverty, A., Mujumdar A.S., Raghavan G.S.V and Ramaswamy H.S. "Handbook of Post-harvest Technology" Marcel Dekker Press, USA, 2001.
2. L.R.Verma and V.K.Joshi, (2000) Post Harvest Technology of fruits and vegetables. Indus Publishing Co, New Delhi, publishing Limited, Cambridge, England.
3. P.Fellows, (2000) Food processing Technology: Principles and Practice. Wood Head.

Websites/ e-Learning Resources

1. [Foods | Free Full-Text | New Approaches for Improving the Quality of Processed Fruits and Vegetables and Their By-Products \(mdpi.com\)](#)
2. [Fruits and Vegetables – Processing Technologies and Applications - Food Processing - Wiley Online Library](#)

CO-PSO Mapping Table

CO/ PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10
CO1	3	3	1	1	2	1	1	1	1	2
CO2	3	3	1	1	2	1	1	2	2	2
CO3	3	3	1	1	2	1	2	2	1	2
CO4	3	3	1	1	2	1	1	2	1	2
CO5	3	3	1	1	1	1	2	1	1	2
Average	3	3	1	1	1.8	1	1.4	1.6	1.2	2

Strong – 3**Medium – 2****Low – 1**